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ABITURIYENT

MATEMATIKA va INFORMATIKA

fanidan mavzulashtirilgan testlar to'plami

1–6

SPECTRUM NASHRIYOTI

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O'QUVCHILAR VA O'QITUVCHILAR GAZETASI

MATEMATIKA va INFORMATIKA

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1–6

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ALGEBRA VA MATEMATIK ANALIZ ASOSLARI

1-bob. Natural va butun sonlar

1. Sonlar ustida amallarning xossalari

1. (a1-g1-1) Bir necha natural sonlarning yig'indisi 46 ga teng. Agar shu sonlarning har biriga 3 ni qo'shib hisoblansa, yig'indi 73 ga teng bo'ladi. Yig'indida nechta son ishtirok etgan?
A) 16 B) 8 C) 9 D) 14

2. (a1-g5-1) 2324252627...7172 sonining raqamlari yig'indisini toping.
A) 431 B) 440 C) 462 D) 423

3. (a1-g7-36) Ushbu 31323334.....7475 sonning raqamlari yig'indisini toping.
A) 420 B) 325 C) 340 D) 414

4. (a1-g11-1) Hisoblang: 274·273 – – 273·272 + 328·327 – 327·326.
A) 310 B) 1200 C) 600 D) 450

5. (a2-g5-1) Ushbu 33343536...7172 sonning raqamlari yig'indisini toping.
A) 480 B) 412
C) 360 D) 372

6. (a2-g8-1) Hisoblang:
467·251 + 123·502 – 231·753.
A) 2510 B) 5020
C) 7530 D) 3765

7. (a2-g9-1) Hisoblang.
274·273 – 273·272 + 328·327 – 327·326
A) 310 B) 1200 C) 600 D) 450

8. (a2-g10-1) Hisoblang.
24·13 + 12·13 + 36·12 + 25·51 – 87·24
A) 87 B) 154 C) 178 D) 89

9. (a2-g17-4) $8^5 + 8^5 + 8^5 + 8^5$ yig'indini hisoblang.
A) 8^{10} B) 4^{10} C) 16^4 D) 2^{17}

10. (a2-g21-1) Hisoblang.
28·25 – 25·25 + 25·32 – 32·22 – 56·3
A) 171 B) 99 C) 57 D) 3

11. (a3-g3-1) Hisoblang.
467·221 + 123·442 – 231·663
A) 2210 B) 4420
C) 6630 D) 4670

12. (a3-g5-2) Barcha ikki xonali sonlar ketma-ket yozib chiqilganda necha xonali son hosil bo'ladi?
A) 198 B) 200 C) 178 D) 180

13. (a3-g8-2) 37·24 – 34·24 + 19·11 – – 16·11 ni hisoblang.
A) 100 B) 110 C) 105 D) 90

14. (a3-g13-1) k, l va m raqamlar. $klm + mlk = 746$ bo'lsa, $(m + k)\cdot l$ ning qiymatini toping. (klm va mlk uch xonali sonlar)
A) 24 B) 56 C) 21 D) 42

15. (a3-g18-2) 262728293031...164165 soni necha xonali son?
A) 341 B) 344 C) 346 D) 343

16. (a3-g18-13) Yig'indini hisoblang.
36 + 42 + 48 + 54 + ... + 96
A) 726 B) 660 C) 690 D) 636

17. (a3-g19-1) Hisoblang.
(7380 + 3690·208):1845 + + 124476:(39832 – 39326)
A) 333 B) 1494 C) 788 D) 666

18. (a3-g20-1) 56 dan 145 gacha bo'lgan sonlarni ketma-ket yozib chiqilganda 4 raqami necha marta takrorlanadi?
A) 25 B) 15 C) 24 D) 14

19. (a3-g21-1) a, b va c lar raqamni ifodalamoqda. $400a + 60b + c = 865$ ga teng bo'lsa, $a\cdot b\cdot c$ ko'paytmani hisoblang.
A) 6 B) 10 C) 15 D) 24

20. (a3-g22-1) Hisoblang.
9562·7565 – 9560·7568
A) –13550 B) 2
C) –2 D) 15250

21. (a3-g24-1) Hisoblang.
65986·65982 – 65984·65983
A) 131958 B) –2
C) 65976 D) 65980

22. (a4-g3-2) x va y raqamlar. xxx va yyy uch xonali sonlar bo'lib, $(xxx)^2 + (yyy)^2 = 61605$ bo'lsa, $x^2 + y^2 = ?$
A) 5
B) 425
C) 15
D) aniqlab bo'lmaydi.

23. (a4-g4-1) abc va ab mos ravishda uch va ikki xonali sonlar. $abc + ab = 1073$ bo'lsa, $a + b + c$ yig'indini hisoblang.
A) 16
B) 22
C) 21
D) Aniqlab bo'lmaydi.

24. (a4-g5-1) 262728293031...72 sonining raqamlari yig'indisini toping.
A) 415 B) 420 C) 422 D) 430

25. (a4-g12-1) Hisoblang.
17·11 + 27·23 – 11·14 – 23·24
A) –66 B) 78 C) 96 D) 102

26. (a4-g15-1) 3637383940....8788 sonining raqamlari yig'indisi quyidagilardan qaysi biriga teng?
A) 532 B) 550 C) 558 D) 542

27. (a4-g15-4) $32^4\cdot125^{13}\cdot8^6$ ko'paytma necha xonali son?
A) 40 B) 39 C) 41 D) 38

28. (a4-g15-12) 37 + 41 + 45 + + 49 + ... + 93 yig'indini hisoblang.
A) 882 B) 975 C) 938 D) 845

29. (a4-g20-1) Hisoblang.
17·15 + 17·18 – 33·34 + 24·18 + 18·9
A) 66 B) 34 C) 68 D) 33

30. (a4-g24-1) n, a va b natural sonlar. $2n + 6 = a + 3b$ bo'lsa, quyidagi ifodalardan qaysi biri doimo toq?
A) $2a + 3b$ B) $5a – 3b$
C) $a – b$ D) $7a – 5b + 3$

31. (a5-g12-1) 84858687...121122123 sonining raqamlari yig'indisini toping.
A) 548 B) 360 C) 447 D) 374

32. (a6-g7-1) 122123124125126. .256 sonining raqamlari yig'indisini toping.
A) 1248 B) 1375
C) 1401 D) 1368

33. (a6-g12-35) 9 + 99 + 999 + + 9999 + ... + $\underbrace{999...9}_{n\text{ ta}}$ yig'indini hisoblang.

A) $\frac{x^2 - 7x + 5}{2x + y}$

B) $\frac{10^{n+1} - 9n - 10}{9}$

C) $\frac{10^n - 2}{10}\cdot 9 - n$

D) $\frac{10^{n+2} - 10n - 9}{10}$

34. (a6-g15-24) Hisoblang:
19·11 + 37·24 – 11·16 – 24·34.
A) 90 B) 105 C) 100 D) 110

35. (a6-g20-8) 565758596061...212 soni necha xonali?
A) 425 B) 427 C) 422 D) 424

36. (a6-g22-15) Natural sonlar to'g'risida keltirilgan mulohazalardan qaysi biri noto'g'ri?
A) Ikkita ikki xonali sonning yig'indisi uch xonali son bo'la oladi.
B) Ikkita ikki xonali sonning ko'paytmasi doimo uch xonali son bo'ladi.
C) Ikki xonali sonning ikki xonali songa bo'linmasi (agar bo'linsa) bir xonali son boladi.
D) Ikkita ikki xonali sonning ayirmasi bir xonali son bo'lishi mumkin.

2. Tub va murakkab sonlar. O'zaro tub sonlar

1. (a2-g2-1) $7a^3 + 8 = 2b – 6c$ ifodada a, b va c lar natural sonlar. Quyidagilardan qaysi biri doimo to'g'ri?
A) a juft son
B) a toq son
C) b va c toq sonlar.
D) b va c juft sonlar

2. (a2-g3-2) x natural son bo'lib, $7x + 4$ juft bo'lsa, quyidagilardan qaysi biri toq?
A) $x + 2$ B) $x^3 + 2$
C) $3x + 3$ D) $x^3 + x$

3. (a2-g6-2) x natural son bo'lib, $7x + 4$ juft bo'lsa, quyidagilardan qaysi biri toq?
A) $x + 2$ B) $x^3 + 2$
C) $3x^2 + 4x^2$ D) $5x^3 + 7$

4. (a2-g11-1) $a^2 + 5 = 2b – 6c$ ifodada a, b va c lar natural sonlar. Quyidagilardan qaysi biri doimo to'g'ri?
A) a juft son
B) a toq son
C) b va c toq sonlar
D) b va c juft sonlar

5. (a2-g14-2) a, b va c lar ketma-ket toq sonlar bo'lsa, $\frac{2b-c}{a} = ?$

A) 1 B) 2 C) 3 D) 4

6. (a2-g18-2) $x-1$dan kichik butun son bo'lsa, quyidagilardan qaysi biri eng katta?

A) $\frac{9}{x+1}$ B) $\frac{9}{x-1}$

C) $\frac{9}{x}$ D) $\frac{9}{x^2}$

7. (a2-g20-2) Quyidagi mulohazalardan qaysi biri to'g'ri?
A) Juft va toq sonlar ko'paytmasi toq bo'ladi.
B) Ratsional sonlar ko'paytmasi irratsional bo'la olmaydi.
C) Toq sonning juft darajasi juft son.
D) To'g'ri kasrning qiymati birdan katta, ikkidan kichik bo'ladi.

8. (a2-g20-13) O'zidan oldingi barcha toq natural sonlar yig'indisining to'qqizdan bir qismiga teng bo'lgan juft natural sonni toping.
A) 18 B) 24 C) 36 D) 48

9. (a2-g22-14) Ikki xonali sonning o'ng tomoniga 4 raqami yozilsa, berilgan sonning to'rtdan bir qismi bilan 511 ning yig'indisiga teng bo'lgan son hosil bo'ladi. Berilgan sonni toping.
A) 54 B) 24 C) 13 D) 52

10. (a3-g4-1) Quyidagi mulohazalardan qaysi biri to'g'ri?
A) Oddiy kasrning surat va maxraji bir xil songa orttirilganda kasrning qiymati o'zgarmaydi.
B) 12 va 8 ga qoldiqsiz bo'lingan sonlar 96 ga ham qoldiqsiz bo'linadi
C) Manfiy sonning manfiy toq darajasi yana manfiy son bo'ladi.
D) Tub sonlar ko'paytmasi ham tub son hisoblanadi.

11. (a3-g4-2) $3x+6$ ifoda toq son bo'lsa, quyidagilardan qaysi biri juft son?
A) x^2+4 B) $3x^3$
C) $2x+3$ D) $3x^2-11x$

12. (a3-g11-1) 16 dan 256 gacha natural sonlar yozib chiqilganda necha xonali son hosil bo'ladi?
A) 639 B) 644 C) 634 D) 650

13. (a3-g17-2) x natural son bo'lib, $12x+5$ toq son bo'lsa, quyidagilardan qaysi biri doimo juft?
A) $x+2$
B) x^3+21
C) $4x+8$
D) aniqlab bo'lmaydi.

14. (a3-g19-14) Ikki xonali sonning raqamlari yig'indisi 10 ga teng. Raqamlari o'rinlari almashtirilganda dastlabki sondan 54 ga kichik bo'lgan son hosil bo'ladi. Sonning raqamlari ko'paytmasini toping.
A) 16 B) 21 C) 9 D) 24

15. (a3-g21-2) Quyidagilardan qaysi biri tub son?
A) 5^7-1 B) 723513
C) 2^8+1 D) $11^{13}+1$

16. (a4-g2-1) n natural son bo'lsa, quyidagilardan qaysi biri doimo juft?
A) $2011n+n^2-5$
B) $2012n+n^5+2$
C) $2015n^3+14n^2-n^2$
D) $404n^5+202n^3-n^2$

17. (a4-g7-1) Agar $7a+3b=4c-5$ tenglik o'rinli bo'lsa, quyidagilardan qaysi biri doimo to'g'ri?
A) $a+b$ juft B) c toq son
C) $a\cdot b$ juft D) c juft son

18. (a4-g13-7) 3 ga karrali dastlabki bir necha sonning yig'indisi o'zining oxirgi hadidan 13 marta katta. Yig'indida nechta had qatnashgan?
A) 25 B) 26 C) 32 D) 39

19. (a4-g22-1) n natural son bo'lsa, quyidagilardan qaysi biri doimo juft son bo'ladi?
A) $4957^n+4959\cdot n$
B) $4957^n+n^{4958}-4955\cdot n$
C) $3236^n+3240n+n^{2010}$
D) $2002^n+n^{3215}-1995n$

20. (a4-g22-4) $9\cdot 8^{24}\cdot 625^{17}$ ko'paytma necha xonali son?
A) 70 B) 73 C) 72 D) 71

21. (a4-g25-24) Natural sonlar haqida berilgan mulohazalardan qaysilari noto'g'ri?
1) ikki xonali sonlar 90 ta; 2) bir nechta juft sonlarning yig'indisi toq son bo'lishi mumkin; 3) bir nechta toq sonlarning yig'indisi juft son bo'lishi mumkin; 4) bir nechta murakkab sonlarning ko'paytmasi tub son bo'lishi mumkin; 5) bir nechta tub sonlarning ko'paytmasi tub son bo'lishi mumkin.
A) 1, 3, 4 B) 2, 4, 5
C) 1, 4, 5 D) 2, 3, 5

22. (a5-g2-13) Raqamlari yig'indisi o'zining 4 dan biriga teng bo'lgan eng katta ikki xonali sonning birlar xonasidagi raqamni toping.
A) 2 B) 4 C) 6 D) 8

23. (a5-g7-1) 15 dan kichik va 15 bilan o'zaro tub bo'lgan sonlar yig'indisini toping.
A) 59 B) 60 C) 72 D) 64

24. (a5-g9-1) Natural sonlar haqida berilgan mulohazalardan qaysilari noto'g'ri?
1) ikki xonali natural sonlar 90 ta; 2) bir nechta juft sonlarning yig'indisi toq son bo'lishi mumkin; 3) bir nechta toq sonlarning yig'indisi juft son bo'lishi mumkin; 4) bir nechta murakkab sonlarning ko'paytmasi tub son bo'lishi mumkin; 5) bir nechta tub sonlarning ko'paytmasi tub son bo'lishi mumkin.
A) 1; 3; 4 B) 2; 4; 5
C) 1; 4; 5 D) 2; 3; 5

25. (a5-g18-7) 1217 sonining tub son ekanligini bilish uchun ketma-ket qaysi tub songacha bo'lish kerak?
A) 37 B) 31 C) 41 D) 29

26. (a5-g23-12) Ikki xonali sonning raqamlari yig'indisi 15 ga teng. Bu sonning raqamlari o'rni almashtirilsa, son 27 ga qisqaradi. Bu sonning raqamlari ko'paytmasini toping.
A) 40 B) 54 C) 56 D) 18

27. (a5-g24-1) $a^2+12=4b-2c$ ifodada a, b va c lar natural sonlar. Quyidagilardan qaysi biri doimo to'g'ri?
A) a juft son
B) a toq son
C) b va c toq sonlar
D) b va c juft sonlar

28. (a6-g5-1) Besh xonali sonning o'n minglar xonasida 7 mavjud. Agar shu 7 birlar xonasiga ko'chirilsa, bu son 31068 taga kamayadi. Shu sonning raqamlari yig'indisini toping.
A) 26 B) 21 C) 18 D) 14

29. (a6-g10-1) Dastlabki 100 ta natural son ichida 8 raqami qatnashmagan natural sonlar nechta?
A) 81 B) 79 C) 82 D) 80

30. (a6-g18-20) Uch xonali sonning birlar va o'nlar xonasidagi raqamlar o'rni almashtirilganda 45 ga ortadigan nechta son mavjud?
A) 40 B) 45 C) 50 D) 36

31. (a6-g24-12) a, b va c raqamlar. $245\cdot abc$ ko'paytmada b ni 2 ga orttirib, c ni 4 taga kamaytirilsa, ko'paytma qanchaga ortadi?
A) 3920 B) 4880 C) 4210 D) 2260

3. Sonlarning bo'linish belgilari

1. (a1-g2-1) 14 ga karrali 3 xonali sonlar nechta?
A) 64 B) 74 C) 63 D) 75

2. (a1-g16-1) 12 ga karrali 3 xonali sonlar nechta?
A) 74 B) 83 C) 67 D) 75

3. (a2-g17-1) n natural son bo'lsa, quyidagilardan qaysi biri doimo juft son bo'ladi?
A) $2011^{2n}+2011\cdot n^2$
B) $2007^{2n}+2004^n-2005^n$
C) $2010^n+2010n+n^{2010}$
D) $2002^n+2007^n+n^{2007}$

4. (a3-g9-11) Quyidagi mulohazalardan qaysi biri noto'g'ri?
A) Bir necha toq sonlar ko'paytmasi juft son bo'lishi mumkin.
B) Darajalari bir xil bo'lgan darajali sonlarni ko'paytirganda asoslari ko'paytirilib, darajalari o'zgarishsiz qoladi.
C) Kvadrat tenglama ikkitadan ko'p ildizga ega bo'la olmaydi.
D) Ikki sonning moduli yig'indisi bu sonlar modullari yig'indisidan kichik bo'lishi mumkin.

5. (a3-g10-1) $4a^3 + 8 = 7b - 3c$ ifodada a, b va c lar natural sonlar. Quyidagilardan qaysi biri doimo to'g'ri?
A) a juft son B) a toq son
C) $b \cdot c$ toq son D) $b + c$ juft son

6. (a6-g8-1) Quyidagi mulohazalardan nechtasi to'g'ri?
1) ikkita ketma-ket toq son kvadratlarining ayirmasi 8 ga bo'linadi;
2) ketma-ket kelgan uchta natural sonlar ko'paytmasi 4 ga qoldiqsiz bo'linadi; 3) bir vaqtda 3 ga va 6 ga bo'lingan son 18 ga bo'linadi;
4) 100 dan kichik barcha tub sonlar ko'paytmasi nol raqami bilan tugaydi.
A) 1 B) 2 C) 3 D) 4

7. (a6-g11-17) Dastlabki 120 ta natural son ichida 3, 5 va 7 ga bo'linmaydigan sonlar nechta?
A) 66 B) 52 C) 54 D) 50

8. (a6-g21-1) $a74b$ to'rt xonali natural son bo'lib, 15 va 18 ga qoldiqsiz bo'linadi. a ning qabul qilishi mumkin bo'lgan qiymatlari yig'indisini toping.
A) 12 B) 7 C) 27 D) 9

4. Sonlarning umumiy bo'luvchisi

1. (a1-g11-2) 570 va 450 sonlarining tub bo'lmagan umumiy bo'luvchilari nechta?
A) 5 B) 6 C) 7 D) 8

2. (a1-g13-1) 108 sonining nechta tub bo'lmagan natural bo'luvchilari mavjud?
A) 6 B) 10 C) 12 D) 8

3. (a2-g16-1) $12 \cdot 34 \cdot 55$ ko'paytmaning natural bo'luvchilari soni nechta?
A) 8 B) 32 C) 64 D) 16

4. (a3-g3-2) 55000 sonining natural bo'luvchilari sonini toping.
A) 40 B) 64 C) 48 D) 24

5. (a3-g6-2) 5148 va 1170 sonlarini qanday bir songa bo'lganda bo'linmalar o'zaro tub sonlar bo'ladi?
A) 78 B) 234 C) 156 D) 396

6. (a3-g9-1) 26100 ning tub bo'luvchilari yig'indisini toping.
A) 32 B) 10 C) 39 D) 42

7. (a5-g8-1) 560 soni qoldiqsiz bo'linadigan butun sonlar nechta?
A) 40 B) 20 C) 24 D) 48

5. Qoldiqli bo'lish

1. (a1-g1-28) 7777^{634} ni 5 ga bo'lganda necha qoldiq qoladi?
A) 1 B) 2 C) 3 D) 4

2. (a1-g4-1) 8 ga bo'linganda 3, 12 ga bo'linganda 7, 15 ga bo'linganda 10 qoldiq qoladigan eng kichik sonni toping?
A) 160 B) 151 C) 125 D) 115

3. (a1-g5-2) $67 \cdot 16 \cdot 22 \cdot 83 + 25 \cdot 16 \cdot 41$ yig'indini 7 ga bo'lgandagi qoldiqni toping.
A) 1 B) 3 C) 6 D) 5

4. (a1-g10-14) Yettiga bo'lganda 4 qoldiq qoladigan barcha ikki xonali sonlarning yig'indisini toping.
A) 594 B) 698
C) 583 D) 689

5. (a1-g12-1) Natural sonlar uchun quyidagi fikrlardan qaysilari noto'g'ri?
1) EKUKi ikki sonning ko'paytmasiga teng bo'lgan sonlar tub sonlar deyiladi;
2) 91 ga qoldiqsiz bo'lingan har qanday son 13 ga ham qoldiqsiz bo'linadi;
3) o'zaro tub sonlarning umumiy bo'luvchilari soni 2 ta;
4) qo'shiluvchilarning ikkisi ham 11 ga bo'linmasa, yig'indi ham 11 ga bo'linmaydi; 5) 9 va 5 ga bo'linadigan juft sonlar 90 ga bo'linadi.
A) 2; 3; 5 B) 1; 2; 4
C) 1; 3; 4 D) 2; 3; 4

6. (a1-g13-13) 6 ga bo'lganda qoldiq 2 chiqadigan dastlabki 20 ta sonning yig'indisini toping
A) 1260 B) 1300
C) 1180 D) 1420

7. (a1-g14-1) Quyidagi fikrlarning qaysi biri noto'g'ri?
A) Agar berilgan son 4 ga va 2 ga bo'linsa, bu son 8 ga ham bo'linadi.
B) Agar ikki qo'shiluvchi 12 ga bo'linsa, yig'indi 6 ga bo'linadi.
C) ko'paytmalari 3 ga bo'linadigan ikki sondan kamida bittasi 3 ga bo'linishi shart.
D) Agar ikki ko'paytuvchidan biri 13 ga bo'linib ikkinchisi bo'linmasa ham ko'paytma 13 ga bo'linadi.

8. (a1-g17-1) $25 + 35 + 40 + 70 + 95$ yig'indini 6 ga bo'lgandagi qoldiqni toping.
A) 1 B) 5 C) 3 D) 0

9. (a2-g1-2) $34a2b$ soni 15 ga qoldiqsiz bo'linadi. Shu sonni 9 ga bo'lganda eng ko'pi bilan necha qoldiq qolishi mumkin?
A) 6 B) 3 C) 5 D) 8

10. (a2-g4-2) 5 dan 32 gacha bo'lgan sonlar ko'paytmasi 3 ning qanday eng katta darajasiga qoldiqsiz bo'linadi?
A) 10 B) 15 C) 13 D) 14

11. (a2-g5-13) Yettiga bo'lganda 4 qoldiq qoladigan barcha ikki xonali sonlarning yig'indisini toping.
A) 594 B) 698
C) 583 D) 689

12. (a2-g6-1) Quyidagi tasdiqlarning qaysi biri noto'g'ri?
A) Agar natural sonning oxirgi ikki raqami hosil qilgan son 2 ga bo'linsa, bu sonning o'zi ham 2 ga bo'linadi.
B) Agar natural sonning raqamlari yig'indisi 6 ga bo'linsa, bu son 3 ga bo'linadi.
C) Agar natural son 15 ga va 9 ga bo'linsa, bu son 105 ga ham bo'linadi.
D) Agar natural sonning oxirgi ikki raqami hosil qilgan son 10 ga bo'linsa, bu son 5 ga bo'linadi.

13. (a2-g7-1) 7777^{634} ni 5 ga bo'lganda necha qoldiq qoladi?
A) 1 B) 2 C) 3 D) 4

14. (a2-g10-2) $62 \cdot 16 \cdot 22 \cdot 65 + 25 \cdot 16 \cdot 18$ yig'indini 7 ga bo'lgandagi qoldiqni toping.
A) 6 B) 0 C) 7 D) 3

15. (a2-g15-2) 2 dan 59 gacha bo'lgan sonlar ko'paytmasi 7 ning qanday eng katta darajasiga qoldiqsiz bo'linadi?
A) 10 B) 9 C) 7 D) 8

16. (a2-g18-1) 4528^{622} ni 5 ga bo'lganda necha qoldiq qoladi?
A) 1 B) 2 C) 3 D) 4

17. (a2-g19-1) 542^{527} ni 7 ga bo'lganda necha qoldiq qoladi?
A) 1 B) 5 C) 3 D) 6

18. (a2-g19-2) Quyidagi mulohazalardan qaysi biri to'g'ri?
A) Ikki son ko'paytmasining x soniga bo'lgandagi qoldiq bu sonlarning har birini x soniga bo'lgandagi qoldiqlar ko'paytmasini x soniga bo'lgandagi qoldiqqa teng.
B) Irratsional sonlar ko'paytmasi doimo ratsional bo'ladi.
C) Noto'g'ri kasrlarning surat va maxrajini bir xil songa orttirganda kasrning qiymati ortadi.
D) Chiziqli tenglama bittadan ko'p ildizga ega bo'la olmaydi.

19. (a2-g21-2) 87 ni bo'lganda qoldiq 11 qoladigan sonlar yig'indisini toping.
A) 57 B) 114
C) 95 D) 133

20. (a2-g22-1) Quyidagi mulohazalardan qaysi biri noto'g'ri?
A) Agar qo'shiluvchilarning har biri 37 ga bo'linmasa u holda yig'indi ham 37 ga bo'linmaydi.
B) Raqamlari yig'indisi 9 ga bo'lingan juft sonlar 6 ga bo'linadi.
C) 9 va 7 ga bo'lingan sonlarning har biri 63 ga bo'linadi.
D) Ikki turli sonning EKUBi shu sonlarning kattasidan doimo kichik bo'ladi

21. (a2-g22-2) Yig'indini 7 ga bo'lgandagi qoldig'ini toping.
$8 + 79 + 789 + 7794 + 77776$
A) 5 B) 2 C) 1 D) 3

22. (a3-g7-1) To'rt xonali $4a5b$ soni 2 va 9 ga qoldiqsiz bo'linsa, a raqami nechta turli qiymatga ega bo'lishi mumkin?
A) 2 B) 4 C) 5 D) 6

23. (a3-g8-1) 842 sonining o'ng tomoniga qanday raqam yozilsa, hosil bo'lgan son 36 ga qoldiqsiz bo'linadi?
A) 8 B) 6 C) 4 D) 2

24. (a3-g12-2) 5 dan 32 gacha bo'lgan sonlar ko'paytmasi 3 ning qanday eng katta darajasiga qoldiqsiz bo'linadi?
A) 10 B) 15 C) 13 D) 14

25. (a3-g14-1) Agar bo'luvchini 6 marta, bo'linuvchini 3 marta orttirsak, bo'linma qanday o'zgaradi?
A) 2 marta ortadi
B) 2 marta kamayadi
C) 18 marta ortadi
D) 18 marta kamayadi

26. (a3-g14-2) Sonni 4, 7 va 12 ga bo'lganda doimo 3 qoldiq qolmoqda. Yuqoridagi shartni qanoatlantiruvchi eng kichik son nechaga teng.
A) 93 B) 81 C) 99 D) 87

27. (a3-g16-8) Quyidagi sonlardan qaysi biri 30 ga qoldiqsiz bo'linmaydi?
A) 72820 B) 20940
C) 19620 D) 16410

28. (a3-g18-1) 7^{122} ni 11 ga bo'lgandagi qoldiqni toping.
A) 10 B) 5 C) 4 D) 9

29. (a3-g19-2) Qoldiqli bo'lishda bo'linuvchi va bo'luvchi 8 marta orttirilsa, qoldiq qanday o'zgaradi?
A) 8 marta kamayadi
B) 4 marta ortadi
C) 8 marta ortadi
D) o'zgarmaydi.

30. (a3-g23-1) Quyidagi mulohazalardan qaysi biri noto'g'ri?
A) Agar qo'shiluvchilarning har biri 17 ga bo'linmasa, u holda yig'indi ham 17 ga bo'linmaydi.
B) Agar sonning raqamlari yig'indisi 9 ga bo'linsa, u sonning o'zi ham 9 ga bo'linadi.
C) 7 va 5 ga bo'lingan sonlarning har biri 35 ga bo'linadi.
D) 24 ning natural bo'luvchilari soni 8 ta.

31. (a4-g6-1) Quyidagilardan nechtasi 66 ga qoldiqsiz bo'linadi?
1) 121·484; 2) 77·246; 3) 243·22; 4) 55·231; 5) 88·27.
A) 2 B) 3 C) 4 D) 5

32. (a4-g7-4) $1\cdot2\cdot3\cdot4\cdot5\cdot\ldots\cdot77$ ko'paytma 3^{x-2} soniga qoldiqsiz bo'linsa, x ning qabul qilishi mumkin bo'lgan eng katta qiymatni toping.
A) 25 B) 35 C) 37 D) 27

33. (a4-g8-2) 7^{32} sonini 9 ga bo'lgandagi qoldiqni toping.
A) 7 B) 8 C) 4 D) 6

34. (a4-g9-1) Qaysidir sonni 65 ga bo'lganda 60 qoldiq qoladi. Shu sonni 13 ga bo'lgandagi qoldiqni toping.
A) 7 B) 5 C) 8 D) 6

35. (a4-g10-1) 1 dan 300 gacha bo'lgan sonlar ko'paytmasi 6^n ga qoldiqsiz bo'linsa, n ning qabul qilishi mumkin bo'lgan eng katta qiymatini toping.
A) 59 B) 148
C) 256 D) 196

36. (a4-g12-2) 457 mn besh xonali son 30 ga qoldiqsiz bo'linsa, m raqamining olishi mumkin bo'lgan eng katta qiymatini toping.
A) 8 B) 2 C) 5 D) 9

37. (a4-g13-33) 3^{4n+2} ni 10 ga bo'lgandagi qoldiqni toping.
A) 4 B) 8 C) 9 D) 1

38. (a4-g14-2) $\frac{14}{3}$, $\frac{12}{7}$ va $\frac{6}{5}$ sonlariga qoldiqsiz bo'linadigan eng kichik natural sonni toping.
A) 124 B) 84
C) 252 D) 102

39. (a4-g16-1) Natural sonni 17 ga bo'lganda bo'linma 15, qoldiq 21 ga teng. Shu sonni toping.
A) 332
B) 372
C) 276
D) bunday bo'lishi mumkin emas.

40. (a4-g17-3) $17^6 + 216$ soni quyidagilardan qaysi biriga bo'linadi?
A) 59 B) 11 C) 9 D) 67

41. (a4-g21-1) Natural sonni 21 ga bo'lganda bo'linma 20, qoldiq 23 ga teng. Shu sonni toping.
A) 432
B) 443
C) 503
D) Bunday bo'lishi mumkin emas.

42. (a4-g23-1) 65^{6n+1} sonni 9 ga bo'lgandagi qoldiqni toping.
A) 2 B) 4 C) 7 D) 5

43. (a5-g2-1) $3a^2b^4$ ko'rinishdagi 24 ga qoldiqsiz bo'linadigan nechta natural son bor?
A) 7 B) 6 C) 8 D) 11

44. (a5-g4-1) 27 dan 56 gacha bo'lgan sonlar ko'paytmasi 3 ning qanday eng yuqori darajasiga bo'linadi?
A) 14 B) 16 C) 12 D) 8

45. (a5-g5-1) 427 ta 427 ning yig'indisini 9 ga bo'lgandagi qoldiqni toping.
A) 4 B) 7 C) 5 D) 2

46. (a5-g6-1) 6, 8 va 10 sonlariga bo'linganda mos ravishda 4, 6 va 8 qoldiq qoladigan eng kichik natural sonni toping.
A) 118 B) 122 C) 88 D) 58

47. (a5-g13-4) Quyidagi sonlardan qaysi biri $9^6 + 64$ soniga qoldiqsiz bo'linadi?
A) 25 B) 23 C) 19 D) 17

48. (a5-g16-1) x sonini 20, 24 va 32 bo'lganda 7 qoldiq qoladi. x ning eng kichik qiymatini toping.
A) 487 B) 247
C) 233 D) 473

49. (a5-g17-23) $2^{24} - 125$ soni quyidagilardan qaysi biriga qoldiqsiz bo'linadi?
A) 17 B) 131 C) 251 D) 261

50. (a5-g19-1) 363738394041...7374 sonini 9 ga bo'lgandagi qoldiqni toping.
A) 7 B) 8 C) 3 D) 2

51. (a5-g20-1) 878787...87 80 xonali sonni 4 ga, 5 ga va 9 ga bo'lgandagi qoldiqlar yig'indisini toping.
A) 8 B) 11 C) 16 D) 9

52. (a5-g21-1) Agar m va n – o'zaro tub natural sonlar $m + n = 20$ shartni qanoatlantirsa, $m\cdot n$ ning olishi mumkin bo'lgan eng katta qiymatini toping.
A) 19 B) 99 C) 91 D) 100

53. (a5-g22-1) a natural sondan 4 ni ayirsa bu son 11 ga bo'linadi. Shu sondan 6 ayirilsa 13 ga, 8 ni ayirsa 15 ga qoldiqsiz bo'linadi. a sonining eng kichik qiymatini toping.
A) 2152 B) 2138
C) 4283 D) 4297

54. (a5-g25-1) $5m4n$ sonini 5 ga bo'lganda 3 qoldiq qoladi va 6 ga qoldiqsiz bo'linadi. m ning olishi mumkin bo'lgan qiymatlar yig'indisini toping.
A) 8 B) 12 C) 15 D) 9

55. (a6-g1-1) 24 dan 62 gacha bo'lgan sonlar ko'paytmasi 12 ning qanday eng yuqori darajasiga bo'linadi?
A) 28 B) 18 C) 19 D) 29

56. (a6-g3-1) x sonini 72 ga bo'lganda bo'linma n ga, qoldiq n^2 ga teng bo'ladi. x ning eng katta qiymati nechaga teng?
A) 73 B) 729 C) 640 D) 468

57. (a6-g3-3) $7^6 + 7^4 - 86$ soni quyidagilardan qaysi biriga qoldiqsiz bo'linadi?
A) 7 B) 17 C) 42 D) 26

58. (a6-g3-12) 36 dan 142 gacha bo'lgan sonlar ichida 5 ga bo'linib, 3 ga bo'linmaydigan nechta son mavjud?
A) 7 B) 14 C) 28 D) 58

59. (a6-g4-1) $7^{6n+2} + 5^{18n+15}$ yig'indini 9 ga bo'lgandagi qoldiqni toping.
A) 3 B) 8 C) 5 D) 2

60. (a6-g9-1) $2001^{2002} + 2003^{2004}$ yig'indini 13 ga bo'lgandagi qoldiqni toping.
A) 2 B) 0 C) 5 D) 12

61. (a6-g12-23) 8 qo'shilsa 8 ga, 10 qo'shilsa 10 ga, 12 qo'shilsa 12 ga bo'linadigan eng kichik sonni toping.
A) 80 B) 100
C) 240 D) 120

62. (a6-g13-7) n quyidagi qiymatlardan qaysi birini qabul qilganda 57^{n+7} sonini 11 ga bo'lganda 9 qoldiq qoladi?
A) 320 B) 123 C) 179 D) 512

63. (a6-g17-1) 34353637...62 sonini 9 ga bo'lgandagi qoldiqni toping.
A) 0 B) 2 C) 3 D) 6

64. (a6-g18-26) $3^{12} - 343^2$ ayirma quyidagilardan qaysi biriga qoldiqsiz bo'linadi?
A) 33 B) 27 C) 24 D) 16

65. (a6-g19-9) 35 dan 2 gacha bo'lgan sonlar kamayish tartibida yozilib chiqib ko'p xonali son yasaldi. Shu yasalgan sonni 25 ga bo'lgandagi qoldiqni toping.
A) 17 B) 7 C) 10 D) 21

66. (a6-g26-1) *abcd* va *adcb* 4 xonali sonlar. *abcd* – *adcb* ayirma haqidagi quyidagi fikrlardan qaysi biri noto'g'ri?
A) 9 ga qoldiqsiz bo'linadi
B) 37 ga qoldiqsiz bo'linadi
C) 33 ga qoldiqsiz bo'linadi
D) 11 ga qoldiqsiz bo'linadi

6. Umumiy bo'luvchi, umumiy karrali

1. (a1-g17-2) $12 \cdot 50 \cdot 16$ sonining nechta butun bo'luvchisi bor?
A) 72 B) 36 C) 48 D) 96

2. (a2-g8-2) 5100 sonining tub bo'luvchilari yig'indisini toping.
A) 27 B) 151 C) 28 D) 14880

3. (a2-g9-2) 570 va 450 sonlarining tub bo'lmagan umumiy bo'luvchilari nechta?
A) 5 B) 6 C) 7 D) 8

4. (a2-g10-6)
$$\sqrt{(\sqrt{5}-\sqrt{3})\sqrt{(\sqrt{5}+\sqrt{3})\sqrt{8+\sqrt{60}}}} = ?$$
A) $\sqrt{2}$ B) 2
C) $2\sqrt{2}$ D) $\sqrt{5}-\sqrt{3}$

5. (a2-g13-34) 15600000 sonining butun bo'luvchilari sonini toping.
A) 192 B) 216 C) 384 D) 256

6. (a2-g23-1) $22^2 + 55^2 + 66^2$ sonining natural bo'luvchilari sonini toping.
A) 18 B) 6 C) 12 D) 9

7. EKUB va EKUK. Sonning natural bo'luvchilari. Sonning natural bo'luvchilari yig'indisi

1. (a1-g6-2) Berilgan ikki sondan biri 15 ga teng. Bu sonlarning EKUKi 75 ga, EKUBi esa 5 ga teng. Ikkinchi sonni toping.
A) 5 B) 25 C) 15 D) 20

2. (a2-g4-1) Ikki sonning EKUK va EKUBlari mos ravishda 108 va 9 ga teng. Bu sonlar ko'paytmasi nechaga teng?
A) 972 B) 486
C) 1458 D) 1944

3. (a2-g5-2) Berilgan ikki sondan biri 36 ga teng. Bu sonlarning EKUKi 252 ga, EKUBi esa 9 ga teng. Ikkinchi sonni toping.
A) 27 B) 63 C) 99 D) 54

4. (a2-g15-1) 24 va 18 sonlarining EKUB va EKUKlari ko'paytmasini toping.
A) 864 B) 384
C) 432 D) 288

5. (a2-g17-2) 48 va 72 sonlarining umumiy bo'luvchilari soni va EKUBi yig'indisini toping.
A) 152 B) 168 C) 144 D) 32

6. (a2-g20-1) 40, 32 va x sonlarining EKUKi $2^5 \cdot 3 \cdot 5$ ga, EKUBi 8 ga teng. x sonining eng kichik qiymatini toping.
A) 36 B) 24 C) 18 D) 48

7. (a2-g23-9) Ikki sonning EKUBi 9 va EKUKi 216. Bu sonlardan biri 72 bo'lsa, ikkinchisini toping.
A) 45 B) 63 C) 27 D) 36

8. (a3-g5-1) Ikki sonning EKUKi 105 ga, EKUBi 7 ga teng. Bu sonlar ko'paytmasi nechaga teng?
A) 315 B) 735
C) 525 D) 630

9. (a3-g7-3) Quyidagi mulohazalardan qaysi biri to'g'ri?
A) Ikki sonning EKUBi bu sonlardan doimo kichik bo'ladi.
B) Bir necha ratsional sonning ko'paytmasi irratsional bo'la olmaydi.
C) Ishoralari bir tomonga qaragan tengsizliklarni ayirganda tengsizlik ishorasi o'zgarmaydi.
D) Ikki modulli ifodaning yig'indisi hech qachon nolga teng bo'la olmaydi.

10. (a3-g12-1) 18 va 12 sonlarining EKUB va EKUKlari ko'paytmasini toping.
A) 108 B) 216 C) 144 D) 288

11. (a3-g23-2) 1260000 sonining natural bo'luvchilari nechta?
A) 150 B) 180
C) 200 D) 250

12. (a3-g24-2) Natural sonlar haqidagi to'g'ri hukmni aniqlang.
A) Ikki sonning EKUBi bu sonlarning kichigidan doimo kichik bo'ladi.
B) Eng kichik tub son 1 ga teng.
C) Natural sonni 17 ga bo'lganda qoldiq eng ko'pi bilan 17 ga teng bo'ladi.
D) 14 va 21 ga qoldiqsiz bo'lingan son 42 ga ham qoldiqsiz bo'linadi.

13. (a4-g1-1) $13^4 + 26^4 + 39^4$ sonining nechta natural bo'luvchisi mavjud?
A) 15 B) 12 C) 30 D) 10

14. (a4-g8-1) 24 va 30 sonlarining EKUB va EKUKlari ko'paytmasini toping.
A) 660 B) 720 C) 780 D) 540

15. (a4-g11-26) 2310000 sonining nechta natural bo'luvchisi bor?
A) 150 B) 180 C) 200 D) 250

16. (a4-g17-1) Ikki natural o'zaro tub sonning yig'indisi 36 ga teng. Bu sonlar EKUKining eng katta qiymati nechaga teng bo'la oladi?
A) 324 B) 323 C) 320 D) 315

17. (a4-g18-1) O'zaro tub sonlarning EKUKi 279 ga teng bo'lsa, bu sonlar ayirmasining moduli nechaga teng?
A) 22
B) 25
C) 17
D) aniqlab bo'lmaydi

18. (a4-g19-1) a va b birdan farqli o'zaro tub sonlar. Bu sonlarning EKUKi 200 ga teng. $a + b$ ning qiymatini toping.
A) aniqlab bo'lmaydi.
B) 45
C) 33
D) 54

19. (a4-g22-2) 108 va 72 sonlarining umumiy bo'luvchilari soni va EKUKi yig'indisini toping.
A) 225 B) 168 C) 144 D) 252

20. (a5-g1-1) 34, 51 va x sonlarining EKUKi 510 ga, EKUBi 17 ga teng bo'lsa, x sonining eng kichik qiymatini toping.
A) 102 B) 68 C) 120 D) 85

21. (a5-g3-1) $26 \cdot 102 \cdot 78$ ko'paytmaning natural bo'luvchilari soni nechta?
A) 32 B) 48 C) 60 D) 72

22. (a5-g9-2) 16500 va 3850 sonlarining umumiy tub bo'luvchilari yig'indisini toping.
A) 12 B) 28 C) 1116 D) 18

23. (a5-g11-1) a va b sonlarining EKUBi c ga teng bo'lsa, shu sonlar EKUKini toping.
A) $\frac{ac}{b}$ B) $\frac{ab}{c}$ C) abc D) ab

24. (a5-g13-1) 24000...0 sonining natural bo'luvchilari soni 416 ta bo'lsa, berilgan son necha xonali?
A) 19 B) 17 C) 14 D) 12

25. (a5-g15-8) Ikki o'zaro tub sonning EKUKi 225 ga teng. Bu sonlarning har biriga 3 qo'shib yangi son hosil qilindi. Yangi hosil qilingan sonlarning EKUKini toping.
A) 450 B) 78 C) 48 D) 84

26. (a5-g17-13) Bir necha sonning EKUBi 30 ga teng. Bu sonlarning hammasi quyidagilardan qaysi biriga bo'linmaydi.
A) 15 B) 30 C) 6 D) 4

27. (a6-g14-3) 1001 va 111111 sonlarining EKUBini toping.
A) 1 B) 1001 C) 37 D) 3

28. (a6-g16-7) Birdan farqli ikki o'zaro tub sonning EKUKi 225 ga teng. Bu sonlarning har biriga 3 qo'shib yangi son hosil qilindi. Yangi hosil qilingan sonlarning EKUKini toping.
A) 336 B) 78 C) 48 D) 84

29. (a6-g18-18) Ikki sonning EKUKi EKUBidan 6 marta katta va EKUB va EKUKlarning yig'indisi 84 ga teng. Bu ikki sonning ko'paytmasini toping.
A) aniqlab bo'lmaydi
B) 864
C) 504
D) 1008

30. (a6-g23-20) a soni b sonidan n marta katta. Bu sonlarning EKUKi EKUBidan necha marta katta?
A) n^2
B) aniqlab bo'lmaydi
C) n
D) $2n$

31. (a6-g25-1) 27% foizi 54 ga, 31% foizi 46,5 ga teng bo'lgan sonlar EKUKining EKUBga nisbatini toping.
A) $\frac{1}{12}$ B) 6 C) 12 D) 1,(6)

8. Sonning oxirgi raqami

1. (a1-g7-1) Yig'indining oxirgi raqamini toping $2^{3215} + 9^{320} + 7^{425}$.
A) 0 B) 4 C) 6 D) 1

2. (a2-g12-3) 25 dan kichik barcha 2 xonali sonlar yig'indisi qanday raqam bilan tugaydi?
A) 8 B) 5 C) 0 D) 4

3. (a3-g1-1) 1 dan 66 gacha bo'lgan juft sonlarning ko'paytmasidan, 1 dan 66 gacha bo'lgan toq sonlar ko'paytmasining ayirmasi qanday raqam bilan tugaydi?
A) 1 B) 0 C) 6 D) 5

4. (a3-g2-2) Birlar xonasidagi raqam 8 bo'lgan 27 ta sonning ko'paytmasi qanday raqam bilan tugaydi?
A) 8 B) 4 C) 2 D) 6

5. (a3-g11-2) Yig'indining oxirgi raqamini toping: $3^{4231} + 4^{723} + 8^{321}$.
A) 3 B) 5 C) 7 D) 9

6. (a3-g15-2) $222^{127} + 334^{234} + 446^{159}$ yig'indining oxirgi raqamini toping.
A) 0 B) 2 C) 6 D) 8

7. (a6-g2-1) $11^{11} + 12^{12} + 13^{13}$sonining oxirgi raqamini toping.
A) 0 B) 6 C) 7 D) 1

8. (a6-g25-20) $1\cdot2\cdot3\cdot4\cdot\ldots\cdot22 + 3\cdot7\cdot11\cdot19$ yig'indi qanday raqam bilan tugaydi?
A) 5 B) 4 C) 0 D) 9

9. Butun sonlar ko'paytmasida nollar sonini topish

1. (a2-g2-2) $15\cdot8\cdot50\cdot27\cdot14\cdot125$ ko'paytma nechta nol bilan tugaydi?
A) 3 B) 4 C) 5 D) 6

2. (a2-g11-2) 18 dan 102 gacha bo'lgan sonlar ko'paytmasi nechta nol bilan tugaydi?
A) 20 B) 17 C) 21 D) 24

3. (a3-g10-2) 23 dan 92 gacha bo'lgan natural sonlar ko'paytmasi nechta nol bilan tugaydi?
A) 22 B) 17 C) 19 D) 15

4. (a5-g23-1) $35\cdot12\cdot375\cdot150\cdot28$ ko'paytma nechta nol bilan tugaydi?
A) 6 B) 8
C) 5 D) 7

2-bob. Butun va ratsional sonlar

10. Butun sonlar ustida amallar

1. (a1-g2-8) Nechta butun x va y sonlar jufti $x^2 - y^2 = 17$ tenglikni qanoatlantiradi?
A) 4 B) 3 C) 1 D) 2

2. (a1-g5-4) Hisoblang. $\dfrac{265^2 - 361}{284}$
A) 274 B) 312
C) 246 D) 512

3. (a1-g6-1) a, b va c raqamlar. $abc + cba = 1453$ bo'lsa, $(a + c)\cdot b$ ning qiymatini toping. (abc va cba uch xonali sonlar)
A) 45 B) 64 C) 80 D) 91

4. (a1-g8-6) a, b va c raqamlar. cba uch xonali, ac ikki xonali sonlar. $cba + ac = 1024$ bo'lsa, $a + b + c$ ni toping.
A) 18 B) 20
C) 24 D) aniqlab bo'lmaydi.

5. (a1-g10-1) Hisoblang.
$12\cdot15 + 13\cdot15 + 25\cdot14 + 29\cdot36 - 61\cdot27$
A) 122 B) 61 C) 66 D) 132

6. (a1-g10-2) $62\cdot14\cdot22\cdot65 + 25\cdot16\cdot14$ yig'indini 6 ga bo'lgandagi qoldiqni toping.
A) 1 B) 3 C) 5 D) 4

7. (a1-g12-17) a, b va c butun sonlar $abc > 0$, $b > c$, $ab < ac$. Yuqoridagilardan foydalanib a, b va c ning ishoralarini mos ravishda toping.
A) –, +, – B) –, –, –
C) +, –, – D) –, –, +

8. (a1-g13-3) Hisoblang. $\dfrac{972^2 - 729}{999}$
A) 981 B) 949 C) 977 D) 945

9. (a1-g15-1) Hisoblang.
$12\cdot17 + 13\cdot17 + 25\cdot18 + 32\cdot35 - 57\cdot34$
A) 114 B) 34
C) 57 D) 68

10. (a1-g15-2) $62\cdot14\cdot22\cdot65 + 25\cdot18\cdot14$ yig'indini 8 ga bo'lgandagi qoldiqni toping.
A) 0 B) 2 C) 6 D) 4

11. (a2-g4-3) $\dfrac{27}{31} + \dfrac{75}{41} + \dfrac{144}{51} = a$ bo'lsa, $\dfrac{4}{31} + \dfrac{7}{41} + \dfrac{9}{51} = ?$
A) $3 - a$ B) $6 - a$
C) $3 + a$ D) $5 + a$

12. (a2-g18-5) Quyidagi mulohazalardan qaysi biri noto'g'ri?
A) Ratsional sonni irratsional songa ko'paytirganda natija doim irratsional bo'ladi.
B) Juft va toq sonlar yig'indisi doimo toq son bo'ladi.
C) Manfiy sonni kvadratga oshirib, kvadrat ildizga olsak yana manfiy son chiqadi.
D) Manfiy sonning manfiy juft darajasi musbat son bo'ladi.

13. (a2-g18-14) Ikki xonali sonning o'nlar xonasiga 3, birlar xonasiga 1 ni qo'shib hosil bo'lgan son bilan dastlabki son qo'shilganda yig'indi 135 ga teng bo'ladi. Dastlabki sonni toping.
A) 52 B) 64 C) 58 D) 48

14. (a2-g20-4) Hisoblang.
$\dfrac{27436^2 - 27432\cdot27440}{42529\cdot42541 - 42535^2}$
A) $-\dfrac{4}{9}$ B) $-\dfrac{2}{3}$ C) $\dfrac{2}{3}$ D) $\dfrac{4}{9}$

15. (a3-g1-4) Hisoblang.
$\dfrac{275^3 + 1200\cdot275\cdot125 + 125^3}{275^2 + 250\cdot275 + 125^2}$
A) 400 B) 1200
C) 400^2 D) 800

16. (a3-g2-1) Hisoblang.
$(450\cdot316 + 450\cdot684):750 +$
$+ (240\cdot543 - 240\cdot243):360$
A) 800 B) 300
C) 700 D) 1000

17. (a3-g4-9) Agar m va n natural sonlar $\sqrt{3}(n-4) + n^2 - 6mn + 23{,}5m = 0$ tenglikni qanoatlantirsa, $m + n$ ni toping.
A) 4 B) 36
C) 12 D) 20

18. (a3-g5-14) Uch xonali sonning birlar xonasi 2 ta orttirildi, o'nlar xonasi 4 ta kamaytirilib, yuzlar xonasi 3 ta orttirildi. Bunda sonning qiymati qanday o'zgaradi?
A) 163 taga kamayadi
B) 163 taga ortadi
C) 163 taga ortadi
D) 262 taga ortadi

19. (a3-g6-1) Hisoblang.
$5 - 2\cdot(5 - 2\cdot(5 - 2\cdot(5 - 2)))$
A) 81 B) –6 C) –27 D) –9

20. (a3-g15-1) Agar kamayuvchi 30 ta va ayriluvchi 12 ta kamaytirilsa, ayirma qanday o'zgaradi?
A) 24 ta ortadi
B) 18 ta kamayadi
C) 12 ta kamayadi
D) 12 ta ortadi

21. (a3-g16-1) Quyidagi mulohazalardan qaysilari to'g'ri?
1) bir necha manfiy sonning ko'paytmasi musbat son bo'lishi mumkin; 2) bir necha toq sonning yig'indisi doimo toq son bo'ladi; 3) ikki sonning EKUBi bu sonlarning kichigidan doimo kichik bo'ladi;
4) noto'g'ri kasrning surati va maxraji bir xil songa orttirilganda kasrning qiymati kamayadi; 5) cheksiz davriy o'nli kasrlar ratsional son hisoblanadi.
A) 1, 3, 4 B) 2, 3, 5
C) 1, 4, 5 D) 2, 4, 5

22. (a3-g22-3) Hisoblang.
$\dfrac{15599^2 - 15595\cdot15603}{9603^3 - 6\cdot9603\cdot9601 - 9601^3}$
A) 0,5 B) 8 C) 2 D) 1

23. (a4-g1-2) Hisoblang.
$\dfrac{3\cdot6\ 9 + 9\cdot18\ 27 + 15\cdot30\ 45 + 18\cdot36\ 54 + 24\cdot48\ 72}{1\cdot2\cdot3 + 3\cdot6\ 9 + 5\ 10\cdot15 + 6\cdot12\ 18 + 8\ 16\cdot24}$
A) 27 B) 9 C) 3 D) 54

24. (a4-g5-4) $12\cdot125^{13}\cdot16^{10} + 27$ soni necha xonali?
A) 39 B) 43 C) 40 D) 41

25. (a4-g5-21) $\sin3x + \sin2x + \sin x = 0$ tenglama $(0; 2\pi)$ oraliqda nechta ildizga ega?
A) 3 B) 5 C) 7 D) 9

26. (a4-g24-3) Hisoblang.

$$\frac{(-3)^4-(-3^4)-3^2}{(-2)^3-(-2)^3+2^4}$$

A) $\frac{153}{16}$ B) $-\frac{9}{16}$
C) $\frac{153}{32}$ D) $-\frac{9}{32}$

27. (a4-g25-1) a, b va c raqamlarni ifodalamoqda. $abc^3 + abc = 5195$ bo'lsa, $a + b + c$ ning qiymatini toping.
A) 15 B) 19 C) 13 D) 21

28. (a5-g4-12) $1\cdot7 + 2\cdot14 + 3\cdot21 + \ldots +$ $+ 20\cdot140$ yig'indida har bir qo'shiluvchining ikkinchi ko'paytuvchisi 3 tadan kamaytirilsa, bu yig'indi qanchaga kamayadi?
A) 630 B) 420 C) 374 D) 465

29. (a5-g8-9) $a\cdot b > 0$, $b^4\cdot c^3 < 0$ va $a\cdot c^2 > 0$ bo'lsa a, b, c larning ishorasi mos ravishda qaysi javobda keltirilgan?
A) –, +, –
B) –, –, +
C) +, –, –
D) +, +, –

30. (a5-g15-16) Hisoblang.

$$\frac{265^2-324}{247}$$

A) 283 B) 217 C) 208 D) 276

31. (a6-g16-14) Hisoblang:

$$\frac{265^2-324}{247}.$$

A) 283 B) 217 C) 208 D) 276

32. (a6-g23-16) Quyidagi funksiya grafigi qaysi choraklardan o'tadi $y = x\cdot|x - \sin x|$.
A) I, II B) I, II, III, IV
C) II, IV D) I, III

11. Oddiy kasrlar ustida amallar

1. (a1-g1-34) Hisoblang.

$$\frac{1}{2}+\frac{1}{24}+\frac{1}{48}+\frac{1}{80}+\frac{1}{120}+\frac{1}{168}$$

A) $\frac{17}{28}$ B) $\frac{125}{333}$ C) $\frac{39}{76}$ D) $\frac{33}{56}$

2. (a1-g3-16) Hisoblang.

$$2\frac{1}{3}+5\frac{1}{3}:\left(6\frac{3}{4}\cdot1\frac{1}{3}-8\frac{1}{9}\right)$$

A) $7\frac{1}{3}$ B) $\frac{26}{3}$
C) $8\frac{1}{3}$ D) $\frac{2}{3}$

3. (a1-g4-2) Hisoblang.

$$\frac{\left(\frac{1}{2}+\frac{1}{3}\right)-\left(\frac{1}{4}-\frac{1}{5}\right)}{\left(\frac{1}{6}+\frac{1}{4}\right)+\left(\frac{1}{10}-\frac{1}{8}\right)}$$

A) $\frac{1}{2}$ B) $\frac{1}{3}$ C) 2 D) 3

4. (a1-g6-3) Hisoblang.

$$\left(89654\frac{2}{7}-89651\frac{1}{2}\right):1\frac{5}{21}+1\frac{4}{5}:2\frac{2}{5}$$

A) $\frac{5}{2}$ B) $\frac{15}{5}$ C) $\frac{3}{2}$ D) $\frac{10}{5}$

5. (a1-g8-7)

$$a=\left(2-\frac{1}{2}\right)\cdot\left(2-\frac{1}{3}\right)\cdot\left(2-\frac{1}{4}\right)\cdot\ldots\cdot\left(2-\frac{1}{10}\right)$$

$$b=\left(1+\frac{1}{3}\right)\cdot\left(1+\frac{1}{5}\right)\cdot\left(1+\frac{1}{7}\right)\cdot\ldots\cdot\left(1+\frac{1}{19}\right)$$

bo'lsa, $a\cdot b$ = ?
A) 26 B) 256
C) 512 D) 1024

6. (a1-g11-3) Hisoblang.

$$\frac{\frac{2}{3}-\frac{2}{5}}{\frac{3}{5}}+\frac{\frac{1}{2}}{\frac{3}{5}}$$

A) $\frac{5}{6}$ B) $\frac{121}{30}$
C) $-\frac{1}{30}$ D) $\frac{103}{15}$

7. (a1-g12-2) Hisoblang.

$$\left(34\frac{2}{7}+16:4\frac{2}{3}\right):8-2\frac{4}{7}$$

A) $4\frac{3}{7}$ B) $2\frac{1}{7}$ C) $3\frac{2}{7}$ D) $6\frac{5}{7}$

8. (a1-g12-15) $\frac{1}{47}+\frac{2}{57}+\frac{3}{67}=a$ bo'lsa, $\frac{93}{47}+\frac{112}{57}+\frac{131}{67}$ nimaga teng?
A) $2a$ B) $3-a$
C) $6-a$ D) $3a$

9. (a1-g13-2) $\frac{5}{57}+\frac{6}{65}+\frac{7}{69}=a$ bo'lsa, $\frac{109}{57}+\frac{59}{65}+\frac{62}{69}$ nimaga teng?
A) $3-a$ B) $6-a$
C) $4-a$ D) $5-a$

10. (a1-g15-3) Hisoblang.

$$\frac{\frac{5}{4}+\frac{5}{4}}{\frac{3}{3}}$$

A) $4\frac{1}{6}$ B) $\frac{5}{6}$
C) $7\frac{1}{4}$ D) $2\frac{1}{12}$

11. (a1-g17-3) Hisoblang.

$$\frac{\frac{5}{2}+\frac{5}{4}+\frac{5}{6}+\frac{5}{8}+\frac{5}{10}}{\frac{4}{3}-\frac{4}{6}-\frac{4}{9}-\frac{4}{12}-\frac{4}{15}}$$

A) $-\frac{1}{2}$ B) $-\frac{9}{8}$
C) $-\frac{5}{4}$ D) $26\frac{5}{8}$

12. (a2-g5-3) Hisoblang.

$$\frac{2-\frac{1}{3}:\frac{5}{6}}{1-\left(\frac{2}{3}-\frac{3}{5}\right)}$$

A) $\frac{3}{2}$ B) $\frac{12}{7}$ C) $\frac{15}{2}$ D) 8

13. (a2-g6-3) $52361-\frac{96730}{96731}$ = ?

A) $52360\frac{1}{96731}$
B) $\frac{96745}{96731}$
C) $52361\frac{96730}{96731}$
D) $52360\frac{96730}{96731}$

14. (a2-g7-2) Hisoblang.

$$\frac{1}{6}+\frac{1}{15}+\frac{1}{35}+\frac{1}{63}+\frac{1}{99}+\frac{1}{143}$$

A) $\frac{37}{84}$ B) $\frac{18}{39}$
C) $\frac{23}{78}$ D) $\frac{7}{12}$

15. (a2-g7-4) $\frac{6}{b}-\frac{b}{3}=\frac{3}{4}$ bo'lsa, $\frac{9}{b^2}+\frac{b^2}{36}$ ni hisoblang.

A) $\frac{9}{64}$ B) $\frac{9}{32}$ C) $\frac{73}{32}$ D) $\frac{73}{64}$

16. (a2-g8-3) Hisoblang.

$$4+\frac{2}{4-\frac{4}{3+\frac{2}{5}}}$$

A) $3\frac{19}{48}$ B) $5\frac{7}{17}$
C) $3\frac{5}{17}$ D) $4\frac{17}{24}$

17. (a2-g9-3) Hisoblang.

$$\frac{\frac{2}{3}-\frac{2}{5}}{\frac{3}{5}}+\frac{\frac{1}{2}}{\frac{3}{5}}$$

A) $\frac{5}{6}$ B) $\frac{121}{30}$
C) $-\frac{1}{30}$ D) $\frac{103}{15}$

18. (a2-g14-4) $x=\frac{11}{3}$, $y=\frac{111}{33}$, $z=\frac{1111}{333}$ larni o'sish tartibida tartiblang.
A) $y < z < x$
B) $z < y < x$
C) $x < y < z$
D) $z < x < y$

19. (a2-g14-5) Agar $\frac{1}{x}+\frac{1}{y}+\frac{1}{z}=-2$ bo'lsa, $\frac{x-7}{x}+\frac{y-7}{y}+\frac{z-7}{z}$ ifoda nechaga teng?
A) 11 B) −11 C) 17 D) 8

20. (a2-g15-3) $A=\frac{2}{11}+\frac{4}{13}-\frac{5}{17}$ va $B=\frac{31}{11}+\frac{22}{13}-\frac{12}{17}$ bo'lsa, A + B ning qiymatini toping.
A) 2 B) 3 C) 4 D) 6

21. (a2-g16-3) Hisoblang.
$\left(\frac{2}{3}+\frac{5}{7}+\frac{5}{9}\right)+\left(\frac{2}{7}+\frac{4}{9}+\frac{10}{13}\right)+\left(\frac{1}{3}+\frac{3}{13}\right)$
A) 4 B) 3 C) 0,25 D) 0,5

22. (a2-g16-7) $\frac{a}{b}=\frac{3}{4}$ va $\frac{a}{c}=\frac{2}{5}$ bo'lsa, $\frac{b}{c}=?$
A) $\frac{8}{15}$ B) $\frac{4}{5}$ C) $\frac{2}{3}$ D) $\frac{9}{4}$

23. (a2-g16-10) $mn=\frac{13}{7}$ va $30<\frac{13}{n}<70$ bo'lsa, m ning olishi *mumkin bo'lgan butun sonlari nechta?*
A) 6 B) 3 C) 4 D) 5

24. (a2-g17-3) $4\frac{2}{5}$ soni $2\frac{3}{4}$ marta kamaygan bo'lsa, u qanchaga kamaygan?
A) $3\frac{2}{3}$ B) $4\frac{1}{3}$
C) $2\frac{4}{5}$ D) $3\frac{1}{4}$

25. (a2-g19-7) Agar $\frac{a}{3}=\frac{b}{4}=\frac{c}{5}$ bo'lsa, $\frac{a^2-b^2+c^2}{bc}$ ni hisoblang.
A) $\frac{9}{10}$ B) $\frac{5}{6}$ C) 0 D) $-\frac{5}{6}$

26. (a2-g20-3) Agar $\frac{68}{37}+\frac{47}{24}+\frac{12}{25}=m$ bo'lsa, $\frac{6}{37}+\frac{1}{24}+\frac{13}{25}$ ning qiymatini toping.
A) $6-m$ B) $m-6$
C) $5-m$ D) $m-5$

27. (a2-g20-14) Qisqarmaydigan oddiy kasrning maxraji suratidan 6 birlikka katta. Agar kasrning surat va maxrajiga 5 ni qo'shsak, hosil bo'lgan kasrning qiymati $\frac{1}{2}$ ga teng bo'ladi. Berilgan kasrning maxrajini toping.
A) 11 B) 13 C) 12 D) 7

28. (a2-g22-3) Hisoblang.
$\left(1-\frac{1}{5^2}\right)\cdot\left(1-\frac{1}{6^2}\right)\cdot\left(1-\frac{1}{6^2}\right)\cdot\ldots\cdot\left(1-\frac{1}{104^2}\right)$
A) $\frac{7}{8}$ B) $\frac{21}{26}$
C) $\frac{21}{104}$ D) $\frac{7}{26}$

29. (a2-g22-7) $\frac{x}{2}=\frac{y}{5}=\frac{z}{6}$ bo'lsa, $\frac{x^2+y^2+z^2}{xy+yz+xz}$ ni hisoblang.
A) $\frac{5}{4}$ B) $\frac{48}{43}$ C) $\frac{32}{25}$ D) $\frac{16}{7}$

30. (a2-g23-2) Kasrni hisoblang.
$\frac{1}{2\cdot5}+\frac{1}{4\cdot7}+\frac{1}{7\cdot10}+\frac{1}{10\cdot13}+\ldots+\frac{1}{37\cdot40}$
A) $\frac{19}{40}$ B) $\frac{11}{40}$ C) $\frac{19}{80}$ D) $\frac{7}{40}$

31. (a3-g1-3) Hisoblang.
$\left(\left(\frac{2}{25}+\frac{7}{45}\right)-\left(\frac{4}{50}-\frac{38}{45}\right)\right):1\frac{2}{3}$
A) $\frac{5}{3}$ B) 0,6 C) $\frac{4}{15}$ D) 3,75

32. (a3-g2-3) $a=-\frac{3}{5}$, $b=-\frac{6}{9}$ va $c=-\frac{5}{8}$ kasrlarini o'sish tartibida joylashtiring.
A) $a<c<b$
B) $c<a<b$
C) $b<a<c$
D) $b<c<a$

33. (a3-g3-3) Hisoblang.
$2+\cfrac{2}{2+\cfrac{4}{3-\cfrac{3}{5}}}$
A) $3\frac{11}{13}$ B) $3\frac{7}{11}$
C) $2\frac{5}{13}$ D) $2\frac{6}{11}$

34. (a3-g4-7) $\frac{8a}{5}=\frac{7b}{6}=\frac{5c}{7}=\frac{6d}{8}$ tenglik o'rinli bo'lsa, quyidagi sonlardan qaysi biri eng katta?
A) a B) b C) c D) d

35. (a3-g6-13) Hisoblang.
$\left(\frac{1}{3}+\frac{2}{3}+\frac{3}{3}\right)+\left(\frac{1}{4}+\frac{2}{4}+\frac{3}{4}+\frac{4}{4}\right)+\ldots+$
$+\left(\frac{1}{15}+\frac{2}{15}+\frac{3}{15}+\ldots+\frac{15}{15}\right)$
A) 70 B) 65 C) 54 D) 63

36. (a3-g7-2) $\frac{1}{3\cdot5}+\frac{1}{5\cdot7}+\frac{1}{7\cdot9}+\ldots+\frac{1}{17\cdot19}$ hisoblang.
A) $\frac{2}{25}$ B) $\frac{7}{51}$ C) $\frac{8}{57}$ D) $\frac{3}{35}$

37. (a3-g9-2) Hisoblang.
$\cfrac{\left(\frac{2}{3}+\frac{5}{7}\right)-\left(\frac{2}{7}-\frac{1}{3}\right)}{\left(\frac{5}{9}+\frac{6}{7}\right)+\left(\frac{4}{9}-\frac{2}{7}\right)}$
A) $\frac{10}{11}$ B) $\frac{11}{10}$ C) $\frac{3}{4}$ D) $\frac{4}{3}$

38. (a3-g11-3) Hisoblang.
$\frac{5}{3\cdot6\cdot9}+\frac{5}{3\cdot9\cdot12}+\frac{5}{3\cdot12\cdot15}+$
$+\frac{5}{3\cdot15\cdot18}+\ldots+\frac{5}{3\cdot27\cdot30}$
A) $1{,}5^{-1}$ B) $4{,}5^{-1}$
C) $13{,}5^{-1}$ D) 18^{-1}

39. (a3-g12-3) $A=\frac{20}{11}+\frac{37}{13}-\frac{7}{15}$ va $B=\frac{13}{11}+\frac{15}{13}-\frac{8}{15}$ bo'lsa, A + B ning qiymatini toping.
A) 3 B) 5 C) 8 D) 6

40. (a3-g13-3) Hisoblang.
$\left(4256\frac{1}{2}-4254\frac{3}{5}\right):2\frac{17}{20}+1\frac{5}{11}:1\frac{31}{33}$
A) $\frac{7}{12}$ B) $\frac{15}{5}$ C) $\frac{17}{12}$ D) $\frac{10}{5}$

41. (a3-g16-2) Hisoblang.
$\cfrac{\frac{3}{2}+\cfrac{\frac{3}{22}+\frac{5}{34}+\frac{7}{44}}{\frac{3}{11}+\frac{5}{17}+\frac{7}{22}}}{}$
A) 2 B) 3,5 C) 1 D) 0,5

42. (a3-g17-3) x soni musbat ratsional son. Undan $4\frac{1}{8}$ sonini ayirganda manfiy butun songa aylanmoqda. x sonining kasr qismi quyidagilardan qaysi biriga teng?
A) 25 B) 125 C) 875 D) 375

43. (a3-g18-3) Qanday eng kichik natural son $\frac{10}{17}$, $\frac{8}{23}$ va $\frac{15}{21}$ sonlarning har biriga qoldiqsiz bo'linadi?
A) 150 B) 120 C) 60 D) 40

44. (a3-g19-3) $\frac{2}{3}$, $\frac{4}{7}$, $\frac{1}{2}$, $\frac{7}{9}$ va $\frac{3}{4}$ kasrlari o'sish tartibida yozib chiqilganida ulardan qaysi biri o'rtada turadi?
A) $\frac{3}{4}$ B) $\frac{2}{3}$ C) $\frac{7}{9}$ D) $\frac{4}{7}$

45. (a3-g20-2) $\frac{4}{7}$ kasr avval $\frac{3}{5}$ marta orttirildi. Keyin $\frac{8}{15}$ marta kamaytirildi. Natijaviy kasr boshlang'ich kasrdan qanchaga ortiq?
A) $\frac{1}{14}$ B) $\frac{9}{8}$ C) $\frac{3}{14}$ D) $\frac{1}{8}$

46. (a3-g22-6) $\frac{a}{2}=\frac{b}{3}=\frac{c}{4}$ bo'lsa,

$\frac{a^2+2bc+c^2}{a+b+c}=?$

A) $\frac{32}{9}$

B) aniqlab bo'lmaydi

C) $\frac{16}{3}$

D) $\frac{44}{9}$

47. (a3-g23-9) $mn=\frac{11}{5}$ va

$25<\frac{11}{n}<70$ bo'lsa, m ning olishi mumkin bo'lgan butun sonlari nechta?

A) 12 B) 4 C) 8 D) 9

48. (a3-g24-3) Hisoblang.

$\frac{\frac{4}{5}}{6}+\frac{\frac{4}{5}}{\frac{6}{6}}+\frac{\frac{1}{4}}{\frac{5}{6}}$

A) $6\frac{4}{15}$ B) $5\frac{7}{30}$

C) $4\frac{7}{10}$ D) $5\frac{2}{5}$

49. (a4-g1-6) Quyidagi mulohazalardan qaysi biri to'g'ri?

A) Manfiy ishorali noto'g'ri kasrning qiymati –1 dan katta bo'ladi.

B) Musbat ishorali noto'g'ri kasrning surat va maxrajini bir xil songa orttirganda kasrning qiymati ortadi.

C) Kasrlarni bo'lganda bo'linma noto'g'ri kasr bo'lsa, bo'luvchi kasr bo'linuvchi kasrdan katta bo'ladi.

D) Musbat ishorali to'g'ri kasrning surat va maxrajidan bir xil son ayrilganda kasrning qiymati kamayadi.

50. (a4-g1-8) a, b, c va d manfiy sonlar bo'lsa, quyidagilardan qaysi biri eng katta?

$\frac{8a}{5}=\frac{7b}{6}=\frac{5c}{7}=\frac{6d}{8}$

A) a B) b C) c D) d

51. (a4-g3-3) $\frac{2}{3}$ qismining $\frac{3}{8}$ qismi 4,(36) ga teng bo'lgan sonni toping.

A) 1,(09) B) 16,(45)

C) 16,(36) D) 17,(45)

52. (a4-g4-3) Quyidagi kasrlarni o'sish tartibida yozing.

$a=\frac{5}{7}$; $b=\frac{7}{10}$; $c=\frac{9}{13}$

A) $c<a<b$ B) $a<b<c$

C) $c<b<a$ D) $b<c<a$

53. (a4-g4-7) $\frac{a}{b}=\frac{8}{3}$; $\frac{b}{c}=\frac{3}{4}$; $\frac{c}{d}=\frac{5}{2}$

bo'lsa, $\frac{a^2+d^2}{2ad}=?$

A) $\frac{13}{5}$ B) $\frac{25}{4}$ C) $\frac{26}{9}$ D) $\frac{12}{5}$

54. (a4-g5-2) Quyidagi kasrlardan nechtasini chekli o'nli kasr shaklida ifodalash mumkin?

1) $\frac{21}{98}$; 2) $\frac{42}{75}$; 3) $\frac{8}{36}$; 4) $\frac{13}{40}$.

A) 1 B) 2 C) 3 D) 0

55. (a4-g5-6) $\frac{x}{4}=\frac{y}{5}=-\frac{z}{3}$ bo'lsa,

$\frac{x^2+xy-yz}{z^2-xy+yz}=?$

A) $\frac{31}{4}$ B) $-\frac{51}{26}$

C) $\frac{31}{26}$ D) $-\frac{51}{44}$

56. (a4-g6-2) Hisoblang.

$\frac{1}{5\cdot6}+\frac{1}{6\cdot8}+\frac{1}{8\cdot10}+\frac{1}{10\cdot12}+\ldots+\frac{1}{34\cdot36}$

A) $\frac{31}{180}$ B) $\frac{13}{90}$ C) $\frac{37}{360}$ D) $\frac{13}{45}$

57. (a4-g8-3) $A=\frac{25}{13}+\frac{32}{17}-\frac{22}{19}$ va $B=\frac{14}{13}+\frac{19}{17}-\frac{16}{19}$ bo'lsa, A + B ning qiymatini toping.

A) 6 B) 5 C) 3 D) 4

58. (a4-g11-15) a, b va c lar raqamlar bo'lsa, $\frac{\overline{aaa}+\overline{bbb}+\overline{ccc}}{\overline{aab}+\overline{bbc}+\overline{cca}}=?$

A) 1 B) 10 C) 11 D) 111

59. (a4-g11-28) 28. $\frac{x}{2}=\frac{y}{5}=\frac{z}{6}$ bo'lsa,

$\frac{x^2+y^2+z^2}{xy+yz+xz}=?$

A) $\frac{5}{4}$ B) $\frac{48}{43}$ C) $\frac{32}{25}$ D) $\frac{16}{7}$

60. (a4-g12-14) Guruhdagi o'g'il bolalar qizlardan 3 baravar ko'p. O'g'il bolalarning o'rtacha yoshi a va qizlarning o'rtacha yoshi b bo'lsa, guruhning umumiy o'rtacha yoshini toping.

A) $\frac{a+b}{2}$ B) $\frac{3a+b}{4}$

C) $\frac{a+3b}{4}$ D) $\frac{4a+b}{4}$

61. (a4-g13-31) Hisoblang.

$2+\frac{2}{3\cdot5}+\frac{2}{5\cdot7}+\ldots+\frac{2}{43\cdot45}$

A) $\frac{116}{45}$ B) $\frac{106}{45}$ C) $\frac{112}{45}$ D) $\frac{104}{45}$

62. (a4-g14-3) Hisoblang.

$$\frac{\left(\frac{13}{14}-\frac{9}{4}\right)-\left(\frac{17}{9}-\frac{1}{14}\right)-\left(\frac{1}{9}+\frac{3}{4}\right)}{\left(\frac{16}{5}+\frac{97}{21}\right)-\left(\frac{47}{17}-\frac{8}{21}\right)-\left(\frac{1}{5}+\frac{4}{17}\right)}$$

A) –0,8 B) $\frac{4}{5}$

C) $1\frac{1}{4}$ D) –1,25

63. (a4-g15-3) Hisoblang.

$\left(251\frac{2}{5}-249\frac{1}{2}\right):1\frac{4}{15}+2\frac{3}{5}:2\frac{4}{11}$

A) 4,3 B) 4,2 C) 5,1 D) 2,6

64. (a4-g16-2) $\frac{5}{6}$ va $\frac{6}{7}$ sonlari orasida umumiy maxrajga ega bo'lgan ikkita kasr son bo'lishi uchun ularning maxraji kamida nechaga teng bo'lishi lozim?

A) 42 B) 84 C) 168 D) 126

65. (a4-g16-13) Qisqarmas kasrning surati maxrajidan 6 ga kam. Kasrning suratiga 2, maxrajiga 11 qo'shilsa, kasrning qiymati 0,5 ga teng bo'ladi. Kasrning surat va maxrajlari yig'indisini toping.

A) 20 B) 16 C) 28 D) 32

66. (a4-g17-2) Hisoblang.

$$\cfrac{2+\cfrac{1}{2+\cfrac{1}{2+\cfrac{1}{2}}}}{2+\cfrac{1}{2+\cfrac{1}{2+\cfrac{1}{3}}}}$$

A) $\frac{7}{14}$ B) $\frac{218}{217}$

C) $\frac{374}{205}$ D) $\frac{493}{492}$

67. (a4-g21-2) $\frac{7}{8}$ va $\frac{8}{9}$ sonlari orasida umumiy maxrajga ega bo'lgan uchta kasr son bo'lishi uchun ularning maxraji kamida nechaga teng bo'lishi lozim?

A) 72 B) 288 C) 36 D) 144

68. (a4-g21-13) Qisqarmas kasrning surati maxrajidan 6 ga kam. Kasrning suratiga 3, maxrajiga 17 qo'shilsa, kasrning qiymati 0,5 ga teng bo'ladi. Kasrning surat va maxrajlari yig'indisini toping.

A) 20 B) 32 C) 28 D) 40

69. (a4-g22-3) $5\frac{2}{3}$ soni $3\frac{1}{4}$ marta ortgan bo'lsa, u qanchaga ortgan?

A) $18\frac{5}{12}$ B) $15\frac{1}{6}$

C) $12\frac{3}{4}$ D) $3\frac{1}{4}$

70. (a4-g23-2) Hisoblang.

$\frac{1}{6\cdot8}+\frac{1}{8\cdot11}+\frac{1}{11\cdot14}+$

$+\frac{1}{14\cdot17}+\ldots+\frac{1}{25\cdot28}$

A) $\frac{11}{252}$ B) $\frac{17}{252}$

C) $\frac{17}{336}$ D) $\frac{11}{168}$

71. (a4-g25-2) Hisoblang.

$$\frac{\frac{1}{13}+\frac{2}{17}+\frac{3}{22}}{\frac{1}{39}+\frac{2}{51}+\frac{1}{22}}-\frac{\frac{2}{17}-\frac{1}{8}-\frac{1}{13}}{\frac{1}{16}+\frac{1}{26}-\frac{1}{17}}$$

A) 5 B) 1 C) –1 D) –5

72. (a5-g1-2) $x=\frac{3}{4}\ y=\frac{2}{5}\ z=\frac{3}{8}$ bo'lsa, quyidagi tengsizliklardan qaysi biri o'rinli?

A) $x<y<z$
B) $z<y<x$
C) $y<x<z$
D) $z<x<y$

73. (a5-g2-2) Hisoblang.

$$\left(2-\frac{1}{2}\right)\cdot\left(1-\frac{1}{3}\right)\cdot\left(1-\frac{1}{4}\right)\cdot\left(1-\frac{1}{5}\right)\cdot\ldots\cdot\left(1-\frac{1}{16}\right)$$

A) $\frac{15}{32}$ B) $\frac{3}{16}$ C) $\frac{45}{32}$ D) $\frac{1}{5}$

74. (a5-g3-7) $\frac{a}{4}=\frac{b}{7}=\frac{c}{3}$ bo'lsa,

$$\frac{a^3+bc^2+abc}{a^2+b^2+c^2}=?$$

A) aniqlab bo'lmaydi
B) $\frac{211}{74}$
C) $\frac{343}{84}$
D) $\frac{162}{37}$

75. (a5-g3-13) Qisqarmas kasrning surati maxrajidan 6 ga kam. Kasrning suratiga 3, maxrajiga 7 qo'shilsa, kasrning qiymati 0,5 ga teng bo'ladi. Kasrning surat va maxrajlari yig'indisini toping.

A) 20 B) 16 C) 28 D) 32

76. (a5-g4-2) $\frac{12}{13}$; $\frac{9}{14}$ va $\frac{15}{28}$ sonlariga qoldiqsiz bo'linadigan eng kichik natural sonni toping.

A) 364 B) 120 C) 180 D) 90

77. (a5-g6-2) $x+\frac{1}{25}$ soni musbat butun son bo'lsa, x ning verguldan keying qismi quyidagilardan qaysi biriga teng?

A) 04 B) 0,96
C) 0,025 D) 0,975

78. (a5-g7-2) $a=\frac{53}{50}$; $b=\frac{553}{550}$ va $c=\frac{1003}{1000}$ sonlarini o'sish tartibida joylashtiring.

A) $a<b<c$
B) $b<a<c$
C) $c<b<a$
D) $c<a<b$

79. (a5-g8-2) $\frac{\frac{3}{4}}{5}$ soni $\frac{3}{\frac{4}{5}}$ marta orttirilsa, u qanchaga ortadi?

A) $\frac{15}{4}$ B) $\frac{33}{80}$
C) $\frac{9}{16}$ D) $\frac{18}{5}$

80. (a5-g9-18) $2^a=3$ va $8^b=81$ va bo'lsa, $\frac{3a-b}{b+a}$ ning qiymatini toping.

A) $\frac{9}{7}$ B) $\frac{5}{7}$
C) 6 D) $-\frac{2}{3}\log_2 3$

81. (a5-g10-1) Ushbu ustunli ko'paytirishda ikkinchi qo'shiluvchi o'ng tomonga bir xona siljib qolgan va natijada noto'g'ri natijaga erishilgan. Agar ko'paytma to'g'ri bajarilganda natija nechaga teng bo'lar edi?

A) 1403 B) 1495
C) 1311 D) 1725

82. (a5-g11-2) Hisoblang.

$$\frac{1}{3}+\frac{1}{4}+\frac{1}{28}+\frac{1}{70}+\frac{1}{130}+\ldots+\frac{1}{700}$$

A) $\frac{2}{3}$ B) $\frac{9}{28}$ C) $\frac{47}{84}$ D) $\frac{55}{84}$

83. (a5-g12-2) $x=1-\frac{1280}{1290}$, $y=\frac{85}{80}-1$ va $y=1-\frac{210}{212}$ sonlarini kamayish tartibida joylashtiring.

A) $x>y>z$
B) $z>y>x$
C) $y>z>x$
D) $z>x>y$

84. (a5-g13-2) Hisoblang.

$$\frac{1\cdot2\cdot3+3\cdot6\cdot9+4\cdot8\cdot12+5\cdot10\cdot15}{1\cdot3\cdot5+2\cdot6\cdot10+3\cdot9\cdot15}$$

A) 43,4 B) $\frac{217}{90}$
C) $\frac{277}{180}$ D) $\frac{177}{24}$

85. (a5-g14-2) Ko'paytmani hisoblang.

$$\left(1-\frac{4}{9}\right)\cdot\left(1-\frac{4}{13}\right)\cdot\left(1-\frac{4}{17}\right)\cdot\ldots\cdot\left(1-\frac{4}{65}\right)$$

A) $\frac{4}{65}$ B) $\frac{1}{13}$ C) $\frac{1}{5}$ D) $\frac{12}{65}$

86. (a5-g16-2) Hisoblang.

$$1+\frac{3}{2-\frac{4}{3+\frac{8}{3}}}$$

A) $\frac{73}{22}$ B) $\frac{97}{46}$
C) $\frac{97}{23}$ D) $\frac{11}{14}$

87. (a5-g17-22) Yig'indini hisoblang.

$$\left(\frac{1}{2}+\frac{1}{3}+\frac{1}{4}\right)+\left(\frac{3}{4}+\frac{2}{3}+\frac{1}{2}\right)+\left(\frac{1}{5}+\frac{1}{6}+\frac{1}{7}\right)+\left(\frac{5}{7}+\frac{4}{5}\right)$$

A) 12 B) 3 C) 6 D) 12

88. (a5-g18-18) Hisoblang.

$$\left(1-\frac{3}{7}\right)\cdot\left(1-\frac{3}{10}\right)\cdot\left(1-\frac{3}{13}\right)\cdot\ldots\cdot\left(1-\frac{3}{25}\right)$$

A) $\frac{1}{25}$ B) $\frac{22}{7}$
C) 0,16 D) 4

89. (a5-g19-2) $\frac{21}{36}$, $\frac{14}{35}$ va $\frac{12}{26}$ sonlariga qoldiqsiz bo'linuvchi eng kichik natural sonni toping.

A) 42 B) 84 C) 21 D) 252

90. (a5-g19-12) Qisqarmas kasrning surati maxrajidan 3 ga kichik. Suratga 13, maxrajiga 4 qo'shilsa, shu kasrga teskari kasr hosil bo'ladi. Kasrning surat va maxrajlari yig'indisini toping.

A) 17 B) 11 C) 21 D) 31

91. (a5-g20-2) Hisoblang.

$$\left(\frac{5}{21}+\frac{10}{31}\right)+\left(\frac{15}{41}+\frac{100}{21}\right)-\left(\frac{97}{41}-\frac{42}{62}\right)$$

A) 6 B) 8 C) 4 D) 5

92. (a5-g21-2) Hisoblang.

$$\left(\frac{48}{78}+\frac{4}{13}\right)+\left(\frac{15}{27}+\frac{27}{26}\right):\frac{3}{2}+3\cdot\left(\frac{17}{81}+\frac{5}{39}\right)$$

A) $\frac{5}{2,5}$ B) $\frac{1}{0,(3)}$
C) 1 D) 0

93. (a5-g23-11) Yig'indini hisoblang.

$$\frac{1}{3\cdot4}+\frac{1}{6\cdot8}+\frac{1}{12\cdot16}+\ldots$$

A) 0,(2) B) $\frac{1}{12}$
C) $\frac{1}{4}$ D) $\frac{1}{9}$

94. (a5-g24-2) Hisoblang.

$$\left(2-\frac{32}{1}\right)\cdot\left(2-\frac{32}{2}\right)\cdot\left(2-\frac{32}{3}\right)\cdot\ldots\cdot\left(2-\frac{32}{32}\right)$$

A) $\frac{32^5}{120}$ B) 0
C) $\frac{2^{32}}{125}$ D) 1

95. (a5-g25-2) Hisoblang.

$$\frac{1+\frac{1}{1-\frac{1}{1+\frac{1}{4}}}}{1-\frac{1}{1+\frac{1}{1-\frac{1}{4}}}}$$

A) 21 B) 5,25
C) 10,5 D) 42

96. (a6-g1-2) Hisoblang:

$\left(2015\frac{7}{12}-2012\frac{3}{4}\right):1\frac{7}{27}-13\frac{4}{7}:54\frac{2}{7}$.

A) 0,5 B) 2 C) 1,5 D) 1

97. (a6-g1-11) Hisoblang:

$\frac{1}{3}-\frac{1}{4}+\frac{1}{9}-\frac{1}{16}+\frac{1}{27}-\frac{1}{64}+\dots$.

A) $\frac{1}{12}$ B) $\frac{7}{12}$ C) $\frac{5}{6}$ D) $\frac{1}{6}$

98. (a6-g3-2) Hisoblang:

$\left(3-\frac{63}{1}\right)\cdot\left(3-\frac{63}{2}\right)\cdot\left(3-\frac{63}{3}\right)\cdot\dots\cdot\left(3-\frac{63}{63}\right)$.

A) 0 B) 147,625

C) $\frac{7^{12}\cdot 3^{18}}{63}$ D) $\frac{63^{31}}{63\cdot 27}$

99. (a6-g4-2) Hisoblang:

$\frac{1}{3}+\frac{1}{5\cdot 8}+\frac{1}{8\cdot 11}+\frac{1}{11\cdot 14}+\dots+\frac{1}{26\cdot 29}$.

A) $\frac{28}{87}$ B) $\frac{28}{29}$

C) $\frac{169}{435}$ D) $\frac{169}{87}$

100. (a6-g6-2) $\frac{2}{\frac{3}{5}}$ soni $\frac{\frac{2}{3}}{5}$ sonidan necha marta katta?

A) 1 B) 4 C) 25 D) 9

101. (a6-g8-2) 0,12 dan katta 0,64 dan kichik bo'lgan, maxraji 50 ga teng bo'lgan qisqarmas kasrlar nechta?

A) 11 B) 13

C) 25 D) 26

102. (a6-g13-4) Hisoblang:

$\left(3-\frac{42}{1}\right)\cdot\left(3-\frac{42}{2}\right)\cdot\left(3-\frac{42}{3}\right)\cdot\dots\cdot\left(3-\frac{42}{42}\right)$.

A) $-1216\frac{25}{42}$ B) $-\frac{7}{51}$

C) $7\frac{2}{7}$ D) 0

103. (a6-g17-2) $A=\frac{7}{17}-\frac{7}{15}+\frac{9}{19}$ va $B=\frac{27}{17}-\frac{38}{15}+\frac{10}{19}$ lar berilgan.

A + B ning qiymatini toping.

A) 1 B) 5 C) 0 D) 3

104. (a6-g18-12) $\frac{2}{\frac{3}{5}}$ soni $\frac{\frac{2}{5}}{3}$ sonidan necha marta katta?

A) 25 B) 9 C) 15 D) 1

105. (a6-g20-1) Kasrni hisoblang:

$3-\cfrac{3-\cfrac{\cdot\cdot\cdot}{4}}{4}$.

A) 4 B) 2,4 C) 3 D) 1,8

106. (a6-g21-26) Hisoblang:

$3+\cfrac{\frac{3}{17}+\frac{1}{24}-\frac{1}{12}}{\frac{1}{17}+\frac{1}{72}-\frac{1}{36}}$.

A) 6 B) 3,(3) C) 0 D) 2,(6)

107. (a6-g22-22) Sonlarni o'sish tartibida joylashtiring $a=\frac{6}{7}$, $b=\frac{60}{77}$, $c=\frac{600}{767}$.

A) $b<c<a$

B) $c<b<a$

C) $a<c<b$

D) $b<a<c$

108. (a6-g24-7) $\frac{a-b}{3}=\frac{a+b}{5}$ bo'lsa, $\frac{a}{b}$ ni hisoblang.

A) 4 B) 3 C) 2 D) 5

109. (a6-g24-23) Hisoblang:

$\cfrac{5}{1+\frac{1}{4}}-\cfrac{1-\frac{1}{4}}{3}$.

A) 2,5 B) 3,75

C) 4 D) –0,8(3)

110. (a6-g26-2) Hisoblang:

$1+\cfrac{1}{1-\cfrac{1}{1+\cfrac{1}{1-\frac{1}{5}}}}$.

A) $\frac{14}{9}$ B) $\frac{5}{9}$ C) $\frac{11}{7}$ D) $\frac{14}{5}$

12. Kasrli ifodalar

1. (a1-g3-14) $\frac{12-2n}{n}$ ifoda n ning nechta butun qiymatida natural son bo'ladi?

A) 4 B) 12 C) 6 D) 10

2. (a1-g11-5) n ning nechta natural qiymatida $\frac{n^2-10n+18}{n}$ ifoda natural son bo'ladi?

A) 4 B) 2 C) 6 D) 10

3. (a1-g13-4) $\frac{n^2+5n-3}{n+1}$ ifoda n ning nechta butun qiymatida natural son bo'ladi?

A) 1 B) 2 C) 3 D) 4

4. (a2-g1-3) Hisoblang.

$\left(1+\frac{1}{2}\right)\cdot\left(1+\frac{1}{3}\right)\cdot\left(1+\frac{1}{4}\right)+\dots\dots+\left(1+\frac{1}{2n}\right)$

A) $\frac{1}{2n}$ B) $\frac{n+1}{2}$

C) $\frac{2n+1}{2n}$ D) $\frac{2n+1}{2}$

5. (a2-g9-5) n ning nechta natural qiymatida $\frac{n^2-10n+18}{n}$ ifoda natural bo'ladi?

A) 4 B) 6 C) 3 D) 9

6. (a2-g12-5) Agar $a\geq 2$, $b\geq 3$, $c\geq 4$ bo'lsa, $\frac{4}{a}+\frac{27}{b}+\frac{16}{c}$ ifodaning eng katta qiymatini toping.

A) 8

B) 17

C) 15

D) aniqlab bo'lmaydi

7. (a2-g12-6) $\frac{5n-1}{n+3}$ ifoda n ning nechta butun qiymatida natural son bo'ladi?

A) 3 B) 5 C) 8 D) 10

8. (a2-g13-2) n ning nechta butun qiymatida $\frac{54-n^6+5n^5}{n^3}$ kasr musbat butun son bo'ladi?

A) 2 B) 3 C) 4 D) 5

9. (a2-g18-4) x ning nechta natural qiymatida $\frac{x^2+3x+14}{x+1}$ ifoda butun qiymatlarni qabul qiladi?

A) 5 B) 6 C) 12 D) 10

10. (a2-g20-7) $\frac{a}{3}=\frac{b}{4}=\frac{c}{5}$ va $\frac{a+b}{kc}=14$ bo'lsa, k ning qiymatini toping.

A) 0,1 B) 2,5 C) 0,4 D) 0,4

11. (a3-g2-5) Agar $a+\frac{1}{2b}=3$ va $a^3+\frac{1}{8b^3}=9$ bo'lsa, a ni b orqali ifodalang.

A) $a=3b$ B) $a=6b$

C) $a=4b$ D) $a=2b$

12. (a3-g20-4) n ning nechta butun qiymatida $\frac{n^3-26n+24}{n}$ ifoda natural bo'ladi?

A) 4 B) 6 C) 16 D) 8

13. (a4-g5-14) Quyidagi mulohazalardan nechtasi doimo to'g'ri?

1) Musbat to'g'ri kasr musbat noto'g'ri kasrdan katta bo'la olmaydi.

2) Ozod hadi nolga teng bo'lgan yuqori darajali tenglamalarning ildizlari yig'indisi nolga teng bo'ladi.

3) Manfiy sonning moduli shu sonning teskarisiga teng bo'ladi.

4) Arifmetik progressiyaning 5- va 12-hadlari yig'indisi shu progressiyaning 3- va 14-hadlari yig'indisiga teng bo'ladi.

5) Toq funksiya absissa o'qiga nisbatan simmetrik bo'ladi.

A) 2 B) 3 C) 4 D) 1

14. (a4-g16-3) $n-3$ ta $n-3$ ning ko'paytmasining $n-3$ ta $n-3$ yig'indisiga nisbatini toping
A) $(n-2)^2$ B) $(n-3)^{n-4}$
C) $(n-3)^{n-5}$ D) $(n-3)^{n-3}$

15. (a4-g17-6) $\frac{x}{7}=\frac{y}{9}=\frac{z}{12}$ nisbat o'rinli bo'lsa, $\frac{x^2+y^2+z^2}{xy+yz+xz}$ ning qiymatini toping.
A) $\frac{274}{255}$ B) $\frac{235}{223}$ C) $\frac{256}{247}$ D) $\frac{247}{235}$

16. (a4-g18-4) $\frac{n^3+4n^2-32}{n^2}$ ifoda n ning nechta butun qiymatida natural qiymatlarni qabul qiladi?
A) 2 B) 6 C) 4 D) 1

17. (a4-g21-3) $n-3$ ta $n-5$ ning ko'paytmasniing, $n-5$ ta $n-5$ yig'indisiga nisbatini toping.
A) $(n-3)^2$ B) $(n-5)^{n-1}$
C) $(n-5)^{n-5}$ D) $(n-5)^{n-3}$

18. (a5-g18-10) n ning nechta butun qiymatida $\frac{n^2+3n+2}{3-n}$ ifoda natural bo'ladi?
A) 4 B) 6 C) 12 D) 10

19. (a5-g23-2) $2\frac{1}{4}+n$ soni eng katta uch xonali natural songa teng bo'lsa, n nechaga teng?
A) 996,75 B) 1001,25
C) 997,25 D) 1000,75

20. (a6-g20-17) $n+4$ ta $n+4$ ko'paytmasining $n+4$ ta $n+4$ yig'indisiga nisbatini toping.
A) $(n+4)^{n+6}$ B) $n+2$
C) $(n+4)^{n+2}$ D) $(n+4)^{n+4}$

21. (a6-g25-12) n ning nechta natural qiymatida $\frac{2n+2n^3-4-n^4}{n-2}$ ifoda natural son bo'ladi.
A) cheksiz ko'p
B) 2 ta
C) 1 ta
D) hech qanday qiymatida

13. Sonning natural va butun ko'rsatkichli darajasi. Daraja xossalari

1. (a1-g1-5) Agar a manfiy son bo'lsa, quyidagilardan qaysi biri musbat?
A) $(a^4)^5\cdot(-a^2)^3$
B) $-(a^3)^5\cdot(a^5)^3$
C) $(-a^2)^5\cdot(a^3)^5$
D) $(-a^3)^2\cdot(a^7)^3$

2. (a1-g2-2) Hisoblang.
$\frac{200^3}{(90-70)^5}\cdot 2^6$
A) 108 B) 1080 C) 160 D) 960

3. (a1-g4-4) $a=\underbrace{9\cdot 9\cdot 9\cdot\ldots\cdot 9}_{15\text{ ta}}$;
$b=\underbrace{27^9+27^9+27^9+\ldots+27^9}_{27\text{ ta}}$ bo'lsa, $\frac{a}{b}$ nisbat nechaga teng?
A) $\frac{1}{9}$ B) $\frac{1}{3}$ C) 1 D) 3

4. (a1-g9-4) Agar $a=2^{48}$ bo'lsa $4^6\cdot 8^{10}\cdot 2^8=?$
A) a B) $2a$ C) a^2 D) $4a$

5. (a1-g13-18) $n^n+n^n+n^n+n^n=1024$ bo'lsa, $(-2)^n$ qiymatini toping
A) -16 B) -8 C) 8 D) 16

6. (a1-g16-2) Hisoblang.
$\frac{300^3}{(70-50)^5}\cdot 2^7$
A) 108 B) 2160
C) 270 D) 1080

7. (a2-g2-4) 3^{24} soni $(3^2)^4$ sonidan necha marta katta?
A) 1 B) 3^4 C) 3^8 D) 3^{16}

8. (a2-g8-4) Soddalashtiring.
$\frac{7\cdot 3^{n+1}-2\cdot 3^{n-1}}{3^n+4\cdot 3^{n-1}}$
A) $7\frac{4}{7}$ B) $12\frac{1}{5}$
C) $8\frac{5}{7}$ D) 13

9. (a2-g16-5) $\frac{2^{27}+1}{2^{18}-511}$ ni hisoblang.
A) 1025 B) 513
C) 511 D) 1023

10. (a2-g18-10) $a^3\cdot b^{10}<0$, $b^3\cdot c^8<0$ va $c-b<0$ bo'lsa, a, b va c ning ishoralari qanday?
A) $-,+,+$ B) $+,-,-$
C) $-,+,-$ D) $-,-,-$

11. (a3-g2-4) Ifodaning uchdan birini toping.
$\frac{3^{10}\cdot 9^4}{27^3\cdot 0,(3)^6}$
A) 1 B) 3 C) 6 D) 9

12. (a3-g3-4) Soddalashtiring.
$\frac{7\cdot 3^{n+1}-3\cdot 3^{n-1}}{3^n+4\cdot 3^{n-1}}$
A) $4\frac{2}{7}$ B) $7\frac{3}{5}$ C) $8\frac{4}{7}$ D) $6\frac{3}{7}$

13. (a3-g4-4) Soddalashtiring.
$\frac{(-x)^5\cdot(-x^4)\cdot(-x)^2\cdot(x^3)}{(-x)^3\cdot(-x)^1\cdot(-x^4)}$
A) x^4 B) $-x^4$ C) x^6 D) $-x^6$

14. (a3-g6-4) Ifodaning yarmini toping.
$\frac{8^{-4}+8^{-4}+8^{-4}+\ldots+8^{-4}}{64\text{ ta}}$
A) 2^{-6} B) 2^{-5} C) 2^{-7} D) 2^{-4}

15. (a3-g7-4) $a=2^{66}$, $b=3^{44}$ va $c=7^{22}$ sonlarining kichikdan kattaga qarab tartiblanishi qaysi javobda to'g'ri ko'rsatilgan?
A) $a<c<b$
B) $a<b<c$
C) $b<a<c$
D) $c<a<b$

16. (a3-g15-4) Hisoblang.
$\frac{(-4)^3}{-4^3}+\frac{(2^3)^3}{(2^4)^2}+\frac{(-3^5)^2}{(-3^2)^5}$
A) 0 B) 2 C) 3 D) 4

17. (a3-g19-4) Ifodaning yarmini toping.
$\frac{8^{2n-1}\cdot 2^{2-4n}}{4^{n-1}\cdot 0,25^{2n+2}}$
A) 4^{2n+2} B) 2^{4n+4} C) 2^{2n+2} D) 4^{n+1}

18. (a3-g21-4) Berilgan sonlarni o'sish tartibida yozing.
$a=125^{22}$; $b=36^{33}$; $c=\left(\frac{11}{2}\right)^{66}$.
A) $a<b<c$ B) $b<c<a$
C) $c<b<a$ D) $a<c<b$

19. (a3-g22-9) Quyidagilardan qaysi biri birhad?
A) $2x^3y^4z^5$ B) $x+y$
C) x^2+5 D) $5x^5yz+yz$

20. (a3-g24-4) 3^{25} soni $(3^2)^5$ sonidan necha marta katta?
A) 3^{22} B) 3^{18} C) 1 D) 3^3

21. (a4-g1-18) Quyidagilardan qaysilari manfiy?
a) $0,2^{-3}$; b) $(-5)^{-4}$; c) 2^{-5}; d) (-3)A) a va d B) hech biri
C) a va c D) faqat d

22. (a4-g6-3) 8^{a+3} soni 2^{3a-2} sonidan necha marta katta?
A) 2^{11} B) 2^5 C) 2^7 D) 2^{13}

23. (a4-g11-16) $n^n+n^n+n^n+n^n=108$ bo'lsa, $(-2)^n$ qiymatini toping
A) -32 B) -8 C) 8 D) 16

24. (a4-g12-4) Ifodaning qiymatini toping.
$\frac{(4^{15}+16^9)^2}{(16^7+4^{17})^2}$
A) 4 B) 64 C) 16 D) 32

25. (a4-g14-5) Hisoblang.
$\frac{44^{44}+44^{43}+44^{42}}{44^{43}}$
A) $44\frac{1}{44}$ B) $45\frac{3}{44}$
C) $40\frac{5}{44}$ D) $45\frac{1}{44}$

26. (a4-g20-17) $n^n+n^n+n^n+n^n+n^n=1280$ bo'lsa, $(-3)^n$ qiymatini toping.
A) -27 B) 81
C) -243 D) 9

27. (a4-g22-13) $2+4n^2+8n^4+\ldots+2^{26}n^{50}$ ni soddalashtiring.

A) $\frac{2-2^{27}\cdot n^{52}}{1-2n^2}$ B) $\frac{2^{26}\cdot n^{52}-2}{2n-1}$

C) $\frac{2^{24}n^{48}-2}{2n-1}$ D) $\frac{2-2^{25}\cdot n^{48}}{1-2n^2}$

28. (a5-g3-4) 2^{32} sonining yarmi quyidagilardan qaysi biriga teng?

A) 2^{16} B) 2^{30}
C) 2^{31} D) 2^{18}

29. (a5-g4-4) 25^{x+2} soni 5^{2x} sonidan necha marta katta?

A) aniqlab bo'lmaydi
B) 25
C) 125
D) 625

30. (a5-g6-17) $n^n+n^n+n^n+n^n=12500$ bo'lsa, $(-2)^n$ qiymatini toping.

A) –32 B) –8 C) 4 D) 16

31. (a5-g7-4) 25^{-27} soni 125^{-20} sonidan necha marta katta?

A) 5^7 B) 5^6 C) 5^{14} D) 5^5

32. (a5-g10-3) $A=18\cdot40^{25}\cdot25^{23}$ soni necha xonali?

A) 74 B) 71 C) 72 D) 77

33. (a5-g14-4) $36\cdot125^{32}\cdot32^{20}$ ko'paytma necha xonali son bo'ladi?

A) 98 B) 100 C) 99 D) 96

34. (a5-g23-3) Ifodani soddalashtiring.

$\frac{6^n+1{,}5^n}{4^n+1}$

A) 6^{-n} B) $1{,}5^n$

C) $1{,}5^{-n}$ D) 6^n

35. (a6-g2-4) Hisoblang:

$\frac{5^{26}+5^{33}-5^{37}}{125^{11}-5^{29}-25^{11}}$.

A) -25^2 B) 5^4
C) 125^{16} D) -5^{48}

36. (a6-g6-4) $(-a^2)^3\cdot(-a^3)^4:(-a^3)^3$ ifoda quyidagilardan qaysi biriga teng?

A) a^9 B) $-a^{-9}$ C) a^3 D) $-a^3$

37. (a6-g8-3) Quyidagilardan qaysi biri doimo birga teng? (k – toq natural son)

A) $\left(\left((-1)^5\right)^7\right)^{3k}$ B) $\left(\left((-1)^7\right)^8\right)^{4k}$

C) $\left(\left((-1)^5\right)^7\right)^{2k+1}$ D) $\left(\left((-1)^3\right)^{k+2}\right)^k$

38. (a6-g12-10) $a=\frac{10^{1987}+1}{10^{1988}+1}$,

$b=\frac{10^{1989}+1}{10^{1990}+1}$, $c=\frac{10^{1989}+1}{10^{1988}+1}$ va

$d=\frac{10^{1990}+1}{10^{1991}+1}$ sonlarini kamayish tartibida yozing.

A) $d>c>b>a$
B) $c>a>b>d$
C) $a>b>c>d$
D) $c>d>b>a$

39. (a6-g13-36) $x^5\cdot y^2>0$, $xyz<0$ va $xz>0$ bo'lsa, x, y va z larning ishoralarini toping.

A) +, +, – B) +, –, +
C) –, +, – D) –, –, +

40. (a6-g19-13) Hisoblang:

$\frac{7^{25}+7^{28}+7^{30}}{7^{23}+7^{26}+7^{28}}$.

A) 7 B) 49 C) 343 D) 50

41. (a6-g21-16) 2^{3^4} soni 4^{3^2} sonidan necha marta katta?

A) 2^{431} B) 2^7 C) 2^{99} D) 2^{63}

42. (a6-g22-13) 16^3 sonining kubi quyidagilarning qaysi biriga teng?

A) 2^{12} B) 16^{12} C) 4^{18} D) 2^{24}

14. Aralash kasrlar va ular ustida amallar

1. (a2-g2-3) Hisoblang.

$\frac{627\frac{3}{5}-624\frac{3}{4}+3{,}4}{0{,}8\cdot0{,}25}$

A) 25,75 B) 27,25
C) 29,75 D) 31,25

2. (a2-g3-3) $\frac{0{,}19}{0{,}0019}-\frac{0{,}5}{0{,}025}-\frac{0{,}1}{0{,}0008}=?$

A) 715 B) 875
C) –45 D) –95

3. (a2-g11-3) Hisoblang.

$\frac{\left(583\frac{3}{4}-579\frac{3}{8}\right)\cdot0{,}3}{0{,}2}$

A) $6\frac{9}{16}$ B) $5\frac{3}{8}$

C) $7\frac{7}{12}$ D) $2\frac{1}{4}$

4. (a2-g12-2) Hisoblang.

$\left(\frac{1}{\sqrt{2}}\right)^{-2}\cdot\left(\frac{6{,}28\cdot5{,}95-4\frac{11}{25}}{5\frac{19}{20}\cdot5{,}28+1{,}51}\right)$

A) 1 B) 2 C) 3 D) 4

5. (a2-g13-1) Hisoblang.

$\frac{2{,}18:2\frac{9}{50}-\left(\frac{0{,}5}{3}-\frac{0{,}(3)}{2}\right):\left(\frac{165}{63}-\frac{63}{165}\right)}{\left(3{,}5:\frac{7}{9}\right)\cdot\frac{4}{9}-\left(\frac{0{,}(5)}{2}+\frac{1{,}(2)}{4}\right):\frac{21}{36}}$

A) $\frac{17}{19}$ B) –1

C) $-\frac{18}{19}$ D) 1

6. (a2-g14-1) Hisoblang.

$\frac{0{,}002:4-0{,}0005:25}{0{,}003:9-0{,}0006:0{,}6}$

A) $\frac{9}{25}$ B) –0,36

C) 0,72 D) –0,72

7. (a2-g19-3) Hisoblang.

$\frac{4{,}86}{0{,}162}+\frac{1{,}25}{0{,}5}-\frac{44{,}4}{1{,}11}$

A) 15 B) 1,5
C) –0,75 D) –7,5

8. (a3-g4-3) Hisoblang.

$\frac{0{,}13}{0{,}013}-\frac{0{,}5}{0{,}25}-\frac{0{,}1}{0{,}008}$

A) 71,5 B) 87,5 C) –4,5 D) –9,5

9. (a3-g6-3) $\frac{0{,}65\cdot0{,}4\cdot6{,}8}{0{,}52\cdot5{,}1\cdot1{,}6}$ ning qiymatini toping.

A) $\frac{5}{12}$ B) $\frac{1}{2}$ C) $\frac{2}{3}$ D) $\frac{1}{6}$

10. (a3-g8-3) $\frac{3{,}2\cdot0{,}15\cdot9{,}2}{4{,}6\cdot0{,}03\cdot19{,}2}$ ning qiymatini toping.

A) $\frac{2}{5}$ B) 2 C) $\frac{5}{3}$ D) $\frac{5}{2}$

11. (a3-g10-3) Hisoblang.

$\frac{483\frac{5}{6}-481\frac{1}{3}+3\frac{1}{3}}{0{,}8\cdot0{,}25}$

A) $30\frac{5}{6}$ B) $27\frac{2}{3}$

C) $29\frac{1}{6}$ D) $10\frac{11}{12}$

12. (a3-g15-3) 0,12 dan katta va 0,64 dan kichik bo'lgan, maxraji 50 ga teng nechta kasr mavjud?

A) 23 B) 24 C) 25 D) 26

13. (a4-g14-11) Bir sonning uchdan biridan 3 ni ayirib, ayirmaning uchdan birining 30% ini hisoblasak, 3,6 ga teng bo'ladi. Shu sonni toping.

A) 336 B) 133 C) 117 D) 924

14. (a5-g3-2) Hisoblang.

$\frac{(1-0{,}5)(1-0{,}(3))(1-0{,}25)\ldots(1-0{,}05)}{(1+0{,}5)(1+0{,}(3))(1+0{,}25)\ldots(1+0{,}05)}$

A) $\frac{1}{55}$ B) $\frac{1}{35}$ C) $\frac{1}{210}$ D) $\frac{4}{105}$

15. (a6-g10-2) $\frac{0{,}5}{1-\left(\frac{1}{2}\right)^2}+\frac{0{,}4}{1-\left(\frac{3}{5}\right)^2}-\frac{0{,}2}{1-\frac{6}{5}}$

ni hisoblang.

A) 0,(32) B) $\frac{37}{12}$ C) $\frac{55}{24}$ D) 0,5

15. O'nli kasrlar va ular ustida amallar

1. (a1-g1-2) 2,4·(1,8 – 2,5) ifodani hisoblang.

A) 4,2 B) –4,2
C) 1,68 D) –1,68

2. (a1-g4-3) Quyidagilardan qaysi birini chekli o'nli kasrga aylantirib bo'lmaydi?

1) $\frac{3}{128}$; 2) $\frac{13}{13}$; 3) $\frac{3}{75}$; 4) $\frac{19}{175}$.

A) 1 B) 4 C) 2, 3, 4 D) 1, 2, 3

3. (a1-g6-4) Hisoblang.
$7{,}235\cdot10^{-4} + 2{,}76\cdot10^{-3}$
A) $9{,}995\cdot10^{-4}$ B) $7{,}511\cdot10^{-4}$
C) $3{,}4835\cdot10^{-3}$ D) $9{,}995\cdot10^{-3}$

4. (a1-g9-2) $a = 5$, $b = 2$ bo'lsa, $\frac{0{,}03}{0{,}002} + \frac{0{,}1}{0{,}02} + \frac{0{,}03}{0{,}005}$ yig'indi quyidagilardan qaysi biriga teng?
A) $a + b$ B) $2a + b$
C) $3a - b$ D) $4a + 3b$

5. (a2-g7-3) $0{,}00014\cdot1{,}4\cdot10^{-3}$ ko'paytma quyidagilarning qaysi biriga teng?
A) $1{,}96\cdot10^{-8}$ B) $19{,}6\cdot10^{-8}$
C) $196\cdot10^{-8}$ D) $1960\cdot10^{-8}$

6. (a2-g21-3) $\frac{0{,}05\cdot1{,}68\cdot0{,}76}{0{,}95\cdot0{,}2\cdot3{,}36}$ ning qiymatini toping.
A) 0,2 B) 0,1
C) 0,01 D) 0,02

7. (a3-g5-3) Quyidagi kasrlardan nechtasini chekli o'nli kasr shaklida yozib bo'lmaydi?
1) $\frac{10}{75}$; 2) $\frac{12}{34}$; 3) $\frac{7}{16}$; 4) $\frac{18}{75}$.
A) 1 B) 2 C) 3 D) 4

8. (a3-g13-4) Hisoblang.
$2{,}432\cdot10^{-4} + 5{,}12\cdot10^{-3}$
A) $7{,}552\cdot10^{-4}$ B) $5{,}3632\cdot10^{-3}$
C) $7{,}552\cdot10^{-3}$ D) $1{,}92\cdot10^{-4}$

9. (a3-g15-5) Soddalashtiring.
$1{,}2\cdot(1 + 0{,}4)(1 + 0{,}4^2)(1 + 0{,}4^4)\cdot$
$\cdot(1 + 0{,}4^8) \dots (1 + 0{,}4^{32}) + 2\cdot(2{,}5^{-64})$
A) 0 B) 1 C) 1,2 D) 2

10. (a4-g19-3) Hisoblang.
$5{,}251\cdot10^{-6} - 4{,}32\cdot10^{-5}$
A) $-4{,}819\cdot10^{-5}$
B) $4{,}819\cdot10^{-6}$
C) $-3{,}7949\cdot10^{-5}$
D) $3{,}7949\cdot10^{-6}$

11. (a5-g1-4) Ifodani hisoblang.
$\frac{43{,}6\cdot10^{12} + 0{,}64\cdot10^{13}}{32{,}8\cdot10^{10} + 1{,}72\cdot10^{9}}$
A) 10^{23} B) 10^{24} C) 10^{22} D) 10^{25}

12. (a5-g2-4) Yig'indini hisoblang:
$1{,}6\cdot10^{-8} + 3{,}4\cdot10^{-9}$
A) $3{,}56\cdot10^{-9}$ B) $1{,}94\cdot10^{-8}$
C) $3{,}56\cdot10^{-8}$ D) $1{,}94\cdot10^{-9}$

13. (a5-g5-2) Hisoblang.
$0{,}73^2 - 0{,}27^2 + 0{,}3^2$
A) 0,55 B) 1,27
C) 1,09 D) 0,27

14. (a6-g7-2) Quyidagi kasrlardan nechtasini chekli o'nli kasr shaklida ifodalab bo'lmaydi?
1) $\frac{111}{275}$; 2) $\frac{154}{35}$; 3) $\frac{47}{141}$; 4) $\frac{267}{75}$; 5) $\frac{44}{275}$.
A) 1 B) 2 C) 3 D) 4

15. (a6-g7-4) Agar $x = 174{,}6$ va $y = 172{,}6$ bo'lsa, $x^3 - y^3 - 6y^2 + 6x - 18y + 5$ ning qiymatini toping.
A) 41 B) 25
C) 13 D) 352,2

16. (a6-g15-10) Hisoblang:
$\frac{0{,}72\cdot3{,}9\cdot0{,}048}{0{,}26\cdot24\cdot0{,}0096}$.
A) 3 B) 4,5 C) 2,25 D) 1,8

17. (a6-g23-1) 994/49995 oddiy kasrning o'nli kasrdagi yoyilmasida verguldan keyingi 2010-o'rinda turgan raqamni toping.
A) 0 B) 1 C) 9 D) 8

16. Cheksiz davriy o'nli kasrlar

1. (a1-g2-3) Quyidagi sonlardan qaysi biri 0,(6) ga teng emas?
A) 0,(666) B) $\frac{2}{3}$
C) 0,6666667 D) $\frac{4}{6}$

2. (a1-g5-3) $a = 0{,}22(223)$, $b = 0{,}22(23)$ va $c = 0{,}(2223)$ sonlarini o'sish tartibida yozing.
A) $c < a < b$ B) $b < a < c$
C) $c < b < a$ D) $a < b < c$

3. (a1-g7-2) Hisoblang.
$\frac{1}{0{,}(2)} + \frac{1}{0{,}(4)} + \frac{1}{0{,}(6)}$
A) $8\frac{1}{4}$ B) 1,(3)
C) $9\frac{1}{6}$ D) $4\frac{1}{3}$

4. (a1-g8-8) Yig'indini hisoblang.
$0{,}(2) + 0{,}0(2) + 0{,}00(2) + 0{,}000(2) + \dots$.
A) $\frac{22}{90}$ B) $\frac{20}{81}$ C) $\frac{2}{9}$ D) $\frac{22}{91}$

5. (a1-g9-6) Tenglamani yeching.
$x{:}2{,}0(6) = 0{,}(27){:}0{,}4(09)$
A) 1,3(4) B) 1,3(7)
C) 1,(37) D) 1,(34)

6. (a1-g14-2) $(1{,}(5) + 3){:}(1{,}(555) + 3)$
A) 1 B) $\frac{1}{5}$ C) $\frac{1}{11}$ D) $\frac{5}{11}$

7. (a1-g16-3) Quyidagi sonlardan qaysi biri 0,(3) ga teng emas?
A) 0,(333) B) $\frac{1}{3}$
C) 0,(9) D) $\frac{3}{9}$

8. (a2-g10-3) Hisoblang.
$\frac{3}{0{,}(4)} + \frac{3}{0{,}(6)} + \frac{3}{0{,}(8)}$
A) 6 B) $16\frac{1}{4}$
C) $9\frac{1}{3}$ D) $14\frac{5}{8}$

9. (a3-g14-3) Hisoblang.
$\frac{0{,}8(5) - 0{,}5(1)}{0{,}(6)}$
A) $\frac{31}{66}$ B) $\frac{34}{60}$ C) $\frac{34}{66}$ D) $\frac{31}{60}$

10. (a3-g21-3) Hisoblang.
$\frac{2{,}44(44) + 3{,}3(33)}{5{,}5(5) - 2{,}(2)}$
A) $\frac{52}{27}$ B) $\frac{23}{9}$ C) $\frac{26}{15}$ D) $\frac{38}{27}$

11. (a3-g22-2) Hisoblang.
$\frac{\frac{1}{9} + 0{,}(2) + 0{,}(3) + 0{,}(4)}{0{,}0(1) + 0{,}0(2) + 0{,}0(3) + 0{,}0(4)}$
A) 11 B) 10
C) 0,(1) D) 0,(09)

12. (a3-g23-3) Quyidagi sonlardan qaysilarini chekli o'nli kasr shakliga keltirib bo'ladi?
1) $\frac{12}{75}$; 2) $\frac{10}{24}$; 3) $\frac{14}{24}$; 4) $\frac{13}{40}$.
A) 1, 4
B) 2, 3
C) barchasini keltirib bo'ladi
D) faqat 4

13. (a4-g2-2) Hisoblang
$\frac{0{,}3(7) - 0{,}2(3)}{0{,}(26)}$
A) $\frac{10}{11}$ B) $\frac{22}{10}$ C) $\frac{20}{11}$ D) $\frac{11}{20}$

14. (a4-g4-2) Quyidagi mulohazalardan qaysilari doimo to'g'ri?
1) maxraji 3 ga bo'linadigan qisqarmas kasrni chekli o'nli kasr shaklida ifodalab bo'lmaydi; 2) ikki irratsional sonning ko'paytmasi ratsional bo'ladi; 3) $x^3 - bx^2 + cx + d = 0$ tenglamaning ildizlari yig'indisi b ga teng; 4) ikki sonning modullari ko'paytmasi ularning ko'paytmasi moduliga teng; 5) arifmetik progressiyaning 5- va 11-hadlari yig'indisi shu progressiyaning 8-hadi ikkilanganiga teng.
A) 2, 3, 4 B) 1, 3, 4
C) 2, 3, 5 D) 1, 4, 5

15. (a4-g10-2) a va b raqamlarni ifodalamoqda. $\frac{a,(a) + b,(b)}{a,(0a) + b,(0b)}$ kasrning qiymatini hisoblang.
A) 0,1 B) 10 C) 1,1 D) 0,01

16. (a4-g18-2) Hisoblang.
$\frac{0{,}(35) + 0{,}(31)}{0{,}0(6) + 0{,}1(6)}$
A) $\frac{7}{45}$ B) $\frac{20}{7}$ C) 2 D) $\frac{12}{25}$

17. (a4-g19-2) Hisoblang.
$17\cdot\left(0{,}(3) - \frac{1}{0{,}(3) - \frac{1}{0{,}(3) - \frac{1}{0{,}(3)}}}\right)$
A) $-9{,}(6)$ B) $13{,}(3)$
C) $-18{,}(3)$ D) 5

18. (a4-g20-2) Hisoblang.

$$\frac{4,33(3)+7,5(55)}{7,(5)-4,3(33)}$$

A) $3\frac{20}{29}$ B) $2\frac{21}{29}$ C) $4\frac{13}{27}$ D) $3\frac{1}{9}$

19. (a4-g24-2) Hisoblang.

$$\frac{3,(9)+\frac{1}{2,(3)}}{\frac{1}{2,(9)}+3,(3)}$$

A) $\frac{13}{11}$ B) $\frac{93}{77}$ C) $\frac{95}{76}$ D) $\frac{11}{13}$

20. (a5-g9-3) $a = 7,4(32)$, $b = 7,(432)$, $c = 7,43(2)$ va $d = 7,4324$ sonlarini o'sish tartibida joylashtiring.
A) $d < b < a < c$
B) $c < a < b < d$
C) $c < a < d < b$
D) $d < c < a < b$

21. (a5-g10-2) a va b biror raqamni ifodalamoqda.

$$\frac{a,(a)+b,(b)}{a,(0a)+b,(0b)} = ?$$

A) 0,01 B) 0,1 C) 1 D) 1,1

22. (a5-g15-24) Quyidagi kasrlardan qaysilarini chekli o'nli kasr shaklida ifodalash mumkin?

1) $\frac{14}{56}$; 2) $\frac{39}{91}$; 3) $\frac{42}{175}$; 4) $\frac{28}{78}$.

A) hech birini aylantirib bo'lmaydi
B) 2, 3, 4
C) faqat 1
D) 1, 3

23. (a5-g22-2) Kasrni hisoblang.

$$\frac{4,44(4)+3,(555)}{8,8(88)+7,11(1)}+4\frac{2}{3}:1\frac{13}{15}$$

A) 2 B) $\frac{12}{4}$ C) $\frac{3}{7}$ D) $\frac{7}{10}$

24. (a6-g9-2) Hisoblang:

$$\frac{3,(9)+4,(4)-2,(2)}{1,01(1)+2,2(2)-3,3(3)}.$$

A) 32,(4) B) 51,0(3)
C) 48,(6) D) –62,(2)

25. (a6-g11-27) Hisoblang:

$$\frac{\frac{0,0(3)}{0,(03)}}{0,(22)}+\frac{0,(02)}{\frac{0,(33)}{0,0(3)}}.$$

A) $4\frac{377}{396}$ B) $5\frac{1}{495}$
C) $4\frac{487}{495}$ D) $5\frac{1}{198}$

26. (a6-g14-30) 0,7(12) qisqarmas $\frac{a}{b}$ ko'rinishida yozildi. $b - a$ ning qiymatini toping.
A) 285 B) 278 C) 57 D) 19

27. (a6-g19-18) Quyidagi sonlardan qaysi biri 0,22(2) va 0,3(33) sonlari orasida joylashgan?

A) $\frac{2}{9}$ B) $\frac{1}{3}$ C) $\frac{7}{18}$ D) $\frac{11}{36}$

28. (a6-g25-25) Hisoblang:

$$\frac{2,18:2\frac{9}{50}-\left(\frac{0,5}{3}-\frac{0,(3)}{2}\right):\left(\frac{165}{63}-\frac{63}{165}\right)}{\left(3,5:\frac{7}{9}\right)\cdot\frac{4}{9}-\left(\frac{0,(5)}{2}+\frac{1,(2)}{4}\right):\frac{21}{36}}$$

A) $\frac{17}{19}$ B) –1 C) $-\frac{18}{19}$ D) 1

3-bob. Algebraik ifodalar

17. Ko'phadning standart korinishi. Ko'phadlar ayirmasi va yig'indisi. Ko'phadlar ustida amallar

1. (a1-g3-19) $(-3x + \alpha y)\cdot(\beta x - 2y) = \gamma x^2 + 4xy + 2y^2$ ayniyatdagi norna'lum koeffitsiyentlardan biri β ni toping.
A) 3 B) 1 C) 2 D) –1

2. (a1-g12-4) $(1 - x^2)(x^2 + x + 1)\cdot(x^2 - x + 1) + x^5 + x^4 + 4$ ifoda soddalashtirilgandan keyin nechta haddan iborat bo'ladi?
A) 3 B) 4 C) 8 D) 10

3. (a2-g13-3) $ab + 4a(11b - A) - a(a - 3) - 27b$ ko'phadni ko'paytuvchilarga ajrating.
A) $(3a - 5)(9b - a)$
B) $(5a - 3)(a - 9b)$
C) $(9b - a)(3 - 5a)$
D) $(5a - 3)(9b - a)$

4. (a2-g15-10) a va b ning qanday qiymatlarida $\frac{4}{x^2-2x} = \frac{a}{x-2} + \frac{b}{x}$ tenglik ayniyat bo'ladi?
A) $a = -2$; $b = 2$
B) $a = 3$; $b = 3$
C) $a = 2$; $b = -2$
D) $a = -2$; $b = -2$

5. (a3-g23-5) $(x^4 + x^2 + 1)\cdot(x^4 + x^2 + 2) - 6$ ifodaning koeffitsiyentlari yig'indisini toping.
A) 3 B) 12 C) –3 D) 6

6. (a4-g1-3) $(a + b)^4 - 4ab(a + b)^2 + 2a^2b^2$ ni soddalashtiring.
A) $a^4 - b^4$
B) $a^4 + b^4$
C) $a^2 - ab + b^2$
D) $a^2 + ab + b^2$

7. (a4-g1-24) $P(x)$ ko'phad: $(x^2 + 2)\cdot P(x) + ax + b = x^7 + 2x^5 + 3x^4 + 3x^3 - 2x + 5$ bo'lsa, $a + b = ?$
A) –23 B) 9 C) 12 D) 23

8. (a4-g5-24) $P(x) = (x^2 + 5x - 3)\cdot(7x^7 - 6x^3 + 5x)(x + 3)$ ko'phadning koeffitsiyentlari yig'indisini toping.
A) 12 B) –1 C) 0 D) 54

9. (a4-g6-24) $P(x) = (4x^2 + 7x - 5)\cdot(9x^9 - 6x^5 + 5x^4)(x - 3)$ ko'phadning ozod hadini toping.
A) 72 B) 15 C) 0 D) –96

10. (a4-g9-24) $x^3 + mx^2 + 4x + 6 = (x - 1)(x^2 + px + q)$ ayniyat bo'lsa, $m + p + q$ yig'indi nechaga teng?
A) –27 B) –13 C) –11 D) –15

11. (a4-g10-4) $(x^2 - ax + b^2)\cdot(1 + a^2x + 2bx^2 + x^3)$ ko'phadlar ko'paytirilganda x^3 li hadning koeffitsiyenti 16 ga teng bo'lsa, $|a - b|$ nechaga teng?
A) 4 B) 16 C) 8 D) 2

12. (a4-g12-5) Quyidagi tengliklardan qaysilari ayniyat emas?

1) $\frac{(a-3)(a+1)}{(b+3)(b-2)} = \frac{(3\ \ a)(a+1)}{(2\ \ b)(3+b)}$;

2) $\frac{(2-a)(1+a)}{(b+2)(b-4)} = \frac{(a\ \ 2)(a+1)}{(-b\ \ 2)(4\ \ b)}$;

3) $\frac{(3+a)(1-a)}{(4-b)(2-b)} = \frac{(a+3)(a\ \ 1)}{(b-4)(b-2)}$;

4) $\frac{(2+a)(2-a)}{(4-b)(3-b)} = \frac{(a+2)(a-2)}{(4-b)(b-3)}$.

A) 1, 4 B) 2, 3 C) 2, 4 D) 1, 3

13. (a4-g13-25) $\frac{2x+7}{x^2\ \ 2x-3} = \frac{A}{x-3} + \frac{B}{x+1}$ bo'lsa, $A + B = ?$
A) –3 B) 2 C) –1 D) 0

14. (a4-g14-23) $\frac{1+3x^2}{x-x^3} = \frac{A}{x+1} + \frac{B}{x-1} + \frac{C}{x}$ ifoda ayniyat bo'lsa, $A + B + C = ?$
A) –3 B) –2 C) 1 D) 2

15. (a4-g17-24) $P(x) = (x^2 - 5x - 3)\cdot Q(x - 1) + 3x - 4$ ko'phad berilgan. $P(x)$ ko'phadning koeffitsiyentlari yig'indisi 13 ga teng bo'lsa, $Q(x)$ ko'phadning ozod hadi nechaga teng?
A) 2 B) –1 C) –2 D) 1

16. (a4-g18-11) $7 + 9 + 11 + \ldots + (2n + 1) = an^2 + bn + c$ bo'lsa, $a + b + c$ ning qiymatini toping.
A) 0 B) 4 C) –5 D) –6

17. (a5-g6-24) $(x^4 + 5x^2 + 3)\cdot(x^4 - 2x^2 + 4) - 12$ ifodaning koeffitsiyentlari yig'indisini toping.
A) 4 B) 15 C) 12 D) 16

18. (a5-g10-24) $x^3 + mx^2 + 4x + 6 = (x - 1)(x^2 + px + q)$ bo'lsa, $m + p + q$ ning qiymatini toping.
A) –21 B) –15 C) –13 D) –27

19. (a5-g18-23) $4x^4 + kx^3 + ax^2 + bx + c = 4x(x + 2)(x + 1)(x - 1)$ ayniyat bo'lsa, $a - b + c$ ning qiymatini toping.
A) –12 B) –4 C) 4 D) 0

20. (a5-g19-3) $(x-4y)^5$ ifodani ochib chiqilishidan hosil bo'lgan ko'phadning koeffitsiyentlari yig'indisini toping.
A) –625 B) –243
C) 0 D) 32

21. (a5-g24-3) $P(x) = 2(2x+3)^3 - (x-7)$ ko'phadning koeffitsiyentlari yig'indisini toping.
A) 256 B) 244
C) 132 D) 118

22. (a6-g4-3) $(2x-3y+5z)^3 - (2x+7z+4)^2$ ifoda yoyib chiqilgandan so'ng o'zgaruvchili hadlar koeffitsiyentlari yig'indisi nechaga teng bo'ladi?
A) –121 B) –89
C) –105 D) 217

23. (a6-g10-3) $P_1(x-1) = 3x-4$, $P_2(x+2) = 4-5x$ hamda $P_3(x) = 6x-2$ bo'lsa, $P_1(x) + P_2(x) - P_3(x-3)$ ifodani hisoblang.
A) $-8x+33$ B) $4x-7$
C) $-4x+7$ D) $-8x+7$

18. Qisqa ko'paytirish formulalari

1. (a1-g3-2) a va b ning qanday qiymatlarida $\frac{5x}{x^2+x-6} = \frac{a}{x+3} - \frac{b}{x-2}$ tenglik ayniyat bo'ladi? ($x \neq -3$; $x \neq 2$)
A) $a=2$; $b=-3$
B) $a=3$; $b=2$
C) $a=3$; $b=-2$
D) $a=-2$; $b=-3$

2. (a1-g3-20) Agar $x-y=3$ va $xy=6$ bo'lsa, $x^3y - xy^3$ ni hisoblang.
A) 126 B) 128 C) 108 D) 72

3. (a1-g6-9) $x+y=7$ va $xy=10$ bo'lsa, x^3+y^3 ning qiymatini toping.
A) 343 B) 1000
C) 203 D) 133

4. (a1-g7-7) x va y natural sonlar bo'lib $x^2-y^2=19$ bo'lsa, $\frac{x}{y}+\frac{y}{x}=?$
A) $\frac{180}{99}$ B) $\frac{182}{99}$
C) $\frac{180}{90}$ D) $\frac{181}{90}$

5. (a1-g8-11) $a-b=5$ va $a\cdot b=3$ bo'lsa, a^3-b^3 ni hisoblang.
A) 95 B) 140 C) 155 D) 170

6. (a1-g9-3) Agar $a-\frac{1}{a}=\frac{2}{3}$ bo'lsa, $\frac{a^4+1}{a^2}=?$
A) $2\frac{4}{9}$ B) $1\frac{1}{3}$ C) $1\frac{5}{9}$ D) $4\frac{2}{3}$

7. (a1-g10-4) $a+\frac{7}{a}=8$ bo'lsa, $a^2+\frac{49}{a^2}=?$
A) 64 B) 60 C) 50 D) 57

8. (a2-g10-4) $k+\frac{3}{k}=9$ bo'lsa, $k^2+\frac{9}{k^2}=?$
A) 75 B) 81 C) 87 D) 64

9. (a3-g6-9) $x+y=A$ va $x^3+y^3=B$ bo'lsa, xy ni A va B orqali ifodalang.
A) $\frac{A^3-3B}{A}$ B) $\frac{A^3-3B}{3}$
C) $\frac{A^3-B}{3A}$ D) $\frac{A^3-B}{3}$

10. (a3-g9-4) $\frac{x^2}{4}+\frac{9}{x^2}=22$ bo'lsa, $\frac{x}{2}+\frac{3}{x}$ ning musbat qiymatini toping.
A) $2\sqrt{6}$ B) $2\sqrt{5}$
C) 4 D) 5

11. (a3-g11-4) $\frac{4}{a}-\frac{a}{2}=\frac{2}{5}$ bo'lsa, $\frac{8}{a^2}+\frac{a^2}{8}$ ni hisoblang.
A) $\frac{4}{25}$ B) $\frac{16}{25}$
C) $\frac{52}{25}$ D) $\frac{104}{25}$

12. (a3-g13-9) $x-y=3$ va $xy=28$ bo'lsa, x^3-y^3 ning qiymatini toping.
A) 407 B) 147
C) 252 D) 279

13. (a4-g17-4) Agar $\frac{x}{3}+\frac{2}{x}=\frac{8}{5}$ bo'lsa, $\frac{x^2}{36}+\frac{1}{x^2}$ ning qiymatini toping.
A) $\frac{13}{75}$ B) $\frac{64}{25}$
C) $\frac{23}{75}$ D) $\frac{9}{75}$

14. (a4-g22-5) Agar $a-\frac{1}{a}=\frac{2}{3}$ bo'lsa, $\frac{a^4+1}{a^2}=?$
A) $2\frac{4}{9}$ B) $1\frac{1}{3}$ C) $1\frac{5}{9}$ D) $4\frac{2}{3}$

15. (a4-g25-4) Agar $3a+\frac{1}{4b}=6$ va $9a^2+\frac{1}{16b^2}=20$ bo'lsa, a ni b orqali ifodalang.
A) $a=9b$ B) $3a=32b$
C) $a=4{,}5b$ D) $9a=16b$

16. (a5-g4-3) $2x-\frac{3}{x}=6$ bo'lsa, $4x^3-\frac{27}{2x^3}=?$
A) 216 B) 72
C) 144 D) 162

17. (a5-g8-3) $2x+\frac{1}{x}=3$ bo'lsa, $x^3+\frac{1}{8x^3}=?$
A) $\frac{27}{8}$ B) $\frac{27}{16}$
C) $\frac{9}{16}$ D) $\frac{9}{8}$

18. (a5-g9-4) Hisoblang.
$\frac{(2011)^2+(2005)^2}{2} - 2011\cdot 2005$
A) 18 B) 36
C) 2008 D) 9

19. (a5-g11-6) $\frac{x^3+4xy^2}{3xy^2+4y^3}=3$ bo'lsa, $\frac{x+3y}{3x+y}$ ni toping.
A) $\frac{1}{2}$ B) $\frac{3}{5}$ C) $\frac{1}{3}$ D) $\frac{2}{5}$

20. (a5-g16-6) Tenglamaning ildizlari yig'indisini toping.
$9x^2+\frac{4}{x^2}+3x-\frac{2}{x}-24=0$
A) 0,(3) B) –1
C) –0,(3) D) 1

21. (a5-g19-4) $3z^2+\frac{12}{z^2}=36$ bo'lsa, $z+\frac{2}{z}$ ning qiymatini toping.
A) $\pm 2\sqrt{2}$
B) $\pm 4\sqrt{2}$
C) ± 6
D) ± 4

22. (a6-g11-23) Agar $a^2+b^2+c^2 = ab+ac+bc$ bo'lsa, $\frac{(a+b+c)^2}{ab+ac+bc}$ ni toping.
A) 1
B) 3
C) 2
D) aniqlab bo'lmaydi

23. (a6-g11-28) Aniq integralni hisoblang: $\int_0^{\frac{\pi}{2}} x\cdot\cos x\,dx$.
A) $\frac{\pi-2}{2}$ B) $\frac{\pi+1}{2}$
C) $\frac{3\pi-2}{3}$ D) $\frac{2\pi-1}{2}$

24. (a6-g15-14) $\frac{4}{a}-\frac{a}{2}=\frac{2}{5}$ bo'lsa, $\frac{8}{a^2}+\frac{a^2}{8}$ ni hisoblang.
A) $\frac{4}{25}$ B) $\frac{16}{25}$
C) $\frac{52}{25}$ D) $\frac{104}{25}$

25. (a6-g17-4) $\frac{x}{4}-\frac{1}{2x}=3$ bo'lsa,

$x^3-\frac{8}{x^3}$ ning qiymatini toping.

A) 1692 B) 1800
C) 1764 D) 1656

26. (a6-g19-23) $\frac{x}{6}+\frac{1}{3x}=2$ bo'lsa,

$x^3+\frac{8}{x^3}$ ning qiymatini toping.

A) 2160 B) 1800
C) 1656 D) 1692

27. (a6-g23-11) $x^2+y^2=1$ bo'lsa, $x^6+3x^2y^2+y^6$ ni toping.

A) –1 B) 2 C) 0 D) 1

19. Ko'phadlarni ko'paytuvchilarga ajratish. Kvadrat uchhadni chiziqli ko'paytuvchiga ajratish

1. (a1-g17-5) $x(y+z)^2+y(z+x)^2+z(x+y)^2-4xyz$ ifodani ko'paytuvchilarga ajrating.

A) $(x+y)(y+z)(x-2z)$
B) $(x+y)(x+2z)(y-z)$
C) $(x+2y)(y+2z)(x-2z)$
D) $(x+y)(x+z)(y+z)$

2. (a2-g4-5) Ko'paytuvchilarga ajrating. $a^3-6a^2+12a+19$

A) $(a-1)(a^2-9a-19)$
B) $(a-1)(a^2+7a-19)$
C) $(a+1)(a^2-7a+19)$
D) $(a+1)(a^2+9a+19)$

3. (a2-g5-4) Ko'phadni ko'paytuvchilarga ajrating. $10mns-30mnt-6n^2s+18n^2t$

A) $n(2s-6t)(3n+5m)$
B) $n(6t-2s)(6n-10m)$
C) $2n(5m-3n)(s-3t)$
D) $2n(3m-5n)(3t+s)$

4. (a2-g8-5) Ifodani ko'paytuvchilarga ajrating. $(x^2-3x)^2-8(x^2-3x)-20$

A) $(x+5)(x+2)(x-1)(x-2)$
B) $(x+5)(x-2)(x+1)(x+2)$
C) $(x-5)(x-2)(x+1)(x+2)$
D) $(x-5)(x-2)(x-1)(x+2)$

5. (a2-g15-5) Ko'paytuvchilarga ajrating. $(2x-5y)^3+(5y-3z)^3-(2x-3z)^3$

A) $3(5y-2x)(5y-3z)(3z-2x)$
B) $-3(5y-2x)(5y-3z)(2x-3z)$
C) $-3(2x-5y)(3z-5y)(2x-3z)$
D) $3(5y-2x)(5y-3z)(2x-3z)$

6. (a2-g18-3) $P(x)$ ko'phadni $3x^2-x-10$ ga bo'lganda $9x-7$ qoldiq qolmoqda. Shu ko'phadni $3x+5$ ko'phadga bo'lgandagi qoldiqni toping.

A) 22 B) –22 C) 8 D) –8

7. (a2-g19-4) $P(x)=x^6-2x^5+4x^3+5x-6$ ko'phadni x^2+5 ga bo'lgandagi qoldiqni toping.

A) $-65x-131$ B) $-25x-119$
C) $-35x-31$ D) $-30x-96$

8. (a2-g22-5) $f(x)=x^5-2x^4+x^3-x+3$ ko'phadni x^2+2 ga bo'lgandagi qoldiqni toping.

A) $x-2$ B) $2x+1$
C) $x-5$ D) $x+3$

9. (a2-g23-4) x^3-ax+b ko'phadni x^2-x-6 bo'lganda, $8x+9$ qoldiq qolgan bo'lsa, $a\cdot b=?$

A) –6 B) –2 C) –3 D) 1

10. (a3-g3-5) $(x^2-x)^2-14(x^2-x)+24$ ifodani ko'paytuvchilarga ajrating.

A) $(x+3)(x+4)(x+1)(x-2)$
B) $(x+4)(x-2)(x-1)(x+3)$
C) $(x-4)(x+3)(x-1)(x-2)$
D) $(x-4)(x-2)(x+1)(x+3)$

11. (a3-g5-5) $x^6+5x^5+2x^3-7x^2+5$ ko'phadni x^2+3 ga bo'lgandagi qoldiqni toping.

A) $39x-1$ B) $45x-28$
C) $51x+1$ D) $9x+11$

12. (a3-g8-4) Agar bo'luvchi $x-9$ ga, bo'linma $x-5$ ga va qoldiq – 3 ga teng bo'lsa, bo'linuvchini toping.

A) $x^2-14x+42$
B) $x^2-14x-42$
C) $x^2+14x-42$
D) $x^2+14x+42$

13. (a3-g10-5) Ifodani ko'paytuvchilarga ajrating. $z(2x-3y)^2+2x(3y+z)^2+3y(2x-z)^2+24xyz$

A) $(z+3y)(2x-z)(2x-3y)$
B) $(z-3y)(2x+z)(2x+3y)$
C) $(z+3y)(2x+z)(2x+3y)$
D) $(z-3y)(2x-z)(2x-3y)$

14. (a3-g12-5) Ko'paytuvchilarga ajrating. $(2x-5y)^3-(3z-5y)^3-(2x-3z)^3$

A) $3(5y-2x)(5y-3z)(3z-2x)$
B) $-3(5y-2x)(5y-3z)(2x-3z)$
C) $-3(2x-5y)(3z-5y)(2x-3z)$
D) $3(5y-2x)(5y-3z)(2x-3z)$

15. (a3-g14-5) $P(x)$ ko'phadni $x^2-7x+12$ uchhadga bo'lganda $2x+5$ qoldiq qoladi. Shu ko'phadni $x-4$ ga bo'lgandagi qoldiqni toping.

A) 3 B) –13 C)–3 D) 13

16. (a3-g16-4) $P(x)=x^3+2x^2-x+2$ ko'phadni x^2+3 ga bo'lgandagi qoldiqni toping.

A) –8 B) $-2x+6$
C) $-8x-4$ D) $-4x-4$

17. (a3-g17-4) $P(x)=x^4-3x^2+mx-5$ ko'phad $x-1$ ga qoldiqsiz bo'linadi. Shu ko'phadni $x+2$ ga bo'lgandagi qoldiqni toping.

A) 13 B) 17
C) –23 D) –15

18. (a3-g18-4) $P(x)$ ko'phadni $2x^2+5x+1$ ga bo'lganda qoldiq qolmaydi. Bu ko'phadning ozod hadi quyidagilardan qaysi biriga teng?

A) 1
B) 5
C) 2
D) aniqlab bo'lmaydi

19. (a3-g18-5) Ko'paytuvchilarga ajrating. $(a+b+c)^3-(a+c)^3+ab^2+b^2c$

A) $b(b+3a+3c)(b+a+c)$
B) $b(b+3a+2c)(b+2a+c)$
C) $b^2(b+3a+3c)(a+c)$
D) $b^2(b+3c)(b+a+c)$

20. (a3-g20-3) $P(x)=(x^3+x+n)\cdot(x^2+3x+4)$ ko'phad $x+2$ ga qoldiqsiz bo'linadi. Shu ko'phad yoyilganda ozod hadida qanday son hosil bo'ladi?

A) 10 B) –10 C) 40 D) –40

21. (a3-g22-4) $P(x)=x^3-ax^2+bx-3$ ko'phadni x^2+2 bo'lganda $2x+3$ qoldiq qoladi. $a+b$ ning qiymatini toping.

A) 5 B) 1 C) –1 D) 7

22. (a3-g23-24) $f(x)=(x^2+x+2)^3+(x^2+x+1)^2+x^2+x$ ifodani x^2+x+4 ga bo'lgandagi qoldiqni toping.

A) –5 B) –3 C) 0 D) 3

23. (a3-g24-5) x^3-x+60 ifodaning ko'paytuvchilarga ajratilgan shaklini ko'rsating.

A) $(x+3)(x^2-3x+20)$
B) $(x+4)(x^2-2x+15)$
C) $(x+4)(x^2-4x+15)$
D) $(x-3)(x^2+3x-20)$

24. (a3-g24-24) $P(x)$ va $Q(x)$ ko'phadlar bo'lib $P(x)=x^3-x+3$ va $Q(x)=4-x$ bo'lsa, $P[Q(6)]=?$

A) –7 B) –3
C) 3 D) 13

25. (a4-g2-3) Agar bo'luvchi x^2-3x+2, bo'linma $x+3$ va qoldiq $2x-5$ ga teng bo'lsa, bo'linuvchi ko'phadni toping.

A) $x^3-6x^2-13x+5$
B) x^3-5x+1
C) $x^3-13x+1$
D) $x^3+6x^2-13x+5$

26. (a4-g3-16) x^3-ax+b ko'phadni x^2-x-6 bo'lganda, $8x+9$ qoldiq qolgan bo'lsa, $a\cdot b=?$

A) –6 B) –2 C) –3 D) 1

27. (a4-g8-5) Ko'paytuvchilarga ajrating. $(2x-5y)^3+(3z+5y)^3-(2x+3z)^3$

A) $-(2x-5y)(5y+3z)(3z+2x)$
B) $-3(5y-2x)(5y+3z)(2x+3z)$
C) $-(2x-5y)(3z+5y)(2x+3z)$
D) $3(5y-2x)(5y+3z)(2x+3z)$

28. (a4-g10-24) $x^5-4x^3+2x^2+x-1$ ko'phadni x^2+1 ga bo'lgandagi qoldiqni toping.

A) $2x-1$ B) $4x-3$
C) $6x-3$ D) $x+3$

29. (a4-g13-26) $f(x)=x^5-2x^4+x^3-x+3$ ko'phadi x^2+2 ga bo'lingandagi qoldiq quyidagilardan qaysi biri?

A) $x-2$ B) $2x+1$
C) $x-5$ D) $x+3$

30. (a4-g15-2) Quyidagi mulohazalardan qaysi biri to'g'ri?

A) Ko'phadni x^4+5 ga bo'lganda, qoldiqning eng katta darajasi 4 ga teng bo'lishi mumkin.

B) Musbat noto'g'ri kasrning qiymati musbat to'g'ri kasrning qiymatidan kichik bo'lishi mumkin.
C) Har qanday natural son ratsional son hisoblanadi.
D) Chiziqli tenglama doimo bitta ildizga ega bo'ladi.

31. (a4-g18-24) $P(x+2)-3x+4=(x^2-5x-7)\cdot Q(x)$ tenglik berilgan. $P(x)$ ko'phadning $x+1$ ga bo'lgandagi qoldiq 21 ga teng bo'lsa, $Q(x)$ ni $x+3$ ga bo'lgandagi qoldiqni toping.
A) –2 B) –1 C) 1 D) 2

32. (a4-g19-24) $P(x)$ ko'phad berilgan. $P(1)=5$, $P(-2)=2$ bo'lsa, bu ko'phadning x^2+x-2 ga bo'lgandagi qoldiqni toping.
A) $x+2$ B) $2x+3$
C) $6x-1$ D) $x+4$

33. (a4-g20-24) $y=(x^2+x+5)^3+(x^2+x+6)^2+x^2+x$ ifodani x^2+x+3 ga bo'lgandagi qoldiqni toping.
A) 14 B) –2 C) –3 D) 8

34. (a4-g24-24) $x^6+2x^4+3x^3+px^2+6x+1$ ko'phadni $x-1$ ga bo'lganda 2 qoldiq qoladi. Shu ko'phadni $x+1$ ga bo'lgandagi qoldiqni toping.
A) –16 B) –11
C) –18 D) –15

35. (a4-g25-3) $3ab-a(10b-28)-b(a-10b)-35b$ ko'phadni ko'paytuvchilarga ajrating.
A) $(5a-4)(7b-2a)$
B) $(7a-2)(4a-5b)$
C) $(7b-2a)(4-5a)$
D) $(4a-5b)(7-2b)$

36. (a5-g1-24) $P(x)$ ko'phad $x-3$ ga qoldiqsiz bo'linsa, $P(2x+5)$ ko'phad quyidagilardan qaysi biriga qoldiqsiz bo'linadi?
A) $x+1$ B) $x-1$
C) $3x-2$ D) $x-2$

37. (a5-g3-3) Ko'paytuvchilarga ajrating. $(x-0,3z)^3+(0,3z-2y)^3+(2y-x)^3$
A) $3(x-0,3z)(2y-0,3z)(x-2y)$
B) $3(0,3z-x)(2y-0,3z)(x-2y)$
C) $3(x-0,3z)(2y+0,3z)(x+2y)$
D) $3(x+0,3z)(0,3z-2y)(2y-x)$

38. (a5-g3-24) $P(x)=2x^{17}-8x^{10}+x^6-54x^2+71$ ko'phadning x^5-3 ga bo'lgandagi qoldiqni toping.
A) x^2-3x+1
B) x^2-3
C) $5x-3$
D) $3x-1$

39. (a5-g5-3) x^4+3x^2+4 ni ko'paytuvchilarga ajrating.
A) ko'paytuvchilarga ajralmaydi
B) $(x+1)^2\cdot(x-1)^2$
C) $(x^2+x+2)(x^2-x+2)$
D) $(x^2+x+2)(x-2)(x+1)$

40. (a5-g5-24) $f(x)=x^{33}+2ax^{21}+x^8+8$ ko'phad a ning qanday qiymatida $x+1$ ga qoldiqsiz bo'linadi?
A) –1 B) 2 C) 1 D) 4

41. (a5-g9-5) Ko'phadni ko'paytuvchilarga ajrating. $27a^2-48c^2+36ab+12b^2$
A) $3(3a-2b+4c)(3a+2b-4c)$
B) $6(3a-2b+4c)(3a-2b-4c)$
C) $3(3a+2b+4c)(3a+2b-4c)$
D) $3(3a+2b-4c)(3a-2b-4c)$

42. (a5-g11-4) $P(x)=(x^4-5x^3+3x^2+7)\cdot(x+5)+14$ ni x^2+5 ga bo'lgandagi qoldiqni toping.
A) $58x+174$
B) $32x+39$
C) $142x-26$
D) $108x-25$

43. (a5-g17-7) a^8-9a^4+16 niratsional ko'paytuvchilarga ajrating.
A) $(a^4+4)(a^2-2)(a^2+2)$
B) $(a^2-2)(a^2-8)(a^2+1)$
C) $(a^4-a^2-4)(a^4+a^2-4)$
D) $(a^4-a^2+4)(a^4-a^2+4)$

44. (a5-g22-3) $P(x)$ ko'phadni x^3-6x^2 ga bo'lgandagi qoldiq x^2-5x+4 bo'lsa, $P(x)$ ko'phadni x^2-6x ga bo'lgandagi qoldiqni toping.
A) $x-4$ B) 4
C) $x+4$ D) 12

45. (a5-g22-4) Berilgan ko'phadni ko'paytuvchilarga ajrating. $2x^2y+18yz^2+12xyz-4xy^2-12y^2z-3x^2z-9xz^2$
A) $(x-2y)(x+3z)(2y-3z)$
B) $(x+2y)(x+3z)(2y-3z)$
C) $(x+2y)(x-3z)(2y-3z)$
D) $(x-2y)(x-3z)(2y+3z)$

46. (a5-g23-4) Ifodani ko'paytuvchilarga ajrating. $7z^3-12z^2y+6zy^2-y^3$
A) $(z-2y)(4y^2-3yz+z^2)$
B) $(7z-y)(y^2-yz+z^2)$
C) $(z-y)(y^2-3yz+7z^2)$
D) $(z-y)(7z^2-5yz+y^2)$

47. (a5-g25-3) $P(x)=(x^2+3x+5)^2-2(x^2+3x+4)-2x+5$ ko'phadni x^2+x+7 ga bo'lgandagi qoldiqni toping.
A) $-18x-13$
B) $-14x+15$
C) $-13x+18$
D) $15x-14$

48. (a5-g25-4) Ko'paytuvchilarga ajrating. x^4-3x^2+1
A) $(x^2+x-1)(x^2+x+1)$
B) $(x^2+x-1)(x^2-x+1)$
C) $(x^2-x-1)(x^2-x+1)$
D) $(x^2-x-1)(x^2+x-1)$

49. (a6-g1-3) $P(x)$ ko'phadni $x+3$ ga bo'lganda 7, $x-2$ ga bo'lganda –3 qoldiq qoladi. Shu ko'phadni x^2+x-6 bo'lgandagi qoldiqni toping.
A) –21 B) $-2x+1$
C) $2x+13$ D) $-3x+2$

50. (a6-g1-4) Ifodani ko'paytuvchilarga ajrating: n^5+n-1.
A) $(n^3+n^2-1)(n^2-n+1)$
B) $(n^3+1)(n^2-n-1)$
C) $(n^3+n^2+1)(n^2-n+1)$
D) $(n^3+n^2-1)(n^2+1)$

51. (a6-g5-3) $a^2+6b(a-3b)+a(a-5b)-2ab-3b^2$ ko'phadni ko'paytuvchilarga ajrating.
A) $(2a+7b)(a-3b)$
B) $(a+7b)(2a-3b)$
C) $(2a-7b)(a+3b)$
D) $(a-7b)(2a+3b)$

52. (a6-g5-4) $P(x)$ ko'phadni $x+3$ ga bo'lganda qoldiq –7 ga, $x-5$ ga bo'lganda esa 5 ga teng. Shu ko'phadni $x^2-2x-15$ ga bo'lgandagi qoldiqni toping.
A) $5x-7$ B) $6x-12$
C) $1,5x-2,5$ D) $0,5x+3$

53. (a6-g9-4) $4x^4+3x^3-2x^2-x+m$ ko'phadni $2x+1$ ga bo'lgandagi qoldiq $-\frac{5}{8}$ ga teng bo'lsa, shu ko'phadni $x^2+x-\frac{1}{4}$ ga bo'lgandagi qoldiqni toping.
A) $-\frac{5x+2}{4}$ B) $\frac{4x-3}{4}$
C) $\frac{2-5x}{4}$ D) $\frac{3-x}{4}$

54. (a6-g11-5) $P(x)=x^{2015}+4x^{2014}+5x+23$ ko'phadni $x+4$ ga bo'lgandagi qoldiqni toping.
A) $4^{2014}+3$ B) –2
C) 3 D) 43

55. (a6-g12-18) $x^{99}+5x^3+2x+8$ ko'phadni x^2+1 ga bo'lgandagi qoldiqni toping.
A) $8x+8$ B) $-2x+8$
C) $-4x+8$ D) $-3x+7$

56. (a6-g13-1) Ko'paytuvchilarga ajrating: $x^2(2y-3z)-4y^2(x+3z)-9z^2(x-2y)+12xyz$.
A) $(x-2y)(2y-3z)(x+3z)$
B) $(3z-2y)(x-2y)(x+3z)$
C) $(x+2y)(2y+3z)(x-3z)$
D) $(x+2y)(2y+3z)(3z-x)$

57. (a6-g14-28) $3x^5+6x^4+11x^3+4x^2+6x+4$ ni $3x^2+2$ ga bo'lgandagi qoldiqni toping.
A) $6x+4$ B) 4
C) $3x+4$ D) 2

58. (a6-g17-3) $P(x)=(x^2-7x+3)\cdot(x^3-5)+x^2+4$ ko'phadning toq darajali hadlari koeffitsiyentlari yig'indisini toping.
A) 39 B) –39 C) 22 D) –22

59. (a6-g18-5) $P(x)=Q(x)\cdot(x^2-7x+6)+5x-4$ berilgan. $P(x)$ ko'phadni $x-6$ ga bo'lgandagi qoldiqni toping.
A) aniqlab bo'lmaydi
B) 34
C) 26
D) 30

60. (a6-g20-6) x^4+16 ifodani ko'paytuvchilarga ajrating.
A) $(x+2)^2\cdot(x-2)^2$
B) $(x^2+8x+4)(x^2-8x+4)$

C) $\left(x^2+2\sqrt{2}x+4\right)\left(x^2-2\sqrt{2}x+4\right)$

D) $\left(x^2+2\sqrt{2}x-4\right)\left(x^2+2\sqrt{2}x+4\right)$

61. (a6-g23-3) Ko'paytuvchilarga ajrating: $n^5+n^4+n^3+n^2+n+1$.
A) $(n+1)(n^2+n+1)(n^2+n-1)$
B) $(n+1)(n^2-n+1)(n^2+n+1)$
C) $(n-1)(n^2+n+1)(n^2+n-1)$
D) $(n+1)(n^2+n+1)(n^2-n-1)$

62. (a6-g23-5) $P(x)=x^3-mx^2+nx-5$ berilgan. $P(x)$ ko'phad x^2-1 ga qoldiqsiz bo'linsa, $m+n$ ni toping.
A) –6 B) –7 C) –5 D) –14

63. (a6-g24-27) $P(x)=2x^{13}+3x^8+$ $+3x^2-5x+3$ ko'phadni $x^3+\sqrt{2}$ ga bo'lgandagi qoldiqni toping.
A) $9x^2+3x+3$ B) $3x^2-13x+3$
C) $-5x+3$ D) x^2-7x+4

64. (a6-g25-17) $P(x)=2x^3-5x^2+ax-b$ ko'phad $(x-1)^2$ ga qoldiqsiz bo'linsa, $a+b$ ni hisoblang.
A) 5 B) 2,5 C) 7 D) 3

65. (a6-g26-4) $n-7$ ta $n-4$ ning ko'paytmasining $n-4$ ta $n-4$ yig'indisiga nisbatini toping.
A) $(n-4)^{n-5}$
B) $(n-4)^5$
C) $(n-4)^{n-3}$
D) $(n-4)^{n-9}$

20. Algebraik kusrlar ustida amallar

1. (a2-g6-4) a^3-9a-a^2+9 ifoda quyidagilardan qaysi biriga bo'linmaydi?
A) $a+3$ B) $a+1$
C) $a-3$ D) a^2-9

2. (a2-g6-9) $\dfrac{5x+14}{x^2+2x-8}=\dfrac{2a}{x-2}+\dfrac{b}{x+4}$ ifoda ayniyat bo'lsa, $a+b=?$
A) 8 B) 5 C) 7 D) 3

3. (a3-g6-5) $\dfrac{x^2+3x}{x^3-2x^2-9x+18}=$ $=\dfrac{x^2-ax}{x^3-3x^2-4x+12}$ bo'lsa, a ni toping.
A) 3 B) –2 C) 2 D) 1

4. (a6-g3-4) Ifodani soddalashtiring:
$$\frac{(2+x)^2-y^2}{(2-x)^2-y^2}\cdot\frac{4-(x+y)^2}{(2+x+y)^2}:\frac{2+x-y}{2-x+y}.$$
A) $\dfrac{2-x+y}{2+x+y}$ B) $\dfrac{2-x-y}{2+x+y}$
C) $\dfrac{2-x+y}{2-x+y}$ D) $\dfrac{2+x+y}{2-x-y}$

5. (a6-g9-3) Ifodani soddalashtiring:
$$\frac{x^2y+y^2x}{x^3+y^3}+\frac{(x-y)^2}{(x-y)^2+xy}.$$
A) 1 B) $x+y$
C) –1 D) $2x$

6. (a6-g12-1) Ifodani soddalashtiring:
$$\left(\frac{x}{y}+\frac{y}{x}+2\right)\cdot\left(\frac{x}{y}+\frac{y}{x}-2\right)\cdot\frac{x^3y^3}{\left(x^2-y^2\right)^2}.$$
A) 1 B) xy
C) $(xy)^{-1}$ D) x/y

7. (a6-g14-22) Ifodani soddalashtiring:
$$\frac{\dfrac{a}{b}-\dfrac{c}{d}}{\dfrac{b}{a}-\dfrac{d}{c}}\cdot\frac{\dfrac{b}{a}+\dfrac{d}{c}}{\dfrac{a}{b}+\dfrac{c}{d}}.$$
A) 1 B) 0 C) –1 D) 0,5

8. (a6-g15-16) Ifodani soddalashtiring:
$$\left(\frac{x^2-4+y^2+2xy}{x^2-y^2+4+4x}\right)^2\cdot\left(\frac{x-y+2}{x+y-2}\right)^2.$$
A) $\dfrac{x+y-2}{x-y+2}$ B) $\dfrac{x-2}{x+2}$
C) 1 D) $x+y$

9. (a6-g16-29) Ifodani soddalashtiring:
$$\frac{k^2+kt-mk-mt}{km+tm-t^2-tk}+\frac{kt-k^2+mt-mk}{m^2-tk-tm+mk}.$$
A) $1+\dfrac{2t}{m-t}$ B) $\dfrac{m-k}{k+t}$
C) –1 D) $1-\dfrac{2m}{k+m}$

21. Ifodalarni soddalashtirish

1. (a1-g1-4) Ifodani soddalashtiring.
$$\frac{a^2-5ab+6b^2}{a^2-2ab-8b^2}:\frac{a^2-2ab-3b^2}{a^2-3ab-4b^2}$$
A) $\dfrac{a-2b}{a+3b}$ B) $\dfrac{a-2b}{a+2b}$
C) $\dfrac{a-3b}{a-4b}$ D) 1

2. (a1-g1-35) Soddalashtiring.
$$\frac{n\sqrt{n}-n}{n+\sqrt[6]{n^5}+\sqrt[3]{n^2}}-\frac{n-\sqrt[3]{n^2}}{\sqrt{n}+\sqrt[3]{n}}-\sqrt[3]{n}$$
A) $-3\sqrt[3]{n}$
B) $-2\sqrt{n}+\sqrt[3]{n}$
C) $-\sqrt[3]{n}$
D) $\sqrt[3]{n}$

3. (a1-g2-4) Kasrni qisqartiring.
$$\frac{12ab-9b^2}{9b^2-16a^2}$$
A) $-\dfrac{3}{3b-4a}$ B) $\dfrac{3b}{3b-4a}$
C) $\dfrac{3}{4a+3b}$ D) $-\dfrac{3b}{4a+3b}$

4. (a1-g5-5) Soddalashtiring.
$$\frac{x^2-1+2(xy-1)-\left(-y^2+1\right)}{2-x-y}$$
A) $x+y-2$
B) $x-y+2$
C) $x-y-2$
D) $-x-y-2$

5. (a1-g6-5) Soddalashtiring.
$$\frac{a^6+a^4+1}{a^6-1}$$
A) $\dfrac{a^4-a^2+1}{(a-1)(a+1)}$ B) $\dfrac{a^4+a^2+1}{a^2+1}$
C) $\dfrac{\left(a^2+1\right)^2}{(a-1)^2}$ D) $\dfrac{(a+1)^2}{a-1}$

6. (a1-g7-15) Ifodani soddalashtiring.
$$\frac{2a^4+a^3+4a^2+a+2}{2a^3-a^2+a-2}$$
A) $\dfrac{a+2}{a-1}$ B) $\dfrac{a^2+1}{a-1}$
C) $\dfrac{a-2}{a+1}$ D) $\dfrac{a-1}{a+1}$

7. (a1-g7-23) Soddalashtiring.
$$\left(\frac{a+b}{\sqrt[3]{a^2}-\sqrt[3]{b^2}}+\frac{\sqrt[3]{ab^2}-\sqrt[3]{a^2b}}{\sqrt[3]{a^2}-2\sqrt[3]{ab}+\sqrt[3]{b^2}}\right):$$
$$:\left(\sqrt[6]{a}-\sqrt[6]{b}\right)$$
A) $a+1$ B) $\sqrt[3]{a}+\sqrt[3]{b}$
C) $\sqrt{a}-\sqrt{b}$ D) $\sqrt[6]{a}+\sqrt[6]{b}$

8. (a1-g8-10) Ifodani soddalashtiring.
$$\frac{a^2+4a+2b-b^2+3}{a+b+1}-3$$
A) $a+b$ B) $a-b$
C) $a-b+1$ D) $a+b+1$

9. (a1-g10-5)
$$\left(\frac{a+b}{2b+a}+\frac{6b^2+5ab}{a^2-4b^2}\right):\left(\frac{1}{4b-2a}\right)$$
ifodaning $a=3{,}6$ va $b=3{,}2$ bo'lgandagi qiymatini toping.
A) 10 B) 13,6
C) –20 D) –5

10. (a1-g11-4) Soddalashtiring.
$$\frac{(m+n-p)^2-(m-n-p)^2}{m^2-p^2}$$
A) $\dfrac{2n}{m-p}$
B) $\dfrac{2(m-n)}{m+p}$
C) $\dfrac{4n}{m+p}$
D) $\dfrac{4(m+n)}{m-p}$

11. (a1-g12-3) Soddalashtiring.
$$\left(\frac{a^3+b^3}{a+b}-\frac{(a-b)^3}{a-b}\right):b$$
A) $3a$ B) $3ab$ C) ab D) a

12. (a1-g12-14) Soddalashtiring.
$$\frac{a+\sqrt{a}+1}{\sqrt{a}-\sqrt[4]{a}+1}$$
A) $6\sqrt{2}$ B) $\sqrt{a}-1$
C) $\sqrt{a}-\sqrt[4]{a}$ D) $\sqrt{a}+$

13. (a1-g13-5) Soddalashtiring.

$$\frac{a+3\sqrt[3]{a^2}+3\sqrt[3]{a}-7}{\sqrt[3]{a^2}+4\sqrt[3]{a}+7}$$

A) $\sqrt[3]{a^2}+1$ B) $\sqrt[3]{a}+1$

C) $\left(\sqrt[3]{a}+1\right)^2$ D) $\sqrt[3]{a}-1$

14. (a1-g14-3) $\frac{x^2-(m-4)x-4m}{x^2+(1-m)x-m}=?$

A) $\frac{x-1}{x+2}$ B) $\frac{x+4}{x+1}$

C) $\frac{x-4}{x-2}$ D) $\frac{x-4}{x-1}$

15. (a1-g14-4) $\frac{a^2x-ax^2}{a-x}=?$

A) ax B) a

C) x D) $a+x$

16. (a1-g15-4) $\frac{a^2-2ab-3b^2}{a^2+4ab+3b^2}:\frac{a-3b}{a^2-b^2}$

ifodaning $a = 0,4$ va $b = -0,2$ bo'lgandagi qiymatini toping.

A) –0,6 B) –0,2

C) 0,2 D) 0,6

17. (a1-g15-5) Soddalashtiring.

$$\left(1-\frac{1}{a^2}\right)\cdot\left(1-\frac{1}{(a-1)^2}\right)\cdot\left(1-\frac{1}{(a.-2)^2}\right)\cdot$$

$$\cdot\left(1-\frac{1}{(a-3)^2}\right)\cdot\ldots\cdot\left(1-\frac{1}{(a-20)^2}\right)$$

A) $\frac{a^2-22a+21}{a^2-20a}$

B) $\frac{a^2-19^2}{(a+10)^2}$

C) $\frac{a^2+20a-21}{a^2+20}$

D) $\frac{a^2-20a-21}{a^2-20a}$

18. (a1-g16-4) Kasrni qisqartiring.

$$\frac{4b-10ab}{25a^2-4}$$

A) $-\frac{2b}{5a+2}$ B) $\frac{2b}{5a+2}$

C) $\frac{2}{5a-2}$ D) $-\frac{2}{5a-2}$

19. (a1-g17-4) Soddalashtiring.

$$\frac{x^2+y^2-z^2+2xy}{x+y-z}$$

A) $x-y+z$ B) $x+y+z$

C) $x+y-z$ D) $x-y-z$

20. (a2-g1-4) Soddalashtiring.

$$\frac{a^2-ab-2b^2}{a^2-b^2}-1$$

A) $\frac{a}{a-b}$ B) $\frac{b}{b-a}$

C) $\frac{1}{b-a}$ D) $\frac{a}{b-a}$

21. (a2-g1-5) Soddalashtiring.

$$\left(\frac{1+x}{x-1}-\frac{x-1}{1+x}\right):\left(\left(\frac{1+x}{1-x}-1\right)\cdot\left(1-\frac{1}{1+x}\right)\right)$$

A) $\frac{x}{2}$ B) $\frac{-2}{x}$ C) $\frac{2}{x}$ D) $\frac{1}{x}$

22. (a2-g2-5) Ifodani soddalashtiring.

$$\frac{x^8+x^4+1}{x^6-1}:\frac{x^6+1}{x^8-1}$$

A) x^4-1 B) x^2+1

C) x^2-1 D) x^4+1

23. (a2-g4-4) Soddalashtiring.

$$\frac{a^3+27b^3}{a^2-9b^2}\cdot\frac{2a-7b}{a^2-3ab+9b^2}$$

A) $2-\frac{b}{a-3b}$ B) $1+\frac{2b}{a+3b}$

C) $2-\frac{8b}{3a+b}$ D) $1-\frac{b}{a-3b}$

24. (a2-g5-5) Soddalashtiring.

$$\frac{a^8+a^4+1}{a^6+1}$$

A) $\frac{a^4-a^2+1}{(a-1)(a+1)}$ B) $\frac{a^4+a^2+1}{a^2+1}$

C) $\frac{(a^2+1)^2}{(a-1)^2}$ D) $\frac{(a+1)^2}{a-1}$

25. (a2-g6-5) Kasrni soddalashtiring.

$$\frac{x^3+5x^2+7x+3}{2x^3+5x^2+4x+1}$$

A) $\frac{3x+1}{x+2}$ B) $\frac{x+3}{2x+1}$

C) $\frac{x+1}{2x^2+3}$ D) $\frac{x^2+1}{3+x}$

26. (a2-g8-6) $\left(\frac{3y^2-7xy+2x^2}{9y^2-x^2}+\frac{2x+y}{3y+x}\right):$

$$:\left(\frac{1}{6y+2x}\right)$$ ifodaning $x = 3,2$ va $y = 3,6$ bo'lgandagi qiymatini toping.

A) 7,2 B) 14,4 C) 6,4 D) 12,8

27. (a2-g9-4) Soddalashtiring.

$$\frac{(m+n-p)^2-(m-n-p)^2}{m^2-p^2}$$

A) $\frac{2n}{m-p}$ B) $\frac{2(m-n)}{m+p}$

C) $\frac{4n}{m+p}$ D) $\frac{4(m+n)}{m-p}$

28. (a2-g10-5)

$$\left(\frac{2y^2-7xy+3x^2}{9x^2-y^2}+\frac{2x+y}{y+3x}\right):\left(\frac{1}{6x+2y}\right)$$

ifodaning $x = 3,2$ va $y = 5,6$ bo'lgandagi qiymatini toping.

A) 2 B) 4 C) 8 D) 30,4

29. (a2-g11-5) Ifodani soddalashtiring.

$3z(x-2y)^2 + x(2y-3z)^2 +$
$+ 2y(x+3z)^2 + 24xyz$

A) $(x+3z)(x+2y)(2y+3z)$

B) $(x-3z)(x-2y)(2y-3z)$

C) $(x-2y)(x-3z)(2y+3z)$

D) $(x+3z)(x+2y)(2y-3z)$

30. (a2-g15-4) Soddalashtiring.

$$\frac{a^3-125b^3}{25b^2+5ab+a^2}:\frac{a^2-25b^2}{a+3b}$$

A) $2-\frac{3b}{a+5b}$ B) $2-\frac{3b}{a-5b}$

C) $1-\frac{2b}{a+5b}$ D) $1-\frac{2b}{a-5b}$

31. (a2-g16-4) $\frac{x^2-(m+3)x+3m}{x^2-(m-3)x-3m}$ ni soddalashtiring.

A) $\frac{x-m}{x+m}$ B) $\frac{x+m}{x-m}$

C) $\frac{x-3}{x+3}$ D) $\frac{x+3}{x-3}$

32. (a2-g17-13) $3 + 9n^2 +$
$+ 27n^4 + \ldots + 3^{23}n^{44}$ ni soddalashtiring.

A) $\frac{3-3^{24}\cdot n^{46}}{1-3n^2}$ B) $\frac{3^{23}\cdot n^{46}-3}{3n-1}$

C) $\frac{3^{24}n^{44}-3}{3n-1}$ D) $\frac{3-3^{23}\cdot n^{44}}{1-3n^2}$

33. (a2-g19-5) Soddalashtiring.

$$\frac{x^3-8}{x^2+x-6}:\frac{x^3+4x^2+8x+8}{x^2-4}$$

A) $\frac{x+2}{x-3}$ B) $\frac{x-2}{x-3}$

C) $\frac{x-2}{x+3}$ D) $\frac{x+2}{x+3}$

34. (a2-g20-5) Soddalashtiring.

$$\frac{b^2-a^2+4b+4}{a^2-b^2+2a-2b}$$

A) $\frac{1}{a-b+2}$ B) $\frac{b-a+2}{b-a-2}$

C) $\frac{2}{a-b}-1$ D) $a-b$

35. (a2-g21-4) Ifodani soddalashtiring.

$(2x-5)^2-(x+5)^2$

A) $3x(x-10)$

B) $(2x+5)(x-5)$

C) $x(3x+10)$

D) $(x+5)(3x-10)$

36. (a2-g21-5) Soddalashtiring.

$$\frac{2x^3+3x^2+6x+9}{x^2+3}-x$$

A) $3x+3$

B) $2x-3$

C) $x+3$

D) $3x-3$

37. (a2-g23-3) Ifodani soddalashtiring.

$$\frac{2a^4+a^3+4a^2+a+2}{2a^3-a^2+a-2}$$

A) $\frac{a+2}{a-1}$ B) $\frac{a^2+1}{a-1}$

C) $a+1$ D) $\frac{a-1}{a+1}$

38. (a3-g1-5) Soddalashtiring.

$$\frac{x^2+y^2-2z^2}{x^2+x(z+y)+yz}+\frac{x-y}{x+z}$$

A) $\frac{2(x-y)}{x+z}$ B) $\frac{x+y}{x+z}$

C) $\frac{2(x-z)}{x+y}$ D) $\frac{x-z}{x+y}$

39. (a3-g3-6) $\left(\frac{6y^2-13xy+6x^2}{4x^2-9y^2}+\frac{2x+y}{3y+2x}\right):\left(\frac{1}{6y+4x}\right)$ ifodaning $x = 3{,}2$ va $y = 6$ bo'lgandagi qiymatini toping.

A) 12 B) 24 C) 16 D) 20

40. (a3-g5-4) Soddalashtiring.

$$\frac{x^2-3(x+6)}{x-6}$$

A) $x+3$ B) $x-6$
C) $x-3$ D) $x+6$

41. (a3-g7-5) Soddalashtiring.

$$\frac{a^2+ab-ac-bc}{c^2-ab-ac+bc}+\frac{a^2+ab+ac+bc}{b^2+ab+ac+bc}$$

A) $\frac{b+c}{b-c}$ B) $\frac{a+b}{a-b}$

C) $\frac{c-b}{b+c}$ D) $\frac{a-c}{a+c}$

42. (a3-g8-5) Soddalashtiring.

$$\frac{a^2+ab+b^2}{a^3-b^3}+\frac{a^2-ab+b^2}{a^3+b^3}$$

A) $\frac{2b}{b^2-a^2}$ B) $\frac{2a}{a^2-b^2}$

C) $\frac{2a}{b^2-a^2}$ D) $\frac{2b}{a^2-b^2}$

43. (a3-g9-3) Soddalashtiring.

$$\frac{x^2-9(x+4)}{x+3}$$

A) x^2+x-12 B) $x-12$
C) $x-3$ D) x^2+9

44. (a3-g11-5) Ifodani soddalashtiring.

$$\frac{2a^4+a^3+4a^2+a+2}{2a^3-a^2+a-2}$$

A) $\frac{a+2}{a-1}$ B) $\frac{a^2+1}{a-1}$

C) $\frac{a-2}{a+1}$ D) $\frac{a-1}{a+1}$

45. (a3-g12-4) Soddalashtiring.

$$\frac{b^2-4ab+16a^2}{64a^3+b^3}\cdot\frac{16a^2-b^2}{4a+7b}$$

A) $1-\frac{6b}{4a+7b}$ B) $1+\frac{8b}{4a+7b}$

C) $2-\frac{6b}{4a+7b}$ D) $1-\frac{8b}{4a+7b}$

46. (a3-g13-5) Soddalashtiring.

$$\frac{a^8+a^4+1}{a^6+1}$$

A) $\frac{a^4-a^2+1}{(a-1)(a+1)}$

B) $\frac{a^4+a^2+1}{a^2+1}$

C) $\frac{(a^2+1)^2}{(a-1)^2}$

D) $\frac{(a+1)^2}{a-1}$

47. (a3-g14-4) Soddalashtiring.

$$\frac{x^2-4(x+8)}{x+4}$$

A) $x-8$ B) $x+4$
C) 8 D) x^2-4

48. (a3-g16-3) Soddalashtiring.

$$\frac{a^2+ab-ac-bc}{a^2+ab+ac+bc}-\frac{ab+ac-bc-b^2}{c^2+ab+ac+bc}$$

A) $\frac{b-c}{b+c}$ B) $\frac{a-b}{a+b}$

C) $\frac{b-c}{a+c}$ D) $\frac{2a-c-b}{a+c}$

49. (a3-g17-5) Soddalashtiring.

$$\frac{x^3-5x^2-2x+24}{x^2-x-6}$$

A) $x-4$ B) $x-2$
C) $x-3$ D) $x+3$

50. (a3-g21-5) Ifodani soddalashtiring.

$$\frac{a^2-6a-4b-b^2+5}{a+b-1}+5$$

A) $a-b$ B) $2a$
C) $a+b+3$ D) $2b$

51. (a3-g23-4) Soddalashtiring.

$$\frac{2a^2+6ab+4b^2}{a^2+5ab+6b^2}$$

A) $\frac{2(a-b)}{a+2b}$

B) $\frac{a-b}{a+2b}$

C) $\frac{2a+2b}{a+3b}$

D) $\frac{a+2b}{2(a-b)}$

52. (a4-g1-4) Soddalashtiring.

$$\frac{a^2-ab-ac+bc}{a^2-ac-bc+ab}-\frac{b^2+bc-ab-ac}{b^2+ab+ac+bc}$$

A) 0 B) $\frac{2a-2b}{a+b}$

C) $\frac{-2b}{a+b}$ D) $\frac{2a}{a+b}$

53. (a4-g2-4) Soddalashtiring.

$$\frac{x^2-3(x+6)}{x-6}$$

A) x^2-3 B) $x+3$
C) 6 D) $x-6$

54. (a4-g3-4) Soddalashtiring.

$$\frac{x^4-x^3-x-1}{x^2-x-1}$$

A) x^2+1 B) x^2-1
C) $x+1$ D) $x-1$

55. (a4-g4-4) Soddalashtiring.

$$\frac{9x^2-y^2-6x+1}{9x^2-y^2-3x-y}$$

A) $\frac{3x-y+1}{3x+y}$ B) $1+\frac{1}{3x-y}$

C) $1-\frac{1}{3x+y}$ D) $\frac{3x-y}{3x+y}$

56. (a4-g4-5) Berilgan ifodani soddalashtiring.

$$\frac{1}{1-\frac{4}{x}+\frac{3}{x^2}}-\frac{3}{x-4+\frac{3}{x}}-\frac{2}{4x-x^2-3}$$

A) $\frac{x-2}{x-1}$ B) $\frac{x-1}{x-3}$

C) $\frac{x-2}{x-3}$ D) $\frac{x-1}{x-2}$

57. (a4-g5-3) Soddalashtiring.

$$\frac{(x+5)^2-(2x-3)^2}{3ax-6bx-4b+2a}$$

A) $\frac{x-8}{2b-a}$ B) $\frac{2x-3}{a+2b}$

C) $\frac{3x-2}{a-2b}$ D) $\frac{8-x}{a+2b}$

58. (a4-g6-4) Soddalashtiring.

$$\frac{a^4+3a^2+4}{(a+0{,}5)^2+1{,}75}$$

A) $(a+2)(a+1)$
B) a^2-a+2
C) $(a-1)(a+2)$
D) a^2+a+2

59. (a4-g7-3) Ifodani soddalashtiring.

$$\frac{x^4+6x^3+96x-256}{x^4+12x^2-64}$$

A) $1+\frac{10}{x+2}$ B) $2-\frac{3}{x+2}$

C) $1+\frac{6}{x+2}$ D) $1+\frac{3}{x-2}$

60. (a4-g8-4) Soddalashtiring.

$$\frac{t^2-4mt+16m^2}{64m^3+t^3}\cdot\frac{16m^2-t^2}{4m+7t}$$

A) $1-\frac{6t}{4m+7t}$ B) $1+\frac{8t}{4m+7t}$

C) $2-\frac{6t}{4m+7t}$ D) $1-\frac{8t}{4m+7t}$

61. (a4-g9-4) Soddalashtiring.

$$\frac{1}{1-\frac{4}{x}+\frac{3}{x^2}}-\frac{3}{x-4+\frac{3}{x}}-\frac{2}{4x-x^2-3}$$

A) $\frac{x-3}{x-2}$ B) $\frac{x+1}{x-3}$

C) $1+\frac{2}{x-3}$ D) $\frac{x-2}{x-3}$

62. (a4-g10-3) $\frac{x^4-3x^2+ax-21}{x^2+x-6}$ kasrni qisqartirish mumkin bo'lsa, a sonining butun qiymatini toping.

A) 9 B) –7 C) –43 D) 11

63. (a4-g12-6) Soddalashtiring.
$\sqrt{(\sqrt{5}-\sqrt{2})\sqrt{13+2\sqrt{19-6\sqrt{10}}}}$
A) 3 B) $\frac{3}{\sqrt{3}}$
C) $\sqrt{5}-\sqrt{2}$ D) $\sqrt{5}+\sqrt{2}$

64. (a4-g14-6) Soddalashtiring.
$\frac{2x^3-x^2-7x+6}{x^2+4x+4}:\frac{x^2-1}{x^2+3x+2}$.
A) $\frac{2x-3}{x+2}$ B) $\frac{-2x-3}{x-1}$
C) $2x-3$ D) $x+2$

65. (a4-g15-5) Ifodani soddalashtiring.
$\frac{a^{12}+a^6+1}{a^9-1}$
A) $1-\frac{1}{a^3-1}$ B) $a^3+\frac{a}{a^3-1}$
C) $a^3+\frac{a^2}{a^3-1}$ D) $a^3+\frac{1}{a^3-1}$

66. (a4-g16-4) Soddalashtiring
$\frac{(x-3)^2-25}{x-8}+2x$
A) $x-8$ B) $3x+2$
C) $x-2$ D) $3x-8$

67. (a4-g18-3) Soddalashtiring.
$\left(\frac{x^2+3x-4}{x^4+8x}\cdot\frac{x^2+5x+6}{x^2+2x-3}\right):\frac{x+4}{x^2-2x+4}$
A) $\frac{1}{x}$ B) $\frac{x+1}{x}$
C) $\frac{x}{x+1}$ D) $\frac{x+2}{x+1}$

68. (a4-g19-4) Soddalashtiring.
$\left(\frac{1+x}{x-1}+\frac{1-x}{1+x}\right):\left(\left(\frac{1+x}{1-x}-1\right)\left(1-\frac{1}{1+x}\right)\right)$
A) $\frac{1}{x}$ B) $\frac{x}{2}$ C) $-\frac{2}{x}$ D) $-\frac{1}{x}$

69. (a4-g20-4) Soddalashtiring.
$\frac{a^2b+a^2c+ab^2+ac^2+b^2c+bc^2+2abc}{ab+ac+bc+c^2}-2b$
A) $2a$ B) $a-b$
C) $a+b$ D) $c-b$

70. (a4-g21-4) Soddalashtiring.
$\frac{(x+5)^2-49}{x+12}+2x$
A) $x-8$ B) $3x-2$
C) $-x-2$ D) $3x-8$

71. (a4-g23-3) Ifodani soddalashtiring.
$\frac{\frac{x}{x+y}+\frac{y}{x-y}}{\frac{x}{y}+\frac{y}{x}}$
A) $\frac{x^2-y^2}{xy}$ B) $\frac{xy}{x^2-y^2}$
C) $\frac{x^2-y^2}{x^2+y^2}$ D) $\frac{x^2+y^2}{x^2-y^2}$

72. (a4-g23-4) Ifodani soddalashtiring.
$\frac{a^6+4a^2-8}{a^2+2}$
A) $a^6-a^5+a^4-4$
B) a^6+4a^2-4
C) $a^6-2a^4+4a^2-4$
D) a^6-a^5-4

73. (a4-g24-4) Soddalashtiring.
$\frac{54xy^2-27y^3}{(2x-3y)^2}+\frac{8x^3+27y^3}{(2x-3y)^2}-$
$-\frac{36x^2y+27y^3}{4x^2+9y^2-12xy}$
A) $2x-3y$ B) $2x+3y$
C) $4x$ D) $6y$

74. (a5-g1-3) $x-y=3$ bo'lsa, $\frac{x^2-3x+3y-y^2}{3-x-y}$ ifodaning qiymatini toping.
A) 2 B) –3 C) –2 D) 3

75. (a5-g2-3) Ifodani soddalashtiring.
$\left(\frac{a}{b-\frac{1}{a}}-\frac{b}{a-\frac{1}{b}}\right)\cdot\frac{a^2b^2-1}{a-\frac{b^2}{a}}$
A) $a(ab-1)$ B) 1
C) 0 D) $a(ab+1)$

76. (a5-g5-4) $\frac{x^4-3x^2+ax-21}{x^2+x-6}$ kasrni sodalashtirish mumkin bo'lsa, a ning qiymatini toping.
A) 8 B) 11 C) 29 D) –7

77. (a5-g6-3) Soddalashtiring.
$\frac{a^2-4b^2}{1-\frac{2b}{a}}:\frac{a+2b}{a^2}$
A) a^3 B) a^2 C) a D) a^{-1}

78. (a5-g7-3) Ifodani soddalashtiring.
$\frac{a^3-a+b-a^2b}{a^2-b^2+b-a}$
A) $\frac{a^2-1}{a+b-1}$ B) $\frac{a^2+1}{a-b+1}$
C) $\frac{a^2+1}{a+1}$ D) $\frac{a^2-1}{a-b+1}$

79. (a5-g10-4) Ifodani soddalashtiring.
$\frac{a^2x^2-ax(b+2)+2b}{a^2bx-a(2b+a^2x^2)+2a^2x}$
A) $\frac{ax-2}{bx-2}$ B) $\frac{a-bx}{a}$
C) $\frac{a}{b}$ D) $-\frac{1}{a}$

80. (a5-g11-3) Ifodani soddalashtiring.
$\frac{2x^3-3x^2y-14x^2-15y+10x+21xy}{4x^2-4xy-3y^2}$
A) $\frac{x^2-7x+5}{2x+y}$ B) $\frac{x^2+7x-5}{2x-3y}$
C) $\frac{2x^2+3x-5y}{4x-y}$ D) $\frac{x^2-y^2}{3x+2y}$

81. (a5-g12-3) $P(x)$ ko'phadni $x^2-10x+5$ ga bo'lganda, bo'linma x^3-7x+2 qoldiq esa $3x+4$ ga teng. $P(x)$ ko'phadning koeffitsiyentlari yig'indisini toping.
A) –18 B) 32
C) –9 D) 23

82. (a5-g12-4) Ifodani soddalashtiring.
$\frac{(x-7)^2-64}{x+1}+2x$
A) $2(x+2)$ B) $3(x-5)$
C) $3x+15$ D) x

83. (a5-g13-3) Kasrni soddalashtiring.
$\frac{2x^3+x^2-2x-1}{2x^3+7x^2+7x+2}$
A) $\frac{x-1}{x+2}$ B) $\frac{2x-1}{2x+1}$
C) $\frac{x+2}{x+1}$ D) $\frac{x+1}{x+2}$

84. (a5-g14-3) Soddalashtiring
$20\cdot\left(5\cdot\frac{x^2-0,64}{5x-4}-10\cdot\frac{0,49-x^2}{7+10x}\right)$
A) $40x+2$ B) 15
C) 1 D) $40x+30$

85. (a5-g15-10) Ifodani soddalashtiring.
$\frac{k^2+kt-mk-mt}{km+tm-t^2-tk}+\frac{kt-k^2+mt-mk}{m^2-tk-tm+mk}$
A) $1+\frac{2t}{m-t}$ B) $\frac{m-k}{k+t}$
C) –1 D) $1-\frac{2m}{k+m}$

86. (a5-g16-3) Soddalashtiring.
$\frac{x^2+4(x-3)}{x-2}$
A) $x-6$ B) x^2+x-6
C) $x+6$ D) x^2-x-6

87. (a5-g16-4) Soddalashtiring.
$\frac{a^{12}+a^6+1}{a^6-a^3+1}$
A) a^6+1 B) a^6-1
C) a^6+a^3-1 D) a^6+a^3+1

88. (a5-g17-5) Tenglama nechta haqiqiy ildizga ega?
$\frac{x^4-7x^3+16x^2-28x+48}{x^2-4x+3}=0$
A) 0 B) 1 C) 2 D) 3

89. (a5-g20-3) Soddalashtiring.
$256\cdot(a+0,5)(a+1,5)((a+1)^2+0,25)\cdot$
$\cdot((a+1)^4+0,0625)+1$
A) $256\cdot(a+1)^{16}$
B) $(2a-2)^8$
C) $256\cdot(a+1)^6$
D) $(2a+2)^8$

90. (a5-g20-4) Soddalashtiring.
$\frac{(a+b)^2x-abx}{a^3-b^3}\cdot\frac{a-b}{abx}$
A) ab B) $(ab)^{-1}$
C) a^2-b^2 D) $a+b$

91. (a5-g21-3) Ifodani soddalashtiring.
$$\frac{cx(b+a)+ab(c-x)-(a+b+x-c)c^2}{c^2(a-b+c-x)-xc(a-b)-ab(c-x)}$$
A) $\frac{c-a}{c+b}$ B) $\frac{c-a}{a+c}$
C) $\frac{b-c}{b+c}$ D) $\frac{x-a}{c-x}$

92. (a5-g24-4) Ifodani soddalashtiring.
$$\frac{2x^2+x-15}{2x^2-13x+15}:\frac{2x^2+5x-25}{(x-5)^2}$$
A) $\frac{2x^2-3x-15}{x^2-10x+25}$
B) $\frac{x^2-8x+15}{2x^2-5x-25}$
C) $\frac{x^2-2x-15}{2x^2+7x-15}$
D) $\frac{2x^2-2x-15}{x^2-2x-15}$

93. (a5-g25-6) $\frac{x^2}{7}=\frac{y^2}{10}=\frac{z^2}{12}$ bo'lsa,
$\frac{x^4+y^2z^2}{x^4+y^4+z^4}$ ni hisoblang.
A) $\frac{169}{289}$ B) $\frac{13}{17}$ C) $\frac{169}{293}$ D) $\frac{13}{25}$

94. (a6-g2-3) Ifodani soddalashtiring.
$$\frac{x^4+4x^2-x+6}{x^4+x^3+4x^2+x+3}.$$
A) $1+\frac{1-x}{x^2+1}$ B) $1-\frac{x+1}{x^2-1}$
C) $2-\frac{2x}{x^2-3}$ D) $1+\frac{x^2}{2x-1}$

95. (a6-g4-4) Ifodani soddalashtiring:
$$\frac{x^4+x^3-x-1}{x^2+x+1}.$$
A) x^2+1 B) $x+1$
C) $-1-x^2$ D) $-1+x^2$

96. (a6-g6-3) $\frac{x^2-(2m-3)x-6m}{x^2+(1-2m)x-2m}\cdot(x+1)$
ifodani soddalashtiring.
A) $x-3$ B) $\frac{x+3}{x+1}$
C) $x-2m$ D) $x+3$

97. (a6-g7-3) Soddalashtiring:
$$\frac{x^2-4(x+3)}{x^2-4}.$$
A) $1-\frac{4}{x-2}$ B) $x+3$
C) $1+\frac{4}{x+2}$ D) $-x-3$

98. (a6-g13-30) Ifodani
soddalashtiring: $\frac{x-5(x-4)}{x-5}$.
A) $x-4$ B) -5
C) -4 D) $x+4$

99. (a6-g21-19) Ifodani soddalashtiring:
$$\frac{x^3+36x+27}{x^3\ \ 27}+\frac{6x}{[illegible]\ 9}.$$
[illegible]
B) [illegible]
D) [illegible]

100. (a6-g22-4) Soddalashtiring:
$$\frac{8m-10}{n-4m+5}-\frac{n^2-16m^2-10n+25}{n^2-25-8nm+16m^2}.$$
A) $\frac{-n-4m+5}{n-4m-5}$
B) 1
C) -1
D) $\frac{12m-n-15}{n-6m+3}$

101. (a6-g24-4) Ifodani soddalashtiring:
$$\frac{a^4+a^2+1}{(a^3+1)(a^2+a+1)}.$$
A) $\frac{1}{a-1}$ B) $\frac{a-1}{a^2+1}$
C) $\frac{1}{a+1}$ D) $\frac{a+1}{a^2+1}$

102. (a6-g26-3) Ifodani soddalashtiring:
$$\frac{x^2+4y^2-9z^2+4xy}{x^2-4y^2+9z^2+6xz}.$$
A) $\frac{x+2y-3z}{x+2y+3z}$ B) $\frac{x+3z}{x-2y+3z}$
C) $\frac{x-3z+2y}{x+3z-2y}$ D) $1-\frac{6z}{x+2y-3z}$

4-bob. Haqiqiy sonlar

22. Arifmetik kvadratildiz. Ildizlarning xossalari

1. (a1-g2-5) $4+2\sqrt{2}$ ga teskari sonni toping.
A) $4-2\sqrt{2}$ B) $0,5-0,25\sqrt{2}$
C) $\frac{x^2}{x+2}$ D) $-4-2\sqrt{2}$

2. (a3-g20-6) Quyidagi mulohazalardan qaysi biri to'g'ri?
A) Ildiz ko'rsatkichi juft bo'lgan ildiz ostidagi ifoda manfiy qiymatlarni qabul qilmaydi.
B) Chiziqli tenglama bittadan ko'p ildizga ega bo'la olmaydi.
C) Qisqarmas kasrning maxraji 10 ga bo'linsa, bu kasrni chekli o'nli kasr ko'rinishida yozish mumkin.
D) Bir necha ratsional sonlar ko'paytmasi irratsional bo'lishi mumkin.

3. (a3-g22-5) Maxrajni irratsionallikdan qutqaring.
$$\frac{4}{\sqrt{5}+\sqrt{3}-\sqrt{2}}$$
A) $\frac{\sqrt{30}-3\sqrt{2}+2\sqrt{3}}{3}$
B) $\frac{2\sqrt{3}+3\sqrt{2}+\sqrt{30}}{3}$
C) $\frac{2\sqrt{2}+3\sqrt{3}+\sqrt{30}}{3}$
D) $\frac{2\sqrt{3}+3\sqrt{2}+\sqrt{30}}{6}$

4. (a4-g1-5) $\sqrt{3}+\sqrt{5}+\sqrt{7}+....+\sqrt{79}=$
$=a-2$ bo'lsa, $\sqrt{12}+3+\sqrt{15}+$
$+\sqrt{21}+....+\sqrt{237}=?$
A) $a+\sqrt{3}$ B) $\sqrt{3}a-3$
C) $3a$ D) $\sqrt{3}a$

5. (a5-g8-4) Ifodani soddalashtiring.
$$\frac{x^4-7x^3+8x^2+28x-48}{x^3-x^2-10x-8}$$
A) $x-3$ B) $x+\frac{6x+5}{x-1}$
C) $x-\frac{6x-6}{x+1}$ D) $x+2-\frac{6-3x}{x+1}$

6. (a6-g14-1) Agar $a=\sqrt{13}-\sqrt{11}$ va $b=\sqrt{7}-\sqrt{5}$ bo'lsa, quyidagi mulohazalardan qaysi biri to'g'ri?
A) $a-b<0$
B) $0<a-b<1$
C) $a-b>2$
D) $1<a-b<2$

23. Kvadrat ildiz. Hisoblashga doir misollar

1. (a1-g3-15) 48% i
$2\cdot(\sqrt{7}-\sqrt{5}):(\sqrt{7}+\sqrt{5})+2\sqrt{35}$ ga
teng bo'lgan sonni toping.
A) 5,76 B) 25 C) 30 D) 45

2. (a1-g3-17) Soddalashtiring.
$$4+9\sqrt{2}-\frac{\sqrt{27}}{\sqrt{6}+\sqrt{3}}$$
A) 13 B) -5
C) $6\sqrt{2}+7$ D) $13-6\sqrt{2}$.

3. (a1-g9-5) Hisoblang.
$$\frac{\sqrt{5+\sqrt{10}}+\sqrt{5-\sqrt{10}}}{\sqrt{5+\sqrt{15}}}$$
A) 1 B) $\sqrt{2}$ C) 3 D) $\sqrt{5}$

4. (a1-g17-6) Hisoblang.
$$\frac{\sqrt{7}+\sqrt{5}}{\sqrt{28}+\sqrt{21}+\sqrt{20}+\sqrt{15}}-\frac{\sqrt{5}+\sqrt{3}}{\sqrt{20}-\sqrt{15}+\sqrt{12}-3}$$
A) $2\sqrt{3}$ B) $-2\sqrt{3}$ C) 2 D) -2

5. (a2-g2-6) Hisoblang.
$$\frac{1+\sqrt{7}}{\sqrt{4+\sqrt{7}}}-\frac{1-\sqrt{5}}{\sqrt{3-\sqrt{5}}}$$
A) 0 B) $2\sqrt{2}$
C) $\sqrt{5}-\sqrt{7}$ D) $\sqrt{5}-\sqrt{2}$

6. (a2-g3-5)
$\sqrt{(\sqrt{5}-\sqrt{3})\sqrt{(\sqrt{5}+\sqrt{3})\sqrt{8+\sqrt{60}}}} = ?$
A) $\sqrt{2}$ B) 2
C) $2\sqrt{2}$ D) $\sqrt{5}-\sqrt{3}$

7. (a2-g4-6) Hisoblang.
$\frac{3}{\sqrt{3}}+\frac{1}{2+\sqrt{3}}$
A) $2\sqrt{3}$ B) $2\sqrt{3}+2$
C) 2 D) $\sqrt{3}$

8. (a2-g7-6) Hisoblang.
$\frac{1}{5\sqrt{2}-7}-5\sqrt{2}+7$
A) 0
B) 14
C) $10\sqrt{2}+14$
D) $10\sqrt{2}$

9. (a2-g12-1)
$\sqrt{\left(\sqrt{\theta}-\frac{3\pi}{2}\right)^2}+\sqrt{\left(\sqrt{\theta}-\frac{5\pi}{2}\right)^2} = ?$
A) $2\sqrt{\theta}-4\pi$ B) $-\pi$
C) π D) $4\pi-2\sqrt{\theta}$

10. (a2-g12-4) $\sqrt{2-\sqrt{3}}+\sqrt{2+\sqrt{3}} = ?$
A) $\sqrt{6}$ B) 1
C) $\sqrt{2}$ D) $\sqrt{3}$

11. (a2-g13-10) Ikki sonning yig'indisi $\sqrt{6}$ ga, ayirmasi $\sqrt{10}$ ga teng. Ularning ko'paytmasi 2 dan qanchaga kam?
A) 3 B) 4 C) 1 D) 2

12. (a2-g15-6) $\sqrt{3}-\sqrt{5}$ soniga qarama-qarshi sonni ko'rsating.
A) $\frac{\sqrt{5}+\sqrt{3}}{-2}$ B) $2\operatorname{tg}^2\alpha$
C) $\frac{2}{\sqrt{5}+\sqrt{3}}$ D) $\frac{2}{\sqrt{5}-\sqrt{3}}$

13. (a2-g18-6) Hisoblang.
$\frac{3}{2\sqrt{3}-3}+\frac{4}{3\sqrt{3}+5}+\frac{2}{7+4\sqrt{3}}$
A) $7\sqrt{3}+7$ B) $14\sqrt{3}$
C) 7 D) $7\sqrt{3}$

14. (a2-g21-6) Quyidagi sonlardan qaysi biri $\sqrt{\frac{13}{76}}$ ga teng emas?
A) $\frac{1}{38}\cdot\sqrt{247}$ B) $6{,}5\sqrt{\frac{1}{247}}$
C) $\frac{1}{2}\cdot\sqrt{\frac{13}{19}}$ D) $\frac{1}{4}\cdot\sqrt{\frac{26}{19}}$

15. (a2-g23-5) $\sqrt{3}+\sqrt{4}+\sqrt{5}+....+$ $+\sqrt{30}=a-2$ bo'lsa, $4+\sqrt{12}+\sqrt{16}+$ $+\sqrt{20}+....+\sqrt{120}=?$
A) $a+\sqrt{3}$ B) $\sqrt{3}a$
C) $2a$ D) $\sqrt{3}a-1$

16. (a3-g1-6) Quyidagi sonlardan nechtasi ratsional?
1) 0,(256); 2) $\frac{\sqrt{14}-\sqrt{10}}{\sqrt{7}-\sqrt{5}}$; 3) $\frac{\sqrt{2}}{\sqrt{7}}\cdot\frac{\sqrt{14}}{4}$;
4) $\sqrt{8}-\sqrt{2}$; 5) $\frac{\sqrt{48}+\sqrt{40}}{\sqrt{12}+\sqrt{10}}$.
A) 0 B) 2 C) 3 D) 5

17. (a3-g2-6) $\frac{7}{\sqrt{4-\sqrt{2}}}$ ifoda quyidagilarning qaysi biriga teng?
A) $\frac{\sqrt{4+\sqrt{2}}\cdot(4-\sqrt{2})}{2}$
B) $\frac{\sqrt{4-\sqrt{2}}\cdot(4+\sqrt{2})}{2}$
C) $\frac{\sqrt{4-\sqrt{2}}}{2}$
D) $\frac{\sqrt{4+\sqrt{2}}}{2}$

18. (a3-g3-7) Hisoblang.
$\sqrt{0{,}09}-\sqrt{0{,}16}+\sqrt{0{,}81}-\sqrt{2{,}56}$
A) –1,2 B) –0,8 C) –1,6 D) –0,12

19. (a3-g9-5) Kasrning maxrajini irratsionallikdan qutqaring.
$\frac{30}{\sqrt{5}-\sqrt{8}+\sqrt{3}}$
A) $5\sqrt{3}+3\sqrt{5}+2\sqrt{30}$
B) $5\sqrt{5}-3\sqrt{3}+2\sqrt{10}$
C) $\frac{10\sqrt{3}+5\sqrt{5}-2\sqrt{15}}{3}$
D) $\frac{10\sqrt{5}-5\sqrt{3}+2\sqrt{15}}{3}$

20. (a3-g10-6) Hisoblang.
$\frac{1-\sqrt{7}}{\sqrt{4-\sqrt{7}}}+\frac{1+\sqrt{5}}{\sqrt{3+\sqrt{5}}}$
A) $\sqrt{5}-\sqrt{7}$ B) $\sqrt{5}-\sqrt{2}$
C) $2\sqrt{2}$ D) 0

21. (a3-g11-6) Hisoblang.
$\frac{\sqrt{5-3\sqrt{2,(6)}}}{\sqrt{2}}+\frac{\sqrt{5+3\sqrt{2,(6)}}}{\sqrt{2}}$
A) $2\sqrt{3}$ B) $\sqrt{6}$
C) 2 D) $2\sqrt{2}$

22. (a3-g12-6) $\sqrt{7}-\sqrt{5}$ soniga qarama-qarshi sonni ko'rsating.
A) $\frac{2}{\sqrt{7}+\sqrt{5}}$ B) $\sqrt{7}+\sqrt{5}$
C) $\frac{\sqrt{7}+\sqrt{5}}{2}$ D) $\frac{-2}{\sqrt{7}+\sqrt{5}}$

23. (a3-g16-5) $x=\sqrt{2}$ va $y=\sqrt{5}$ bo'lsa, $\sqrt{9x^2-12xy+4y^2}-\sqrt{9x^2+12xy+4y^2}$ ni hisoblang.
A) $\frac{1}{2}F(x)$ B) $-4\sqrt{5}$
C) $2\sqrt{5}-6\sqrt{2}$ D) $2\sqrt{5}+6\sqrt{2}$

24. (a3-g17-6) Hisoblang.
$\sqrt{4-\sqrt{15}}-\sqrt{4+\sqrt{15}}$
A) $-\sqrt{6}$ B) $-\sqrt{10}$
C) $\sqrt{6}$ D) $\sqrt{10}$

25. (a3-g18-6) Quyidagilardan qaysi biri $\sqrt{7}+\sqrt{4}$ sonining teskarisi emas.
A) $\frac{1}{\sqrt{7}+\sqrt{4}}$ B) $\frac{\sqrt{7}-\sqrt{4}}{3}$
C) $\frac{1}{\sqrt{7}-\sqrt{4}}$ D) $\frac{\sqrt{28}-\sqrt{16}}{6}$

26. (a3-g21-6) Hisoblang.
$\left(\frac{\sqrt{6}+\sqrt{14}}{\frac{\sqrt{3}}{\sqrt{7}}+1}\right)^2$
A) $\frac{2}{7}$ B) 2 C) 7 D) 14

27. (a4-g2-11) $\sqrt{32-p^2}+\sqrt{16-p^2}=8$ bo'lsa, $\sqrt{32-p^2}-\sqrt{16-p^2}=?$
A) Aniqlab bo'lmaydi.
B) 2
C) 4
D) 6

28. (a4-g7-5) $\frac{2}{\sqrt{6}+\sqrt{8}}$ kasr quyidagilardan qaysi biriga teng emas?
A) $\frac{2\sqrt{2}}{\sqrt{12}+4}$
B) $2\sqrt{2}-\sqrt{6}$
C) $\frac{\sqrt{2}}{2+\sqrt{3}}$
D) $\frac{4\sqrt{2}-2\sqrt{3}}{2}$

29. (a4-g8-6) $3-\sqrt{7}$ soniga qarama-qarshi sonni ko'rsating.
A) $\frac{2}{\sqrt{7}+3}$ B) $\sqrt{7}+3$
C) $\frac{\sqrt{7}+3}{2}$ D) $\frac{-2}{\sqrt{7}+3}$

30. (a4-g9-5) Hisoblang.
$\sqrt{829\cdot154-830\cdot153}$
A) 26 B) 24 C) 16 D) 14

31. (a4-g14-1) Hisoblang.
$\frac{5\cdot\sqrt{1{,}96}+10\cdot\sqrt{2{,}25}+5\cdot\sqrt{2{,}56}}{3\cdot\sqrt{2{,}89}-2\cdot\sqrt{3{,}24}}$
A) 20 B) 30 C) 40 D) 50

32. (a4-g20-5) Hisoblang.
$\left(\sqrt{\frac{7}{8}}-\sqrt{\frac{2}{7}}\right):\frac{7}{2\sqrt{14}}$
A) $\frac{5}{14}$ B) 2
C) $\frac{3}{7}$ D) 3

33. (a4-g23-5) n natural son bo'lsa, quyidagi ifodani soddalashtiring.

$$\sqrt{1+\frac{1}{2}}\cdot\sqrt{1+\frac{1}{3}}\cdot\sqrt{1+\frac{1}{4}}\cdot\ldots\cdot\sqrt{1+\frac{1}{2n^2+4n+1}}$$

A) $2(n+1)$ B) $\sqrt{2}(n+1)$

C) $\frac{n+1}{2}$ D) n + 1

34. (a5-g8-5) $\frac{\sqrt{0,2}}{3}+\frac{\sqrt{7,2}}{4}-\frac{3\sqrt{0,05}}{2}=a\sqrt{5}$. a ning qiymatini toping.

A) $\frac{6}{13}$ B) $\frac{13}{60}$

C) $\frac{1}{2}$ D) $\frac{65}{12}$

35. (a5-g18-11) Hisoblang.

$\sqrt{6450\cdot3890-6448\cdot3891}$

A) $12\sqrt{13}$ B) $6\sqrt{37}$

C) $4\sqrt{39}$ D) 36

36. (a6-g5-6) $\frac{3+\frac{x+6}{5}}{2-\frac{x+3}{7}}=5$ bo'lsa, $\frac{x+5}{x-1}$ ni hisoblang.

A) 3 B) 4 C) 2,5 D) 7

37. (a6-g9-5) Maxrajni irratsionallikdan qutqaring: $\frac{12}{\sqrt{3}+\sqrt{6}+\sqrt{9}}$.

A) $\frac{\sqrt{6}+\sqrt{12}-\sqrt{18}}{2}$

B) $\sqrt{6}+2\sqrt{3}-3\sqrt{2}$

C) $1+\sqrt{2}-\sqrt{3}$

D) $3\sqrt{3}-2\sqrt{2}+\sqrt{6}$

38. (a6-g18-28) $a=-3\sqrt{5}$ va $b=-2\sqrt{3}$ bo'lsa, $\sqrt{a^2+4ab+4b^2}-\sqrt{a^2-4ab+4b^2}$ ni hisoblang.

A) $-6\sqrt{5}$ B) $-8\sqrt{3}$

C) $6\sqrt{5}$ D) $8\sqrt{3}$

39. (a6-g19-19) Hisoblang:

$\frac{1}{\sqrt{6-\sqrt{11}}}-\frac{1}{\sqrt{6+\sqrt{11}}}$.

A) $\frac{\sqrt{22}}{5}$ B) $-\frac{\sqrt{22}}{5}$

C) $\frac{\sqrt{2}}{5}$ D) $-\frac{\sqrt{2}}{5}$

40. (a6-g21-5) $a=-\sqrt{17}-4$, $b=-\sqrt{15}-\sqrt{14}$ va $c=-2\sqrt{15}$ bo'lsa, bu sonlarni o'sish tartibida yozing.

A) $b<c<a$

B) $c<a<b$

C) $c<b<a$

D) $a<c<b$

24. Kvadrat ildiz qatnashgan ifodalarni soddalashtirish

1. (a1-g8-12) Hisoblang.

$\frac{(5\sqrt{3}+\sqrt{50})\cdot(5-\sqrt{24})}{\sqrt{75}-5\sqrt{2}}$

A) 1 B) $2\sqrt{2}$

C) $\sqrt{5}-\sqrt{3}$ D) $\sqrt{3}-\sqrt{2}$

2. (a1-g10-6) $2\sqrt{3-\sqrt{5}}(6+2\sqrt{5})\cdot(\sqrt{10}-\sqrt{2})=?$

A) 32 B) 20 C) 12 D) 4

3. (a1-g11-6) Hisoblang.

$\sqrt{2-2\cdot\sqrt{1-4\sqrt{9-\sqrt{80}}}}$

A) $1-\sqrt{5}$

B) $\sqrt{5}-2$

C) $\sqrt{5}+2$

D) $\sqrt{5}-1$

4. (a1-g15-6) Hisoblang.

$\sqrt{3+4\sqrt{-2+4\sqrt{15+6\sqrt{6}}}}$

A) $\sqrt{6}+2$ B) $4+\sqrt{2}$

C) $2\left(3+2\sqrt{2}\right)$ D) $\sqrt{3}+2\sqrt{2}$

5. (a1-g15-7) Maxrajni irratsionallikdan qutqaring. $\frac{2}{\sqrt[4]{8}-\sqrt[4]{2}}$

A) $2\sqrt[4]{2}+\sqrt[4]{8}$ B) $\sqrt[4]{8}-\sqrt{2}$

C) $2-\sqrt[4]{2}$ D) $2\sqrt[4]{8}+2$

6. (a1-g16-5) $1+\sqrt{2}$ ga teskari ifodani toping.

A) $\sqrt{2}-1$ B) $1-\sqrt{2}$

C) $\frac{1}{1-\sqrt{2}}$ D) $\frac{1}{\sqrt{2}-1}$

7. (a2-g5-6) $y=3\sqrt{5}$ va $z=5\sqrt{3}$ bo'lsa, $\sqrt{z^2-6yz+9y^2}+\sqrt{y^2-2yz+z^2}$ ning qiymatini toping.

A) $6\sqrt{5}$ B) $10\sqrt{3}$

C) $-6\sqrt{5}$ D) $12\sqrt{5}-10\sqrt{3}$

8. (a2-g8-7) Hisoblang.

$\sqrt{0,09}+\sqrt{0,16}-\sqrt{0,81}+\sqrt{2,56}$

A) 1,2 B) 1,4 C) 1,6 D) 0,12

9. (a2-g9-6) Hisoblang.

$\sqrt{2-2\cdot\sqrt{1-4\sqrt{9-\sqrt{80}}}}$

A) $1-\sqrt{5}$ B) $\sqrt{5}-2$

C) $\frac{\sqrt{2}}{4}$ D) $\sqrt{5}-1$

10. (a2-g11-6) Hisoblang.

$\frac{1+\sqrt{7}}{\sqrt{4+\sqrt{7}}}+\frac{1-\sqrt{5}}{\sqrt{3-\sqrt{5}}}$

A) 0 B) $2\sqrt{2}$

C) $\sqrt{5}-\sqrt{7}$ D) $\sqrt{5}-\sqrt{2}$

11. (a2-g12-7) $\frac{\sqrt{x}+1}{x\sqrt{x}+x+\sqrt{x}}:\frac{1}{x^2-\sqrt{x}}=?$

A) $\frac{1}{x+1+\sqrt{x}}$ B) $x\sqrt{x}-1$

C) $x-1$ D) $\frac{x-1+\sqrt{x}}{x+1+\sqrt{x}}$.

12. (a2-g20-12) $x=n+\sqrt{n^2-16}$; $y=n-\sqrt{n^2-16}$ va $y=2$ bo'lsa, $\frac{x+y}{2}$ ni hisoblang.

A) 3 B) 5 C) 4 D) 8

13. (a3-g6-6) $a=7-\sqrt{40}$ bo'lsa, $2\sqrt{a}+2\sqrt{2}$ ni toping.

A) $\sqrt{5}$ B) $\sqrt{20}$

C) $-\sqrt{10}$ D) $4\sqrt{2}$

14. (a3-g8-6) Hisoblang.

$\sqrt{15-9\sqrt{3}+\sqrt{2+4\sqrt{3}-2\sqrt{4-2\sqrt{3}}}}$

A) $2\sqrt{3}-2$ B) $2\sqrt{3}+1$

C) $2\sqrt{3}-1$ D) $2\sqrt{3}+2$

15. (a3-g13-6) $y=-3\sqrt{5}$ va $z=-5\sqrt{3}$ bo'lsa, $\sqrt{9z^2-6yz+y^2}-\sqrt{y^2-2yz+z^2}$ ning qiymatini toping.

A) $6\sqrt{5}$

B) $10\sqrt{3}$

C) $-10\sqrt{3}$

D) $-6\sqrt{5}+10\sqrt{3}$

16. (a3-g13-7) Hisoblang.

$\frac{\sqrt{7-3\sqrt{5,(3)}}}{\sqrt{2}}+\frac{\sqrt{7+3\sqrt{5,(3)}}}{\sqrt{2}}$

A) $2\sqrt{3}$ B) $\sqrt{6}$

C) 4 D) $2\sqrt{2}$

17. (a3-g14-12) $\sqrt{32-p}+\sqrt{p+16}=4$ bo'lsa, $\sqrt{32-p}-\sqrt{p+16}=?$

A) aniqlab bo'lmaydi.

B) 2

C) 4

D) 8

18. (a3-g24-6) Hisoblang.

$\frac{\sqrt{13-6\sqrt{4,(6)}}}{\sqrt{3+6\sqrt{0,(22)}}}-\frac{\sqrt{13+6\sqrt{4,(6)}}}{\sqrt{3-6\sqrt{0,(22)}}}$

A) $2\sqrt{7}$

B) $2\sqrt{14}$

C) $-2\left(2\sqrt{3}+\sqrt{7}\right)$

D) $2\left(2\sqrt{3}-\sqrt{7}\right)$

19. (a4-g24-5) Hisoblang.

$\sqrt{1+\frac{1}{6}}\cdot\sqrt{1+\frac{1}{7}}\cdot\sqrt{1+\frac{1}{8}}\cdot\ldots\cdot\sqrt{1+\frac{1}{35}}$

A) 6 B) 5 C) $\sqrt{6}$ D) $\frac{1}{\sqrt{5}}$

20. (a4-g25-5) Soddalashtiring. $(x > 0,\ y > 0)$

$$\frac{x\sqrt{y}-3y\sqrt{x}-4y\sqrt{y}}{x\sqrt{x}+4x\sqrt{y}+3y\sqrt{x}} : \frac{y\sqrt{y}-x\sqrt{y}}{x\sqrt{x}+2x\sqrt{y}-3y\sqrt{x}}$$

A) $\frac{3\sqrt{y}+\sqrt{x}}{\sqrt{y}-\sqrt{x}}$ B) $\frac{\sqrt{y}-3\sqrt{x}}{\sqrt{x}+\sqrt{y}}$

C) $\frac{\sqrt{x}+\sqrt{y}}{\sqrt{y}-\sqrt{x}}$ D) $\frac{4\sqrt{y}-\sqrt{x}}{\sqrt{y}+\sqrt{x}}$

21. (a5-g1-5) Ifodani hisoblang.

$$\sqrt{\frac{3}{\sqrt{3}}+\frac{4}{4-\sqrt{12}}-\sqrt{3}}$$

A) $\sqrt{3}-1$

B) $\sqrt{3}+1$

C) $2\sqrt{3}$

D) $\sqrt{3}$

22. (a5-g9-6) Soddalashtiring.

$$\frac{\sqrt{3}-1}{1-\sqrt{3}-\sqrt{5}+\sqrt{15}}$$

A) $\frac{1+\sqrt{5}}{4}$ B) $\frac{1}{1-\sqrt{5}}$

C) $\frac{1}{\sqrt{5}+1}$ D) $\frac{1-\sqrt{5}}{4}$

23. (a5-g10-5) $b = 2\sqrt{3}$ va $c = 3\sqrt{2}$ bo'lsa, $\sqrt{c^2-4bc+4b^2}+\sqrt{b^2-2bc+c^2}$ ning qiymatini toping.

A) $2\sqrt{3}$ B) $6\left(\sqrt{3}-\sqrt{2}\right)$

C) $-2\sqrt{3}$ D) $3\sqrt{2}$

24. (a5-g11-5) Agar $-2 < a < 0$ bo'lsa, $\sqrt{2-\sqrt{4-a^2}}+\sqrt{2+\sqrt{4-a^2}}$ ni hisoblang.

A) $\frac{\sqrt{a-2}-\sqrt{a+2}}{\sqrt{2}}$

B) $\sqrt{4+2a}$

C) $\frac{\sqrt{a-2}+\sqrt{a+2}}{\sqrt{2}}$

D) $\sqrt{4-2a}$

25. (a5-g15-28) Hisoblang.

$$\sqrt{4+\sqrt{7}}+\frac{\sqrt{11-6\sqrt{3,(1)}}}{\sqrt{2}}$$

A) $\frac{2\sqrt{14}-\sqrt{2}}{2}$ B) $\frac{3\sqrt{2}}{2}$

C) $\frac{3\sqrt{7}-1}{\sqrt{2}}$ D) $\frac{\sqrt{14}}{2}$

26. (a5-g19-5) Ifodani hisoblang.

$$\frac{6\sqrt{15}-8\sqrt{6}}{16-6\sqrt{10}}$$

A) $3\sqrt{3}+2\sqrt{2}$

B) $3\sqrt{3}-2\sqrt{2}$

C) $\frac{\sqrt{6}}{3}$

D) $-\frac{\sqrt{6}}{2}$

27. (a5-g22-5) $(-4 \le a \le 0)$ bo'lsa, quyidagi ifodani soddalashtiring.

$$\frac{\sqrt{4+\sqrt{16-a^2}}}{\sqrt{4-\sqrt{16-a^2}}}$$

A) $\frac{4-\sqrt{16-a^2}}{a}$ B) $\frac{\sqrt{16-a^2}-4}{a}$

C) $\frac{\sqrt{16-a^2}+4}{a}$ D) $-\frac{\sqrt{16-a^2}+4}{a}$

28. (a5-g25-5) Ifodani soddalashtiring.

$$\sqrt{11-4\sqrt{7}}+\sqrt{16-6\sqrt{7}}$$

A) 5 B) 1

C) $2\sqrt{7}-5$ D) $2\sqrt{7}+1$

29. (a6-g2-5) Hisoblang:

$$\sqrt{11}\left(\frac{1}{1+\sqrt{2}}+\frac{1}{\sqrt{2}+\sqrt{3}}+\ldots+\frac{1}{\sqrt{98}+\sqrt{99}}+1\right).$$

A) 11 B) 33 C) 22 D) 44

30. (a6-g5-5) Hisoblang:

$$\frac{4}{\sqrt{17}+\sqrt{13}}+\frac{12}{5-\sqrt{13}}-\frac{3}{2\sqrt{5}-\sqrt{17}}.$$

A) $2\sqrt{5}+5$ B) $2\sqrt{17}+2\sqrt{5}$

C) $5-2\sqrt{13}$ D) $5-2\sqrt{5}$

31. (a6-g6-5) $a = \pi - e$ bo'lsa,

$$\sqrt{a^2\left(a^2-a+1\right)+a^2\left(a+1\right)+1}-$$

$$-\sqrt{a^2\left(a^2+a-1\right)-a^2\left(a+1\right)+1}$$ ifodani soddalashtiring.

A) 2

B) $2a^2$

C) $2-2a^2$

D) $\sqrt{a^4+1}-\sqrt{a^4-1}$

32. (a6-g8-5) Ifodani soddalashtiring:

$\sqrt[4]{17-12\sqrt{2}}$.

A) $\sqrt{2}+1$ B) $3+\sqrt{8}$

C) $\sqrt{2}-1$ D) $3-\sqrt{8}$

33. (a6-g10-5) $\sqrt{12-\sqrt{63}}\cdot\left(4\sqrt{6}+\sqrt{42}\right)\cdot\left(\sqrt{7}-1\right)$ ni hisoblang.

A) 48 B) 54 C) 16 D) 72

34. (a6-g11-12) Maxrajni irratsionallikdan qutqaring:

$$\frac{70}{\sqrt{5}+\sqrt{7}+\sqrt{12}}.$$

A) $5\sqrt{7}+7\sqrt{5}-2\sqrt{105}$

B) $5\sqrt{7}-7\sqrt{5}+\sqrt{105}$

C) $10\sqrt{5}+14\sqrt{7}-12\sqrt{3}$

D) $7\sqrt{5}-5\sqrt{7}+\sqrt{105}$

35. (a6-g12-27)

$$\frac{2+\sqrt{3}}{\sqrt{2}+\sqrt{2+\sqrt{3}}}+\frac{2-\sqrt{3}}{\sqrt{2}-\sqrt{2-\sqrt{3}}}$$ ni soddalashtiring.

A) $\frac{\sqrt{6}}{3}$ B) $\frac{\sqrt{2}}{2}$

C) 2 D) $\sqrt{2}$

36. (a6-g13-2) Hisoblang:

$$\frac{\sqrt{5}-\sqrt{2}}{\sqrt{15}+\sqrt{5}-\sqrt{6}-\sqrt{2}}-\frac{\sqrt{6}-\sqrt{3}}{\sqrt{18}+\sqrt{3}-3-\sqrt{6}}.$$

A) -1 B) $-\sqrt{3}$

C) $\sqrt{3}$ D) 1

37. (a6-g17-5) Ifodani soddalashtiring:

$$\frac{1}{\sqrt{5}+\sqrt{7}}+\frac{1}{\sqrt{7}+\sqrt{9}}+$$

$$+\frac{1}{\sqrt{9}+\sqrt{11}}+\ldots+\frac{1}{\sqrt{123}+\sqrt{125}}.$$

A) $-3\sqrt{5}$ B) $3\sqrt{5}$

C) $-2\sqrt{5}$ D) $2\sqrt{5}$

25. Ratsional ko'rsatkichli daraja va uning xossalari

1. (a1-g1-6) $\sqrt[4]{2982\cdot2020-2018\cdot2980}$ ni hisoblang.

A) 6 B) 8 C) 10 D) 12

2. (a1-g3-18) $\sqrt[5]{144\cdot54}+\sqrt[3]{81\cdot72}$ ni hisoblang.

A) 64 B) 45 C) 30 D) 24

3. (a1-g3-33) $\sqrt[4]{(-2)^4}-\sqrt[3]{-27}-\sqrt[5]{(-1)^5}+$

$+\sqrt[6]{(-3)^6}$ ni hisoblang.

A) -9 B) -7 C) -1 D) 9

4. (a1-g8-13) Quyidagilardan qaysi biri noto'g'ri?

A) $a > 0,\ b < 0,\ c > 0$ bo'lsa, $\sqrt[3]{(abc)^3} = abc$

B) $a, b \in R$ bo'lsa, $\sqrt{ab} = \sqrt{a}\cdot\sqrt{b}$

C) $a > 0,\ b < 0,\ c > 0$ bo'lsa, $\sqrt{(abc)^2} = -abc$

D) $3^4+3^4+3^4 = 3^5$

5. (a1-g10-7) Hisoblang.

$$\sqrt[4]{4\cdot\sqrt[3]{2\cdot\sqrt{8}}}\cdot\sqrt{8\cdot\sqrt[3]{2\cdot\sqrt[4]{4}}}$$

A) $2^{\frac{25}{12}}$ B) $2^{\frac{17}{12}}$

C) $2^{\frac{59}{24}}$ D) $2^{\frac{51}{24}}$

6. (a1-g11-7) $a = \sqrt[12]{3^7}$, $b = \sqrt[9]{3^5}$ va $c = \sqrt[7]{3^4}$ sonlarini o'sish tartibida joylashtiring

A) $c < b < a$

B) $b < c < a$

C) $a < b < c$

D) $c < a < b$

7. (a1-g14-5) Hisoblang.

$\sqrt[4]{(-2)^4}-\sqrt[3]{-27}-\sqrt[5]{(-1)^5}+\sqrt[6]{(-3)^6} = ?$

A) 3 B) -7

C) -1 D) 9

8. (a2-g1-6) Hisoblang.

$\sqrt[4]{13+\sqrt{5+\sqrt[3]{62+\sqrt[5]{32}}}}$

A) 5 B) 2 C) 4 D) 3

9. (a2-g4-7) Ifodaning maxrajini irratsionallikdan qutqaring.

$$\frac{20}{5+\sqrt[3]{25}+\sqrt[3]{5}}$$

A) $\sqrt[3]{25}-\sqrt[3]{5}$
B) $5-\sqrt[3]{25}$
C) $5+\sqrt[3]{25}$
D) $\sqrt[3]{25}+\sqrt[3]{5}$

10. (a2-g8-8) Soddalashtiring va ratsional ko'rsatkichli daraja shaklida ifodalang.

$$\sqrt{xy}\cdot\sqrt[3]{x^5y^2}\cdot\sqrt[6]{x^{-1}y^{-1}}$$

A) x^2y B) $xy^{\frac{1}{2}}$
C) $x^{\frac{2}{3}}y^{\frac{3}{2}}$ D) $x^{\frac{1}{3}}y^{\frac{5}{6}}$

11. (a2-g9-7) $a=\sqrt[12]{3^7}$, $b=\sqrt[9]{3^5}$ va $c=\sqrt[7]{3^4}$ sonlarini o'sish tartibida joylashtiring
A) $c<b<a$
B) $b<c<a$
C) $a<b<c$
D) $c<a<b$

12. (a2-g10-7) Hisoblang.

$$\sqrt[3]{3\cdot\sqrt[4]{9\cdot\sqrt{27}}}\cdot\sqrt{3\cdot\sqrt[3]{27\cdot\sqrt[4]{9}}}$$

A) $3^{\frac{1}{2}}$ B) $3^{\frac{37}{12}}$ C) $3^{\frac{35}{12}}$ D) $3^{\frac{41}{24}}$

13. (a2-g14-6) $(1{,}22-0{,}97)^{0,5}\cdot(3{,}69-1{,}44)^{1,5}\cdot(2{,}01-1{,}76)^{-2,5}$ ni hisoblang.

A) $\frac{27}{2}$ B) $\left(\frac{1}{54}\right)^{-1}$
C) $\left(\frac{3}{2}\right)^3$ D) 27

14. (a2-g17-6) $x=\sqrt{3\cdot\sqrt[3]{81}\cdot\sqrt[6]{3}}$ bo'lsa, quyidagilardan qaysi biri ratsional son bo'ladi?
A) x^9 B) x^4 C) x^3 D) x^6

15. (a3-g3-8) Soddalashtiring va ratsional ko'rsatkichli daraja shaklida ifodalang.

$$\sqrt{x^3y^5}\cdot\sqrt[3]{x^2y}\cdot\sqrt[6]{x^{-1}y^{-5}}$$

A) x^2y^2 B) $xy^{\frac{1}{2}}$
C) $x^{\frac{2}{3}}y^{\frac{3}{2}}$ D) $x^{\frac{1}{3}}y^{\frac{5}{6}}$

16. (a3-g5-6) Hisoblang.

$$\sqrt[4]{\frac{4^{12}-12^{12}}{2^{12}-6^{12}}}$$

A) 8 B) 4
C) 0,125 D) 0,25

17. (a3-g7-6) Hisoblang.

$$\sqrt[6]{4-2\sqrt{3}}\cdot\sqrt[3]{1+\sqrt{3}}$$

A) $\sqrt[3]{2}$ B) $\sqrt[6]{2}$ C) $\sqrt{2}$ D) 1

18. (a3-g18-12) Tenglikni qanoatlantiruvchi a ning qiymatini toping.

$$\sqrt[4]{a\cdot\sqrt[4]{a\cdot\sqrt[4]{a\cdot\ldots}}}+\sqrt{a:\sqrt{a:\sqrt{a:\ldots}}}=10$$

A) 25 B) 100
C) 125 D) 1000

19. (a3-g19-6) Quyidagi juftliklardan qaysi biri o'zaro qarama-qarshi sonlar?

A) $\sqrt{19-3\sqrt{2}}$ va $\sqrt{19+3\sqrt{2}}$

B) $\sqrt[4]{\left(3-\sqrt{2}\right)^2}$ va $\sqrt[4]{\left(\sqrt{2}-3\right)^2}$

C) $\sqrt{3-2\sqrt{2}}$ va $\sqrt{2\sqrt{2}+3}$

D) $\sqrt[3]{\sqrt{5}-3}$ va $\sqrt[6]{14-6\sqrt{5}}$

20. (a3-g20-11) Ifodani hisoblang.

$$\sqrt[4]{243:\sqrt[4]{243:\sqrt[4]{243:\sqrt[4]{243:\ldots}}}}+$$
$$+\sqrt[3]{64+\sqrt[3]{64+\sqrt[3]{64+\sqrt[3]{64+\ldots}}}}$$

A) 7 B) 11 C) 17 D) 13

21. (a4-g1-10) $2a=\sqrt{3}b$ va $3\sqrt{3}<b<5\sqrt{27}$ shartlarga ko'ra, a to'g'risidagi quyidagi mulohazalardan qaysi biri to'g'ri?

A) $\frac{1}{\sqrt{3}}<a<12$

B) $2\sqrt{3}<a<\frac{11}{2}\sqrt{3}$

C) $4{,}5<a<22{,}5$
D) $3<a<21{,}5$

22. (a4-g6-5) $\dfrac{\sqrt{2\sqrt[3]{4\sqrt[4]{8}}}}{\sqrt[3]{4\sqrt[4]{8\sqrt{2}}}}$ ni hisoblang.

A) $\sqrt[24]{2^{11}}$ B) $\sqrt[3]{2}$
C) $\sqrt[8]{8}$ D) 1

23. (a4-g11-17) n va m natural sonlar bo'lib quyidagi ifodani qanoatlantiradi.

$$\sqrt[n]{16\cdot\sqrt[n]{16\cdot\sqrt[n]{16\cdot\ldots}}}=m$$

Bu holda n ning olishi mumkin bo'lgan eng katta qiymatini toping.
A) 8 B) 2 C) 5 D) 4

24. (a4-g11-18) Kasrning maxrajini irratsionallikdan qutqaring.

$$\frac{42}{7+\sqrt[3]{7}+\sqrt[3]{49}}$$

A) $\sqrt[3]{49}-\sqrt[3]{7}$ B) $\sqrt[3]{49}-1$
C) $7-\sqrt[3]{49}$ D) $1+\sqrt[3]{49}$

25. (a4-g15-11) Berilgan ifodaning qiymatini toping.

$$\sqrt{6+\sqrt{6+\sqrt{6+\ldots}}}+\sqrt{6\cdot\sqrt{6\cdot\sqrt{6\cdot\ldots}}}$$

A) 12 B) 18 C) 9 D) 42

26. (a4-g16-5) Hisoblang.

$$\sqrt[4]{76+\sqrt[3]{122+\sqrt[3]{30+\sqrt[5]{-243}}}}$$

A) 3 B) –2 C) –3 D) 2

27. (a4-g17-5) Hisoblang.

$$\frac{5\sqrt[4]{3}+3\sqrt[4]{5}}{\sqrt[4]{675}+\sqrt[4]{1125}}-\sqrt{\frac{\sqrt{3}}{\sqrt{5}}+\frac{\sqrt{5}}{\sqrt{3}}+2}$$

A) $\frac{\sqrt{3}}{\sqrt{5}}$ B) $\frac{\sqrt[4]{5}}{\sqrt[4]{3}}$
C) –1 D) $\frac{1}{2}$

28. (a4-g18-5) Hisoblang.

$$\sqrt[4]{11-6\sqrt{2}}\cdot\sqrt{3-\sqrt{2}}\cdot\left(3+\sqrt{2}\right)$$

A) $9-\sqrt{7}$ B) 1
C) 7 D) 5

29. (a4-g22-6) $x=\sqrt[4]{3\cdot\sqrt[3]{81\cdot\sqrt[6]{3}}}$ bo'lsa, x ning qanday eng kichik darajasi ratsional son bo'ladi?
A) x^6 B) x^8 C) x^{24} D) x^{12}

30. (a5-g2-5) Ifodani soddalashtiring.

$$\sqrt{2\cdot\sqrt[3]{\frac{1}{4}\cdot\sqrt[4]{\frac{1}{8}}}}$$

A) $\sqrt[12]{2}$ B) $\sqrt[48]{2}$
C) $\sqrt[6]{2}$ D) $\sqrt[24]{2}$

31. (a5-g3-5) $36^{0,14}\cdot36^{0,36}-243\cdot243^{-0,8}=?$
A) 3 B) 7 C) 5 D) 9

32. (a5-g4-11) Hisoblang.

$$\sqrt[3]{5\cdot\sqrt{5\cdot\sqrt[3]{5\cdot\sqrt{5\cdot\ldots}}}}+\sqrt{2+\sqrt{2+\sqrt{2\ldots}}}$$

A) 2
B) 7
C) $\sqrt[5]{5}+\sqrt{2}$
D) $\sqrt[5]{5^3}+2$

33. (a5-g5-5)

$$\sqrt{\left(\sqrt{7}-\sqrt{5}\right)\sqrt{\left(\sqrt{7}+\sqrt{5}\right)\sqrt{12+\sqrt{140}}}}=?$$

A) $\sqrt{2}$ B) 2
C) $2\sqrt{2}$ D) $\sqrt{7}-\sqrt{5}$

34. (a5-g7-5) Quyidagi ifodalardan qaysi biri noto'g'ri?

A) $\sqrt[3]{abc}=\sqrt[3]{a}\cdot\sqrt[3]{b}\cdot\sqrt[3]{c}$

B) $\sqrt[3]{(b-a)^3}=-a+b$

C) $\sqrt[5]{a:b}=\frac{\sqrt[8]{a}}{\sqrt[5]{b}}$

D) $\sqrt[4]{(a+b)^4}=a+b$

35. (a5-g13-5) Quyidagilardan qaysi biri $\dfrac{3+\sqrt[4]{27}}{\sqrt[4]{3}}$ ga teng?

A) $5\sqrt[4]{3}$
B) $3+\sqrt{3}$
C) $\sqrt[4]{27}+\sqrt[4]{9}$
D) $3\sqrt[4]{3}+\sqrt[4]{9}$

36. (a5-g14-5) Hisoblang.

$$\left(2\sqrt[3]{256}+3\sqrt[3]{108}-4\sqrt[3]{500}\right)^3+$$
$$+\left(-2\sqrt{45}-3\sqrt{80}+4\sqrt{20}\right)^2$$

A) 608 B) 392
C) 284 D) –608

37. (a5-g23-5) Sonlarni o'sish tartibida yozing. $a=\sqrt[3]{7}$, $b=\sqrt[4]{12}$, $c=\sqrt{5}$;
A) $b<a<c$
B) $c<b<a$
C) $c<a<b$
D) $b<c<a$

38. (a6-g4-5) Kasrning maxrajini irratsionallikdan qutqaring:

$$\frac{3}{\sqrt[3]{3}+\sqrt[3]{6}+\sqrt[3]{12}}.$$

A) $\sqrt[3]{9}-2$ B) $3-\sqrt[3]{9}$
C) $\sqrt[3]{18}-2$ D) $\sqrt[3]{18}-\sqrt[3]{9}$

39. (a6-g14-26) $\frac{\sqrt[a]{m^b}}{\sqrt[c]{m^d}}$ ifoda quyidagilardan qaysi biriga teng?

A) $m^{\frac{ad-bc}{ac}}$ B) $m^{\frac{ac-bd}{ad}}$
C) $m^{\frac{ad+bc}{ac}}$ D) $m^{\frac{bc-ad}{ac}}$

40. (a6-g16-25) Hisoblang:

$$\sqrt{4+\sqrt{7}}+\frac{\sqrt{11-6\sqrt{3,(1)}}}{\sqrt{2}}.$$

A) $\frac{2\sqrt{14}-\sqrt{2}}{2}$ B) $\frac{3\sqrt{2}}{2}$
C) $\frac{3\sqrt{7}+1}{\sqrt{2}}$ D) $\frac{\sqrt{14}}{2}$

41. (a6-g20-9) Hisoblang:

$$\frac{\sqrt[6]{10+\sqrt{96}}\cdot\sqrt[3]{2-\sqrt{6}}}{\sqrt[3]{128}+6\sqrt[3]{2}-6\sqrt[3]{16}}.$$

A) 0,25 B) –0,25
C) –0,5 D) 0,5

42. (a6-g21-2) Maxrajni irratsionallikdan qutqaring $\frac{3}{\sqrt[4]{12}-\sqrt{3}}$.

A) $3\sqrt{6}+2\sqrt[4]{27}-3\sqrt[4]{12}-12$
B) $3\sqrt{6}+2\sqrt[4]{27}+3\sqrt[4]{12}+12$
C) $2\sqrt[4]{108}+3\sqrt[4]{12}+3\sqrt{3}+6$
D) $\sqrt[4]{108}-3\sqrt[4]{12}-3\sqrt{3}+6$

43. (a6-g26-5) Hisoblang: $\sqrt[7]{\frac{7^{28}-21^{28}}{27^7-3^{49}}}$.

A) $\frac{7}{3}$ B) $\frac{49}{27}$ C) $\frac{49^2}{3^3}$ D) $\frac{7^3}{81}$

26. Daraja qatnashgan ifodalarni soddalashtirish

1. (a1-g4-6) Hisoblang.

$$\frac{\sqrt{6-6\sqrt{0,(88)}}}{\sqrt{3+6\sqrt{0,(22)}}}-\frac{\sqrt{6+6\sqrt{0,(88)}}}{\sqrt{3-6\sqrt{0,(22)}}}$$

A) –8 B) 4
C) $4\sqrt{2}$ D) $4\left(\sqrt{2}+1\right)$

2. (a1-g5-6) Hisoblang.

$$\frac{\sqrt{2}-1}{\sqrt{10}+\sqrt{6}-\sqrt{5}-\sqrt{3}}+\frac{\sqrt{5}+2}{2\sqrt{5}-\sqrt{15}-2\sqrt{3}+5}$$

A) $2\sqrt{5}+2\sqrt{3}$ B) $2\sqrt{5}$
C) $\sqrt{5}$ D) $-2\sqrt{3}$

3. (a1-g5-7) Maxrajni irratsionallikdan qutqaring.

$$\frac{6}{\sqrt[6]{81}-\sqrt[6]{3}}$$

A) $3\sqrt[3]{3}+\sqrt[6]{243}$
B) $\sqrt[3]{81}-\sqrt[6]{3}$
C) $3+\sqrt[6]{243}$
D) $2\sqrt[3]{9}-\sqrt[6]{3}$

4. (a1-g6-6) $b=2\sqrt{3}$ va $c=3\sqrt{2}$ bo'lsa, $\sqrt{c^2-4bc+4b^2}+\sqrt{b^2-2bc+c^2}$ ning qiymatini toping.

A) $2\sqrt{3}$ B) $6\left(\sqrt{3}-\sqrt{2}\right)$
C) $-2\sqrt{3}$ D) $3\sqrt{2}$

5. (a1-g6-7) Hisoblang.

$$\frac{\sqrt{5-3\sqrt{2,(6)}}}{\sqrt{2}}+\frac{\sqrt{5+3\sqrt{2,(6)}}}{\sqrt{2}}$$

A) $2\sqrt{3}$ B) $\sqrt{6}$
C) 2 D) $2\sqrt{2}$

6. (a1-g7-4) $2\sqrt{3-\sqrt{5}}\cdot\left(6+2\sqrt{5}\right)\cdot\left(\sqrt{10}-\sqrt{2}\right)=?$

A) 32 B) 20 C) 12 D) 4

7. (a2-g2-7) Soddalashtiring.

$$\left(2+\sqrt[3]{\frac{a}{b}}+\sqrt[3]{\frac{b}{a}}\right):\left(\sqrt[3]{\frac{a}{b}}-\sqrt[3]{\frac{b}{a}}\right)-1$$

A) $\frac{2\sqrt[3]{b}}{\sqrt[3]{a}-\sqrt[3]{b}}$ B) $\frac{2\sqrt[3]{a}}{\sqrt[3]{a}-\sqrt[3]{b}}$
C) $\frac{\sqrt[3]{a}+\sqrt[3]{b}}{\sqrt[3]{a}-\sqrt[3]{b}}$ D) $\frac{-2\sqrt[3]{b}}{\sqrt[3]{a}+\sqrt[3]{b}}$

8. (a2-g6-6) Soddalashtiring. $(-1<a<1)$

$$\sqrt[4]{(-2a+a^2+1)(a^2-1)(a-1)}:\frac{a^2-3+2a}{\sqrt[4]{a+1}}$$

A) $-\frac{\sqrt{a+1}}{a+3}$ B) $-\frac{\sqrt{a+1}}{-a-3}$
C) $\frac{\sqrt{a-1}}{a+3}$ D) $\sqrt{a-1}$

9. (a2-g7-7) Soddalashtiring.

$$\frac{\sqrt{m}+27}{\sqrt[3]{m}-2\sqrt[6]{m}-15}:\frac{\sqrt[3]{m}-3\sqrt[6]{m}+9}{\sqrt[3]{m}-25}$$

A) $\sqrt[3]{m}+5$
B) $\sqrt[6]{m}+3$
C) $\sqrt[6]{m}+5$
D) $\sqrt{m}-5$

10. (a2-g11-7) Soddalashtiring.

$$\left(\sqrt[3]{\frac{a}{b}}+\sqrt[3]{\frac{b}{a}}-2\right):\left(\sqrt[3]{\frac{a}{b}}-\sqrt[3]{\frac{b}{a}}\right)-1$$

A) $\frac{2\sqrt[3]{a}}{\sqrt[3]{a}-\sqrt[3]{b}}$ B) $\frac{-2\sqrt[3]{a}}{\sqrt[3]{a}+\sqrt[3]{b}}$
C) $\frac{\sqrt[3]{a}-\sqrt[3]{b}}{\sqrt[3]{a}+\sqrt[3]{b}}$ D) $\frac{-2\sqrt[3]{b}}{\sqrt[3]{a}+\sqrt[3]{b}}$

11. (a2-g13-6) Hisoblang.

$$\sqrt[3]{38+\sqrt{1445}}+\sqrt[3]{38-\sqrt{1445}}$$

A) 4 B) 2 C) 8 D) $\sqrt{8}$

12. (a2-g14-8) $x\cdot y=81$ va $x+y=18$ bo'lsa,

$$\left(\sqrt[4]{y}+\sqrt[4]{z}-\sqrt[4]{x}\right)\cdot\left(\sqrt[4]{x}+\sqrt[4]{z}-\sqrt[4]{y}\right)=?$$

A) $\sqrt[4]{z}$ B) $\sqrt{z}-12$
C) $\left(\frac{1}{z}\right)^{\frac{1}{2}}$ D) $-\sqrt{z}$

13. (a2-g15-7) Soddalashtiring.

$$\frac{a^{\frac{3}{2}}+2a^{\frac{5}{4}}-3a}{a^{\frac{3}{4}}-a^{\frac{1}{4}}}\cdot\frac{a^{\frac{1}{4}}+a^{\frac{1}{2}}}{a-9a^{\frac{1}{2}}}$$

A) $\frac{a^{\frac{1}{4}}+1}{a^{\frac{1}{4}}-3}$ B) $\frac{a^{\frac{1}{2}}}{a^{\frac{1}{4}}-3}$
C) $\frac{a^{\frac{1}{2}}-a^{\frac{1}{4}}}{a^{\frac{1}{4}}+3}$ D) $\frac{a^{\frac{1}{4}}}{a^{\frac{1}{2}}-1}$

14. (a2-g16-6) $x<y<z<0$ bo'lsa,

$$\sqrt[4]{(x-z)^4}+\sqrt[3]{(x+y)^3}+\sqrt{(x+y)^2}$$ ni soddalashtiring.

A) $3x+2y-z$
B) $z-x$
C) $z-3x-2y$
D) $x-z$

15. (a2-g19-6) Soddalashtiring.

$$\frac{\sqrt{t}+8}{\sqrt[3]{t}+\sqrt[6]{t}-2}:\frac{\sqrt[3]{t}-2\sqrt[6]{t}+4}{\sqrt[3]{t}-1}$$

A) $\sqrt[6]{t}+2$ B) $\sqrt[6]{t}+1$
C) $\frac{\sqrt[6]{t}+2}{\sqrt[6]{t}-1}$ D) $\sqrt{t}-1$

16. (a2-g20-6) Soddalashtiring.

$$\frac{3\left(\sqrt[3]{7}+\sqrt[3]{4}\right)}{\sqrt[3]{49}+\sqrt[3]{28}+\sqrt[3]{16}}$$

A) $\sqrt[3]{49}-\sqrt[3]{16}$ B) 3
C) $\sqrt[3]{7}-\sqrt[3]{4}$ D) $\sqrt[3]{9}$

17. (a2-g21-7) Soddalashtiring.

$$\frac{n\sqrt{n}-n}{n+\sqrt[6]{n^5}+\sqrt[3]{n^2}}-\frac{n-\sqrt[3]{n^2}}{\sqrt{n}+\sqrt[3]{n}}-\sqrt[3]{n}$$

A) $-3\sqrt[3]{n}$ B) $-2\sqrt{n}+\sqrt[3]{n}$
C) $-\sqrt[3]{n}$ D) $\sqrt[3]{n}$

18. (a2-g21-10) Agar $x+y=\sqrt{\sqrt{23}+2}$ va $xy=1$ bo'lsa, x^5y+xy^5 ning qiymatini toping.

A) 25 B) 21 C) 5 D) 47

19. (a2-g22-4) Soddalashtiring

$$\frac{a^{6n}-729^n}{\left(a^{2n}-9^n\right)\cdot\left(a^{2n}-3^n\cdot a^n+9^n\right)}$$

A) a^n+3^n
B) $a^{2n}+9^{2n}$
C) $a^{2n}-3^n\cdot a^n+9^n$
D) $a^{2n}+3^n\cdot a^n+9^n$

20. (a2-g22-6) Soddalashtiring.

$$\frac{t^2+t-6+(t+2)\sqrt{t^2-9}}{t^2-t-6+(t-2)\sqrt{t^2-9}}$$

A) $\frac{\sqrt{t+2}}{\sqrt{t-3}}$ B) $-\frac{\sqrt{t+3}}{\sqrt{t-3}}$

C) $\frac{\sqrt{t-3}}{\sqrt{t+2}}$ D) $\frac{\sqrt{t+3}}{\sqrt{t-3}}$

21. (a3-g4-6) Soddalashtiring.

$$\sqrt{\left(\sqrt{e}-\frac{3\pi}{2}\right)^2}+\sqrt{\left(\sqrt{e}-\frac{5\pi}{2}\right)^2}=?$$

A) $2\sqrt{e}-4\pi$ B) $-\pi$

C) π D) $4\pi-2\sqrt{e}$

22. (a3-g10-7) Soddalashtiring.

$$\left(2+\sqrt[3]{\frac{a}{b}}+\sqrt[3]{\frac{b}{a}}\right):\left(\sqrt[3]{\frac{a}{b}}-\sqrt[3]{\frac{b}{a}}\right)+1$$

A) $\frac{2\sqrt[3]{b}}{\sqrt[3]{a}-\sqrt[3]{b}}$ B) $\frac{2\sqrt[3]{a}}{\sqrt[3]{a}-\sqrt[3]{b}}$

C) $\frac{\sqrt[3]{a}+\sqrt[3]{b}}{\sqrt[3]{a}-\sqrt[3]{b}}$ D) $\frac{-2\sqrt[3]{b}}{\sqrt[3]{a}+\sqrt[3]{b}}$

23. (a3-g12-7) Soddalashtiring.

$$\frac{a-4a^{\frac{1}{2}}}{a^{\frac{3}{2}}-a^{\frac{5}{4}}-2a}\cdot\frac{a^{\frac{3}{4}}-a^{\frac{1}{4}}}{a^{\frac{1}{2}}-a^{\frac{1}{4}}}$$

A) $\frac{a^{\frac{1}{4}}+2}{a^{\frac{1}{2}}}$ B) $\frac{a^{\frac{1}{4}}-2}{a^{\frac{1}{4}}+1}$

C) $\frac{a^{\frac{1}{4}}}{a^{\frac{1}{4}}-1}$ D) $\frac{a^{\frac{1}{2}}-4}{a^{\frac{1}{4}}+1}$

24. (a3-g14-6) Hisoblang.

$$\frac{\left(\sqrt[3]{9-2\sqrt{20}}\right)^2}{\sqrt[3]{9+\sqrt{80}}}-11+\sqrt{80}$$

A) -2 B) -3 C) -5 D) $2\sqrt{5}$

25. (a3-g15-6) Ifodani soddalashtiring.

$$\frac{a+\sqrt[3]{a^2b}-2\sqrt[3]{ab^2}}{a-\sqrt[3]{ab^2}}-\frac{2\sqrt[3]{a^2}+\sqrt[3]{ab}-3\sqrt[3]{b^2}}{\sqrt[3]{a^2}-\sqrt[3]{b^2}}$$

A) -1 B) 0 C) 1 D) 2

26. (a3-g20-5) Quyidagi kasrning maxrajini irratsionallikdan qutqaring.

$$\frac{3}{\sqrt[3]{75}-\sqrt[3]{45}+3}$$

A) $\frac{3+\sqrt[3]{75}}{8}$ B) $\frac{\sqrt[3]{45}-3}{2}$

C) $\frac{3+\sqrt[3]{45}}{8}$ D) $\frac{\sqrt[3]{75}-3}{2}$

27. (a4-g2-5) Hisoblang.

$$\frac{\left(\sqrt[3]{14-2\sqrt{33}}\right)^2}{\sqrt[3]{14+\sqrt{132}}}+\frac{\sqrt{33}+19}{4}$$

A) 26 B) 6,5

C) $\frac{\sqrt{33}}{2}$ D) $\sqrt{33}$

28. (a4-g2-24) Soddalashtiring.

$$\frac{n\sqrt{n}-n}{n+\sqrt[6]{n^5}+\sqrt[3]{n^2}}-\frac{n-\sqrt[3]{n^2}}{\sqrt{n}+\sqrt[3]{n}}-\sqrt[3]{n}$$

A) $-3\sqrt[3]{n}$ B) $-2\sqrt{n}+\sqrt[3]{n}$

C) $-\sqrt[3]{n}$ D) $\sqrt[3]{n}$

29. (a4-g4-6) Hisoblang.

$$\sqrt{\left(1-\sqrt{2}\right)^2}-\sqrt[3]{(-2)^3}+\sqrt[4]{(-2)^4}$$

A) $-3-\sqrt{2}$ B) $3+\sqrt{2}$

C) $1-\sqrt{2}$ D) $\sqrt{2}-1$

30. (a4-g5-5) Soddalashtiring.

$$\frac{a-\sqrt[3]{a^2}+\sqrt[3]{a}}{a+1}-\frac{\sqrt[4]{a}-1}{\sqrt[6]{a}-1}+\frac{1}{\sqrt[3]{a}+1}$$

A) $\frac{\sqrt[3]{a}+\sqrt[6]{a}}{\sqrt[12]{a}-1}$ B) $\frac{\sqrt[3]{a}-\sqrt[6]{a}}{\sqrt[12]{a}+1}$

C) $-\frac{\sqrt[6]{a}}{\sqrt[12]{a}+1}$ D) $\frac{\sqrt[3]{a}}{\sqrt[12]{a}-1}$

31. (a4-g10-5) Hisoblang.

$$\frac{25\sqrt[4]{2}+2\sqrt{5}}{\sqrt{250}+5\sqrt[4]{8}}-\sqrt{\frac{\sqrt{2}}{5}+\frac{5}{\sqrt{2}}+2}$$

A) 5 B) -1

C) $\sqrt[4]{2}+1$ D) $5\sqrt{2}-1$

32. (a4-g12-7) Tenglamani yeching.

$$\left(2\frac{19}{22}+x\right):4\frac{1}{5}=5$$

A) $18\frac{3}{22}$ B) $17\frac{19}{22}$

C) 21 D) $17\frac{3}{22}$

33. (a4-g13-2) $\sqrt{\frac{\sqrt{3}}{5}+\frac{5}{\sqrt{3}}+2}=?$

A) $\frac{\sqrt{3}}{5}+\frac{5}{\sqrt{3}}$ B) $\frac{\sqrt{3}}{\sqrt{5}}+\frac{\sqrt{5}}{\sqrt{3}}$

C) $\frac{\sqrt[4]{3}}{\sqrt{5}}+\frac{\sqrt{5}}{\sqrt[4]{3}}$ D) $\frac{\sqrt[4]{3}}{\sqrt[4]{5}}+\frac{\sqrt[4]{5}}{\sqrt[4]{3}}$

34. (a4-g14-7) $m, n\neq 0$ va $\frac{m^7}{n^7}=\frac{8}{27}$, bo'lsa, $\frac{\sqrt[3]{m^7}+\sqrt[3]{n^7}}{\sqrt[3]{m^7}-\sqrt[3]{n^7}}=?$

A) 5 B) 3 C) -3 D) -5

35. (a4-g15-6) Hisoblang.

$$\frac{\sqrt[6]{8+\sqrt{60}}\cdot\sqrt[3]{\sqrt{3}-\sqrt{5}}}{2\sqrt[3]{54}+\sqrt[3]{16}-4\sqrt[3]{2}}$$

A) 0,5 B) $-0,25$

C) $-0,5$ D) 0,25

36. (a4-g15-24) Soddalashtiring.

$$\left(\frac{a+b}{\sqrt[3]{a^2}-\sqrt[3]{b^2}}+\frac{\sqrt[3]{ab^2}-\sqrt[3]{a^2b}}{\sqrt[3]{a^2}-2\sqrt[3]{ab}+\sqrt[3]{b^2}}\right):\left(\sqrt[6]{a}-\sqrt[6]{b}\right)$$

A) $a+1$ B) $\sqrt[3]{a}+\sqrt[3]{b}$

C) $\sqrt{a}-\sqrt{b}$ D) $\sqrt[6]{a}+\sqrt[6]{b}$

37. (a4-g18-10) Hisoblang.

$$\sqrt{20+\sqrt{20+\sqrt{20+\ldots}}}-\sqrt{2\sqrt[3]{4\sqrt{2\sqrt[3]{4\sqrt{2\sqrt[3]{4\ldots}}}}}}$$

A) 1 B) 3 C) 4 D) 5

38. (a4-g19-5) $\sqrt[5]{1019+\sqrt[4]{621+\sqrt{60+\sqrt{16}}}}$ ifodaning qiymatini toping.

A) 4 B) 3 C) 5 D) 2

39. (a4-g21-5) Hisoblang.

$$\sqrt{11+\sqrt[4]{622-\sqrt[3]{-246+\sqrt[3]{27}}}}$$

A) 4 B) 3 C) 2 D) 5

40. (a5-g4-5) Hisoblang.

$$\frac{36\sqrt[4]{3}+3\sqrt{6}}{\sqrt{648}+6\sqrt[4]{27}}-\sqrt{\frac{\sqrt{3}}{6}+\frac{6}{\sqrt{3}}+2}$$

A) 5

B) -1

C) $\sqrt[4]{3}+1$

D) $6\sqrt{3}+1$

41. (a5-g6-5) Soddalashtiring. $(a>2)$

$$\sqrt[4]{\left(-4a+a^2+4\right)\left(a^2-4\right)(a-2)}:\frac{a^2-6+a}{\sqrt[4]{a+2}}$$

A) $-\frac{\sqrt{a+2}}{a+3}$ B) $-\frac{\sqrt{a+2}}{-a-3}$

C) $\frac{\sqrt{a-2}}{a+3}$ D) $\frac{1}{a+3}$

42. (a5-g12-5) Hisoblang.

$$\sqrt{\sqrt{10+\frac{2}{\sqrt{8-\frac{2}{\sqrt{6+4\sqrt{2}}}+3\sqrt{2}}}}+\frac{18}{\sqrt{2}}}\cdot\sqrt{2-\sqrt{2}}$$

A) 2 B) $2-\sqrt{2}$

C) $\sqrt[4]{8}$ D) $2\sqrt[4]{2}$

43. (a5-g16-5) Hisoblang.

$$\sqrt[3]{\sqrt{6}-\sqrt{70}}\cdot\sqrt[6]{76+4\sqrt{105}}$$

A) $2\sqrt{33}$ B) 4

C) $-2\sqrt{6}$ D) -4

44. (a5-g17-1) Ifodani hisoblang.

$$\frac{6}{\sqrt[3]{9}-\sqrt[3]{3}}-3\sqrt[3]{3}+\sqrt[3]{9}$$

A) 9 B) $2\sqrt[3]{9}+3$

C) $6\sqrt[3]{3}$ D) $6\sqrt[3]{3}-3$

45. (a5-g18-13) Ifodani hisoblang.

$$\sqrt[3]{9\sqrt{3\sqrt[3]{9\sqrt{3\sqrt[3]{9\sqrt{3}}}}}}+\sqrt{6+\sqrt{6+\sqrt{6}}}\ldots$$

A) 6 B) 9 C) 12 D) 5

46. (a5-g21-5) $\frac{49\sqrt[4]{3}+3\sqrt{7}}{\sqrt{1029}+7\sqrt[4]{27}}-\sqrt{\frac{\sqrt{3}}{7}+\frac{7}{\sqrt{3}}-2}=?$

A) -1 B) $\frac{2\sqrt{7}-\sqrt[4]{3}}{\sqrt[4]{3}}$

C) $\sqrt[4]{3}+\sqrt{7}$ D) $\frac{2\sqrt{3}-\sqrt{7}}{\sqrt{7}}$

47. (a5-g24-5) Hisoblang.

$\sqrt[3]{2-\sqrt{31}}\cdot\sqrt[6]{35+4\sqrt{31}}$

A) 2 B) –2 C) 3 D) –3

48. (a6-g1-5) Ifodani soddalashtiring, $(0 < n < 1)$

$$\frac{\sqrt{\frac{1}{4}\cdot\left(\frac{1}{\sqrt{n}}+\sqrt{n}\right)^2-1}}{\sqrt{\frac{1}{4}\cdot\left(\sqrt{n}-\frac{1}{\sqrt{n}}\right)^2+1}-\frac{1}{2}\left(\sqrt{n}-1\right)}.$$

A) $\sqrt{n}-1$ B) $\sqrt{n}+1$

C) $\sqrt{n}\cdot 1$ D) $1-\sqrt{n}$

49. (a6-g3-5) $x < -2$ bo'lsa, ifodani soddalashtiring:

$\sqrt{x^2+4x+4}-\sqrt[3]{(x+2)^3}$.

A) 0 B) $-2x-4$

C) $2x+4$ D) $-2x$

50. (a6-g7-5) Soddalashtiring:

$$\frac{\sqrt[6]{45}+2\sqrt[6]{60}+\sqrt[6]{80}}{\sqrt[3]{3}-\sqrt[3]{4}}:\frac{\sqrt[6]{80}+\sqrt[6]{60}+\sqrt[6]{45}}{\sqrt{3}-\sqrt{4}}.$$

A) $\sqrt[6]{3}-\sqrt[6]{4}$

B) $\sqrt[3]{15}+\sqrt[3]{20}$

C) $\sqrt[6]{3}+\sqrt[6]{4}$

D) $\sqrt[6]{5}-\sqrt[6]{45}$

51. (a6-g15-3) Soddalashtiring:

$$\frac{\sqrt{2\sqrt[3]{81}+3\sqrt[3]{24}+\sqrt[3]{192}}}{\sqrt[3]{32\sqrt{12}}+\sqrt[3]{9\sqrt{27}}-\sqrt[3]{2\sqrt{48}}}.$$

A) $\frac{2}{5}$ B) 1,25 C) $\frac{3}{4}$ D) $\frac{4}{5}$

52. (a6-g22-1) Ifodani soddalashtiring:

$\sqrt[3]{(42+12\sqrt{6})\sqrt[3]{(42+12\sqrt{6})\sqrt{42+12\sqrt{6}}}}$.

A) $\sqrt{6}+5$

B) $2\sqrt{6}+6$

C) $\sqrt[10]{42+12\sqrt{6}}$

D) $\sqrt{6}+6$

53. (a6-g23-2) Ifodani soddalashtiring:

$$\frac{a+b}{\sqrt[3]{a^2}-\sqrt[3]{b^2}}+\frac{\sqrt[3]{ab^2}-\sqrt[3]{a^2b}}{\sqrt[3]{a^2}-2\sqrt[3]{ab}+\sqrt[3]{b^2}}-\sqrt[6]{b}.$$

$\sqrt[6]{a}-\sqrt[6]{b}$

A) 1 B) $\sqrt[6]{b}$

C) $\sqrt[6]{a}-2\sqrt[6]{b}$ D) $\sqrt[6]{a}$

54. (a6-g24-1) Hisoblang:

$\sqrt{218+\sqrt[3]{333+\sqrt{108-\sqrt[3]{512}}}}$.

A) 14 B) 16 C) –14 D) 15

55. (a6-g25-4) Soddalashtiring:

$$\left(\frac{a\sqrt[3]{a}+\sqrt[3]{a^2}}{\sqrt[3]{a}+a}-\sqrt[3]{b}\right)\cdot\left(\left(\sqrt[3]{a}-\sqrt[3]{b}\right)^2+3\left(\sqrt[3]{a}+\sqrt[3]{b}\right)^2\right)-4(a-b)$$

A) 8(a – b) B) 4a

C) –4b D) 0

5-bob. Tenglama

27. Chiziqli tenglama. Ayniyat

1. (a1-g2-6) Tenglamani yeching.

$4(3^2+1)(3^4+1)\ldots(3^{256}+1)x=1-3^{512}$

A) 3 B) –2 C) $\frac{1}{2}$ D) $-\frac{1}{3}$

2. (a1-g14-6) Tenglamani yeching.

$x-(5x-(2x-(1+3x)+x)+3)=8-x$

A) –2 B) 3

C) –4 D) –3

3. (a1-g16-6) Tenglamani yeching.

$3(4+1)(2^4+1)\ldots(2^{512}+1)x=1-2^{1024}$.

A) 1 B) –1 C) $\frac{1}{3}$ D) $-\frac{1}{3}$

4. (a2-g7-5) Quyidagi tengliklardan qaysilari ayniyat emas?

1) $\frac{(a+3)(a-2)}{(b-3)(b-1)}=\frac{(3+a)(2-a)}{(1-b)(3-b)}$;

2) $\frac{(a-1)(2-a)}{(b-4)(3+b)}=\frac{(1-a)(a-2)}{(b+3)(b-4)}$;

3) $\frac{(3-a)(2+a)}{(b-4)(b+5)}=\frac{(a-3)(a+2)}{(5+b)(b-4)}$;

4) $\frac{(a-5)(a-2)}{(b-2)(4+b)}=\frac{(2-a)(a-5)}{(b+4)(2-b)}$.

A) 1, 3 B) 2, 4

C) 3, 4 D) 1, 2

5. (a2-g8-9) Tenglamani yeching.

$\frac{3x+1}{2}-2x+3=\frac{x+2}{7}$.

A) 4 B) 5 C) 6 D) 7

6. (a2-g17-5) Agar $\frac{15x}{(x-4)(x+1)(x+3)}=$

$=\frac{A}{x^2-x-12}+\frac{B}{x^2-3x-4}$ ifoda ayniyat bo'lsa, B ning qiymatini toping.

A) 15 B) 7,5

C) 0 D) –7,5

7. (a2-g22-9) Agar $\frac{3x-1}{x^2-9}=\frac{a}{x+3}+\frac{b}{x-3}$ ayniyat bo'lsa, $a-b=?$

A) 3 B) $\frac{2}{3}$ C) –3 D) $\frac{1}{3}$

8. (a3-g2-9) $\frac{16}{x^2+2x-15}=\frac{a}{x-3}+\frac{b}{x+5}$ tenglik ayniyat bo'lsa, $a-2b$ ning qiymatini toping.

A) 6 B) 4,5 C) –6 D) 8

9. (a3-g12-10) a va b ning qanday qiymatlarida $\frac{3}{x^2-x}=\frac{a}{x}+\frac{b}{x-1}$ tenglik ayniyat bo'ladi?

A) $a=3$; $b=-3$

B) $a=-3$; $b=3$

C) $a=-3$; $b=-3$

D) $a=3$; $b=3$

10. (a3-g15-7) Tenglamani yeching.

$\frac{x}{2}+\frac{5x}{6}=2x+\frac{x}{3}+9$

A) –3 B) –9 C) 1 D) 3

11. (a4-g5-11) $3+7+11+\ldots+$ $+4x-3=820$ bo'lsa, x ni toping.

A) 79 B) 20 C) 20,5 D) 41

12. (a4-g8-10) a va b ning qanday qiymatlarida $\frac{4}{x^2-x-2}=\frac{a}{x-2}+\frac{b}{x+1}$ tenglik ayniyat bo'ladi?

A) $a=-1,(3)$; $b=-1,(3)$

B) $a=1,(3)$; $b=-1,(3)$

C) $a=-1,(3)$; $b=1,(3)$

D) $a=1,(3)$; $b=1,(3)$

13. (a4-g9-6) $\frac{a+b}{a}=\frac{b+c}{b}=\frac{a+c}{c}$ bo'lsa, quyidagilardan qaysi biri to'g'ri?

A) $a=b=c$ B) $a<b<c$

C) $b<c<a$ D) $c<a<b$

14. (a4-g11-6) Tenglamani yeching $(x+1)+(x+5)+(x+9)+\ldots+$ $+(x+73)=1216$

A) 22 B) 27 C) 32 D) 49

15. (a4-g18-7) $\frac{a-2b}{5}=\frac{b-3c}{6}=\frac{c-2a}{8}=2$ bo'lsa, $a+b+2c$ ning qiymatini toping.

A) –16 B) –38 C) 38 D) 16

16. (a5-g2-6) Tenglamani yeching.

$\frac{2x-1}{6}-\frac{x-2}{3}=\frac{1}{2}$

A) 0,5 B) Ø

C) $(-\infty;\infty)$ D) 0,(6)

17. (a6-g16-30) Tenglamani yeching:

$$\frac{\frac{\frac{x+1}{3}-1}{3}-1}{3}-1}{3}=2.$$

A) 226 B) 200 C) 194 D) 206

28. Proporsiya. Proporsiyaning noma'lum hadini topish. Proporsiya xossasi

1. (a1-g7-5) Tenglamani yeching.

$378:(50-115:x)=14$

A) 4 B) 5 C) 6 D) 7

2. (a1-g11-8) Tenglamani yeching.

$120:(90-800:x)=3$

A) 10 B) 25 C) 8 D) 16

3. (a2-g2-8) Tenglamani yeching.

$240:(120-360:x)=5$

A) 6 B) 5 C) 12 D) 15

4. (a2-g7-8) Proporsiyaning noma'lum hadini toping.

$5\frac{1}{5}:4\frac{1}{3}=2\frac{1}{4}:x$

A) $1\frac{7}{8}$ B) $\frac{8}{15}$

C) $1\frac{5}{12}$ D) $2\frac{3}{20}$

5. (a2-g9-8) Tenglamani yeching.
$120:(90-800:x)=3$
A) 10 B) 25 C) 8 D) 16

6. (a2-g21-8) $a-b$; 2; $a+2b$ va 3 sonlari proporsiyaning ketma-ket hadlari bo'lsa, $\frac{a^2+3b^2}{a^2-23b^2}$ ni hisoblang.

A) $\frac{1}{3}$ B) 3 C) 2 D) $\frac{1}{2}$

7. (a3-g6-7) $\frac{2x+y}{2y-x}=\frac{3}{2}$ proporsiya berilgan. y/x ni toping.

A) $\frac{1}{8}$ B) 8

C) $\frac{4}{7}$ D) $\frac{7}{4}$

8. (a4-g12-8) $x^2+2x+\frac{1}{x^2}+\frac{2}{x}=6$ tenglamaning ildizlari yig'indisini toping.
A) 2 B) –5 C) –3 D) –2

9. (a4-g20-6) Tenglamani yeching.
$120:(6-12:x)=30$
A) 4 B) 3 C) 12 D) 6

10. (a4-g25-6) Proporsiyaning noma'lum hadini toping.
$2\frac{3}{7}:x=3\frac{2}{5}:1\frac{1}{4}$

A) $2\frac{1}{7}$ B) $\frac{3}{5}$

C) $\frac{25}{28}$ D) $1\frac{3}{4}$

11. (a5-g5-6) Tenglamani yeching.
$\frac{1}{2}-\frac{1}{3}:\frac{1}{x}-\frac{1}{4}=\frac{1}{6}$
A) 4 B) 1
C) 0,5 D) 0,25

12. (a5-g9-7) Proporsiyaning noma'lum hadini toping.
$17\frac{1}{2}:3\frac{1}{2}=6\frac{2}{3}:\frac{x}{2}$

A) $\frac{3}{8}$ B) $3\frac{1}{3}$

C) $4\frac{1}{2}$ D) $2\frac{2}{3}$

13. (a5-g22-6) Tenglamani yeching.
$922:(26-84:x)=461$
A) 7 B) 42
C) 3,5 D) 1,75

14. (a6-g4-6) $48:(2+3:(x+2))=6$ bo'lsa, x ni toping.
A) 1 B) –1 C) –1,5 D) 3

15. (a6-g20-27) Proporsiyaning noma'lum hadini toping
$5\frac{1}{5}:4\frac{1}{3}=2\frac{1}{4}:x$.

A) $1\frac{7}{8}$ B) $\frac{8}{15}$

C) $1\frac{5}{12}$ D) $2\frac{3}{20}$

29. Kvadrat tenglama (tola, chala, tenglama ildizlari sonini topish)

1. (a1-g5-8) $x^2-12x+q=0$ tenglamaning ildizlaridan biri ikkinchisidan 2 marta katta. Bu tenglamaning koeffitsiyentlari yig'indisini toping.
A) 32 B) 21 C) 45 D) 44

2. (a1-g6-8) $8x^2-9x+2=0$ tenglama ildizlari o'rta arifmetigining o'rta geometrigiga nisbatini toping.

A) $1\frac{1}{8}$ B) $\frac{7}{8}$ C) $\frac{9}{32}$ D) $\frac{16}{9}$

3. (a1-g9-7) $x^2-9x+a+b=0$ tenglamaning ildizlari a va b ga teng bo'lsa, bu tenglamaning diskriminantini toping.
A) 81 B) 49 C) 33 D) 45

4. (a1-g12-6) Ildizlari $x^2+4x+2=0$ tenglamaning ildizlaridan 3 taga ko'p bo'lgan tenglamaning koeffitsientlari yig'indisini toping.
A) –2 B) 4 C) 10 D) –6

5. (a1-g17-7) $x^2-5x-24=0$ tenglamaning kichik ildizidan katta ildizi ayirmasini toping.
A) –11 B) 11 C) 5 D) –5

6. (a3-g13-8) $8x^2=3-2x$ tenglama ildizlari ko'paytmasi va yig'indisining ko'paytmasini toping.

A) $-\frac{3}{32}$ B) $\frac{3}{4}$

C) $-\frac{3}{16}$ D) $\frac{3}{32}$

7. (a3-g23-6) $x^2+bx+c=0$ kvadrat tenglamaning diskriminanti Δ bo'lsa, quyidagilarning qaysilari noto'g'ri?
1) $\Delta>0$ va $c>0$ bo'lsa, tenglama ikkita bir xil ishorali ildizga ega.
2) $c=0$ va $b\neq 0$ bo'lsa, tenglama ikkita ildizga ega va bulardan biri nolga teng.
3) $\Delta>0$ va $c<0$ bo'lsa, ildizlari qarama-qarshi ishorali.
4) $\Delta>0$ va $b=0$ bo'lsa, tenglama ildizlari o'zaro teskari sonlar.
5) $\Delta>0$ va $b>0$ bo'lganda tenglamaning ikki ildizi ham manfiy.
A) 1, 5 B) 4, 5
C) 2, 3 D) 3, 4, 5

8. (a4-g11-4) Ildizlari x_1 va x_2 bo'lgan tenglama berilgan. $x_1x_2-2(x_1+x_2)=8$ va $2x_1+2x_2+x_1x_2=-4$ bo'lsa, shu tenglama quyidagilardan qaysi birida to'g'ri ko'rsatilgan?
A) $x^2-3x+2=0$
B) $x^2+3x+2=0$
C) $x^2-x+2=0$
D) $x^2+x+2=0$

9. (a4-g11-5) $x^2+bx+c=0$ kvadrat tenglamaning diskriminanti Δ bo'lsa, quyidagilarning qaysi biri noto'g'ri?
1) $\Delta>0$ va $c>0$ bo'lsa, tenglama ikkita bir xil ishorali ildizga ega;
2) $\Delta=0$ va $c=0$ bo'lsa, tenglama ikkita ildizga ega va bulardan biri nolga teng;
3) $\Delta>0$, $b>0$ va $c>0$ bo'lsa, ildizlari qarama-qarshi ishorali;
4) $\Delta>0$ va $b=0$ bo'lsa, tenglama ildizlari o'zaro teskari sonlar;
5) $\Delta<0$ bo'lganda, tenglama haqiqiy ildizga ega bo'lmaydi.
A) 1, 5 B) 2, 3, 4
C) 2, 3 D) 2, 3, 4, 5

10. (a4-g16-7) x_1 va x_2 $x^2-6x+3=0$ tenglamaning ildizlari bo'lsa, ildizlari $2x_1+1$ va $2x_2+1$ bo'lgan tenglama tuzing.
A) $x^2-10x+25=0$
B) $x^2-14x+25=0$
C) $x^2+12x+14=0$
D) $x^2-14x+16=0$

11. (a4-g19-6) $x^2-5x+3=0$ tenglamaning ildizlari x_1 va x_2.
$\left(\frac{2}{x_1}+x_2\right)\left(\frac{1}{x_2}+2x_1\right)$ ifodaning qiymatini toping.
A) 11,(6) B) 14
C) 5 D) 8,(6)

12. (a4-g21-12) Quyidagi mulohazalardan qaysi biri doimo to'g'ri?
A) Yuqori ildiz ko'rsatkichli ifodada ildiz ostida manfiy son bo'la olmaydi.
B) Chiziqli tenglama bittadan ko'p ildizga ega bo'la olmaydi.
C) Kvadrat tenglamaning diskriminanti noldan kichik bo'lganda cheksiz ko'p ildizga ega bo'ladi.
D) Juft ildiz ko'rsatkichli ildizdan doimo musbat son chiqadi.

13. (a4-g23-24) Quyidagi mulohazalardan qaysi biri to'g'ri?
A) Ikki irratsional sonning yig'indisi natural bo'la olmaydi.
B) Daraja ko'rsatkichlari teng bo'lgan darajali ifodalarni ko'paytirganda, asoslari ko'paytirilib, daraja o'zgarishsiz qoladi.
C) Kasrning surat va maxrajlari bir xil songa orttirilganda kasrning qiymati ortadi.
D) Chiziqli tenglama doimo bitta ildizga ega bo'ladi.

14. (a5-g4-6) $x^2+7x-6=0$ tenglamaning ildizlari a va b bo'lsa ildizlari $2a+1$, $2b+1$ bo'lgan tenglama quyidagilardan qaysi biri bo'la oladi?
A) $x^2-13=0$
B) $x^2+16x-37=0$
C) $x^2-16x-9=0$
D) $x^2+12x-37=0$

15. (a5-g5-7) x_1 va x_2 $x^2-30x+81=0$ tenglamaning ildizlari bo'lsa, $\sqrt{x_1}+\sqrt{x_2}$ ning qiymatini toping.

A) $\sqrt{30}$
B) 9
C) $4\sqrt{3}$
D) $5\sqrt{2}$

16. (a5-g20-6) $ax^2 + bx + c = 0$ tenglamaning ildizlari o'zaro teskari sonlar bo'lsa, quyidagi mulohazalardan qaysi biri to'g'ri?
1) $a = c$; 2) $b = 0$; 3) $|b| > |2c|$;
4) $|b| < |2a|$.
A) 1 va 4 B) 2 va 3
C) 1 va 3 D) 2 va 4

17. (a6-g10-4) $x^2 - 5x + 2 = 0$ bo'lsa, $\frac{x^4 + 4x^2 + 4}{2x^2}$ ni hisoblang.
A) 12,5 B) 0,5 C) 5,5 D) 8,6

18. (a6-g15-26) Tenglama nechta ildizga ega $\sqrt{12 + \sqrt{12 + \sqrt{12 + \ldots}}} = x^2 + 4x + 8$?
A) 2 B) 1 C) 4 D) 0

19. (a6-g25-5) $x^2 - 7x + 1 = 0$ tenglama ildizlari haqidagi mulohazalardan qaysi biri to'g'ri?
A) 2 ta ildizi ham manfiy
B) ildizlari o'zaro teskari sonlar
C) ildizlari o'zaro qarama-qarshi sonlar
D) tenglama haqiqiy ildizga ega emas

30. Viyet teoremasi. Viyet teoremasini qo'llash

1. (a1-g13-7) x_1 va x_2 $x^2 - 9x + 9 = 0$ tenglamaning ildizlari bo'lsa, $|x_1^2 - x_2^2|$ ning qiymatini toping.
A) $27\sqrt{5}$ B) 54
C) 0 D) $3\sqrt{5}$

2. (a2-g3-7) $x^2 - 5x + 5 = 0$ bo'lsa, $x_1^3 x_2 + x_1^2 + x_1 x_2^3 + x_2^2$ nechaga teng?
A) 25 B) 75 C) 60 D) 90

3. (a2-g4-8) Ildizlari $x^2 - 7x + 4 = 0$ tenglamaning ildizlariga teskari sonlardan iborat bo'lgan tenglama tuzing.
A) $x^2 + 7x + 4 = 0$
B) $4x^2 - 7x + 1 = 0$
C) $4x^2 + 7x + 1 = 0$
D) $x^2 + 7x - 4 = 0$

4. (a2-g5-7) $2x^2 + 7x - 3 = 0$ tenglama ildizlari teskarilari yig'indisini toping.
A) $\frac{7}{3}$ B) $\frac{1}{7}$ C) $\frac{3}{7}$ D) $\frac{3}{2}$

5. (a2-g8-10) $3x^2 - x = 4$ tenglamaning ildizlari x_1 va x_2 bo'lsa, $x_1^2 x_2^3 + x_1^3 x_2^2$ ni hisoblang.
A) $\frac{3^2}{4^3}$ B) $\frac{3^3}{4^2}$ C) $\frac{4^2}{3^3}$ D) $\frac{4^3}{3^2}$

6. (a2-g11-9) x_1 va x_2 $x^2 - 5x + 3 = 0$ tenglamaning ildizlari bo'lsa, $x_1^2 x_2 + x_1 x_2^2$ ni hisoblang.
A) –15 B) 8 C) 15 D) –8

7. (a2-g15-8) Ildizlari $x^2 - 7x + 4 = 0$ tenglamaning ildizlariga qarama-qarshi sonlardan iborat bo'lgan tenglama tuzing.
A) $x^2 + 7x + 4 = 0$
B) $4x^2 - 7x + 1 = 0$
C) $4x^2 + 7x + 1 = 0$
D) $x^2 + 7x - 4 = 0$

8. (a2-g17-8) $3x^2 - 4x - 5 = 0$ tenglamaning ildizlari x_1 va x_2 bo'lsa, $(x_1 + x_1^{-1}) + (x_2 + x_2^{-1})$ ifodaning qiymatini toping.
A) $\frac{4}{15}$ B) $-1\frac{1}{15}$
C) $1\frac{3}{5}$ D) $\frac{8}{15}$

9. (a2-g18-7) $x^2 - 5x + q = 0$ tenglamaning ildizlaridan biri 6 ga teng. Bu tenglamaning koeffisiyentlari yig'indisini toping.
A) 2 B) –10
C) –11 D) 1

10. (a3-g3-10) $5x^2 - x = 7$ tenglamaning ildizlari x_1 va x_2 bo'lsa, $x_1^2 x_2^3 + x_1^3 x_2^2$ ni hisoblang.
A) $\frac{5^2}{7^3}$ B) $\frac{5^3}{7^2}$ C) $\frac{7^2}{5^3}$ D) $\frac{7^3}{5^2}$

11. (a3-g5-8) $3x^2 - x - 4 = 0$ tenglamaning ildizlari x_1 va x_2 ga teng. Ildizlari $\frac{3x_1 - x_2}{x_2}$ va $\frac{3x_2 - x_1}{x_1}$ bo'lgan tenglama tuzing.
A) $4x^2 - 37x + 52 = 0$
B) $2x^2 + 33x + 39 = 0$
C) $4x^2 + 33x + 65 = 0$
D) $2x^2 - 37x + 39 = 0$

12. (a3-g7-7) Agar $x^2 + 4x - 2 = 0$ kvadrat tenglamaning ildizlari x_1 va x_2 bo'lsa, $\frac{x_1^2 \cdot x_2 + x_1 \cdot x_2^2}{x_1 \cdot x_2 - x_1 - x_2}$ ni hisoblang.
A) 4 B) 2 C) 6 D) –7

13. (a3-g8-8) Ildizlari $x^2 - 17x + 52 = 0$ tenglamaning ildizlaridan ikkiga katta bo'lgan kvadrat tenglama tuzing.
A) $x^2 + 21x + 90 = 0$
B) $x^2 - 21x + 90 = 0$
C) $x^2 - 21x - 90 = 0$
D) $x^2 + 21x - 90 = 0$

14. (a3-g9-6) Ildizlari $x^2 - 6x + 7 = 0$ tenglamaning ildizlariga qarama-qarshi sonlardan iborat bo'lgan tenglamani ko'rsating.
A) $7x^2 - 6x + 1 = 0$
B) $7x^2 + 6x + 1 = 0$
C) $x^2 + 6x + 7 = 0$
D) $x^2 + 6x - 7 = 0$

15. (a3-g10-9) x_1 va x_2 $x^2 - 5x - 3 = 0$ tenglamaning ildizlari bo'lsa, $x_1^2 x_2 + x_1 x_2^2$ ni hisoblang.
A) –15 B) 8 C) 15 D) –8

16. (a3-g12-8) Ildizlari $x^2 - 5x + 3 = 0$ tenglamaning ildizlariga qarama-qarshi sonlardan iborat bo'lgan tenglama tuzing.
A) $x^2 + 5x + 3 = 0$
B) $3x^2 - 5x + 1 = 0$
C) $3x^2 + 5x + 1 = 0$
D) $x^2 + 5x + 3 = 0$

17. (a3-g14-7) Ildizlari $x^2 - 62x + 6 = 0$ ildizlariga qarama-qarshi sonlardan iborat tenglama tuzing.
A) $x^2 + 62x + 6 = 0$
B) $x^2 + 62x - 6 = 0$
C) $6x^2 - 62x + 1 = 0$
D) $6x^2 - 62x - 1 = 0$

18. (a3-g16-7) $3x^2 - x - 4 = 0$ tenglamaning ildizlari x_1 va x_2 ga teng. Ildizlari $\frac{3x_1 - x_2}{x_2}$ va $\frac{3x_2 - x_1}{x_1}$ bo'lgan tenglama tuzing.
A) $4x^2 + 37x + 52 = 0$
B) $2x^2 - 33x + 39 = 0$
C) $4x^2 + 33x + 65 = 0$
D) $2x^2 + 37x + 39 = 0$

19. (a3-g17-7) x_1 va x_2 $x^2 - 7x + 5 = 0$ tenglamaning ildizlari bo'lsa, $-x_1^3 x_2 + x_1^2 - x_1 x_2^3 + x_2^2$ nechaga teng?
A) –156 B) –124
C) 234 D) –116

20. (a4-g2-6) Ildizlari $x^2 - 21x + 9 = 0$ tenglamaning ildizlaridan 3 marta katta sonlardan iborat tenglama tuzing.
A) $x^2 - 63x + 81 = 0$
B) $x^2 - 126x + 81 = 0$
C) $x^2 - 63x + 27 = 0$
D) $x^2 - 126x + 27 = 0$

21. (a4-g6-6) x_1 va x_2 $x^2 - 7x + 12 = 0$ tenglamaning ildizlari. Ildizlari $\frac{x_1}{2x_2 - 3x_1}$ va $\frac{x_2}{2x_1 - 3x_2}$ bo'lgan tenglama tuzing.
A) $x^2 - 5x + 6 = 0$
B) $9x^2 - 18x + 2 = 0$
C) $x^2 + 11x + 10 = 0$
D) $3x^2 + 11x + 6 = 0$

22. (a4-g7-7) $x^2 - 7x + 9 = 0$ tenglamaning ildizlari x_1 va x_2 bo'lsa, $x_1^3 x_2 + x_1 x_2^3 + x_1 x_2^2 + x_1^2 x_2$ ni hisoblang.
A) 342 B) 279 C) 441 D) 510

23. (a4-g8-8) Ildizlari $x^2 - 5x + 3 = 0$ tenglamaning ildizlariga teskari sonlardan iborat bo'lgan tenglama tuzing.
A) $x^2 + 5x + 3 = 0$
B) $3x^2 - 5x + 1 = 0$
C) $3x^2 + 5x + 1 = 0$
D) $x^2 + 5x + 3 = 0$

24. (a4-g9-7) $x^2 - 5x + 1 = 0$ tenglamaning ildizlari x_1 va x_2 bo'lsa, ildizlari $2x_1 - x_2$ va $2x_2 - x_1$ bo'lgan tenglama tuzing.
A) $x^2 - 9x + 16 = 0$
B) $x^2 - 5x - 41 = 0$
C) $x^2 - 5x + 16 = 0$
D) $x^2 - 9x - 41 = 0$

25. (a4-g21-7) x_1 va x_2 $x^2 - 8x + 4 = 0$ tenglamaning ildizlari bo'lsa, ildizlari $2x_1 + 1$ va $2x_2 + 1$ bo'lgan tenglama tuzing.
A) $x^2 - 16x + 33 = 0$
B) $x^2 - 18x + 33 = 0$
C) $x^2 + 14x + 26 = 0$
D) $x^2 - 18x + 42 = 0$

26. (a4-g22-8) $4x^2 - 3x - 5 = 0$ tenglamaning ildizlari x_1 va x_2 bo'lsa, $(x_1 + x_1^{-1}) + (x_2 + x_2^{-1})$ ifodaning qiymatini toping.
A) 1,35 B) 0,6 C) 0,75 D) 0,15

26. (a4-g22-8) $4x^2 - 3x - 5 = 0$ tenglamaning ildizlari x_1 va x_2 bo'lsa, $(x_1 + x_1^{-1}) + (x_2 + x_2^{-1})$ ifodaning qiymatini toping.
A) 1,35 B) 0,6
C) 0,75 D) 0,15

27. (a5-g7-6) x_1 va x_2 $x^2 - 5x + 2 = 0$ tenglamaning ildizlari bo'lsa, $x_1^4 + x_2^4$ ning qiymatini toping.
A) 433 B) 625 C) 641 D) 325

28. (a5-g24-6) x_1 va x_2 $2x^2 - 7x + 5 = 0$ tenglamaning ildizlari bo'lsa, $\frac{x_1}{x_2} + \frac{x_2}{x_1}$ ning qiymatini toping.
A) 2,9 B) 6,9 C) 7,8 D) 11,8

29. (a6-g1-6) x_1 va x_2 $x^2 - 9x + 5 = 0$ tenglamaning ildizlari. Ildizlari $2x_1 - x_2$ va $2x_2 - x_1$ bo'lgan tenglama tuzing.
A) $x^2 - 9x - 117 = 0$
B) $x^2 + 9x + 1 = 0$
C) $x^2 - 9x + 1 = 0$
D) $x^2 + 9x - 117 = 0$

30. (a6-g10-7) $3x^2 - 7x + 4 = 0$ tenglama ildizlarining kublari yig'indisini toping.
A) $\frac{91}{27}$ B) $\frac{343}{27}$
C) 259 D) 343

31. (a6-g19-6) $ax^2 + bx + c = 0$ tenglamaning ildizlari x_1 va x_2 bo'lsa, ildizlari $\frac{1}{x_1+1}$ va $\frac{1}{x_2+1}$ bo'lgan tenglama tuzing.
A) $(c + 2)x^2 + (b + 2)x + 4a = 0$
B) $(c - b + a)x^2 + (b - 2a)x + a = 0$
C) $(c - 2)x^2 + (b - 2)x + 4a = 0$
D) $(c + b - a)x^2 + (2a + b)x + a = 0$

32. (a6-g23-22) Ildizlari x_1 va x_2 bo'lgan kvadrat tenglamaning ozod hadi, $x_1 + 3$ va $x_2 + 3$ tenglamaning ozod hadidan 36 ga ortiq bo'lsa, $x_1 + x_2$ ni toping.
A) 15 B) –9 C) –15 D) –9

31. Bikvadrat tenglama. Kvadrat tenglama keltiriladigan tenglamalar

1. (a2-g1-7) $x^{12} + 7x^6 - 8 = 0$ tenglamaning ildizlari yig'indisini toping.
A) 0 B) 1 C) 8 D) –7

2. (a3-g22-7) $x^4 + 5x^2 - 6 = 0$ tenglamaning ildizlari ko'paytmasini toping.
A) 6 B) –6 C) –1 D) 1

3. (a4-g6-7) $3x^{12} - 4x^6 + 1 = 0$ tenglamaning ildizlari yig'indisini toping.
A) $\frac{1}{3}$ B) 4 C) 0 D) $\frac{4}{3}$

4. (a4-g16-6) $x^4 - 7x^2 + 4 = 0$ tenglamaning ildizlari yig'indisini toping.
A) 0 B) –7 C) 7 D) 4

5. (a4-g21-6) $2x^4 - 28x^2 + 9 = 0$ tenglamaning ildizlari yig'indisini toping.
A) 0 B) –28 C) 28 D) 9

6. (a5-g4-7) $x^4 - 7x^2 + 9 = 0$ tenglamaning ildizlari yig'indisini toping.
A) 7 B) 9 C) –9 D) 0

7. (a5-g7-7) $x^4 + 2x^2 - 3 = 0$ tenglama nechta haqiqiy ildizga ega?
A) 0 B) 4 C) 1 D) 2

32. Ratsional tenglama

1. (a1-g4-7) Tenglamani yeching.
$$\frac{2(3x+4)+3(2x+4)}{-3(2x+4)+4(2x-3)} = \frac{4}{3}$$
A) 4 B) $-5\frac{4}{7}$
C) –2 D) $\frac{156}{28}$

2. (a1-g7-3) $\left(\frac{x}{x-1} - \frac{x}{x+1}\right) : \frac{1}{x - \frac{1}{x}} = ?$
A) 1 B) 2 C) 3 D) 0,5

3. (a1-g8-4) $x^3 - x^2 - 4x + m = 0$ tenglamaning ildizlaridan biri 1 ga teng. Shu tenglamaning ildizlari ko'paytmasini toping.
A) –4 B) –2 C) 2 D) 4

4. (a1-g10-9) $x + \cfrac{2}{x + \cfrac{2}{x + \cfrac{2}{\ddots}}} = 6$, $x = ?$
A) 1 B) $\frac{1}{2}$
C) $\frac{17}{3}$ D) Hisoblab bo'lmaydi

5. (a1-g11-9) Tenglamaning ildizlari yig'indisini toping
$$x^2 + \frac{1}{x^2} + 2\left(x + \frac{1}{x}\right) - 6 = 0$$
A) –3 B) –4 C) 1 D) –2

6. (a1-g13-6) $\frac{2x^2 - 7x + 5}{x - 1} = 0$ tenglama ildizlari yig'indisini toping.
A) 2,5 B) 3,5 C) 5 D) 7

7. (a1-g14-7) Tenglamaning yechimlari ko'paytmasini toping.
$$\left(x^2 + \frac{1}{x^2}\right) - 4\left(x + \frac{1}{x}\right) + 5 = 0$$
A) 3 B) $2\sqrt{3}$ C) 6 D) 1

8. (a1-g17-8) Tenglamani yeching.
$$\cfrac{\cfrac{x+1}{3} - 1}{\cfrac{\cfrac{3}{3} - 1}{3}} = 1$$
A) 17 B) 26 C) 38 D) 50

9. (a2-g1-8) Tenglamani yeching.
$$\cfrac{7}{5 - \cfrac{6}{4 - \cfrac{2x-3}{x+1}}} = \frac{7}{3}$$
A) 2 B) ildizi yo'q
C) 4 D) 1

10. (a2-g2-9) Tenglamaning ildizlari yig'indisini toping.
$$\frac{x+3}{x-2} + \frac{x-2}{x+3} = \frac{5}{2}$$
A) 5 B) –2,5 C) –1 D) 7

11. (a2-g4-9) Tenglama nechta ildizga ega? $\frac{x+2}{(x-2)(x+3)} + \frac{x}{(x+3)(x-1)} = \frac{2}{(x-2)(x-1)}$
A) 0 B) 1 C) 2 D) 4

12. (a2-g5-8) Tenglamaning ildizlari yig'indisini toping
$$x^2 + \frac{1}{x^2} + 2\left(x + \frac{1}{x}\right) - 6 = 0$$
A) –3 B) –4 C) 1 D) –2

13. (a2-g6-8) Tenglamani yeching
$$x + \cfrac{2}{x + \cfrac{2}{x + \cfrac{2}{\ddots}}} = 8$$
A) 1 B) $\frac{1}{4}$ C) $\frac{31}{4}$ D) $\frac{35}{8}$

14. (a2-g7-9) Tenglamaning ildizlari ko'paytmasini toping.
$$\frac{3x^2}{7x-2} + \frac{7x}{x^2} = \frac{2}{4}$$
A) 0,(6) B) 2
C) 1,(3) D) 7

15. (a2-g9-9) Tenglamaning ildizlari yig'indisini toping
$$x^2 + \frac{1}{x^2} + 2\left(x + \frac{1}{x}\right) - 6 = 0$$
A) –3 B) –4 C) 1 D) –2

16. (a2-g11-8) Tenglamani yeching.
$$\cfrac{\cfrac{x}{2} - 1}{\cfrac{\cfrac{2}{2} - 1}{2}} + 1 = 5$$
A) 18 B) 26 C) 38 D) 54

17. (a2-g15-9) Tenglama nechta ildizga ega? $\frac{x+2}{(x-2)(x+3)} + \frac{x}{(x+3)(x-1)} = -\frac{1}{4(x-2)(x-1)}$
A) 0 B) 1 C) 2 D) 4

18. (a2-g16-8) Quyidagi tenglamaning ildizlari yig'indisini toping.
$$\frac{x^2 - 5x + 6}{x - 2} + x^2 + 4 = 2x + 3$$
A) –1 B) 1 C) 2 D) 3

19. (a2-g17-7) Tenglamani yeching.
$$5 - \cfrac{2 - \cfrac{3}{3 - x}}{2 + \cfrac{4}{2x - 1}} = 4$$
A) 1,5 B) –4,5
C) –3,5 D) 2,5

20. (a2-g18-8) Tenglama nechta haqiqiy ildizga ega?
$(x^4 + 5x^2 + 6)(x^4 - 7x^2 + 12) = 0$
A) ildizi yo'q B) 2
C) 4 D) 8

21. (a2-g19-8) Tenglamaning barcha ildizlari yig'indisini toping.
$x^2 + \frac{1}{x^2} - 7x + \frac{7}{x} + 8 = 0$
A) 5 B) –2 C) 2 D) 7

22. (a2-g20-8) Tenglamaning barcha ildizlari yig'indisini toping.
$\frac{x^2}{4} + \frac{16}{x^2} - \left(\frac{x}{2} + \frac{4}{x}\right) = 2$
A) 1 B) –5 C) 6 D) 2

23. (a2-g21-9) $(x^2 + 4x + 2)\cdot(x^2 + 4x + 6) = -3$ tenglama nechta haqiqiy ildizga ega?
A) 1 B) 2 C) 3 D) 4

24. (a2-g22-8) $(x + 6)\cdot(x + 5)\cdot(x + 3)\cdot(x + 2) = 180$
Tenglamaning eng katta va eng kichik ildizlari ayirmasini toping.
A) 12 B) 8 C) 9 D) 6

25. (a2-g23-6) Tenglama nechta ildizga ega? $(x^2 - 0{,}25)\cdot(x + 0{,}4) = (5x + 2)\cdot(2x - 1)^2$
A) 0 B) 1 C) 2 D) 3

26. (a3-g1-7) Tenglamani yeching.
$\frac{3(2x+3)+2(3x+4)}{-4(2x+3)+3(2x-4)} = \frac{4}{3}$
A) 4 B) $-3\frac{15}{44}$
C) –2 D) $\frac{147}{44}$

27. (a3-g1-8) $(x^2 + 3x + 2)\cdot(x^2 + 3x + 7) = 24$ tenglama nechta haqiqiy ildizga ega?
A) 0 B) 1
C) 2 D) 4

28. (a3-g2-7) Tenglamani yeching.
$$\frac{\frac{5}{x}+1}{3+\frac{\frac{5}{x}+1}{5}} = 20$$
A) $-4\frac{1}{5}$ B) $-\frac{5}{21}$
C) –20 D) $\frac{1}{20}$

29. (a3-g3-9) Tenglamani yeching.
$\frac{3x+1}{2} - 5 - \frac{12}{5} = \frac{x-2}{5}$
A) 4 B) 5 C) 6 D) 7

30. (a3-g4-5) $(x^2 + x)^2 - 11(x^2 + x) - 12$
Ifodani ko'paytuvchilarga ajrating.
A) $(x + 4)(x - 3)(x^2 + x + 1)$
B) $(x - 4)(x + 3)(x^2 - x + 1)$
C) $(x - 4)(x + 3)(x^2 + x + 1)$
D) $(x + 4)(x - 3)(x^2 - x + 1)$

31. (a3-g5-7) Tenglamaning nechta haqiqiy ildizi bor?
$x + 6 = -\frac{8}{x}$
A) 2 B) 1
C) ildizi yo'q. D) 3

32. (a3-g6-8) $(x^2 - 7x + 2)^2 - 13(x^2 - 7x) - 26 = 0$ tenglamaning ildizlari yig'indisini toping.
A) 14 B) 7
C) –7 D) –9

33. (a3-g7-8) Berilgan tenglamaning ildizlari ko'paytmasini toping.
$3x^3 - 10x^2 + 7x + 10 = 0$
A) $\frac{10}{3}$ B) $-\frac{2}{3}$
C) $\frac{7}{3}$ D) $-\frac{10}{3}$

34. (a3-g11-8) Tenglamaning ildizlari ko'paytmasini toping.
$\frac{3x^2}{7x-2} + \frac{7x-2}{x^2} = 4$
A) 0,(6) B) 2
C) 1,(3) D) 7

35. (a3-g12-9) Tenglama nechta ildizga ega? $\frac{x+2}{(x-2)(x+3)} + \frac{x}{(x+3)(x-1)} = \frac{4}{5(x-2)(x-1)}$
A) 0 B) 1 C) 2 D) 4

36. (a3-g14-8) Tenglamani yeching.
$\frac{x^2+9x+18}{x+6} = 2x - 3$
A) 6 B) 3 C) 1 D) Ø

37. (a3-g15-8) Tenglamaning nechta haqiqiy ildizi bor? $-\frac{4}{x} = x + 1$
A) ildizi yo'q B) 1
C) 2 D) 3

38. (a3-g17-8) $\frac{a^2+b^2}{ax} - 1 = \frac{2b^2}{ax} + \frac{b}{a}$ bo'lsa, x ni toping.
A) a B) $a + b$
C) $a - b$ D) ab

39. (a3-g18-7) Tenglamani yeching.
$$\frac{24}{2+\frac{6}{2+\frac{4}{3+x}}} = 6$$
A) 1 B) 0 C) –1 D) –1

40. (a3-g19-7) Tenglamani yeching.
$$\frac{\frac{2}{x}-5}{1+\frac{\frac{2}{x}-5}{3}} = 12$$
A) $\frac{1}{2}$ B) 2 C) $\frac{4}{3}$ D) 4

41. (a3-g20-7) $x^3 - x^2 - 8x + 12 = 0$ tenglamaning ildizlari ko'paytmasini toping.
A) 12 B) –12 C) 8 D) –6

42. (a3-g21-7) Tenglamaning ildizlari ko'paytmasini toping.
$x^4 + \frac{2}{x-4} = 256 - \frac{2}{4-x}$
A) –4 B) 4 C) 16 D) –16

43. (a3-g21-8) $x^3 - mx^2 + 4x - 16 = 0$ tenglama uchta ildizga ega va ulardan ikkitasining ko'paytmasi 8 ga teng. m ning qiymatini toping.
A) –2 B) 0 C) 2 D) –8

44. (a3-g21-24) $(x^3 + 5x)^4 = x^5 + 5x^2 + 4$ tenglamaning manfiy ildizlari nechta?
A) 0 B) 1 C) 2 D) 3

45. (a3-g23-7) $x^3 - 24x^2 + mx + n = 0$ tenglama uchta ildizga ega va uning ildizlari arifmetik progressiyani tashkil etsa, uning ikkinchi ildizini toping.
A) 7 B) 3 C) 8 D) 12

46. (a3-g24-7) Tenglamani yeching.
$\frac{3(2x+3)+2(3x+4)}{2(x-4)+3(x+3)} = \frac{4}{3}$
A) 4 B) $-2\frac{15}{16}$
C) –2 D) $\frac{156}{32}$

47. (a3-g24-8) Tenglamaning haqiqiy yechimlari yig'indisini toping.
$\left(x^2 + \frac{1}{x^2}\right) - 3\left(x + \frac{1}{x}\right) - 8 = 0$
A) 4 B) 3 C) –1 D) 5

48. (a4-g2-7) Tenglamaning ildizlari yig'indisini toping.
$\frac{x^2-5x+6}{x-2} = 2x^2 - 9$
A) –1,5 B) 0,5 C) 3,5 D) 2

49. (a4-g4-8) $x^{24} - 3x^8 + 4x^4 + x = 0$ tenglamaning ildizlari ko'paytmasini toping.
A) 3
B) –1
C) 0
D) aniqlab bo'lmaydi.

50. (a4-g5-7) $(3x - 5)\cdot(2x + 5)\cdot(x + 3) = (x + 2{,}5)\cdot(x^2 - 5x + 3)\cdot(x - 1{,}(6))$ tenglama nechta ildizga ega?
A) 2 ta B) 1 ta C) 4 ta D) 0 ta

51. (a4-g7-6) $\frac{x^3 - x^2 - 8x + 12}{x^3 + 9x^2 + 27x + 27} = 0$ tenglama nechta ildizga ega?
A) 0 B) 1 C) 2 D) 3

52. (a4-g8-9) Tenglamaning ildizlari yig'indisini toping. $\frac{x+2}{(x-2)(x+3)} + \frac{x}{(x+3)(x-1)} = \frac{4}{5(x-2)(x-1)}$
A) 2 B) –1,1 C) 0,9 D) 9

53. (a4-g10-6) Tenglamani yeching.

$$\frac{6}{1+\frac{x-2}{1+\frac{3-x}{2}}}=3$$

A) 0 B) 2 C) 3 D) 4

54. (a4-g12-9) $\begin{cases} a+b=2 \\ a^3+b^3=98 \end{cases}$ bo'lsa, $|a-b|=?$

A) 6 B) 4 C) 10 D) 8

55. (a4-g13-32) $x^3+(m-3)x^2-m^2x++m^2+1=0$ tenglamaning ildizlaridan biri 2 ga teng bo'lsa, m ning qiymatini toping.

A) 3; 4 B) 0; 1 C) 1; 3 D) 3; 5

56. (a4-g15-7) Tenglamani yeching.

$$\frac{2+\frac{x+2}{5}}{1-\frac{x-3}{4}}=3$$

A) 0,(3) B) Ildizi yo'q.
C) 3 D) 4

57. (a4-g18-6) Tenglamaning ildizlarini toping. $\frac{x}{x^2+x-6}-\frac{2}{x^2-5x+6}=\frac{1}{x+3}$

A) Ø
B) $(-\infty;\infty)$
C) $-3;\ 2;\ 3$
D) $(-\infty;-3)\cup(-3;2)\cup(2;3)\cup(3;\infty)$

58. (a4-g19-8) Tenglamani yeching.

$$\frac{\frac{5}{x}+1}{3+\frac{\frac{5}{x}+1}{5}}=20$$

A) $-4\frac{1}{5}$ B) $-\frac{5}{21}$ C) -20 D) $\frac{1}{20}$

59. (a4-g20-7) $x^3-13x^2+55x-75=0$ tenglamaning ildizlari ko'paytmasini toping.

A) 75 B) 5 C) 15 D) -75

60. (a4-g22-7) Tenglamani yeching.

$$7-\frac{2+\frac{3}{3-x}}{2-\frac{4}{2x-1}}=6$$

A) 1,5 B) $-4,5$
C) $-3,5$ D) 2,5

61. (a4-g23-6) Tenglamani yeching.

$$2-\frac{2}{1-\frac{2}{3x}}=-1$$

A) -1 B) -2 C) 1 D) 2

62. (a4-g23-7) Quyidagi tenglama ildizlari yig'indisini toping.

$$\frac{x^3-9x}{x^2-x-6}=0$$

A) -3 B) 9 C) 0 D) 3

63. (a4-g24-7) $x^3-5x^2-8x+48=0$ tenglama ildizlari yig'indisini toping.

A) 5 B) -3 C) 1 D) 7

64. (a5-g1-6) Tenglamani yeching.

$$1+\frac{1}{x+\frac{3}{1-\frac{1}{2}}}=4$$

A) $-\frac{43}{19}$ B) $-\frac{4}{7}$
C) $-\frac{17}{3}$ D) $-\frac{21}{5}$

65. (a5-g2-7) $x^3-8x+20=0$ tenglamaning ildizlari x_1, x_2 va x_3 ga teng bo'lsa, $\frac{1}{x_1x_2}+\frac{1}{x_1x_3}+\frac{1}{x_2x_3}$ ning qiymatini toping.

A) $-0,4$ B) 0,4
C) 0 D) 8

66. (a5-g3-6) $(x-7)\cdot(x-5)\cdot(x-3)\cdot(x-1)=20$ tenglamaning haqiqiy ildizlari yig'indisini toping.

A) 16 B) 8
C) 85 D) 23

67. (a5-g3-12) $x<0,(3)$ bo'lsa, $1+3x+9x^2+...=\frac{7}{3}$ tenglamani yeching.

A) $\frac{3}{7}$ B) $\frac{4}{17}$
C) $\frac{4}{21}$ D) $\frac{1}{7}$

68. (a5-g6-6) Tenglamaning ildizlari yig'indisini toping.

$$\frac{1}{x-2}-\frac{2}{x^2-1}=0$$

A) ildizga ega emas
B) 2
C) 3
D) -2

69. (a5-g6-7) $x^3-28x+m=$ tenglama uchta ildizga ega bo'lib, ulardan biri ikkinchisidan 2 marta katta bo'lsa, m ning musbat qiymatini toping.

A) 32 B) 48 C) 64 D) 28

70. (a5-g7-11) Tenglama nechta ildizga ega? $(x+2)(3-x)\left(\sqrt{x-7}+3\right)=12$

A) 0 B) 1 C) 2 D) 3

71. (a5-g7-24) $\frac{4}{x}=x^2-6x+11$ tenglama nechta ildizga ega?

A) 1 B) 2 C) 0 D) 3

72. (a5-g8-7) Tenglamaning ildizlari yig'indisini toping.

$$\frac{x}{x^2+2x-3}+\frac{2}{x^2+5x-6}=\frac{2}{x^2+9x+18}$$

A) -6 B) -14 C) -8 D) -4

73. (a5-g10-7) $x^3+ax^2-bx-27=0$ tenglamaning ildizlari geometrik progressiya tashkil etadi. a ning b ga nisbatini toping.

A) 2 B) 1
C) 0,(3) D) 0,25

74. (a5-g11-7) Tenglamaning ildizlari yig'indisini toping.

$$\frac{x-3}{(x-2)(x-4)}-\frac{1}{2(x-2)}=\frac{3}{(x-4)(x+1)}$$

A) 2 B) 5 C) 7 D) 10

75. (a5-g12-6) Tenglama ildizlari yig'indisini toping.
$(2x^2+5x+2)\cdot(3x^2+2x+2)\cdot(2x-x^2+8)=0$

A) $-\frac{7}{6}$ B) 0
C) -5 D) $-\frac{1}{2}$

76. (a5-g12-7) $\frac{16}{x-\frac{8}{2+\frac{1}{2}}}=4$ tenglamani yeching.

A) 0,8 B) 1,6 C) 7,2 D) 4,8

77. (a5-g14-7) Tenglama nechta haqiqiy ildizga ega?

$$x^3-\frac{1}{x^3}-3x+\frac{3}{x}=64$$

A) 0 B) 1 C) 2 D) 4

78. (a5-g15-2) Tenglamaning ildizlari yig'indisini toping.

$$\frac{x^3+x^2-13x+14}{x-2}=0$$

A) -1 B) -3 C) -5 D) -14

79. (a5-g17-36) $(x^2-6x)^2+3(x-3)^2=97$ tenglamaning ildizlari yig'indisini toping.

A) -6
B) 12
C) ildizga ega emas
D) 6

80. (a5-g18-32) $(x+5)\cdot(x+4)\cdot(x+2)\cdot(x+1)=40$ tenglamaning eng katta va eng kichik yechimlari orasidagi masofani toping.

A) 4 B) 8 C) 5 D) 6

81. (a5-g19-7) Tenglamaning ildizlari yig'indisini toping.

$$\frac{1}{x-3}+\frac{2x+3}{x^2+3x+9}=\frac{9x}{x^3-27}$$

A) ildizga ega emas
B) 9
C) 3
D) 0

82. (a5-g21-7) $2x^3-3x^2+7x=3$ tenglamaning haqiqiy ildizlari yig'indisini toping.

A) 1 B) 1,5 C) 0,5 D) 3

83. (a5-g22-7) $\left(x^2-\frac{3}{x^2}\right)+\left(x-\frac{3}{x}\right)=0$ tenglama nechta haqiqiy ildizga ega?

A) 1 B) 2 C) 3 D) 4

84. (a5-g23-6) Tenglamaning ildizlari yig'indisini toping.

$$\frac{x}{x-3}+\frac{4}{x+2}=\frac{4x+3}{x^2-x-6}$$

A) -2 B) -5 C) 3 D) 8

85. (a5-g24-7) $(x+2)^4 + x^4 = 82$ tenglamaning haqiqiy ildizlari yig'indisini toping.
A) –4 B) –3 C) –2 D) 1

86. (a5-g25-7) Tenglamaning ildizlari yig'indisini toping.
$\frac{x-3}{x+2} + \frac{x-3}{x-1} = \frac{x-3}{x-5}$
A) 7 B) 10 C) –10 D) 13

87. (a6-g3-6) $x^3 - ax^2 + 12 = 0$ $(a < 0)$ tengalamaning uchta haqiqiy ildizi mavjud bo'lsa, quyidagilarning qaysi biri to'g'ri?
A) Ildizlarining uchalasi ham musbat.
B) Ildizlaridan biri musbat, ikkitasi manfiy.
C) Ildizlarining ikkisi musbat, biri manfiy.
D) Ildizlarining uchalasi ham manfiy.

88. (a6-g4-7) $(x^2-1)(x+2)(x+4) = 2800$ tenglikni qanoatlantiruvchi haqiqiy sonlar yig'indisini toping.
A) 6 B) –3 C) 15 D) –6

89. (a6-g5-7) $-ax^3 - 2x^2 + 5x + 11 + a = 0$ tenglama uchta ildizga ega bo'lib, ulardan biri –1 ga teng bo'lsa, a ni toping.
A) –1 B) –2 C) 0 D) 2

90. (a6-g6-7) $x^{36} + 124x^{19} - 3x^5 = 24x$ tenglamaning ildizlari ko'paytmasini toping.
A) –24
B) –3
C) 0
D) aniqlab bo'lmaydi

91. (a6-g7-7) $(x^2+4x+2)(x^2+4x+6) = 5$ tenglama nechta haqiqiy ildizga ega?
A) 0 B) 1 C) 2 D) 4

92. (a6-g9-7) Quyidagi tenglama nechta haqiqiy ildizga ega?
$x^3 + \frac{7x^2}{12} - \frac{1}{24}x - \frac{1}{24} = 0$
A) 0 B) 1 C) 2 D) 3

93. (a6-g12-20) Tenglamani yeching:
$\frac{x-1}{x} + \frac{x-2}{x} + \frac{x-3}{x} + \ldots + \frac{1}{x} = 3.$
A) 7 B) 5 C) 4 D) 8

94. (a6-g12-30) $(x^2+2x+4)^2 + 5(x^2+2x+4) = x-3$ tenglamaning ildizlari yig'indisini toping.
A) ildizga ega emas
B) –4
C) –2
D) 6

95. (a6-g13-16) Tenglamani yeching:
$\frac{2}{x-5} + \frac{x-3}{5} = \frac{x}{5}.$
A) $4\frac{2}{5}$ B) 0,75 C) $7\frac{1}{2}$ D) $8\frac{1}{3}$

96. (a6-g13-25) $4x^5 + x^4 + 12x^3 + 3x^2 + 20x + 5 = 0$ tenglama nechta manfiy ildizga ega?
A) 1
B) 2
C) 3
D) manfiy ildizi yo'q

97. (a6-g14-14) Tenglamani yeching:
$x+1+\cfrac{x+\cfrac{x+\cfrac{\ldots}{x+1}}{x+1}}{x+1} = 21.$
A) 19; 0 B) 19
C) –19; 0 D) 0

98. (a6-g15-12) Tenglamaning ildizlari ko'paytmasini toping:
$\frac{7x-3}{x^2} + \frac{2x^2}{7x-3} = 3.$
A) 4,5 B) 3 C) 1,5 D) 3,5

99. (a6-g16-2) Tenglamaning ildizlari yig'indisini toping:
$\frac{x^3+x^2-13x+14}{x-2} = 0.$
A) –1 B) –3 C) –5 D) –14

100. (a6-g17-6) Tenglama nechta ildizga ega $\frac{3x-5}{x+3} = \frac{3x-20}{x-2}.$
A) cheksiz ko'p B) 0
C) 1 D) 2

101. (a6-g18-9) Tenglama nechta ildizga ega: $\frac{2}{x-2} + \frac{3}{x-3} = \frac{x^2-3x}{x^2-5x+6}.$
A) 0 B) 1
C) 2 D) cheksiz ko'p

102. (a6-g21-10) $2x^3 - ax^2 + (a-2)x + 6 = 0$ tenglama uchta ildizga ega bo'lib, bu ildizlardan biri –0,5 ga teng bo'lsa, qolgan ikki ildizi yig'indisini toping.
A) 9 B) 5 C) 4,5 D) 8,5

103. (a6-g21-29) Quyidagi tenglikni qanoatlantiruvchi barcha x lar yig'indisini toping $\frac{2x+5}{x-3} + \frac{3x+2}{2x+5} = 5{,}25.$
A) $\frac{17}{4}$ B) $\frac{11}{2}$
C) $5\frac{3}{14}$ D) $8\frac{11}{14}$

104. (a6-g22-7) $\frac{a+x}{b-x} - \frac{a-x}{b+x} = \frac{2b^2-2a^2}{b^2-x^2}$ tenglamani yeching.
A) $a+b$ B) $a-b$
C) $-a+b$ D) $-a-b$

105. (a6-g22-26) $(x^2-6x)^2 + 4(x-3)^2 = 41$ tenglamaning haqiqiy ildizlari yig'indisini toping.
A) 12 B) 6 C) 0 D) –6

106. (a6-g24-15) $3x^{25} - 2x^{12} + 4x^3 - 5x = 0$ tenglamaning haqiqiy ildizlari ko'paytmasini toping.
A) 5 B) –5 C) 2 D) 0

107. (a6-g25-16) Ildizlari 2; $\frac{1}{4} - \sqrt{5}$ va $\frac{1}{4} + \sqrt{5}$ bo'lgan uchinchi darajali tenglama tuzing.
A) $16x^3 - 20x^2 - 95x + 158 = 0$
B) $16x^3 + 20x^2 + 95x - 158 = 0$
C) $16x^3 + 40x^2 + 63x - 158 = 0$
D) $16x^3 - 40x^2 - 63x + 158 = 0$

33. Parametrli chiziqli tenglamalar

1. (a1-g1-7) m ning qanday qiymatlarida $\frac{mx+3}{3} = \frac{7x+m}{2}$ tenglamaning ildizi 1 ga teng bo'ladi?
A) –15 B) 12 C) 0 D) –9

2. (a1-g11-17) a ning qanday qiymatlarida $a^2(x-1) + a(2x-1) + 3(2-x) = 0$ tenglama cheksiz ko'p yechimga ega bo'ladi?
A) 1 va –3 B) 1 va 2
C) –3 D) 1

3. (a1-g12-5) $k^2x + 9k - 20 = 7kx + k^2 - 10x$ tenglama k ning qanday qiymatlarida ildizga ega bo'lmaydi?
A) 5; 2 B) 4; 5
C) 2 D) 4

4. (a2-g3-8) $\frac{a^2+b^2}{ax} - 1 = \frac{2b^2}{ax} + \frac{b}{a}$ bo'lsa, x = ?
A) a B) $a+b$
C) $a-b$ D) ab

5. (a2-g9-17) a ning qanday qiymatlarida $a^2(x-1) + a(2x-1) + 3(2-x) = 0$ tenglama cheksiz ko'p yechimga ega bo'ladi?
A) 1 va –3 B) 1 va 2
C) –3 D) 1

6. (a3-g3-19) $y = 3x + k - 2$ funksiya k ning qanday qiymatida A(4; 8) nuqtadan o'tadi?
A) –19 B) 12
C) –2 D) 1

7. (a4-g12-18) $y = 3^{\frac{x}{2}} + 4$ funksiyaga teskari funksiyani ko'rsating.
A) $y = 2\log_3 x - 4$
B) $y = 2\log_3(x-4)$
C) $y = 2\log_3 x + 4$
D) $y = 2(\log_3 x - 4)$

8. (a4-g25-16) n ning qanday qiymatlarida $\frac{xn-1}{3} = \frac{2n-x}{2} - 1$ tenglamaning ildizi 4 dan katta bo'ladi?
A) $-16 < x < -3$
B) $-8 < x < -1{,}5$
C) $3 < x < 8$
D) $-12 < x < -4$

9. (a6-g15-19) n ning qanday qiymatlarida $\frac{xn-1}{3} = \frac{2n-x}{2} - 1$ tenglamaning ildizi 4 dan katta bo'ladi?
A) $-16 < n < -3$
B) $-8 < n < -1{,}5$
C) $3 < n < 8$
D) $-12 < n < -4$

10. (a6-g25-18) a ning qanday qiymatlarida $(a-3)(x-3) = a^2 + 3x$ tenglama ildizga ega bo'lmaydi?
A) 3 B) hech qanday
C) 6 D) –3

34. Parametrli kvadrat tenglamalar

1. (a1-g2-7) m ning qanday qiymatlarida $\frac{1}{3}x^2 - 3x + 2m = 0$ tenglamaning ildizlaridan biri boshqasidan 2 marta katta bo'ladi?
A) 9 B) 3 C) 4 D) 2

2. (a1-g2-26) Quyidagi tenglama a ning qanday qiymatida 3 ta yechimga ega bo'ladi?
$x^2 - 4x + 5 = |a|$
A) 1
B) 2
C) 9
D) hech qanday qiymatida

3. (a1-g6-17) k ning qanday qiymatlarida $x^2 + 2(k+2)x + 6k - 3 = 0$ tenglama ikkita turli manfiy ildizga ega bo'ladi?
A) $(0,5; 1) \cup (1; \infty)$
B) $k \neq 1$
C) $(-\infty; -2)$
D) $(0,5; \infty)$

4. (a1-g8-20) m ning qanday eng katta butun qiymatida $x^2 - 2x + \lg(m+2) = 0$ tenglama ikkita haqiqiy ildizga ega bo'ladi?
A) 10 B) 8 C) 3 D) 7

5. (a1-g10-8) $x^2 - 12x + q = 0$ tenglamaning ildizlaridan biri ikkinchisidan 3 marta katta. Bu tenglamadagi ozod hadni toping.
A) 36 B) 27 C) 18 D) 12

6. (a1-g15-8) $x^2 - 15x + q = 0$ tenglamaning ildizlaridan biri ikkinchisidan 4 marta kichik. Bu tenglamadagi ozod hadni toping.
A) 36 B) 27 C) 18 D) 12

7. (a1-g16-7) m ning qanday qiymatlarida $\frac{1}{3}x^2 - 2mx + 15 = 0$ tenglamaning ildizlaridan biri boshqasidan 5 marta katta bo'ladi?
A) –9; 9 B) –3; 3
C) –4; 4 D) –2; 2

8. (a2-g10-8) $x^2 - px + 36 = 0$ tenglamaning ildizlaridan biri ikkinchisidan 4 marta katta bo'lsa, tenglamadagi p koeffitsiyentni toping.
A) 12 B) ±9 C) –3 D) ±15

9. (a2-g13-4) $y^2 - by + 9 = 0$ tenglamaning ildizlari m va n ga teng. $\sqrt[4]{mn^3} - \sqrt[4]{m^3n} = \sqrt{75}$ bo'lsa, b nimaga teng?
A) 11 B) –11 C) 31 D) –31

10. (a2-g20-17) a ning qanday qiymatida $x^2 - 2x - 3 = |a|$ tenglama har xil uchta haqiqiy ildizga ega bo'ladi?
A) hech qanday qiymatida
B) 4
C) 2
D) 1

11. (a2-g21-18) b va c ning qanday qiymatlarida N(–3; 2) nuqta $y = x^2 + bx + c$ parabolaning uchi bo'ladi?
A) $b = 6$; $c = 11$
B) $b = -6$; $c = 7$
C) $b = 6$; $c = -11$
D) $b = -6$; $c = -7$

12. (a2-g23-7) $x^2 - (2a+1)x - 1 = 0$ tenglamaning yechimlari x_1, x_2 va $x_1^3 \cdot x_2^2 + x_1^2 \cdot x_2^3 = 7$ o'rinli bo'lsa, a = ?
A) 1 B) 2 C) 3 D) 4

13. (a3-g2-8) $x^2 + 2kx - 8k = 5$ tenglamaning bir ildizi 3 ga teng bo'lsa, uning barcha koefftisiyentlari yig'indisini toping.
A) –17 B) –15
C) –12 D) –16

14. (a3-g4-8) $x^2 - kx + 9 = 0$ tenglamaning ildizlari x_1 va x_2 ga teng. $x_2\sqrt{x_1} - x_1\sqrt{x_2} = 6$ bo'lsa, k ning qiymatini toping.
A) 10 B) 6 C) 12 D) –6

15. (a3-g8-7) a ning qanday qiymatida $x^2 - (a-2)x + 20 = 0$ tenglamaning ildizlaridan biri 5 ga teng bo'ladi?
A) –7 B) 11 C) –11 D) 7

16. (a3-g15-16) a ning qanday qiymatlarida $y = x^2 - (5-x)a + 4$ va $y = 3x - 5a$ funksiyalarning grafiklari kesishmaydi?
A) $(-\infty; -7) \cup (1; \infty)$
B) $(-1; 7)$
C) $(-\infty; -1) \cup (7; \infty)$
D) $(-6; 1)$

17. (a3-g19-8) $2x^2 + 3kx - 2k^2 + 4k = 3$ tenglamaning bir ildizi 1 ga teng bo'ladigan k ning qiymatlari yig'indisini toping.
A) –3,5 B) –7
C) 0,5 D) 3,5

18. (a3-g22-24) $|x-5| = -(x-k)^2$ tenglama k ning qanday qiymatlarida 2 ta ildizga ega bo'ladi?
A) 0 B) 5
C) –5 D) hech qanday

19. (a4-g1-7) $x^2 - ax + 9 = 0$ tenglamaning ildizlari x_1 va x_2 ga teng. $x_2\sqrt{x_1} - x_1\sqrt{x_2} = 6$ bo'lsa, a nimaga teng?
A) 10 B) –2 C) 4 D) 2

20. (a4-g1-17) $y = kx^2 - 4(k^2 - 2k)x + 2$ parabolaning uchi $x - 3k = 0$ to'g'ri chiziqda bo'lsa, k = ?
A) 4 B) –3 C) –4 D) 3

21. (a4-g3-7) $x^2 + 5ax + 2a - 4 = 0$ tenglama ikkita manfiy ildizga ega bo'lsa, a qaysi oraliqda joylashgan?
A) $0 < a < 2$ B) $a < 2$
C) $a > 0$ D) $a > 2$

22. (a4-g3-18) $x^2 - 3(\log_2 a)x + 2 = 0$ tenglamaning ildizlari teskarilarining yig'indisi 3 ga teng bo'lishi uchun a nechaga teng bo'lishi kerak?
A) 1 B) 2 C) 8 D) 4

23. (a4-g10-7) $x^2 + px + q = 0$ tenglama ikkita ildizga, $x^3 + (p-2)x^2 - px + 6 = 0$ tenglama uchta ildizga ega. Bu tenglamalarning ikkitadan ildizlari teng bo'lsa, p ni toping.
A) –3 B) –1 C) 2 D) 5

24. (a4-g13-19) $x^2 + x + a - 4 = 0$ tenglamaning ildizlari x_1, x_2 va $3x_1 + 2x_2 = 1$ bo'lsa, a = ?
A) –8 B) –3
C) 3 D) 8

25. (a5-g8-6) $(k+2)x^2 - 5(k-3)x + 4 = 0$ tenglamaning ildizlari yig'indisi 2 ga teng bo'lsa, k ning qiymatini toping.
A) 2,(6) B) 3
C) 6,(3) D) 3,(6)

26. (a5-g8-16) $|x^2 - 4x - 7| = a$ tenglama a *ning* qanday qiymatlarida to'rtta ildizga ega bo'ladi?
A) $a = 2$
B) $0 < a < 11$
C) $a > 11$
D) $a > 2$

27. (a5-g9-8) $x^2 + (a+1)x + a - 12 = 0$ tenglamaning bir ildizi a ga teng bo'lsa, ikkinchi ildizini toping. ($a < 0$)
A) –5 B) 5 C) 2 D) –3

28. (a5-g13-6) $x^2 - (2a-3)x + 7 = 0$ tenglamaning ildizlari x_1 va x_2 ga teng. $x_1^2x_2 + x_1x_2^2 = 35$ bo'lsa, a ning qiymatini toping.
A) 1 B) 4 C) 5 D) 8

29. (a5-g16-10) $\sqrt{4x+5} = x$ tenglamaning ildizi $x^2 - (m-3)x + 2m = 0$ tenglamaning ham ildizi bo'lsa, m = ?
A) 13,(3) B) 5
C) 7 D) 1

30. (a5-g19-6) $x^2 - ax + 33 = 0$ tenglamaning ildizlaridan biri $6 + \sqrt{3}$ bo'lsa, a ning qiymatini toping.
A) –12 B) $6 - \sqrt{3}$
C) $2\sqrt{3}$ D) 12

31. (a6-g2-6) $2x^2 - 7x + n^2 - 5n + 7 = 0$ tenglamaning ildizlaridan biri 0,5 bo'lsa, n ning qabul qilishi mumkin bo'lgan qiymatlarini toping.
A) 0,5 va 3 B) 7 va 1
C) 3 va 2 D) 1 va 4

32. (a6-g5-15) a ning qanday qiymatlarida $x^2 - 2(a-2)x + a^2 - 3a - 28 = 0$ tenglama 2 ta manfiy ildizga ega bo'ladi?
A) (7; 32) B) $(-4; \infty)$
C) (–4; 2) D) $(-\infty; -4)$

33. (a6-g8-6) a ning qanday qiymatlarida $5(a+4)x^2 - 10x + a = 0$ tenglama ikkita bir xil ishorali ildizga ega bo'ladi?
A) (–4; 0)
B) (–5; 1)
C) $(-\infty; -4) \cup (0; \infty)$
D) $(-5; -4) \cup (0; 1)$

34. (a6-g11-2) $6x^3 - 35x^2 + kx - 30 = 0$ tenglama uchta haqiqiy ildizga ega va ildizlari orasida $\frac{1}{x_1} + \frac{1}{x_2} = x_3$ munosabat mavjud bo'lsa, k ning qiymati nechaga teng?
A) –1,2 B) 71
C) 6 D) 61

35. (a6-g18-1) $(a+2)x^2 - 5ax + 12 = 0$ tenglamaning ildizlaridan biri 3 ga teng bo'lsa, ikkinchi ildizini toping.
A) $-\frac{4}{3}$ B) $\frac{4}{7}$
C) $\frac{4}{9}$ D) $-\frac{4}{7}$

6-bob. Tenglamalar sistemasi

35. Chiziqli tenglamalar sistemasi

1. (a1-g1-9) $a^2 - b^2 = 48$, $a + b = 6$ va $ax + b = 13$ bo'lsa, x = ?
A) 1 B) –2 C) –3 D) 2

2. (a1-g10-10) $\begin{cases} 4x - y = 11 \\ 2y + 5z = 5 \\ x - 2z = 9 \end{cases}$
$z + y - x$ = ?
A) 5 B) 3 C) 1 D) –1

3. (a1-g14-8) $2x + 3y + 9z = 10$
$4x + 8y + 16z = 25$ bo'lsa, $y - z$ = ?
A) –7,5 B) –2,5
C) 2,5 D) 5

4. (a1-g17-9) $\begin{cases} x + y = 18 - z \\ 4x + 5y + 4z = 76 \end{cases}$ bo'lsa,
y = ?
A) 3
B) 4
C) 6
D) aniqlab bo'lmaydi

5. (a2-g10-10) $\begin{cases} 2a - 3b + c = 1 \\ 4a - b + 3c = 25 \\ 3a + 2b + 2c = 29 \end{cases}$
a = ?
A) 1 B) 3 C) 5 D) 6

6. (a2-g14-11) Tenglamani yeching.
$9x - (-4x - (5x - (3 + 4x) + 2x) + 8) =$
$= -6 + x$
A) $\frac{1}{3}$ B) $\left(\frac{10}{9}\right)^{-1}$
C) $-\left(\frac{9}{10}\right)^{-1}$ D) 1,(1)

7. (a2-g20-9) $\begin{cases} 2x + 5y + 2z = 7 \\ 3x - 2y + z = 12 \\ x - y - z = 3 \end{cases}$ bo'lsa,
$x + y + z$ = ?
A) 3 B) 5,5
C) 6 D) 4

8. (a4-g10-8) $\begin{cases} 2a - 3b + c = 1 \\ 4a - b + 3c = 25 \\ 3a + 2b + 2c = 29 \end{cases}$
bo'lsa, a ni toping.
A) 2 B) 4 C) 8 D) 5

9. (a5-g6-8) $\begin{cases} a + b = 9 \\ b + c = 13 \\ a + c = 12 \end{cases}$ bo'lsa,
$a \cdot b \cdot c$ = ?
A) 160 B) 120
C) 108 D) 156

10. (a5-g16-7) Quyidagi tenglamalar sistemasidan b ni toping.
$\begin{cases} 3a - 7b + 3c = 9 \\ 5a + 2b + 7c = 38 \\ 2a - 2b + 4c = 7 \end{cases}$
A) 1 B) 2 C) 5 D) 6

11. (a6-g6-6) $\frac{a+b-2}{c} = \frac{2a+c+1}{b} =$
$= \frac{2b+2c+d}{a} = 3$ bo'lsa, d ning qiymatini toping.
A) 0,5 B) 1 C) 2 D) 1,5

12. (a6-g8-4) Agar $27x^3 - 8y^3 = 98$ va $4xy^2 - 6x^2y = -10$ bo'lsa, $3x - 2y + 2$ ning qiymatini toping.
A) 4 B) 2 C) 0 D) –2

13. (a6-g17-7) $\begin{cases} 4x + y + 2z = 13 \\ 2x + 5y - z = 21 \\ 6x + 2y - 3z = 12 \end{cases}$
bo'lsa, $y + z$ = ?
A) 9 B) 7,5
C) 5,5 D) 6

36. I va II darajali tenglamalar sistemasi

1. (a1-g4-9) $\begin{cases} \frac{a-b}{b} = \frac{3}{2} \\ 1 - \frac{b}{a} = c \end{cases}$ bo'lsa, c = ?
A) $\frac{1}{5}$ B) $\frac{2}{5}$ C) $\frac{3}{5}$ D) 1

2. (a1-g5-9) $\begin{cases} \frac{5a}{2} + \frac{4}{b} = 21 \\ \frac{4a}{3} + \frac{2}{b} = 11 \end{cases}$ bo'lsa,
$a + b$ = ?
A) 13,5 B) 6,(6)
C) 0,75 D) 11,6

3. (a1-g8-14) $\begin{cases} \frac{4}{a} + \frac{1}{b} = 3 \\ \frac{1}{a} + \frac{4}{b} = 7 \end{cases}$ bo'lsa,
$\frac{a+b}{ab}$ ning qiymatini toping.
A) 10 B) 5 C) 2 D) 4

4. (a1-g11-10) $\begin{cases} \frac{2}{a} + \frac{3}{b} = \frac{4}{5} \\ \frac{1}{a} + \frac{4}{b} = \frac{1}{2} \end{cases}$ bo'lsa,
b = ?
A) 25 B) 50 C) 17 D) 34

5. (a1-g13-8) $\begin{cases} x^2 + y^2 = 5 \\ x + y = 5 \end{cases}$ tenglamalar sistemasi nechta yechimga ega?
A) 0 B) 1 C) 2 D) 4

6. (a1-g15-9) $\begin{cases} \frac{2a}{5} + \frac{9}{b} = 7 \\ \frac{3a}{10} + \frac{12}{b} = 7 \end{cases}$ bo'lsa,
$a + b$ = ?
A) 7 B) 6 C) 13 D) 14

7. (a2-g1-9) $\begin{cases} a^2 - b^2 - 3a + 3b = 21 \\ a - b = 3 \end{cases}$
bo'lsa, $a + b$ = ?
A) –7 B) 10 C) 4 D) 7

8. (a2-g2-10) $\begin{cases} 16a^2 + 9b^2 = 436 \\ ab = 10 \end{cases}$
bo'lsa, $|4a + 3b|$ = ?
A) 18 B) 42
C) 36 D) 26

9. (a2-g6-7) $\frac{x}{y} = \frac{2}{3}$ va $\frac{y}{z} = \frac{6}{5}$,
$x + y + z = 60$ bo'lsa, z ning qiymatini toping.
A) 24 B) 30 C) 20 D) 16

10. (a2-g7-10) $\begin{cases} x^2y = 108 \\ xy^2 = 54 \end{cases}$ bo'lsa,
$x - y$ = ?
A) 2 B) 3 C) 1 D) 4

11. (a2-g8-11) $\begin{cases} 2x - y = 2 \\ 2x^2 + 5xy - 3y^2 = 30 \end{cases}$
bo'lsa $y - x$ = ?
A) 15 B) 8 C) –1 D) 1

12. (a2-g11-10) $\begin{cases} 4a^2 + 9b^2 = 109 \\ ab = 5 \end{cases}$
bo'lsa, $|2a - 3b|$ = ?
A) 6 B) 7
C) 8 D) 13

13. (a2-g13-9) $\begin{cases} a^2 - ab = \frac{3}{5} \\ \frac{a-b}{b} = \frac{9}{25} \end{cases}$ bo'lsa,
ab = ?
A) $\frac{3}{5}$ B) $\frac{7}{5}$ C) $\frac{5}{3}$ D) $\frac{5}{7}$

14. (a2-g16-9) $\begin{cases} x + y = 8 \\ \frac{x}{y} = 3 \end{cases}$ tenglamalar sistemasi nechta yechimga ega?
A) 0 B) 4 C) 2 D) 1

15. (a2-g17-9) Quyidagi sistemadan $|m+n|$ ni toping $\begin{cases} m=\frac{17}{m}-n \\ n=\frac{8}{n}-m \end{cases}$.

A) 3 B) 5 C) 7 D) 9

16. (a2-g18-9) $\begin{cases} 4x+2y=12 \\ 2x+4y=6 \end{cases}$ tenglamalar sistemasidan x^2-y^2 ning qiymatini toping.

A) 9 B) 108 C) 27 D) 15

17. (a2-g19-9) $\begin{cases} x-y=3 \\ \frac{1}{x}+\frac{1}{y}=\frac{7}{10} \end{cases}$ sistemaning nechta ildizi mavjud?

A) 0 B) 1 C) 2 D) 4

18. (a2-g23-8) $\begin{cases} x+y+z=4 \\ \frac{1}{x}+\frac{1}{y}+\frac{1}{z}=3 \\ xy+xz+yz=24 \end{cases}$ bo'lsa, $\frac{xyz}{x+y+z}=?$

A) 2 B) 32 C) 18 D) 12

19. (a3-g1-9) $\begin{cases} a^2-ab=\frac{3}{5} \\ \frac{a-b}{b}=\frac{21}{25} \end{cases}$ bo'lsa, $ab=?$

A) $\frac{3}{5}$ B) $\frac{7}{5}$ C) $\frac{5}{3}$ D) $\frac{5}{7}$

20. (a3-g3-11) $\begin{cases} 2x+y=2 \\ 2x^2-7xy-4y^2=24 \end{cases}$ bo'lsa $-4y+x=?$

A) 6 B) 8 C) –2 D) 12

21. (a3-g5-9) $\begin{cases} a+\frac{1}{b}=24 \\ b+\frac{1}{a}=6 \end{cases}$ bo'lsa, $\frac{a}{b}=?$

A) 1/16 B) 4 C) 1/4 D) 8

22. (a3-g9-7) $\begin{cases} a^2-ab=\frac{14}{13} \\ \frac{a-b}{b}=\frac{7}{26} \end{cases}$ bo'lsa, $ab=?$

A) 1 B) $\frac{7}{6}$ C) 4 D) $\frac{7}{2}$

23. (a3-g10-10) $\begin{cases} 9a^2+4b^2=180 \\ ab=12 \end{cases}$ bo'lsa, $|3a-2b|=?$

A) 6 B) 7 C) 8 D) 10

24. (a3-g11-9) a, b va c musbat sonlar $\begin{cases} \frac{1}{a}\cdot\frac{2}{b}=\frac{1}{6} \\ \frac{2}{a}\cdot\frac{1}{c}=\frac{1}{9} \\ \frac{3}{b}\cdot\frac{2}{c}=\frac{1}{4} \end{cases}$ bo'lsa $a+b+c=?$

A) 9 B) 13 C) 12 D) 16

25. (a3-g15-9) $\begin{cases} a+\frac{1}{b}=15 \\ b+\frac{1}{a}=5 \end{cases}$ bo'lsa, $\frac{a}{b}=?$

A) 1/3 B) 4 C) 9 D) 3

26. (a3-g16-9) $\begin{cases} x+y+\frac{x}{y}=11 \\ (x+y)\frac{x}{y}=18 \end{cases}$

x_0 yuqoridagi tenglamada x ning kichik qiymati bo'lsa, $\frac{x_0+1}{4}=?$

A) 0,3 B) 1,8 C) 0,7 D) 1,75

27. (a3-g18-11) $\begin{cases} 2x+\frac{3}{y}=7 \\ 4x^2-\frac{9}{y^2}=35 \end{cases}$ bo'lsa, y nechaga teng?

A) $\frac{2}{3}$ B) 2

C) 3 D) 6

28. (a3-g19-5) Agar $4x+\frac{1}{3y}=5$ va $16x^2+\frac{1}{9y^2}=15$ bo'lsa x ni y orqali ifodalang.

A) $x=3y$
B) $x=3{,}5y$
C) $x=3{,}75y$
D) $x=5y$

29. (a3-g19-9) $\begin{cases} a^2+2ab=35 \\ 2b^2+ab=7 \end{cases}$ bo'lsa, $|a+2b|=?$

A) 7 B) 5 C) 6 D) 8

30. (a3-g20-8) $\begin{cases} \frac{1}{x}+\frac{1}{y}=\frac{7}{12} \\ \frac{1}{x}\cdot\frac{1}{y}=\frac{1}{12} \end{cases}$ tenglikni qanoatlantiruvchi x va y larning barcha qiymatlari yig'indisini toping.

A) 7 B) 14
C) 0 D) –7

31. (a3-g23-8) $a-b+c=3$ va $ab+bc-ac=4$ bo'lsa, $a^2+b^2+c^2$ ning qiymatini toping.

A) 13 B) 19
C) 22 D) 17

32. (a4-g6-8) $\begin{cases} \frac{2}{x}+\frac{3}{y}=1{,}6 \\ \frac{4}{x}-\frac{5}{y}=1 \end{cases}$ bo'lsa, $x\cdot y$ ni toping.

A) 10 B) 6 C) 2 D) 18

33. (a4-g7-8) $\begin{cases} x^2+y^2=64 \\ x+y=3 \end{cases}$ tenglamalar sistemasi nechta ildizga ega?

A) 0 B) 1 C) 2 D) 4

34. (a4-g9-8) $\begin{cases} a+\frac{4}{b}=2 \\ b+\frac{3}{a}=3 \end{cases}$ bo'lsa, $\frac{2b-3a-1}{a+b}=?$

A) –2 B) –1 C) 0 D) 1

35. (a4-g11-19) $\begin{cases} x^2+xy=\frac{11}{19} \\ 1+\frac{x}{y}=\frac{11}{38} \end{cases}$ bo'lsa, $x\cdot y=?$

A) 2 B) 0,5 C) 1 D) 0,25

36. (a4-g15-8) $\begin{cases} a^2+ab=\frac{8}{7} \\ \frac{a+b}{b}=\frac{16}{49} \end{cases}$ bo'lsa, $ab=?$

A) $\frac{7}{2}$ B) $\frac{128}{343}$ C) $\frac{343}{128}$ D) $\frac{2}{7}$

37. (a4-g17-7) $\begin{cases} 3x_1+3x_2-5x_1x_2=-4 \\ 6x_1x_2-4x_1-4x_2=2 \end{cases}$ Ildizlari yuqoridagi sistemani qanoatlantiruvchi x_1 va x_2 bo'lgan kvadrat tenglama tuzing.

A) $x^2+7x+5=0$
B) $x^2-7x+5=0$
C) $x^2+12x+9=0$
D) $x^2-12x+9=0$

38. (a4-g19-7) $\begin{cases} a^2+c^2=18 \\ b^2+c^2=6 \\ a-b=2 \end{cases}$ bo'lsa, $|c|$ ning qiymatini toping.

A) 1 B) 2
C) $\sqrt{2}$ D) $2\sqrt{2}$

39. (a4-g20-8) $x^2y+xy^2=9$, $xy^2-x^2y=5$ ga teng. $\frac{x+y}{x-y}$ ning qiymatini toping.

A) –3,6 B) –1,8 C) 2,4 D) 1,8

40. (a4-g22-9) Quyidagi sistemadan $|m-n|$ ni toping.

$\begin{cases} m=\frac{27}{m}+n \\ n=\frac{22}{n}+m \end{cases}$

A) 3 B) 5 C) 7 D) 9

41. (a4-g23-8) $\frac{yz}{x}=1$, $\frac{xz}{y}=2$ va $\frac{xy}{z}=3$ bo'lsa, $x^2+y^2+z^2$ ning qiymatini toping.

A) 26 B) 14 C) 11 D) 29

42. (a4-g24-6) $\begin{cases} \frac{1}{x}+\frac{3}{y}=\frac{14}{15} \\ \frac{3}{x}+\frac{4}{y}=\frac{9}{5} \end{cases}$ sistemani qanoatlantiruvchi x va y larning barcha qiymatlari yig'indisini toping.

A) 12 B) 8 C) 9 D) 10

43. (a4-g25-8) Tenglamalar sistemasini yeching. $\begin{cases}\frac{y^2}{4}-\frac{x^2}{4}=18\\6x+6y=36\end{cases}$

A) (3; –9) B) (3; 9)
C) (–3; –9) D) (–3; 9)

44. (a5-g1-8) $\begin{cases}ax+by=3\\bx+ay=5\\a+b=2\end{cases}$ bo'lsa,

$x+y=?$
A) 4 B) 6 C) 8 D) 0

45. (a5-g3-8) $\begin{cases}x^2+y^2=169\\xy=60\end{cases}$ sistemani qanoatlantiruvchi barcha x va y larning yig'indisi nechaga teng?
A) 17 B) 34 C) 0 D) –34

46. (a5-g4-8) Tenglamalar sistemasini yeching. $\begin{cases}\frac{y^2-x^2}{3}=9\\4x+4y=36\end{cases}$

A) (–6; –3) B) (9; 3)
C) (6; 3) D) (3; 6)

47. (a5-g5-8) $\begin{cases}a^2+c^2=18\\b^2+c^2=6\\a-b=2\end{cases}$ bo'lsa,

c ning qiymatini toping.
A) ±2 B) ±1
C) $\pm2\sqrt{2}$ D) $\pm\sqrt{2}$

48. (a5-g6-4) $xy=5$ va $\frac{1}{x^2}+\frac{1}{y^2}=\frac{18}{5}$ bo'lsa, $x+y$ quyidagilardan qaysi biriga teng bo'lishi mumkin?
A) 6 B) 6,4 C) 9,6 D) 10

49. (a5-g8-8) $\begin{cases}m+np=42\\n+mp=22\\m+n-p=1\end{cases}$ bo'lsa,

p ning qabul qiladigan qiymatlari yig'indisini toping.
A) 2 B) 9 C) 0 D) –2

50. (a5-g9-9) $\begin{cases}(a+1)(b+1)=12\\(a+b)(ab+1)=35\end{cases}$ va $(a>b)$ bo'lsa, a/b ni toping.
A) 3 B) 1,5 C) 4 D) 9

51. (a5-g10-6) $3x=4y=5z$ va $x+y+z=188$ bo'lsa, x ning qiymatini toping.
A) 66 B) 72 C) 90 D) 80

52. (a5-g10-23) Quyidagi tenglamalar sistemasida z ning qiymatini toping.

$\begin{cases}4x-6y+3z=102\\\frac{2}{3}x-y+3z=12\end{cases}$

A) aniqlab bo'lmaydi
B) –6
C) –2
D) 1

53. (a5-g13-7) $\begin{cases}x+y+z=4\\\frac{1}{x}+\frac{1}{y}+\frac{1}{z}=2\\xy+xz+yz=96\end{cases}$ bo'lsa,

$\frac{xyz}{x+y+z}=?$
A) 3 B) 6 C) 9 D) 12

54. (a5-g14-6) $\begin{cases}\frac{2}{5}x+\frac{3}{4}y=3\\\frac{x}{2}+\frac{3y}{20}=15\end{cases}$ bo'lsa,

$x+y$ ning qiymatini toping.
A) 20 B) 10 C) 16 D) 24

55. (a6-g3-7) $\begin{cases}a+\frac{1}{b}=24\\b+\frac{1}{a}=9\end{cases}$ bo'lsa, $\frac{a}{b}=?$

A) $\frac{3}{8}$ B) $2\frac{2}{3}$ C) $\frac{64}{9}$ D) $\frac{9}{64}$

56. (a6-g7-6) $\begin{cases}2x_1x_2-x_1-x_2=-25\\x_1+x_2+3x_1x_2=-10\end{cases}$

tenglamalar sistemasi berilgan. Ildizlari sistemadagi x_1 va x_2 bo'lgan kvadrat tenglama tuzing.
A) $x^2+11x-7=0$
B) $2x^2-11x+7=0$
C) $x^2-11x-7=0$
D) $2x^2+11x-7=0$

57. (a6-g14-29)

$\begin{cases}16x^2+16xy+4y^2+x+2y=263\\2x+y=8\end{cases}$

tenglikni qanoatlantiruvchi barcha x va y larning yig'indisini toping.
A) 5 B) 10 C) 7 D) 14

58. (a6-g19-22) $\begin{cases}\frac{3}{2x+3}+\frac{5}{3y-5}=1\\\frac{6}{2x+3}-\frac{5}{3y-5}=\frac{1}{2}\end{cases}$

tenglamalar sistemasidan foydalanib, $y-x$ ni hisoblang.
A) 6,5 B) –3,5
C) –6,5 D) 3,5

37. Yuqori darajali tenglamalar sistemasi

1. (a1-g1-8) $4(5x-2)(4x-3)(x+2)=15(x-0{,}4)(x-0{,}75)(x-4)$ tenglama nechta ildizga ega?
A) 0 B) 1 C) 2 D) 3

2. (a1-g4-8) $(x^2+3x+2)\cdot(x^2+3x+7)=24$ tenglamaning haqiqiy ildizlari yig'indisini toping.
A) –3 B) –1 C) –6 D) 0

3. (a1-g5-27) Teng yonli ABC uchburchakning BC asosi 2 ga, yon tomonlari 8 ga teng. Uchburchakning AB tomoniga CD balandlik tushirilgan. ADC uchburchakning yuzi BDC uchburchakning yuzidan necha marta katta?
A) 17 B) 23 C) 4 D) 31

4. (a2-g13-7) $2x=3y=4z$ va $\frac{1}{x}+\frac{1}{y}+\frac{1}{z}=1$, $y=?$
A) 4 B) 3 C) 2 D) 1

5. (a4-g12-10) $a>c>b>0$ bo'lsa, $\frac{1}{a}$, $\frac{1}{a+b}$ va $\frac{1}{a+c}$ larni taqqoslang.

A) $\frac{1}{a}<\frac{1}{a+b}<\frac{1}{a+c}$
B) $\frac{1}{a}<\frac{1}{a+c}<\frac{1}{a+b}$
C) $\frac{1}{a+c}<\frac{1}{a+b}<\frac{1}{a}$
D) $\frac{1}{a+b}<\frac{1}{a+c}<\frac{1}{a}$

6. (a5-g7-8) $\begin{cases}a^4+ab^3=9\\b^4+ba^3=18\end{cases}$ bo'lsa, $2a+3b$ ning qiymatini toping.
A) 3 B) ±9 C) ±8 D) 4

7. (a5-g23-7) $\begin{cases}xy+x+y=39\\xy^2+x^2y=308\end{cases}$ tenglamalar sistemasi nechta haqiqiy ildizga ega?
A) 8 B) 2 C) 1 D) 4

8. (a6-g8-7) $\begin{cases}x^4-y^4=65\\x^2+y^2=13\end{cases}$ tenglamalar sistemasining yechimlaridan iborat barcha x va y larning yig'indilarini toping.
A) $2\sqrt{8}+2\sqrt{3}$ B) $-2\sqrt{2}-\sqrt{3}$
C) 8 D) 0

9. (a6-g9-6) $\begin{cases}x^3+x^2y=32\\2x^2y-2y^3=-48\\3y^2x+3y^3=24\end{cases}$ bo'lsa,

$x+y$ ni toping.
A) $\sqrt[3]{2}$ B) 8 C) 2 D) 4

10. (a6-g11-6) $\begin{cases}y=x^2-15x+55\\y=y^2+3x-18\end{cases}$

tenglamalar sistemasi nechta ildizga ega?
A) cheksiz ko'p B) 0
C) 1 D) 2

11. (a6-g15-30) $\begin{cases}a+b=-3\\a^3+b^3=-63\end{cases}$ bo'lsa, $|a-b|=?$
A) 4 B) 5 C) 3 D) 6

12. (a6-g22-27) $\begin{cases}x^3=86-3xy^2\\y^3=-211-3yx^2\end{cases}$

bo'lsa, $x+y$ ni toping.
A) –25 B) 5 C) 25 D) –5

38. Parametrli tenglamalar sistemasi

1. (a2-g7-16) k ning qanday qiymatlarida $4x + 2 = y$ va $3x - 2k = 5y$ funksiyalarning kesishish nuqtasi ordinatasi 2 dan kichik bo'ladi?
A) $k < -5$ B) $k < 5$
C) $k > -5$ D) $k = 5$

2. (a3-g8-9) a va b ning qanday qiymatlarida $\begin{cases} ax - 6y = 7 \\ 3x - by = 10{,}5 \end{cases}$ tenglamalar sistemasi cheksiz ko'p yechimga ega bo'ladi?
A) $a = 2;\ b = 9$
B) $a = 2;\ b \neq 9$
C) $a \neq 2;\ b = 9$
D) $a = -2;\ b = 9$

3. (a4-g22-17) k ning nechta butun qiymatida $y = 4x^2 - 2kx + 3$ va $y = kx + 2$ funksiyalar kesishmaydi?
A) 1 B) 3 C) 4 D) 5

4. (a5-g4-15) $\begin{cases} 3x + (a-2)y - 4 = 0 \\ bx - 2y + 12 = 0 \end{cases}$
Yuqoridagi tenglamalar sistemasi cheksiz ko'p yechimga ega bo'lsa, $a - b = ?$
A) $\frac{8}{3}$ B) $\frac{27}{5}$ C) $\frac{35}{3}$ D) 12

7-bob. Tengsizliklar

39. Bir noma'lumli chiziqli tengsizliklar

1. (a3-g18-9) $\left(3 - \sqrt{10}\right)x < 16 - 5\sqrt{10}$ tengsizlikni yeching.
A) $\left(-\infty;\ 2 - \sqrt{10}\right)$
B) $\left(2 - \sqrt{10};\ \infty\right)$
C) $\left(-\infty;\ 2 + \sqrt{10}\right)$
D) $\left(2 + \sqrt{10};\ \infty\right)$

2. (a3-g20-9) $(e - \pi)x > 7(\pi - e)$ tengsizlikni yeching.
A) $(-\infty;\ -7)$ B) $(-\infty;\ 7)$
C) $(7;\ \infty)$ D) $(-7;\ \infty)$

3. (a5-g3-9) Tengsizlikni yeching. $(e - 5)x > 25 - e^2$
A) $(-e - 5;\ \infty)$ B) $(-\infty;\ -e - 5)$
C) $(-\infty;\ e + 5)$ D) $(e + 5;\ \infty)$

4. (a5-g7-9) $\left(\sqrt{3} - \sqrt{7}\right)(7 - x) \geq 0$ tengsizlikni yeching.
A) $[7;\ \infty)$ B) $\varnothing$
C) $(-\infty;\ 7]$ D) R

5. (a5-g19-8) Tengsizlikni yeching.
$\frac{x}{\sqrt{7} - \sqrt{11}} > \sqrt{28} + \sqrt{44}$
A) $(-8;\ \infty)$ B) $(-4;\ \infty)$
C) $(-\infty;\ -4)$ D) $(-\infty;\ -8)$

6. (a6-g6-8) $(e - \pi)(x + 2) \geq \pi - e$ tengsizlikni yeching.
A) $(-\infty;\ -3]$ B) $[-3;\ \infty)$
C) $[-1;\ \infty)$ D) $(-\infty;\ -1]$

7. (a6-g18-23) Tengsizlikni yeching:
$\frac{x}{\sqrt{2} - \sqrt{5}} > \sqrt{2} + \sqrt{5}$.
A) $(-\infty;\ -3)$ B) $(-3;\ \infty)$
C) $(3;\ \infty)$ D) $(-\infty;\ 3)$

40. Qo'sh tengsizlik

1. (a3-g8-10) Nechta tub son $2 \leq \frac{3x - 19}{2x - 33} \leq 3$ tengsizlikning yechimi bo'ladi?
A) 3 B) 6 C) 7 D) 2

2. (a3-g10-11) Agar $-4 \leq a \leq 2$ va $-3 \leq b \leq 2$ – bo'lsa, $2a^2 - 3b$ ifodaning eng katta va eng kichik qiymatlari yig'indisini toping.
A) 43 B) 19 C) 23 D) 35

3. (a4-g3-19) Tengsizlikni yeching. $1 \leq (x - 2)^2 < 4$
A) $(0;1] \cup [3;\ 4)$ B) $(0;\ 4)$
C) $[1;\ 3) \cup (3;\ 4]$ D) $(0;1) \cup (3;\ 4)$

4. (a4-g4-9) $-5 \leq a < 2$ va $-4 \leq b < 4$ shartlar berilgan. $a^2 - b^2$ ning eng katta qiymatini toping.
A) 9 B) 16 C) 20 D) 25

5. (a4-g14-9) $x^2 > x^3 > x^4$ bo'lsa, x qaysi oraliqda joylashgan?
A) $(-\infty;\ 1)$ B) $(0;\ 1)$
C) $(-\infty;\ -1)$ D) $(1;\ \infty)$

6. (a4-g18-8) $3 < x < 6$, $2 \leq y < 7$ bo'lsa, $2x - 3y$ ifoda nechta butun qiymat qabul qila oladi?
A) 6 B) 21 C) 12 D) 20

7. (a4-g23-9) Qo'sh tengsizlikni yeching.
$\frac{x+1}{3} \leq 2x + 1 < \frac{x-1}{4}$
A) $\varnothing$
B) $\left(-\frac{5}{7};\ -0{,}4\right]$
C) $\left(-\infty;\ -\frac{5}{7}\right) \cup [-0{,}4;\ \infty)$
D) $(-\infty;\ -0{,}4]$

8. (a5-g17-35) $-3 \leq x \leq 25$ va $-12 \leq x \leq 10$ bo'lsa, $x - y$ ning eng katta va eng kichik qiymatlari yig'indisini toping.
A) 24 B) 20 C) 28 D) 35

9. (a5-g18-27) $3 < \frac{2x - 5}{3} \leq 7$ tengsizlikni qanoatlantiruvchi nechta tub son mavjud?
A) 6 B) 7 C) 2 D) 1

10. (a6-g4-8) Qo'sh tengsizlikni yeching: $-4x + 3 < 7 \leq 2x - 5$.
A) $(-1;\ 6]$ B) $(-\infty;\ -1)$
C) $\varnothing$ D) $[6;\ \infty)$

11. (a6-g5-2) $\frac{1}{3} < \frac{a}{90} < \frac{4}{5}$ shartni qanoatlantiruvchi a ning nechta juft qiymati bor?
A) 40 B) 41 C) 21 D) 20

12. (a6-g7-8) x va y butun sonlar bo'lib, $-3 < x \leq 9$ va $-5 < y < 7$ bo'lsa, $\frac{x + y}{x \quad y}$ ifodaning eng katta butun qiymati nechaga teng?
A) 9 B) 15 C) 14 D) 13

13. (a6-g17-8) $-5 \leq x < 3$ va $-4 \leq y < 5$ bo'lsa, $x - 2y$ ning qiymatlari qaysi oraliqda bo'ladi?
A) $(-1;\ 17]$
B) $(-10;\ 33]$
C) $[-1;\ 17]$
D) $[-10;\ 33]$

41. Intervallar usuli. Ratsional tengsizlik

1. (a1-g1-36) Tengsizlikni yeching.
$\frac{3x^2}{x + 3} > 3x - 1$
A) $\left(\frac{3}{8};\ \infty\right)$
B) $\left(-\infty;\ \frac{3}{8}\right)$
C) $\left(-3;\ \frac{3}{8}\right)$
D) $(-\infty;\ -3) \cup \left(\frac{3}{8};\ \infty\right)$

2. (a1-g2-9) Tengsizlikni yeching.
$\frac{6x + 4 - 4x^2}{4 - x^2} \geq 4$
A) $(-2;\ 2)$
B) $(-\infty;\ 2)$
C) $(-\infty;-2) \cup (2;\ \infty)$
D) $(-\infty;-2) \cup \{2\}$

3. (a1-g4-10) $\frac{(x-1) \cdot (5-x)^4}{x^3 + 2x^2} \leq 0$
Tengsizlikni qanoatlantiruvchi nechta butun son mavjud?
A) 2 B) 3
C) 5 D) cheksiz ko'p

4. (a1-g6-10) Tengsizlikni yeching.
$\frac{(x-5)\left(9x - 20 - x^2\right)}{1 + x} \geq 0$
A) $(-1;\ 4] \cup [5;\ \infty)$
B) $(-\infty;\ -1) \cup [4;\ 5]$
C) $(-1;\ 4] \cup \{5\}$
D) $(-1;\ 4]$

5. (a1-g7-6) Tengsizlikni yeching.
$\frac{6x + 4 - 4x^2}{4 - x^2} \geq 0$
A) $(-\infty;\ -2) \cup [-0{,}5;\ \infty)$
B) $(-2;\ -0{,}5]$
C) $(-\infty;\ -2) \cup [-0{,}5;\ 2) \cup (2;\ \infty)$
D) $(-\infty;\ -2) \cup \{2\}$

6. (a1-g8-5) $a < 0 < b < c$ bo'lsa $(ax + b)(cx + b) > 0$ tengsizlikni yeching.

A) $\left(-\infty; \frac{b}{c}\right) \cup \left(-\frac{b}{a}; \infty\right)$

B) $\left(-\frac{b}{a}; -\frac{b}{c}\right)$

C) $\left(-\infty; \frac{b}{a}\right) \cup \left(-\frac{b}{c}; \infty\right)$

D) $\left(-\frac{b}{c}; -\frac{b}{a}\right)$

7. (a1-g10-11) Tengsizlikni yeching.

$5 - x - \frac{6}{x} \geq 0$

A) $(-\infty; 0] \cup [3; \infty)$

B) $(-\infty; 0) \cup [2; 3]$

C) $[2; 3]$

D) $(0; 2) \cup [3; \infty)$

8. (a1-g11-11) Tengsizlikni yeching.

$\frac{2x-5}{x+3} > 3$

A) $(-\infty; -14) \cup (-3; \infty)$
B) $(-14; \infty)$
C) $(-14; -3)$
D) $(-14; -3) \cup (-3; \infty)$

9. (a1-g12-7) $x(x-2)^2(x+4)^3(x-5)^4 \leq 0$ tengsizlikning nechta butun yechimi mavjud?

A) cheksiz ko'p B) 5
C) 3 D) 7

10. (a1-g14-9) $\frac{x(2-x)}{x^2-2x+1} \leq 0$ tengsizlik quyidagi oraliqlardan qaysi birida o'rinli emas?

A) $[0; 1) \cup (1; 2]$
B) $(0; 2)$
C) $(-\infty; 0] \cup [2; \infty)$
D) $(4; \infty)$

11. (a1-g16-9) Tengsizlikni yeching.

$\frac{6x+4-4x^2}{4-x^2} \geq 4$

A) $(-\infty; -2)$
B) $[2; \infty)$
C) $(-\infty; -2) \cup (2; \infty)$
D) $(-\infty; -2) \cup [2; \infty)$

12. (a2-g1-10) Tengsizlikni yeching.

$\frac{x}{x+1} \geq 2$

A) $(-\infty; -2)$
B) $(-\infty; -1)$
C) $(1; \infty)$
D) $(-2; -1)$

13. (a2-g4-11) Tengsizlikni yeching.

$\frac{2x-8}{x-5} > x - 2$

A) $(3; 5) \cup (6; \infty)$
B) $(-\infty; 3) \cup (6; \infty)$
C) $(3; 6)$
D) $(-\infty; 3) \cup (5; 6)$

14. (a2-g5-10) Tengsizlikni yeching.

$\frac{(x^2-7x+12)(2x+7)}{16-x^2} \geq 0$

A) $(-\infty; -4) \cup [-3,5; 3] \cup \{4\}$
B) $(-4; -3,5] \cup [3; 4) \cup (4; \infty)$
C) $(-\infty; -4) \cup [-3,5; 3]$
D) $(-4; -3,5] \cup [3; \infty)$

15. (a2-g8-12) Tengsizlikni yeching.

$\frac{2}{x-3} \geq 1$

A) $(-\infty; 5]$
B) $(-\infty; 3) \cup [5; \infty)$
C) $(-\infty; 1) \cup (3; 5]$
D) $(3; 5]$

16. (a2-g9-11) Tengsizlikni yeching.

$\frac{2x-5}{x+3} > 3$

A) $(-\infty; -14) \cup (-3; \infty)$
B) $(-14; \infty)$
C) $(-14; -3)$
D) $(-14; -3) \cup (-3; \infty)$

17. (a2-g10-11) Tengsizlikni yeching.

$\frac{6x+4-4x^2}{4-x^2} \geq 4$

A) $(-\infty; -2)$
B) $[2; \infty)$
C) $(-\infty; -2) \cup (2; \infty)$
D) $(-\infty; -2) \cup \{2\}$

18. (a2-g14-13) Tengsizlikning musbat butun yechimlari nechta?

$\frac{(x^2-5x+6)^2(\pi^2-x)(1-x)}{(x^2-4)(e^2+1)} \leq 0$

A) 4 B) 3 C) 6 D) 2

19. (a2-g15-11) Tengsizlikni yeching.

$\frac{x+3}{x-5} > 3$

A) $(5; 9)$
B) $(-\infty; 9)$
C) $(9; \infty)$
D) $(-\infty; 5) \cup (9; \infty)$

20. (a2-g17-10) $\frac{x^2-7x-44}{x^2+6x-16} \leq 0$ tengsizlikning 8 dan kichik butun yechimlari nechta?

A) 11 B) 7
C) 9 D) 8

21. (a2-g20-10) $(x-2)(x-5)^2(x+3)^3 \cdot (x+7)^4 \leq 0$ tengsizlik nechta butun ildizga ega?

A) 9 B) 8
C) 4 D) cheksiz ko'p

22. (a2-g21-11) Tengsizlikni yeching.

$\frac{3x^2}{x+3} > 3x - 1$

A) $\left(\frac{3}{8}; \infty\right)$

B) $\left(-\infty; \frac{3}{8}\right)$

C) $\left(-3; \frac{3}{8}\right)$

D) $(-\infty; -3) \cup \left(\frac{3}{8}; \infty\right)$

23. (a2-g22-10) Tengsizlikni yeching. $(a < b < 0 < c)$,

$\frac{(x+a)(x^2+2bx+b^2)}{x+c} \leq 0$

A) $(-c; -a]$ B) $[-a; -c)$
C) $[-b; -c)$ D) $(-c; -b)$

24. (a2-g23-10)

$\frac{x^2-9x+20}{(x^2-6x+9)\cdot(x^2+7x+10)} \leq 0$

tengsizlik nechta butun yechimga ega?

A) 8 B) 4
C) 2 D) cheksiz ko'p

25. (a3-g2-10) Tengsizlikni yeching.

$\frac{3}{1-x} \leq \frac{x-3}{x}$

A) $[0; 1]$
B) $(-\infty; 0) \cup (1; \infty)$
C) $(0; 1)$
D) $(-\infty; -1] \cup [-1; 1)$

26. (a3-g3-12) Tengsizlikni yeching.

$\frac{2}{x-3} \leq 1$

A) $(-\infty; 5]$
B) $(-\infty; 3) \cup [5; \infty)$
C) $(-\infty; 1) \cup (3; 5]$
D) $(3; 5]$

27. (a3-g5-10) Tengsizlikni yeching.

$\frac{1}{3x^2+x+11} \geq \frac{1}{2x^2-5x+3}$

A) $[-4; -2]$
B) $(-\infty; -4] \cup [-2; \infty)$
C) $[-4; -2] \cup (1; 1,5)$
D) $(-\infty; -4] \cup [-2; 1) \cup (1,5; \infty)$

28. (a3-g6-10) Tengsizlikning musbat butun yechimlari nechta?

$\frac{(x^2-5x+6)^2(\pi^2-x^2)(1-x)}{(x^2-4)(e^2+1)} \leq 0$

A) 4 B) 3
C) 2 D) 6

29. (a3-g9-8) Tengsizlikni yeching

$\frac{x+5}{x-5} \geq 2$

A) $(-\infty; 5) \cup [5; 15)$

B) $(-\infty; 15]$

C) $[15; \infty)$

D) $(5; 15]$

30. (a3-g11-10) Tengsizlikni yeching

$\frac{1}{3x^2+x+11} \geq \frac{1}{2x^2-5x+3}$

A) $[-4; -2]$
B) $(-\infty; -4] \cup [-2; \infty)$
C) $[-4; -2] \cup (1; 1,5)$
D) $(-\infty; -4] \cup [-2; 1) \cup (1,5; \infty)$

31. (a3-g12-11) Tengsizlikni yeching.

$\frac{x-5}{x+3} < 3$

A) $(-3; 7)$
B) $(-\infty; -7) \cup (-3; \infty)$
C) $(7; \infty)$
D) $(-\infty; 7)$

32. (a3-g13-10) Tengsizlikni yeching.

$\frac{(3-x)(x^2+3x-18)}{2-x} \le 0$

A) $[-6; 2)$
B) $(-\infty; 6] \cup (2; \infty)$
C) $[-6; 2) \cup \{3\}$
D) $[-6; 2) \cup [3; \infty)$

33. (a3-g16-10) Tengsizlikni yeching.

$\frac{(x^2-6x+9)\cdot(x^2+7x+10)}{x^2-9x+20} \le 0$

A) $(-\infty; -5] \cup [-2; 3] \cup (4; 5)$
B) $[-5; -2] \cup \{3\} \cup (4; 5)$
C) $(-\infty; -5] \cup [-2; 4) \cup (5; \infty)$
D) $[-5; -2] \cup (3; 4) \cup (5; \infty)$

34. (a3-g17-9) Tengsizlikni yeching.

$-\frac{3}{x-2} > x$

A) $(-1; 2) \cup (3; \infty)$
B) $(-\infty; 1) \cup (2; 3)$
C) $(-\infty; \infty)$
D) $(-\infty; 2)$

35. (a3-g19-10) Tengsizlikni yeching.

$\frac{1}{3x^2-4x+1} \ge \frac{1}{4x^2+x+5}$

A) $[-4; -1]$
B) $[-4; -2] \cup (1/3; 1)$
C) $(-\infty; -4] \cup [-1; 1/3) \cup (1; \infty)$
D) $(-\infty; -4] \cup [-1; \infty)$

36. (a3-g22-8)

$(x+3)(x-4)^2(x-1)^3(x+7)^4 \le 0$

tengsizlikning butun yechimlari yig'indisini toping.

A) -5 B) 5
C) -3 D) -8

37. (a4-g5-8) $\frac{x}{x-5} \ge 2$ tengsizlikni yeching.

A) $(-\infty; 10]$
B) $(5; 10]$
C) $[10; \infty)$
D) $(-\infty; 5) \cup [10; \infty)$

38. (a4-g6-9) $(x-3)(x+1)^2(x+5)^3 \cdot (x-2)^4 < 0$ tengsizlikni qanoatlantiruvchi butun sonlar nechta?

A) 3 B) 4
C) 9 D) 5

39. (a4-g7-9) Tengsizlikni yeching.

$\frac{1}{x-1} - \frac{2}{x-2} > 0$

A) $(-\infty; 0) \cup (1; 2)$
B) $(-\infty; 0)$
C) $(-\infty; 1) \cup (2; \infty)$
D) $(1; 2)$

40. (a4-g8-11) Tengsizlikni yeching.

$\frac{x-3}{x+5} < 3$

A) $(-9; -5)$
B) $(-\infty; -9) \cup (-5; \infty)$
C) $(-9; \infty)$
D) $(-\infty; 9)$

41. (a4-g13-10) Tengsizlikni yeching.

$\frac{x^3-5x^2-8x+48}{x^4-x^3-4x^2+4x} > 0$

A) $(-3; -2) \cup (0; 1) \cup (2; \infty)$
B) $(-3; -2) \cup (0; 1) \cup (2; 4) \cup (4; \infty)$
C) $(-2; 1) \cup (3; 4) \cup (4; \infty)$
D) $(-\infty; -3) \cup (-2; 0) \cup (1; 2) \cup (4; \infty)$

42. (a4-g16-8) $x^2(x-1)(x+4)^3(x-3)^4 \le 0$ tengsizlik nechta butun yechimga ega?

A) 10 B) 9
C) 7 D) cheksiz ko'p

43. (a4-g21-8) $(x+3)^2(x-2) \cdot (x+7)^3(x-6)^4 \le 0$ tengsizlik nechta butun yechimga ega?

A) 10 B) 8
C) 11 D) cheksiz ko'p

44. (a4-g22-10) $\frac{x^3-7x^2-44x}{x^2+6x-16} \le 0$ tengsizlikning butun yechimlari nechta?

A) 15 B) 13
C) 11 D) cheksiz ko'p

45. (a4-g24-8) $\frac{(2-x^2)(x-3)^3}{(x+1)(x^2-3x-4)} \ge 0$ tengsizlik nechta butun yechimga ega?

A) cheksiz ko'p B) 2
C) 4 D) 3

46. (a5-g1-9) Tengsizlikni yeching.

$\frac{(2-x)(x+1)}{x^2+4x+4} \ge 0$

A) $(-\infty; -2) \cup [-1; 2]$
B) $(-2; 1]$
C) $(-2; -1] \cup [2; \infty)$
D) $[-1; 2]$

47. (a5-g2-9) Tengsizlikni yeching.

$1 < \frac{1}{x+1} < 2$

A) $\varnothing$
B) $(-1; 0)$
C) $(-1; -0,5)$
D) $(-0,5; 0)$

48. (a5-g6-9) $\frac{x}{x+2} \le \frac{1}{x}$ tengsizlikni qanoatlantiruvchi butun sonlar nechta?

A) 5 B) cheksiz ko'p
C) 7 D) 3

49. (a5-g9-10) Tengsizlikni qanoatlantiruvchi eng kichik butun sonni toping.

$x-5+\frac{x-5}{2}+\frac{x-5}{4}+\frac{x-5}{6} > 46$

A) 19 B) 20 C) 30 D) 28

50. (a5-g11-8) Tengsizlikni yeching.

$x-17 \ge \frac{60}{x}$

A) $(-\infty; -3) \cup [20; \infty)$
B) $(-\infty; -3) \cup (0; 20]$
C) $[-3; 0) \cup [20; \infty)$
D) $[-3; 20]$

51. (a5-g13-8) Tengsizlikni yeching.

$\frac{49x-x^3}{x^2+14x+49} \le 0$

A) $[0; 7]$
B) $(-\infty; -7) \cup [0; 7]$
C) $(-7; 0] \cup [7; \infty)$
D) $(-7; 0] \cup \{7\}$

52. (a5-g14-8) Tengsizlikni yeching.

$x^3 \le \frac{1}{x}$

A) $(-\infty; -1] \cup (0; \infty)$
B) $(-\infty; 0)$
C) $[-1; 1]$
D) $(-\infty; -1] \cup (0; 1]$

53. (a5-g15-26) Tengsizlikni yeching.

$\frac{2x-4}{x-2} > x-8$

A) $(-\infty; 2) \cup (10; \infty)$
B) $(-\infty; 2) \cup (2; 10)$
C) $(2; 5)$
D) $(-\infty; 10)$

54. (a5-g16-8) Tengsizlikni yeching.

$\frac{(x+2)^3 \cdot (x-1)^2}{4-x^2} \le 0$

A) $(-\infty; -2) \cup (-2; 2)$
B) $\{1\} \cup 2(2; \infty)$
C) $(-\infty; -2) \cup [1; 2)$
D) $(-2; 2)$

55. (a5-g20-8) Tengsizlikni yeching.

$\frac{1}{2x} \le \frac{1}{x+1}$

A) $[1; \infty)$
B) $(-\infty; -1) \cup (0; 1]$
C) $(-\infty; 1]$
D) $(-1; 0) \cup [1; \infty)$

56. (a5-g21-8) Tengsizlikni qanoatlantiruvchi nechta butun son bor?

$\frac{(4-\sqrt{3}x)(2\sqrt{2}-3)(6-\sqrt{2}x)}{(x+\sqrt{7})(x+2\sqrt{5})} \ge 0$

A) 4 B) 5
C) 6 D) cheksiz ko'p

57. (a5-g22-8) $b < 0$ bo'lsa, $\frac{2x^2-5bx+2b^2}{x+3b} \ge 0$ tengsizlikni yeching.

A) $[2b; 0,5b] \cup (-3b; \infty)$
B) $(-\infty; 2b] \cup [0,5b; -3b)$
C) $(-\infty; -3b] \cup [0,5b; 2b)$
D) $(-3b; 0,5b] \cup [2b; \infty)$

58. (a6-g1-8) Tengsizlikni yeching:

$$\frac{(3-x)^2\cdot(x^2+6x+5)}{(1-x)\cdot(-x^2+x-10)}<0.$$

A) $[-5;1]\cup(1;\infty)$

B) $[-5;1]\cup(1;3]$

C) $(-\infty;-5]\cup[-1;1)\cup\{3\}$

D) $(-\infty;-5]\cup[-1;1)\cup[3;\infty)$

59. (a6-g2-7) $x(x-1)(x+1)(x+2)+1=0$ tenglama nechta haqiqiy ildizga ega?

A) 4 B) 2 C) 3 D) 1

60. (a6-g3-8) Tengsizlikni yeching:

$$\frac{1}{x-2}>2.$$

A) $(-\infty;2,5]$

B) $(-\infty;2)\cup[2,5;\infty)$

C) $[2,5;\infty)$

D) $(2;2,5]$

61. (a6-g5-8) $7\le x\le y\le z\le t\le 84$ bo'lsa, $\frac{x}{y}+\frac{z}{t}$ ning eng kichik qiymatini toping.

A) $\frac{2}{\sqrt{12}}$ B) $4\sqrt{3}$

C) $2\sqrt{14}$ D) $\frac{1}{\sqrt{14}}$

62. (a6-g8-8) $\frac{x^6(x^2+2x)^2\cdot(3-x)^3}{(x^2+3x+4)\cdot(x+2)}>0$

tengsizlikni qanoatlantiruvchi butun sonlar nechta?

A) 5 B) 6

C) 3 D) cheksiz ko'p

63. (a6-g10-8) Agar $a>0$ bo'lsa, $\frac{a}{x}<\frac{x}{a}$ tengsizlikni yeching.

A) $(-\infty;-a)\cup(a;\infty)$

B) $(-a;a)$

C) $(-\infty;-a)\cup(0;a)$

D) $(-a;0)\cup(a;\infty)$

64. (a6-g15-7) $\frac{(x-1)\cdot(5-x)^4}{x^3+2x^2}\le 0$

tengsizlikni qanoatlantiruvchi nechta butun son mavjud?

A) 2 B) 3

C) 5 D) cheksiz ko'p

65. (a6-g16-23) Tengsizlikni yeching:

$$\frac{2x-4}{x-2}>x-8.$$

A) $(-\infty;2)\cup(10;\infty)$

B) $(-\infty;2)\cup(2;10)$

C) $(2;10)$

D) $(-\infty;10)$

66. (a6-g19-16)

$(-x)^3(x+5)(x-7)^2(x+2)^4\ge 0$

tengsizlik nechta butun yechimga ega?

A) 6 B) 7 C) 5 D) 8

67. (a6-g20-20) $m<0<n<k$ bo'lsa, $\frac{(x+m)(x^2+2nx+n^2)}{x+k}\le 0$ tengsizlikni yeching

A) $(-k;-m]$

B) $[-m;k)$

C) $(m;k)$

D) $(-k;-n]$

68. (a6-g22-2) Tengsizlikni yeching:

$$-2\le\frac{x-3}{x}\le 3.$$

A) $(0;\infty)$

B) $(-\infty;-1,5]\cup[1;\infty)$

C) $(-\infty;0)\cup(0;\infty)$

D) $[-1,5;0)\cup(0;1]$

69. (a6-g23-27) Tengsizlikni yeching:

$$2x-\frac{5}{x}\ge 3.$$

A) $(-\infty;-1]\cup[2,5;\infty)$

B) $[-1;0)\cup[2,5;\infty)$

C) $(-\infty;-1]\cup(0;2,5]$

D) $[-1;2,5]$

70. (a6-g24-3) Tengsizlikni yeching:

$$x-2<\frac{24}{x}.$$

A) $(-4;0)\cup(6;\infty)$

B) $(-4;6)$

C) $(-\infty;-4)\cup(0;6)$

D) $(-\infty;-4)\cup(6;\infty)$

71. (a6-g26-8) $b<c<a<0$ tengsizlik o'rinli bo'lsa, $(x-b)(ax-c)>0$ tengsizlikni yeching.

A) $\left(b;\frac{c}{a}\right)$

B) $\left(\frac{c}{a};b\right)$

C) $\left(-\infty;b\right)\cup\left(\frac{c}{a};\infty\right)$

D) aniqlab bo'lmaydi

42. Parametli tengsizliklar. Tengsizliklar sistemasi

1. (a2-g3-16) m ning qanday qiymatlarida $x^2+2mx+9\ge 0$ tengsizlik x ning barcha qiymatlari uchun o'rinli?

A) $[-3;3]$ B) $[-2;2]$

C) $[-1;1]$ D) $(-\infty;0]$

2. (a2-g7-11) Sistemani yeching.

$$\begin{cases}\frac{12-5(x+1)}{3}>5+2(x-1)-3x\\ 11-2(x+5)>\frac{13-5(x+3)}{4}\end{cases}$$

A) $(-\infty;-1)$

B) $(-1;2)$

C) $(2;\infty)$

D) $(-\infty;2)$

3. (a2-g19-10) Quyidagi tengsizliklar sistemasi b ning qanday qiymatlarida yechimga ega bo'lmaydi?

$$\begin{cases}bx>3b+2\\ bx<2b-3\end{cases}$$

A) $\left(-\frac{2}{3};\frac{3}{2}\right)$ B) $[-5;\infty)$

C) $(-\infty;-1]$ D) $[-1;\infty)$

4. (a3-g7-15) $f(x)=\begin{cases}2x-7, & x\ge 4\\ x^2+3, & x<4\end{cases}$

va $g(x)=\frac{x+14}{3}$ funksiyalar berilgan.

$f(g(11))=?$

A) 9

B) $\frac{138}{3}$

C) $\frac{29}{3}$

D) $\frac{25}{3}$

5. (a3-g15-10) Tengsizliklar sistemasini yeching.

$$\begin{cases}-1\le\frac{x+1}{3}<4\\ 1<3x-2\le 43\end{cases}$$

A) $(-4;11)$ B) $(1;15]$

C) $(1;11)$ D) $[-4;15]$

6. (a4-g3-9) $\frac{-x^2+3x-9}{(m-1)x^2+(m-1)x+1}<0$

tengsizlik, x ning barcha qiymatlarida o'rinli bo'lsa, m qaysi oraliqda joylashgan?

A) $(2;6)$ B) $(-1;2)$

C) $(5;\infty)$ D) $(1;5)$

7. (a4-g9-9) $\begin{cases}\frac{2}{x+1}<1\\ x^5-x^4>0\end{cases}$ tengsizlik sistemasini yeching.

A) $(-\infty;-1)\cup(1;\infty)$

B) $(-\infty;-1)$

C) $(1;\infty)$

D) $(-1;1)$

8. (a4-g11-20) $\frac{(a-1)x^2+2x-3}{x^2+4x+5}<0$

a ning qanday qiymatlarida tengsizlik x ning barcha qiymatlarida o'rinli bo'ladi?

A) $a<0,(6)$ B) $a<1$

C) $0,(6)<a<-1$ D) $\varnothing$

9. (a4-g14-19) $|a|=-a$ va $\frac{x^2-3ax+2a^2}{x^2+2ax+a^2}<0$ bo'lsa, x ni qanoatlantiruvchi oraliqni toping.

A) $x<2a$

B) $x>a$

C) $2a<x<a$

D) $a<x<2a$

10. (a4-g25-9) Tengsizlikning nechta butun yechimi mavjud?

$$\begin{cases}\frac{x-2}{4} \le \frac{x+3}{5} \\ \frac{x+5}{4} \ge \frac{x-3}{7}\end{cases}$$

A) cheksiz ko'p B) 38
C) 40 D) 25

11. (a5-g5-9) $\begin{cases}a^2 < b \\ ab > b\end{cases}$ tengsizliklar sistemasi uchun quyidagilardan qaysi biri doim to'g'ri?
A) $0 < b < 1$ B) $b > a$
C) $b > 1$ D) $b < 0$

12. (a5-g6-16) m ning qanday qiymatlarida $x^2 - (2m+3)x + 9 \ge 0$ tengsizlik x ning barcha qiymatlari uchun o'rinli?
A) $(-\infty; -4,5] \cup [1,5; \infty)$
B) $(-\infty; -1,5]$
C) $[-4,5; 1,5]$
D) hech qanday qiymatida

13. (a5-g10-8) $\begin{cases}-3 < x < 2 \\ -4 < y < 3\end{cases}$ bo'lsa, $x^2 - y^2$ ning eng kichik butun qiymatini toping.
A) -15 B) -10 C) -16 D) -5

14. (a5-g25-8) $\begin{cases}x^2 > 1 \\ x^2 + x \le 6\end{cases}$ tengsizliklar sistemasini qanoatlantiruvchi butun sonlar nechta?
A) 3 B) 5
C) 1 D) cheksiz ko'p

15. (a6-g2-8) $a^4 \cdot b^3 > 0$, $bc < 0$ va $a - b > 0$ bo'lsa, a, b va c larning ishoralarini toping.
A) +, +, – B) –, +, –
C) –, +, + D) +, +, +

16. (a6-g9-8) $\begin{cases}\frac{x^2 - 7x + 13}{x+3} \le 0 \\ \frac{x-3}{x-1} \le 1\end{cases}$ tengsizlikni yeching.
A) $(-3; -1)$
B) $[1; 3]$
C) $\varnothing$
D) $(-\infty; -3) \cup (-1; \infty)$

43. Tengsizliklarni isbotlash

1. (a1-g9-9) $a > b$ va $a^2 < b^2$ bo'lsa, quyidagilardan qaysi biri doimo to'g'ri?
A) $a < -b$ B) $a^2 < b$
C) $a^2 > |b|$ D) $-a < b$

2. (a1-g13-9) Quyidagi mulohazalardan qaysilari noto'g'ri?

1) $a>b$ bo'lsa, $\frac{1}{a} < \frac{1}{b}$;

2) $a>b$ va $c>d$ bo'lsa, $a + c>b + d$;

3) $a > b$ va $c > d$ bo'lsa, $a - c>b - d$;

4) $a^2 > b^2$ bo'lsa, $a > b$;

5) $a^3 > b^3$ bo'lsa, $a - b > 0$.

A) 1, 4, 5 B) 2, 3, 4
C) 1, 3, 4 D) 2, 4, 5

3. (a1-g17-10) $a < 0 < b < c$ bo'lsa, quyidagilardan qaysi biri noto'g'ri?

A) $\frac{1}{b} > \frac{1}{c}$

B) $\frac{1}{b} > \frac{1}{a}$

C) $\frac{1}{a} - \frac{1}{b} - \frac{1}{c} < 0$

D) $\frac{1}{b} - \frac{1}{a} - \frac{1}{c} < 0$

4. (a2-g2-11) Agar $-6 \le a \le 3$ va $-4 \le b \le 5$ bo'lsa, $a^2 - 2b$ ifodaning eng katta va eng kichik qiymatlari yig'indisini toping.
A) 43 B) 19 C) 23 D) 34

5. (a2-g6-10) Agar $2 \le a \le 6$ va $5 \le b \le 12$ bo'lsa, $\frac{a-1}{b+2}$ ifodaning eng katta qiymatini toping.
A) $\frac{4}{3}$ B) $\frac{1}{14}$ C) $\frac{8}{3}$ D) $\frac{5}{7}$

6. (a2-g14-10) x, y va z haqiqiy sonlar $xy - xz > 0$ va $yz < 0$ bo'lsa, quyidagilardan qaysi biri doimo to'g'ri?
A) $xz > 0$ B) $xy > 0$
C) $x + z < 0$ D) $y + z > 0$

7. (a3-g14-10) Quyidagi mulohazalardan qaysilari to'g'ri?
1) agar $0 > a > b$ bo'lsa, $c < 0$ bo'lganda $ab > c$; 2) agar $ab > 0$ bo'lsa, u holda a va b manfiy qiymatlarni qabul qila oladi; 3) agar $a > b$ va $c > d$ bo'lsa, u holda $a - c > b - d$ tengsizlik o'rinli; 4) $0 > a > b$ bo'lganda $a + b$ yig'indi faqat manfiy qiymatlarni qabul qiladi; 5) a va b musbat sonlar va c va d manfiy sonlar bo'lsa, $a \cdot b < c \cdot d$ tengsizlik o'rinli.
A) 2, 4, 5 B) 1, 3, 5
C) 1, 2, 4 D) 2, 3, 4

8. (a3-g21-9) $x > 0$ va $y < 0$ va $\frac{x}{y} < \frac{y}{x}$ bo'lsa, quyidagilardan qaysi biri doimo o'rinli?
A) $x^2 < y^2$ B) $x + y > 0$
C) $y^2 > x$ D) $y - x > 0$

9. (a3-g24-9) a, b, c va d natural sonlar bo'lib $\frac{a+d}{d} < \frac{b+c}{c}$ shartni qanoatlantirsa, quyidagilarning qaysi biri to'g'ri?
A) $a \cdot b < c \cdot a$ B) $a < c$
C) $b < d$ D) $a \cdot c < b \cdot d$

10. (a4-g2-9) Quyidagi mulohazalardan qaysilari doimo to'g'ri?
1) agar $a > 0 > b$ bo'lsa, $c < 0$ bo'lganda $ab > c$; 2) agar $ab < 0$ bo'lsa, u holda a va b dan biri musbat, ikkinchisi manfiy; 3) agar $a > b$ va $c > d$ bo'lsa, u holda $a + c > b + d$ tengsizlik doimo o'rinli; 4) $a > 0 > b$ va $|b| > a$ bo'lganda $a + b$ yig'indi faqat manfiy qiymatlarni qabul qiladi; 5) a va b musbat sonlar va c va d manfiy sonlar bo'lsa, $a \cdot b > c \cdot d$ tengsizlik o'rinli.
A) 2, 4, 5 B) 1, 3, 5
C) 1, 2, 4 D) 2, 3, 4

11. (a4-g7-2) a, b, c va d musbat sonlar. Quyidagi mulohazalardan qaysi biri to'g'ri?

A) $\frac{a}{b} : \frac{c}{d} > 0$ bo'lsa, $\frac{a}{b} > \frac{c}{d}$ bo'ladi

B) $\frac{a}{b} : \frac{c}{d} < -1$ bo'lsa, $\frac{c}{d} > \frac{a}{b}$ bo'ladi

C) $\frac{a}{b} > \frac{a+c}{b+c}$ tenglik doimo o'rinli.

D) $\frac{a}{b} \cdot \frac{c}{d} > 1$ bo'lsa, $\frac{a}{b} > \frac{d}{c}$ bo'ladi.

12. (a4-g12-11) Tengsizlikni qanoatlantiruvchi butun sonlar nechta?

$$\frac{|5 + 4x| - 9}{4 + |x - 2|} \le 0$$

A) 2 B) 3 C) 4 D) 5

13. (a4-g14-4) $x = (0,7 - 0,4)^2$; $y = 0,7^2 - 0,4^2$; $z = 0,7 - 0,4$ sonlarining tartiblanishi qaysi javobda to'g'ri ko'rsatilgan?
A) $z > x > y$
B) $y > x > z$
C) $x > z > y$
D) $y > z > x$

14. (a4-g15-9) Agar $19 \le x \le y \le z \le t \le 304$ bo'lsa, $\frac{x}{y} + \frac{z}{t}$ ning eng kichik qiymatini toping.
A) 2 B) 1
C) 0,25 D) 0,5

15. (a4-g17-8) $a > 0 > b > c$ bo'lsa, quyidagi ketma-ketliklardan qaysi biri o'rinli?

A) $\frac{1}{a^2} > \frac{1}{a^2 + b^2} > \frac{1}{a^2 + c^2}$

B) $\frac{1}{a^2} > \frac{1}{a^2 + c^2} > \frac{1}{a^2 + b^2}$

C) $\frac{1}{a^2 + c^2} > \frac{1}{a^2 + b^2} > \frac{1}{a^2}$

D) $\frac{1}{a^2 + b^2} > \frac{1}{a^2 + c^2} > \frac{1}{a^2}$

16. (a4-g19-9) $\frac{2a+b}{2} > \left(\frac{2}{b}\right)^{-1}$ tengsizlik o'rinli bo'lsa, quyidagilardan qaysi biri doimo o'rinli?
A) $a > 0$ B) $a > b$
C) $a = b$ D) $a < b$

17. (a5-g4-9) $3 \le a \le 7$ va $-42 \le b \le 84$ bo'lsa, $\frac{b}{a}$ nechta butun qiymat qabul qiladi?
A) 43 B) 27 C) 19 D) 35

18. (a5-g12-8) $a > 0 > b > c$ hamda $|a| < |b|$ bo'lsa, quyidagi tengsizliklardan qaysi biri doimo o'rinli?
A) $|a| + b - c^2 > 0$
B) $\log_a(bc) < 0$
C) $\frac{a}{c} - \frac{a}{b} > 0$
D) $32\sqrt{2}\pi$

19. (a5-g16-9) a, b, c haqiqiy sonlar. $c < 0 < a < b$ bo'lsa, quyidagilardan qaysi biri doimo to'g'ri?
A) $a \cdot c > a \cdot b$
B) $c^2 < a^2$
C) $b > a + c$
D) $a + b + c > 0$

20. (a5-g23-8) $x^2 - y^2 > 0$ bo'lsa, quyidagilardan qaysi biri doimo o'rinli?
A) $x - y > 0$ B) $x + y > 0$
C) $\frac{x+y}{x-y} > 0$ D) $\frac{x-y}{x+y} < 0$

21. (a5-g24-8) x va y manfiy sonlar. $\frac{x}{y} < \frac{y}{x}$ tengsizlik o'rinli bo'lsa, quyidagilardan qaysi biri har doim o'rinli?
A) $y^2 < x^2$ B) $x > y$
C) $y > 3x$ D) $xy < 0$

22. (a6-g12-7) a, b va c manfiy butun sonlar bo'lsa, $\frac{a}{2} = \frac{b}{3} = \frac{c}{5}$ bo'lganda, quyidagi mulohazalardan qaysi biri to'g'ri?
A) $a^2 > c^2$ B) $ab > c^2$
C) $a + b > c$ D) $\frac{a}{c} < \frac{b}{c}$

23. (a6-g25-28) $x < 0 < y < -z$ bo'lsa, quyidagilardan qaysi biri to'g'ri?
A) $\frac{xy}{z} < 0$
B) $\frac{x+z}{y} < 0$
C) $\frac{x \cdot z}{y} < 0$
D) $\frac{y+z}{x} < 0$

8-bob. Modul

44. Sonning moduli, modul xossasi. Modulli ifodalar

1. (a1-g5-11) $x = \sqrt{2}$, $y = \sqrt[3]{3}$, $z = \sqrt[4]{4}$ bo'lsa, $|x - y| + |z - y| + |y - x - z|$ ifodani soddalashtiring.
A) $-y$ B) $x + z - 2y$
C) $x - z + y$ D) $2x - y$

2. (a1-g6-11) $|-abc| = -abc$, $|a - b| = -b + a$, va $|-b| = b$ bo'lsa, quyidagilardan qaysi biri to'g'ri?
A) $b < 0 < a < c$ B) $0 < c < b < a$
C) $c < 0 < b < a$ D) $b < c < 0 < a$

3. (a1-g8-15) $a > 0$, $b < 0$, $c < 0$ bo'lsa, $|a - b| + \sqrt[3]{27a^3} - |4a| + \sqrt{9b^2} - \sqrt[3]{c^3}$ ni hisoblang.
A) $-c$ B) $5b + c$
C) $c - 2b$ D) $-4b - c$

4. (a1-g17-11) $-2 < x < 2$ bo'lganda $\frac{|x+2| - x + 2}{|-2-x| - |x-2|}$ ni hisoblang.
A) $\frac{2}{x}$ B) $-\frac{2}{x+2}$
C) 1 D) 2

5. (a2-g4-12) $x < 0 < y < z$ bo'lsa, $|x - y| - |x| + |z - y|$ ni soddalashtiring.
A) $z - 2y$
B) z
C) $z - 2x$
D) $2y - z - x$

6. (a2-g10-12) $x < |x|$ va $xy^3 < 0$ shartga ko'ra, $|x - y| - |-y| - |-x|$ ifoda nimaga teng?
A) $-2y - 2x$ B) $-2y$
C) $-2x$ D) 0

7. (a2-g19-11) $x < y < 0 < z$ bo'lganda $|z - x| - |x + y| + |y - z|$ ifoda quyidagilardan qaysi biriga teng bo'ladi?
A) $2(y - x)$ B) $-2x$
C) $2z$ D) $2(z - y)$

8. (a3-g2-11) Agar $y = x + 5 = z + 3$ bo'lsa, quyidagi ifodaning qiymatini toping. $||x - z| - 5| + 3 \cdot |x - y + 3| + |z - y|$
A) 30 B) 16 C) 12 D) 34

9. (a3-g13-2) Quyidagi mulohazalardan qaysi biri to'g'ri?
A) Har qanday sonning juft darajasi juft songa teng bo'ladi.
B) Noto'g'ri kasrning surat va maxrajidan maxrajdan kichik musbat son ayrilganda, kasrning qiymati ortadi.
C) Yuqori darajali ildiz ostidan doimo musbat son chiqadi.
D) Ikki sonning modullari yig'indisi bu sonlar yig'indisi moduliga teng.

10. (a3-g13-11) $|abc| = -abc$, $|a - b| = b - a$ va $|-a| = a$ bo'lsa, quyidagilardan qaysi biri to'g'ri?
A) $b < a < 0 < c$
B) $c < 0 < a < b$
C) $b < 0 < c < a$
D) $c < b < a < 0$

11. (a3-g16-11) $x > 0 > y > z$ ketma-ketlik berilgan bo'lsa, $|y - x| + |z - y| - |z|$ ifodani soddalashtiring.
A) $-x$ B) $2y - 2z + x$
C) x D) $2z - x$

12. (a3-g21-10) Agar $-2 < x < 0$ bo'lsa, quyidagi ifodaning qiymatini toping. $\frac{|x+3| + \sqrt{x^2 - 8x + 16}}{|1-x| + x}$
A) 7 B) $\frac{7}{2x-1}$
C) $2x - 1$ D) 1

13. (a4-g18-9) $a > 0$, $b < 0$, $c < 0$ bo'lsa, $|a - b| + \sqrt[3]{27a^3} - |4a| + \sqrt{9b^2} - |4b| - \sqrt[3]{c^3}$ ifodaning qiymatini toping.
A) $a - b$ B) $a + b$
C) $-c$ D) $5b + c$

14. (a5-g3-10) Agar $x = y - 7 = z - 3$ bo'lsa, quyidagi ifodaning qiymatini toping. $|x - z + 6| + |y - x - 4| + 2 \cdot |y - z + 4|$
A) 28 B) 22 C) 20 D) 14

15. (a5-g4-10) $|-abc| = abc$, $|a - b| = b - a$, va $|-b| = -b$ bo'lsa, quyidagilardan qaysi biri to'g'ri?
A) $a < b < 0 < c$
B) $c < 0 < b < a$
C) $b < c < 0 < a$
D) $c < b < 0 < a$

16. (a5-g5-10) Agar $x > 2$ bo'lsa, $2x - |4 - |2x + 6| + 3x|$ ifoda quyidagilardan qaysi biriga teng?
A) 2 B) $x - 2$
C) $x + 2$ D) $2x - 2$

17. (a5-g7-10) $a < 0 < b$ va $|a| > |b|$ shartlarini qanoatlantiruvchi a va b lar uchun $|a + b| - |a - b|$ ifodani soddalashtiring.
A) $-2a$ B) $2b$ C) $-2b$ D) 0

18. (a5-g10-9) $|-abc| = abc$, $|b - a| = a - b$, va $|-a| = -a$ bo'lsa, quyidagilardan qaysi biri to'g'ri?
A) $b < a < 0 < c$
B) $c < 0 < b < a$
C) $b < c < 0 < a$
D) $c < b < a < 0$

19. (a5-g13-9) Agar $x < -4$ bo'lsa, $||x - 2| + x| + |x^2 - 16|$ ifoda quyidagilardan qaysi biriga teng?
A) $x^2 - 14$
B) $x^2 + 2x - 18$
C) $18 - x^2$
D) $2x + 14 - x^2$

20. (a5-g17-34) $a < b < -6$ bo'lsa, $|a + b| = |a + 3| + 12$ tenglikni qanoatlantiruvchi b *ning* qiymatini toping.
A) -15
B) aniqlab bo'lmaydi
C) -9
D) -12

21. (a5-g22-9) $|-abc| = abc$, $|a - b| = -a + b$, va $|-b| = -b$ bo'lsa, quyidagilardan qaysi biri to'g'ri?
A) $a < b < 0 < c$
B) $a < b < c < 0$
C) $c < 0 < b < a$
D) $b < c < 0 < a$

22. (a5-g23-9) $a - b > 0$, $ac - bc > 0$ va $a < 0$ bo'lsa, $|a + b - |c|| + |b - a|$ ni soddalashtiring.
A) $c - 2b$
B) $-c$
C) $c - 2a$
D) $c - 2a - 2b$

23. (a6-g2-9) Ifodani soddalashtiring:
$\frac{|x-7|-|7-x|-|2x-10|}{|5-x|}$.

A) 2 B) $\frac{2x-14}{x-5}$

C) –2 D) $\frac{14-2x}{x-5}$

24. (a6-g7-9) $0 < a < 2$ bo'lsa, $\frac{|a^2-4|-|a-2|}{|a^2-2a|}$ kasrning qiymatini toping.

A) 1 B) $\frac{a-2}{a}$

C) $\frac{a+2}{a}$ D) $\frac{a+1}{a}$

45. Modul qatnashgan tenglamalar. Modul qatnashgan parametrli tenglamalar

1. (a1-g2-10) Tenglamaning barcha ildizlari ko'paytmasini toping.
$(|x|-4)^2 = 2(16-|x|)$
A) –16 B) 256 C) –64 D) –4

2. (a1-g3-3) a ning qanday qiymatlarida $|a^2-9| = 9-a^2$ tenglik o'rinli bo'ladi?
A) 3; –3
B) $(-\infty; -3] \cup [3; \infty)$
C) $(-\infty; -3]$
D) [–3; 3]

3. (a1-g4-11) $|x^2-2x-3| = |x-3|$ tenglamaning ildizlari yig'indisi qaysi javobda to'g'ri ko'rsatilgan?
A) –2 B) 4 C) 0 D) 1

4. (a1-g7-8) Tenglamaning haqiqiy ildizlari yig'indisini toping.
$|x^2+4x+2| = 3$
A) –8 B) 8 C) 0 D) –4

5. (a1-g10-12) Agar $x^4 < x$ va $\frac{|x-1|+|x+1|}{|-x^2|} = 8$ bo'lsa x ni toping.

A) $\left\{-\frac{1}{4}; \frac{1}{4}\right\}$ B) $\left\{-\frac{1}{2}; \frac{1}{2}\right\}$

C) $\left\{\frac{1}{4}\right\}$ D) $\left\{\frac{1}{2}\right\}$

6. (a1-g11-12) Tenglamaning ildizlari yig'indisini toping.
$(2x-3)^2 + 3\cdot|2x-3| - 40 = 0$
A) –6 B) 3 C) 0 D) 6

7. (a1-g14-10) $(x+3)^2 - 2|x+3| = 0$ tenglama ildizlarining yig'indisini nechaga teng?
A) –6 B) –9
C) –4 D) –5

8. (a1-g15-11) $|2x^2-26x+44| = -(26x-44-2x^2)$ tenglik x ning qanday qiymatlarida o'rinli bo'ladi?
A) (2; 11)
B) $(-\infty; 0) \cup (0; 11)$
C) $(-\infty; 2) \cup (11; \infty)$
D) $(-2; 0) \cup (0; 11)$

9. (a1-g16-10) Tenglamaning barcha ildizlari yig'indisini toping.
$(|x|-4)^2 = 2|x|$
A) 10 B) –10 C) 0 D) 6

10. (a1-g16-26) Quyidagi tenglama a ning qanday qiymatida 3 ta yechimga ega bo'ladi?
$|x^2-5x+4| = a$
A) $\frac{19}{4}$ B) $\frac{25}{4}$ C) $\frac{15}{4}$ D) $\frac{9}{4}$

11. (a2-g2-12) Tenglama nechta butun yechimga ega?
$|x^2-5x+6| = 5x-x^2-6$
A) 2 B) 4
C) 5 D) cheksiz ko'p

12. (a2-g5-11) Tenglamaning ildizlari yig'indisini toping.
$(2x-3)^2 + 3\cdot|2x-3| - 40 = 0$
A) –6 B) 3 C) 0 D) 6

13. (a2-g11-12) Tenglama nechta butun yechimga ega?
$|x^2-8x+12| = 8x-x^2-12$
A) 2 B) 4
C) 5 D) cheksiz ko'p

14. (a2-g14-19) Quyidagi tenglama ildizlarining yig'indisini toping.
$\left|\frac{|x-3|}{5} - 6\right| = 7$
A) 4 B) 12 C) 8 D) 6

15. (a2-g16-11) $|x+5|+|x-2| = 5$ tenglama nechta ildizga ega?
A) 0 B) 1 C) 2 D) 3

16. (a2-g20-11) Tenglamaning ildizlari yig'indisini toping.
$x^2-6x+2|x-3|+1 = 0$
A) 4 B) 5 C) 6 D) –2

17. (a2-g21-12) Tenglamaning ildizlari yig'indisini toping.
$5-3|x-6| = -7$
A) 12 B) 8 C) 10 D) 6

18. (a3-g4-11) $|x^2+2x-3| = |x-1|$ tenglamaning ildizlari yig'indisini toping.
A) –6 B) 6 C) –5 D) 0

19. (a3-g5-11) Tenglamaning ildizlari yig'indisini toping.
$|2-x| + |2x-4| + 3\cdot|x-2| = 18$
A) 4 B) 1 C) 5 D) 3

20. (a3-g7-10) Quyidagi tenglamaning nechta ildizi mavjud?
$||x-3|+6| = 4$
A) 0 B) 1 C) 2 D) 4

21. (a3-g10-12) Tenglama nechta butun yechimga ega?
$|x^2-8x+12| = x^2-8x+12$
A) 2 B) 4
C) 5 D) cheksiz ko'p

22. (a3-g11-11) Tenglamaning ildizlari yig'indisini toping
$|3-x| + |2x-6| + 4|x-3| = 28$
A) 3 B) 4 C) 6 D) 8

23. (a3-g12-12) Tengsizlikning butun yechimlari yig'indisini toping.
$|x^2-9|\cdot(x^2-3x-10) \le 0$
A) 12 B) 15 C) 9 D) 24

24. (a3-g13-17) a ning qanday qiymatlarida $|x^2-6x+6| = a$ tenglama 4 ta ildizga ega bo'ladi?
A) {3}
B) (0; 3)
C) (3; ∞)
D) hech qanday qiymatda

25. (a3-g15-11) Tenglamaning ildizlari yig'indisini toping.
$|3-x| + |2x-6| + 4|x-3| = 28$
A) 3 B) 4 C) 6 D) 8

26. (a3-g17-10) Tenglamaning ildizlari yig'indisini toping.
$x^2-4 = |x-2|$
A) 2 B) –2 C) –1 D) –3

27. (a3-g19-11) Agar $x = y-5 = z-2$ bo'lsa, quyidagi ifodaning qiymatini toping.
$|x-z+7| + |y-x-6| + 2\cdot|y-z+4|$
A) 12 B) 34
C) 20 D) 8

28. (a3-g23-10) $x^2-6|x|+8 = 0$ tenglamaning ildizlari ko'paytmasini toping.
A) 64 B) –8 C) 8 D) –16

29. (a4-g1-11) Tenglamaning barcha ildizlari yig'indisini toping.
$(|x-2|-4)^2 = 2|x-2|-5$
A) 10 B) 8 C) 4 D) 0

30. (a4-g7-10) $\frac{x^3}{|x^2-16|} = \frac{x^3}{16-x^2}$
tenglama nechta butun ildizga ega?
A) cheksiz ko'p
B) 7 ta
C) 9 ta
D) 4 ta

31. (a4-g9-10) $x\cdot|x-2| = 3$ tenglama nechta ildizga ega?
A) 0 B) 1 C) 2 D) 4

32. (a4-g10-10) $x^2-6x+3|x-3|-1 = 0$ tenglamaning ildizlari yig'indisini toping.
A) 2 B) 12
C) –3 D) 6

33. (a4-g13-8) Quyidagi tenglama nechta haqiqiy yechimga ega?
$\frac{3}{x-2} + |x^2-5x+6| = 0$

34. (a4-g14-10) $x < 0$ bo'lsa, $|x-|x-3|| - |3-x| = ?$
A) $3x-6$ B) $-x$
C) 6 D) $3x$

35. (a4-g15-10) Tenglamaning ildizlari yig'indisini toping.

$$\frac{|x-4|+3}{|8-2x|-3}=2$$

A) 1 B) 4 C) 7 D) 8

36. (a4-g19-10) $\big||x+3|-5\big|=6$ tenglamaning ildizlari yig'indisini toping.

A) –12 B) –14
C) –6 D) 8

37. (a4-g20-10) $x^2-4x=5-|x-3|$ tenglama nechta ildizga ega?

A) 1 B) 2 C) 4 D) 0

38. (a4-g23-10) $|x-2|+|x-5|=7$ tenglama nechta ildizga ega?

A) 0 B) 1 C) 2 D) 3

39. (a4-g24-15) $2x^3+3=|x-3|+|x+2|$ tenglama nechta haqiqiy ildizga ega?

A) 0 B) 1 C) 2 D) 3

40. (a4-g25-7) $(x^3-8)(x^2+2x+3)=\frac{x^2+5}{|x-5|}$ tenglama nechta manfiy ildizga ega?

A) 0 B) 1 C) 2 D) 3

41. (a4-g25-10) $|x|+|-2x|+|3x|=20+|-4x|$ tenglamaning ildizlari ko'paytmasini toping.

A) –169 B) –100
C) –400 D) –256

42. (a5-g1-10) $\big|x-|x+|x|\big|=2$ tenglama nechta haqiqiy ildizga ega?

A) 0 B) 1 C) 2 D) 4

43. (a5-g9-11) Tenglama nechta yechimga ega?

$$\left|\left|\frac{x-3}{4}\right|-2\right|=5$$

A) 2 B) 1
C) 4 D) ildizi yo'q

44. (a5-g10-15) $|x^2-6x+1|=2a$ tenglama a ning qanday qiymatlarida to'rtta ildizga ega bo'ladi?

A) $(-\infty;4)$ B) $\{4\}$
C) $(0;4)$ D) $(0;8)$

45. (a5-g14-9) Tenglamaning ildizlari yig'indisini toping.

$$\frac{|3x-12|-6+2|2x-8|}{|4x-16|}=3$$

A) 2,4 B) 1,2
C) ildizi yo'q D) 3

46. (a5-g19-9) $|x+5|=|x-3|-|x+2|$ tenglama nechta ildizga ega?

A) 0 B) 1 C) 2 D) 3

47. (a5-g20-9) $\big||x+1|-2\big|=|x-4|$ tenglama nechta ildizga ega?

A) ildizi yo'q
B) 4
C) 2
D) 1

48. (a5-g21-9) $\left|\frac{x^2-9}{x+4}\right|=\frac{9-x^2}{4+x}$ tenglamani yeching.

A) $\{-3;3\}$

B) $(-4;-3]\cup[3;\infty)$

C) $(-\infty;-4)\cup[-3;3]$

D) $(-4;3]$

49. (a6-g1-9) Tenglamaning ildizlari yig'indisini toping: $x|x-2|=3$.

A) 4 B) 2 C) –1 D) 3

50. (a6-g1-15) $|x^2-4x+7|=2a$ tenglama a ning qanday qiymatlarida 4 ildizga ega bo'ladi?

A) 3
B) 1,5
C) 2
D) hech qanday qiymatida

51. (a6-g5-30) $y=5-|x-2|$, $x=0$ va $y=0$ chiziqlar kesishishidan yuzaga kelgan shaklni OX o'qi atrofida aylantirishdan hosil bo'lgan jism hajmini toping.

A) $\frac{250\pi}{3}$ B) 58π

C) $\frac{223\pi}{3}$ D) $\frac{175\pi}{3}$

52. (a6-g7-15) $|x^2-6x+12|=3a$ tenglama a ning qiymatlarida 2 ta ildizga ega bo'ladi?

A) $(1;\infty)$
B) $[0;1)$
C) $\{0\}\cup(1;\infty)$
D) $(3;\infty)$

53. (a6-g9-9) Tenglamaning ildizlari yig'indisini toping: $|x^2-15x+56|=x-7$.

A) 2 B) 16 C) –7 D) 9

54. (a6-g10-9) $|x^2|\cdot|x^2-1|=1$ tenglama nechta ildizga ega?

A) 4
B) 1
C) 2
D) cheksiz ko'p

55. (a6-g13-21) $|x^2-7x+5|=2x+3$ tenglama nechta ildizga ega?

A) 0 B) 1 C) 2 D) 4

56. (a6-g14-4) k ning qanday qiymatlarida $|2x^2-16x+24|=2k$ tenglama to'rtta ildizga ega bo'ladi?

A) $(0;4)\cup(4;\infty)$

B) $(-4;0)$
C) $(0;4)$
D) $(4;\infty)$

57. (a6-g14-24) $2x^3=|x+2|-5$ tenglama nechta haqiqiy ildizga ega?

A) 0 B) 1 C) 2 D) 3

58. (a6-g15-23) Tenglamaning ildizlari yig'indisini toping $|2-x|+|2x-4|+3\cdot|x-2|=18$.

A) 4 B) 1 C) 5 D) 3

59. (a6-g19-2) $|x^2-7x+18|=3a$ tenglama a ning qanday qiymatlarida ildizga ega bo'lmaydi?

A) $a<0$ B) $a<\frac{23}{12}$

C) $a<\frac{23}{4}$ D) $0<a<\frac{23}{12}$

60. (a6-g20-24) Tenglamaning haqiqiy ildizlari yig'indisini toping $|x^2+4x+2|=3$.

A) –8 B) 8
C) 0 D) –4

61. (a6-g21-12) Nechta tub son $|12x-x^2+6|=12-x^2+6$ tenglikni qanoatlantiradi?

A) cheksiz ko'p
B) 11
C) 6
D) 5

62. (a6-g24-30) $\frac{2|x-5|}{x-5}+3x=7$ tenglama nechta ildizga ega?

A) 3 B) 1 C) 2 D) 0

46. Modul qatnashgan tengsizliklar

1. (a1-g9-10) $|x+2|\le 3$ tengsizlik nechta butun yechimga ega?

A) 5 B) 6 C) 7 D) 8

2. (a1-g13-10) Tengsizlikni yeching.

$$\frac{x^2-5|x|+6}{x-3}\ge 0$$

A) $(-\infty;-3]\cup[-2;2]\cup(3;\infty)$
B) $[-2;2]\cup[3;\infty)$
C) $[-3;-2]\cup[2;3)$
D) $[-3;-2]\cup[2;3)\cup(3;\infty)$

3. (a2-g1-11) $\left|\frac{3}{x-3}\right|\ge\frac{1}{3}$ tengsizlikni qanoatlantiruvchi butun sonlar yig'indisini toping.

A) 54 B) 57
C) 63 D) 60

4. (a2-g7-12) Tengsizlikni yeching.

$$\frac{x^2-7|x|+10}{x-2}\ge 0$$

A) $[-5;-2]\cup[5;\infty)$
B) $(-\infty;-5]\cup[-2;2)\cup[5;\infty)$
C) $[5;\infty)$
D) $(-\infty;2)\cup[5;\infty)$

5. (a2-g8-15) Tengsizlikni yeching.

$|5-2x|\le 3$

A) $[1;\infty)$
B) $(-\infty;1]\cup[4;\infty)$
C) $[1;4]$
D) $(-\infty;4]$

6. (a2-g9-12) Tenglamaning ildizlari yig'indisini toping.

$(2x-3)^2+3\cdot|2x-3|-40=0$

A) –6 B) 3 C) 0 D) 6

7. (a2-g13-12) $|x-4| < |x+3| + x - 4$ tengsizlikni qanoatlantiruvchi oraliqni toping.

A) $\left(-\infty; \frac{5}{3}\right) \cup (4; \infty)$

B) $\left(\frac{5}{3}; \infty\right)$

C) $(-\infty; 4)$

D) $(4; \infty)$

8. (a2-g15-12) Tengsizlikning butun yechimlari yig'indisini toping.

$|x^2 - x - 12| \cdot (x^2 + 3x - 10) \le 0$

A) –12 B) –8
C) –5 D) –9

9. (a2-g17-11) Tengsizlikni yeching.

$|3x + 9| + |-2x - 6| > 30$

A) (–3; 9)
B) $(-\infty; -9) \cup (3; \infty)$
C) (–9; 3)
D) $(-\infty; -6) \cup (6; \infty)$

10. (a2-g18-11) $|x-3| + |x+5| \le 7$

tengsizlik nechta butun yechimga ega?

A) cheksiz ko'p
B) 0
C) 8
D) 16

11. (a2-g22-11) Tengsizlikni yeching.

$|x + 3| < |x - 3|$

A) $(-\infty; 0)$
B) $(0; \infty)$
C) $(3; \infty)$
D) $(-\infty; \infty)$

12. (a2-g23-11) $\frac{|x-2|-9}{|2x-4|} = -2$

tenglama ildizlari yig'indisini toping.

A) 4 B) 5 C) 11 D) 0

13. (a3-g1-11) Tengsizlikni yeching.

$\left|\frac{3y}{2} - \frac{4}{3}\right| \le \frac{5}{6}$

A) $\left[\frac{1}{3}; \frac{13}{9}\right]$

B) $\left(-\infty; \frac{1}{3}\right] \cup \left[\frac{13}{9}; \infty\right)$

C) $\left(-\infty; \frac{13}{9}\right]$

D) $\left[\frac{1}{3}; \infty\right)$

14. (a3-g3-15) Tengsizlikni yeching

$|5 - 2x| \ge 3$

A) $[1; \infty)$
B) $(-\infty; 1] \cup [4; \infty)$
C) [1; 4]
D) $(-\infty; 4]$

15. (a3-g6-11) Tengsizlikning butun yechimlari nechta?

$(|2x + 4| - 5)(3 + |3x - 1|) < 0$

A) 8 B) 4 C) 10 D) 5

16. (a3-g8-11) $\left|\frac{1}{2} - \frac{1}{x}\right| > \frac{2}{5}$

tengsizlikning barcha butun sonlardagi yechimlari yig'indisini toping.

A) 77 B) 84 C) 88 D) 90

17. (a3-g9-9) Tenglama nechta ildizga ega? $x^2 - 7|x| + 10 = 0$

A) 0 B) 1 C) 2 D) 4

18. (a3-g14-11) Tengsizlikning natural yechimlari yig'indisini toping.

$|2 - 3x| \le 8$

A) 3 B) 6 C) 0 D) 5

19. (a3-g18-10) Tengsizlik nechta butun yechimga ega?

$x^2 - 6x + 4 < 4|x - 3|$

A) 10 B) 9
C) 11 D) cheksiz ko'p

20. (a3-g20-10) Nechta butun son $|x + 3| + |x - 2| > 0$ tengsizlikni qanoatlantirmaydi?

A) cheksiz ko'p B) 2
C) 4 D) 0

21. (a3-g22-10) $|x - 2| > x - 2$

tengsizlikni yeching.

A) (–2; 2) B) $(2; \infty)$
C) $(-\infty; \infty)$ D) $(-\infty; 2)$

22. (a3-g24-10) $|x + m| \le n$ tengsizlikning yechimi [–5; 7] oraliqdan iborat bo'lsa, $m + n$ ning qiymatini toping.

A) 2 B) 5 C) 6 D) 10

23. (a4-g2-10) Tengsizlikning butun yechimlari soni nechta?

$4 < |x^2 - 3x| \le 10$

A) 8 B) cheksiz ko'p
C) 4 D) 2

24. (a4-g3-11) Tengsizlikni yeching.

$|x - 3| < |x + 2| + x - 3$

A) $(-2; \infty)$ B) $\left(\frac{4}{3}; \infty\right)$

C) $(6; \infty)$ D) $\left(-2; \frac{4}{3}\right)$

25. (a4-g4-10) $\left|\frac{10}{x-3}\right| \ge 5$ tengsizlikning butun ildizlari yig'indisini toping.

A) 15 B) 9 C) 12 D) 7

26. (a4-g5-9) Tengsizlikni yeching.

$|x - 2| + |x + 5| > 0$

A) R
B) $R - \{-5; 2\}$
C) $\{-5; 2\}$
D) Ø

27. (a4-g6-10) Tengsizlikni yeching.

$|x - 2| - |x + 5| > 0$

A) $\left(-\infty; -\frac{3}{2}\right)$ B) $\left(-\frac{3}{2}; \infty\right)$

C) $(-\infty; \infty)$ D) Ø

28. (a4-g8-12) Tengsizlikning butun yechimlari yig'indisini toping.

$(x^2 - 25)(x^2 - 7x + 30) \le 0$

A) 54 B) 49 C) 44 D) 39

29. (a4-g12-12) Tengsizlikni yeching.

$\sqrt{\sqrt{36} - x^2}(x - 3) \le 0$

A) (–6; 3)
B) $[-6; 3) \cup \{6\}$
C) (3; 6)
D) $\{-6\} \cup (3; 6]$

30. (a4-g13-4) Tengsizlikni yeching.

$|x - 3| \cdot |x - 4| + |x - 5| \le 3$

A) [5; 7]
B) [1; 3]
C) $[1; 3] \cup [5; 7]$
D) [1; 7]

31. (a4-g13-20) $\frac{|x+2|(x^2 - 4x + 16)}{x^2 - 3x - 18} \le 0$

Tengsizlikni qanoatlantiradigan nechta turli butun son mavjud?

A) 7 B) 8 C) 6 D) 9

32. (a4-g16-9) Tengsizlikni yeching.

$|x - 4| + |x + 3| \le 0$

A) {–3; 4} B) Ø
C) $(-\infty; \infty)$ D) {4}

33. (a4-g17-9) Tengsizlikni yeching.

$\frac{x^2 - 8x - 4|x - 4| + 19}{|x - 2| - 5} \le 0$

A) $(-3; 1) \cup (3; 5) \cup (7; \infty)$
B) $(-\infty; -3) \cup (1; 3) \cup (5; 7)$
C) $(-3; 1) \cup (3; 5)$
D) $(-\infty; -3) \cup (1; 3) \cup (5; 7) \cup (7; \infty)$

34. (a4-g21-9) Tengsizlikni yeching.

$|x + 4| + |x - 3| \le 0$

A) {–4; 3} B) Ø
C) $(-\infty; \infty)$ D) {3}

35. (a4-g22-11) Tengsizlikni yeching.

$|5x + 25| + |-2x - 10| > 42$

A) (–11; 1)
B) $(-\infty; -11) \cup (1; \infty)$
C) (–1; 11)
D) $(-\infty; -5) \cup (5; \infty)$

36. (a4-g24-9) Tengsizlikni yeching.

$\frac{|x-3|-4}{x^2 - |x| - 2} \ge 0$

A) $(-2; -1] \cup (2; 7]$
B) $(-\infty; -1] \cup [7; \infty)$
C) $(-\infty; -2) \cup [-1; 2) \cup [7; \infty)$
D) [–1; 7]

37. (a5-g2-10) $1 < |2 - 4x| < 3$ tengsizlik nechta butun ildizga ega?

A) 0 B) 1 C) 2 D) 4

38. (a5-g6-10) $|x^2 - 4x| < 5$ tengsizlikni yeching.

A) $(-\infty; \infty)$ B) (–5; 1)
C) (–1; 5) D) Ø

39. (a5-g8-10) Tengsizlikni yeching.

$x^2 + 8|x| + 7 \ge 0$

A) $(-\infty; -7] \cup [-1; 1] \cup [7; \infty)$

B) $\varnothing$

C) $[-7; -1] \cup [1; 7]$

D) R

40. (a5-g8-17) Quyidagi tenglama nechta haqiqiy ildizga ega?

$|x^2 - 7x + 12|^{2x-7} = |x^2 - 7x + 12|$

A) 3 B) 4 C) 5 D) 6

41. (a5-g11-9) $\left|\frac{1}{0{,}5 - \frac{x}{4}}\right| > \frac{4}{5}$

tengsizlikning barcha butun sonlardagi yechimlari yig'indisini toping.

A) 15 B) 18 C) 16 D) 19

42. (a5-g15-18) $(x-2)^2 + 7 \cdot |x-2| - 30 < 0$ tengsizlik nechta butun ildizga ega?

A) 21 B) 5 C) 19 D) 7

43. (a5-g24-9) $||x+2| - 5| \le 4$ tengsizlik nechta butun ildizga ega?

A) 8 B) 9 C) 16 D) 18

44. (a5-g25-9) $|a - |a|| + a \le 3$ tengsizlikni yeching.

A) $[-3; 3]$

B) $(-\infty; 3]$

C) $[0; 3]$

D) $(-\infty; 3] \cup [3; \infty)$

45. (a6-g3-9) Tengsizlikni yeching:

$\frac{|x+3|-8}{7-|4-x|} \ge 0$.

A) $(-3; 11]$

B) $[-11; -3) \cup [5; 11)$

C) $(-\infty; -11] \cup (-3; 5] \cup (11; \infty)$

D) $(-\infty; -3) \cup [11; \infty)$

46. (a6-g4-9) $||2x-3| - 7| \ge 4$ tengsizlikni yeching.

A) $(-\infty; -4] \cup [0; 3] \cup [7; \infty)$

B) $[-4; 7]$

C) $\varnothing$

D) $[0; \infty)$

47. (a6-g5-9) $|x-m| \le n$ $|x-m| \le n$ tengsizlikning yechimi $[-7; 8]$ oraliqdan iborat bo'lsa, $m+n$ ning qiymatini toping.

A) 8 B) 7 C) 1 D) 15

48. (a6-g6-9) $|x^2 - 5x + 6| \cdot (-x^2 - 10x - 9) \ge 0$ tengsizlikni qanoatlantiruvchi butun sonlar yig'indisini toping.

A) –40 B) –45

C) –30 D) –35

49. (a6-g11-19) Tengsizlikni yeching:

$\frac{|x^2-7x+6|}{x-3} \ge \frac{|x^2-7x+6|}{x+2}$.

A) $\varnothing$

B) $R - \{-2; 3\}$

C) $(-2; 3) \cup \{6\}$

D) $(-\infty; -2) \cup \{1\} \cup (3; \infty)$

50. (a6-g13-31) $\frac{x^2 - 3|x| - 4}{x-2} \le 0$ tengsizlik nechta musbat butun yechimga ega?

A) 3 B) 2

C) 1 D) cheksiz ko'p

51. (a6-g16-16) $(x-2)^2 + 7 \cdot |x-2| - 30 < 0$ tengsizlik nechta butun ildizga ega?

A) 21 B) 5 C) 19 D) 7

52. (a6-g17-9) Tengsizlikning eng kichik va eng katta butun yechimlari yig'indisini toping $|2x-3| - |x+3| < 0$.

A) 8 B) 5 C) 7 D) 6

53. (a6-g18-30) $\frac{|x^2+2x-35|}{x+3} \ge \frac{|x^2+2x-35|}{x-4}$ tengsizlikni qanoatlantiruvchi butun sonlar yig'indisini toping.

A) 1 B) 3 C) 2 D) 4

54. (a6-g19-15) Tengsizlikni yeching: $|x^2 - 7x + 6| > x^2 - 7x + 6$.

A) R

B) ildizga ega emas

C) (1; 6)

D) $(-\infty; 1) \cup (6; \infty)$

55. (a6-g23-25) $5 < |x+3| < 8$ tengsizlikni qanoatlantiruvchi butun sonlar nechta?

A) 4 B) 6 C) 3 D) 2

56. (a6-g25-15) $\left|\frac{x^2-5x+4}{x^2-4}\right| < 1$ tengsizlikni yeching.

A) $(0; 1{,}6) \cup (2{,}5; \infty)$

B) $(-2; 0) \cup (2; 2{,}5)$

C) $(-2; 1{,}6) \cup (2; 2{,}5)$

D) $(-2; 2)$

57. (a6-g26-9) Tengsizlikning butun yechimlari yig'indisini toping

$\left|\frac{2x-6}{5}\right| + \left|\frac{x-3}{2}\right| \le 2{,}8$.

A) 15 B) 21 C) 28 D) 27

47. Modul qatnashgan tenglamalar sistemasi

1. (a5-g12-9) $\begin{cases} |x| + |y| = x^2 + y^2 \\ |x \cdot y| = \left|\frac{x}{y}\right| \end{cases}$

tenglamalar sistemasi nechta ildizga ega?

A) 2 B) 4

C) 6 D) cheksiz ko'p

2. (a5-g18-28) $\begin{cases} |x-4| - 2y = 4 \\ 2|x-4| - 3y = 2 \end{cases}$

tenglamalar sistemasini qanoatlantiruvchi x larning yig'indisini toping.

A) 12

B) 8

C) 4

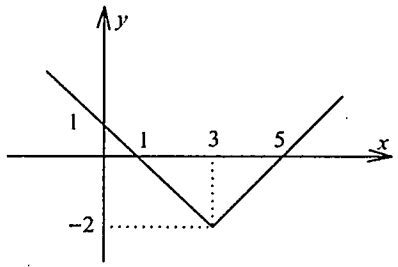
D) ildizga ega emas

3. (a6-g22-10) Agar $\begin{cases} 3|x| + y = 13 \\ 3x + y = -5 \end{cases}$ bo'lsa, $2x + y$ ning qiymatini toping.

A) 10 B) 3 C) –2 D) 12

48. Modulli funksiyaning grafigi, qiymatlar sohasi

1. (a2-g22-16) Rasmda keltirilgan grafikka mos keluvchi funksiyani ko'rsating.



A) $y = |x-2| + 3$

B) $y = |x+3| - 2$

C) $y = |x-3| - 2$

D) $y = |x+2| + 3$

2. (a3-g6-17) $y = \sqrt{x+2}$ va $y = |x|$ funksiyalarning kesishish nuqtalari orasidagi masofani toping.

A) $\sqrt{30}$ B) $\sqrt{10}$

C) 2 D) $4\sqrt{2}$

3. (a3-g16-17) $y = |x+4| - 7$ funksiyaning grafigi qaysi choraklardan o'tadi?

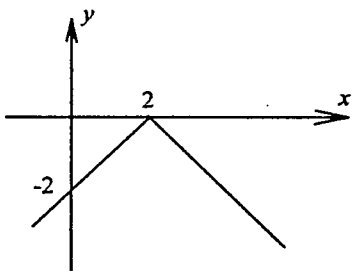
A) barcha choraklardan

B) I, II va III

C) I, III va IV

D) I va III

4. (a3-g17-22)



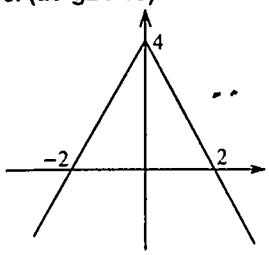
Yuqorida ko'rsatilgan grafik qaysi funksiyaga tegishli?

A) $y = |x| - 2$ B) $y = |x-2|$

C) $y = -|2-x|$ D) $y = 2 - |x-2|$

5. (a3-g22-16) $y = \dfrac{16}{|x-3|+|x+5|}$ funksiyaning qiymatlar sohasini ko'rsating.
A) $(-\infty; 2]$ B) $[-2; 2]$
C) $(0; 2]$ D) $[2; \infty)$

6. (a3-g24-15)



Rasmda tasvirlangan grafik qaysi funksiyaga tegishli?
A) $y = 4 - |x|$
B) $y = |4 - 2x|$
C) $y = |4 - x|$
D) $y = 4 - 2|x|$

7. (a4-g6-16) $y = |x^2 - 16| + x^2 - 3$ funksiyaning qiymatlar sohasini toping.
A) $[4; \infty]$ B) $[16; \infty)$
C) $[13; \infty)$ D) $[19; \infty)$

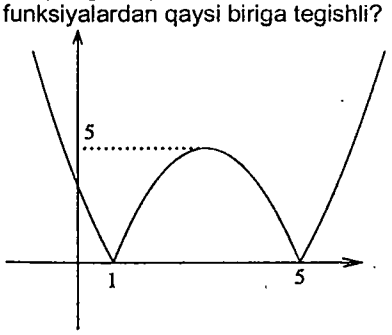
8. (a4-g15-16) Quyidagi funksiyaning qiymatlar sohasini aniqlang.

$$y = \frac{x+8}{|x+8|} + 8$$

A) $[7; 9]$
B) $\{7; 9\}$
C) $(-\infty; 7] \cup [9; \infty)$
D) $[8; \infty)$

9. (a4-g17-15) $y = |2x + 5| - |x - 2|$ funksiya koordinata o'qlarini nechta nuqtada kesib o'tadi?
A) 1 B) 2 C) 3 D) 4

10. (a5-g3-16) Rasmda grafik quyidagi funksiyalardan qaysi biriga tegishli?



A) $y = |7{,}5x - 1{,}25x^2 - 6{,}25|$
B) $y = |0{,}8x^2 - 4{,}8x + 4|$
C) $y = |(x-1)(x-5)|$
D) $y = |x^2 + 6x + 10|$

11. (a5-g4-16) $y = |x - 7| - |x + 5|$ funksiyaning qiymatlar sohasini toping.
A) $[-12; 12]$
B) $[-12; 0]$
C) $(-\infty; 0]$
D) $(-\infty; 12]$

12. (a5-g7-16) $y = |x + 4| - |x - 6|$ funksiyaning grafigi qaysi choraklardan o'tadi?
A) I, III, IV B) I, II
C) II, III, IV D) I, II, IV

13. (a5-g11-15) $y = |x^2 + 7x + 12| - 12$ funksiyaning grafigi qaysi choraklardan o'tadi?
A) 1, 2, 3 va 4
B) 1, 2 va 4
C) 1, 2 va 3
D) 1 va 2

14. (a5-g12-14) $y = \dfrac{|x+2|}{x+2} - 8$ funksiya koordinata tekisligining qaysi choraklaridan o'tadi?
A) I va II B) III va IV
C) I va III D) II va IV

15. (a5-g12-15) $y = 2|x + 3| + 3|x - 4|$ funksiyaning eng kichik qiymatini toping.
A) 21 B) 14 C) –6 D) 18

16. (a5-g13-14) $y = |x^2 - 3x + 2|$ funksiya haqidagi quyidagi fikrlardan qaysilari to'g'ri?
1) funksiya $x = 2$ va $x = 1$ nuqtalarda OX o'qini kesib o'tadi;
2) funksiyaning qiymatlar sohasi $[0; \infty)$;
3) $x = 1{,}5$ nuqtada funksiya eng kichik qiymatga erishadi;
4) funksiyaning grafigi OY o'qini $(0; 2)$ nuqtada kesib o'tadi;
5) funksiya x ning barcha qiymatlarida aniqlangan.
A) 1, 3, 4 B) 2, 4, 5
C) 1, 3, 5 D) 2, 3, 4

17. (a5-g19-15) $y = |x + a| + b$ funksiyaning grafigi barcha choraklardan o'tsa, quyidagilardan qaysi biri noto'g'ri?
A) $ab > 0$.
B) Funksiyaning grafigi OX o'qini bir musbat va bir manfiy qiymatda kesib o'tadi.
C) Funksiyaning grafigi OY o'qini manfiy qiymatda kesib o'tadi.
D) a ning ishorasini aniqlash uchun ma'lumotlar yetarli emas.

18. (a5-g24-15) $y = \dfrac{|x^2 - 9|}{x - 3}$ funksiyaning qiymatlar sohasini toping.
A) $(-\infty; 0] \cup (6; \infty)$
B) $(-\infty; 6) \cup (6; \infty)$
C) $(-\infty; -6] \cup (6; \infty)$
D) $[0; 6) \cup (6; \infty)$

19. (a6-g3-15) $y = \dfrac{|3-x|}{x-3} - 2x$ funksiyaning qiymatlar sohasini toping.
A) $(-\infty; -7) \cup (-5; \infty)$
B) $(-7; -5)$
C) $R - \{-7; -5\}$
D) R

20. (a6-g6-15) $y = \dfrac{5}{|x-2|}$ funksiyaning grafigi qaysi choraklardan o'tadi?
A) I, III va IV
B) I, II, III va IV
C) I, II va IV
D) I va II

21. (a6-g10-15) $f(x) = \dfrac{|x-2|}{x-2} + \dfrac{|1-x|}{x-1}$ ning qiymatlar to'plamini toping.
A) $(-\infty; 1) \cup (1; 2) \cup (2; \infty)$
B) $[-2; 2]$
C) $\{-2; 0; 2\}$
D) aniqlab bo'lmaydi.

22. (a6-g26-15) $y = -|x - 7| - |x + 5|$ funksiyaning qiymatlar sohasini toping.
A) $(-\infty; -5]$ B) $[-12; 12]$
C) $[-\infty; -12]$ D) $[-\infty; -5]$

9-bob. Irratsional tenglama va tengsizliklar

49. Irratsional tenglamalar

1. (a1-g1-29)

$$\sqrt{x^2 - x + \sqrt{x^2 - x + \sqrt{x^2 - x + \ldots}}} = 3$$

tenglama nechta ildizga ega?
A) 1
B) 2
C) 3
D) ildizga ega emas

2. (a1-g4-12) Tenglamani yeching.

$$\sqrt{x - \sqrt{x+8}} = 2$$

A) 1; 8 B) 8 C) 1 D) 8; 4

3. (a1-g5-12) $\sqrt{16x^2 - 32} + \sqrt{36x^2 - 72} = 10\sqrt{2}$ tenglamaning nechta ildizi mavjud?
A) ildizi yo'q
B) 1
C) 2
D) 4

4. (a1-g6-12) Tenglamaning ildizlari yig'indisini toping.

$$(x^2 - 3x - 28)(x+5)\sqrt{7x - 10 - x^2} = 0$$

A) 3 B) ildizi yo'q
C) 4 D) 7

5. (a1-g7-9) Tenglamaning ildizlari ko'paytmasini toping.

$$\sqrt{x+1} + \sqrt{2x+3} = 5$$

A) –3 B) 143 C) 3 D) 429

6. (a1-g8-16) Tenglamaning ildizlari yig'indisini toping.

$$\sqrt{x+1} + \frac{7}{\sqrt{x+1}+4} = 4$$

A) 0 B) –2 C) 8 D) 6

7. (a1-g15-12) Tenglamaning ildizlari ayirmasini toping.

$$6\sqrt{x} = x + 5$$

A) 4 B) 24 C) 16 D) 12

8. (a1-g17-12) Tenglamaning ildizlari yig'indisini toping.

$$\sqrt{2-x}+\frac{4}{\sqrt{2-x+3}}=2$$

A) –2 B) 1 C) 1 D) –1

9. (a2-g1-12) Tenglama nechta ildizga ega? $\sqrt{x+1}+x-1=0$

A) 1 B) 2 C) 0 D) 4

10. (a2-g2-13) Tengsizlikni yeching.

$\sqrt{-x^2+5x}<6$

A) [0; 5]
B) [0; 2) ∪ (3; 5]
C) (2; 3)
D) (–∞; 2) ∪ (3; ∞)

11. (a2-g3-19) Quyidagi tenglama ildizlari yig'indisini toping.

$x-7=\sqrt{2x-1}$

A) 16 B) $2\sqrt{14}$
C) $8+\sqrt{14}$ D) 50

12. (a2-g5-12) Tenglamaning ildizlari yig'indisini toping.

$(x^2-6x-16)(x-9)\sqrt{8x-15-x^2}=0$

A) 15 B) ildizi yo'q
C) 8 D) 22

13. (a2-g7-13) Tenglamaning ildizlari yig'indisini toping.

$\sqrt{x^2+x+\sqrt{x^2+x+\sqrt{x^2+x+...}}}=4$

A) –4 B) 3 C) 7 D) –1

14. (a2-g8-13) Tenglamaning ildizlari yig'indisini toping.

$(x^3-27)\cdot\sqrt[6]{x^2-5x+4}=0$

A) 3 B) 5 C) 4 D) 8

15. (a2-g10-13) Tenglamaning ildizlari ko'paytmasini toping.

$\sqrt{x+1}+\sqrt{2x+3}=5$

A) –3 B) 143 C) 3 D) 429

16. (a2-g12-8) $\sqrt[3]{(5+x)^2}+4\sqrt[3]{(5-x)^2}=5\sqrt[3]{25-x^2}$ tenglama ildizlari o'rta arifmetigini toping.

A) $\frac{126}{13}$ B) $\frac{31}{65}$
C) $\frac{63}{26}$ D) $\frac{126}{26}$

17. (a2-g12-11) Tenglamaning nechta ildizi bor?

$\left(x+\sqrt{x^2-1}\right)^5\left(x-\sqrt{x^2-1}\right)^3=1$

A) 1 B) 2
C) 3 D) ildizi yo'q

18. (a3-g4-12) $\sqrt[3]{(4+x)^2}+4\sqrt[3]{(3-x)^2}=5\sqrt[3]{-x^2-x+12}$ tenglama ildizlari o'rta arifmetigini toping.

A) $\frac{188}{65}$ B) $-\frac{1}{2}$
C) $\frac{441}{130}$ D) $\frac{311}{260}$

19. (a3-g5-12) $\sqrt{\frac{x-1}{3}}+\sqrt[4]{\frac{x-1}{3}}=12$ tenglamaning ildizlari yig'indisini toping.

A) 1013 B) 769
C) 244 D) 525

20. (a3-g11-12) $\sqrt{1-\frac{1}{2x}}=\frac{2x-1}{x}-15$ bo'lsa, $48x+7$ ning qiymatini toping.

A) 5 B) –0,4
C) 4 D) 7

21. (a3-g13-12) Tenglamaning ildizlari yig'indisini toping.

$(x^2-6x-16)(x-9)\sqrt{4x+5-x^2}=0$

A) 4 B) –6 C) 15 D) 12

22. (a3-g15-12) $\sqrt{\frac{x+2}{5}}+\sqrt[4]{\frac{x+2}{5}}=6$

Tenglamaning ildizlari yig'indisini toping.

A) 78 B) 82
C) 403 D) 481

23. (a3-g17-11) Tenglama nechta ildizga ega? $\sqrt{x+4}+\sqrt{x+5}=3$

A) 0 B) 1 C) 2 D) 4

24. (a3-g19-12) $\sqrt{x+3}-\sqrt{44+2\cdot\sqrt{x+3}}=2$ tenglamaning ildizlari yig'indisini toping.

A) 6 B) 110
C) 118 D) 97

25. (a3-g21-11) Tenglama ildizlari yig'indisini toping. $\sqrt[3]{4-\sqrt{x+5}}=-2$

A) ildizi yo'q B) 139
C) 149 D) 288

26. (a3-g22-11) Tenglamaning ildizlari yig'indisini toping. $\sqrt[3]{x+4}=\sqrt{x+4}$

A) –4 B) ildizi yo'q
C) –7 D) –3

27. (a3-g23-11) Quyidagi tenglamaning yechimlari yig'indisini toping.

$\sqrt[3]{\frac{2-x}{1+x}}-3\sqrt[3]{\frac{1+x}{2-x}}=-2$

A) $-\frac{29}{26}$ B) $\frac{1}{2}$
C) ildizi yo'q D) $-\frac{8}{13}$

28. (a3-g24-11) Tenglama nechta ildizga ega?

$\sqrt{11x+1}-\sqrt{3-x}=\sqrt{9x+7}-\sqrt{x-3}$

A) 2 B) 0 C) 1 D) 3

29. (a4-g1-12) Tengsizlik nechta butun yechimga ega?

$(x^2-2x-3)\sqrt{5+4x-x^2}\geq 0$

A) 7 B) 4 C) 5 D) 3

30. (a4-g3-5)

$$\frac{\sqrt{x^2+x+\sqrt{x^2+x+\sqrt{x^2+x...}}}}{\sqrt[3]{x^2\cdot\sqrt{x\cdot\sqrt[3]{x^2\cdot\sqrt{x\cdot...}}}}}=5$$

bo'lsa, x ning musbat qiymatini toping.

A) 1 B) $\frac{1}{2}$ C) $\frac{1}{4}$ D) $\frac{1}{3}$

31. (a4-g3-10) Tenglamaning yechimlarini ko'rsating.

$x^2+3\sqrt{x^2+x-8}=18-x$

A) 4; 5 B) –7; 2
C) –4; 3 D) 6; 1

32. (a4-g5-10) $\sqrt[4]{\frac{2-x}{x+1}}+2\sqrt[4]{\frac{x+1}{2-x}}=3$ tenglamaning ildizlari yig'indisini toping.

A) $-\frac{11}{34}$ B) $\frac{55}{17}$ C) $\frac{1}{2}$ D) $-\frac{14}{17}$

33. (a4-g6-11) Tenglamaning ildizlari yig'indisini toping.

$\sqrt{x-\sqrt{x-\sqrt{x-...}}}=\sqrt[3]{36\cdot\sqrt[3]{36\cdot\sqrt[3]{36\cdot...}}}$

A) 26 B) 54 C) 30 D) 42

34. (a4-g13-14) Quyidagi tenglamaning yechimlari yig'indisini toping.

$\sqrt[3]{\frac{2-x}{1+x}}+2\sqrt[3]{\frac{1+x}{2-x}}=3$

A) $-\frac{2}{3}$ B) $\frac{1}{2}$ C) 0 D) $-\frac{1}{6}$

35. (a4-g16-24) Tenglama nechta ildizga ega?

$\sqrt[4]{x^4-17x^2+16}+|x^2-4x-5|=0$

A) 0 B) 1 C) 4 D) 2

36. (a4-g17-10) Quyidagi tenglama nechta ildizga ega?

$\sqrt{x^2-7x+12}-\sqrt{x^2-4x+3}=x-3$

A) 0 B) 1 C) 2 D) 3

37. (a4-g20-11) Tenglamani yeching.

$\sqrt{x+\sqrt{x+\sqrt{x+...}}}=\sqrt[4]{125\cdot\sqrt[4]{125\cdot\sqrt[4]{125\cdot...}}}$

A) 600 B) 120
C) 100 D) 20

38. (a4-g21-10) Tengsizlikni yeching.

$\frac{2-\sqrt{x}}{\sqrt{x}-4}\leq 0$

A) (–∞; 4] ∪ (16; ∞)
B) [0; 4] ∪ (16; ∞)
C) [4; 16)
D) [0; 16) ∪ (16; ∞)

39. (a4-g21-24) Tenglama nechta ildizga ega?

$\sqrt[4]{x^4-17x^2+16}+|x^2-4x-5|=0$

A) 0 B) 1 C) 4 D) 2

40. (a4-g22-12) Tenglamaning ildizlari yig'indisini toping.

$3x-2-\sqrt{6x+3}=0$

A) $\frac{3-2\sqrt{2}}{3}$ B) 2
C) $\frac{3+2\sqrt{2}}{3}$ D) $\frac{4}{9}$

41. (a4-g23-11) Tenglamaning ildizlari yig'indisini toping.

$\sqrt{20x-3x^2-2x^3}\cdot(12+x-x^2)=0$

A) –1 B) 1
C) –0,5 D) –1,5

42. (a4-g24-10) Tenglamani yeching.
$3\sqrt[3]{x\sqrt[3]{x\sqrt[3]{x\sqrt[3]{x...}}}} + 2\sqrt{x\sqrt{x\sqrt{x\sqrt{x...}}}} = 27$
A) 3 B) 18 C) 9 D) 6

43. (a4-g25-11) Tengsizlikni yeching.
$\sqrt{x+5} \le \sqrt{x} - 5$
A) $(\infty; 4]$ B) $[-5; 4]$
C) $[0; 4]$ D) $\varnothing$

44. (a5-g1-11) Tenglamani yeching.
$$\frac{\frac{1+2\sqrt{x}}{2+3\sqrt{x}}}{\frac{3+4\sqrt{x}}{4+5\sqrt{x}}} = \frac{5}{6}$$
A) $\frac{9}{16}$ B) $\frac{3}{4}$ C) $\varnothing$ D) $\frac{36}{49}$

45. (a5-g2-11) $x + \sqrt{3-x} = 1$
tenglamaning ildizlari yig'indisini toping.
A) –1
B) ildizga ega emas
C) 2
D) 1

46. (a5-g6-11) $\sqrt{1+x} + \sqrt{1-x} = \sqrt{4-3x}$
tenglama nechta ildizga ega?
A) 0 B) 1
C) 2 D) cheksiz ko'p

47. (a5-g8-11) Tenglamaning ildizlari yig'indisini toping.
$\sqrt{2x-7} + \sqrt{3-x} = \sqrt{3-x} + \sqrt{3x-10}$
A) 3
B) –3
C) ildizga ega emas
D) –1

48. (a5-g10-10) $\sqrt{x} - \sqrt{x+1} + \sqrt{2x+1} = 0$
tenglama nechta haqiqiy ildizga ega?
A) 0 B) 1 C) 2 D) 3

49. (a5-g11-10) $(x+4)(7-x)\cdot\left(\sqrt{x-15}+4\right) = 18$ tenglama nechta haqiqiy ildiga ega?
A) 0 B) 1 C) 2 D) 4

50. (a5-g15-4) Tenglamaning ildizlari yig'indisini toping.
$(x^2-6x-27)(x-7)\sqrt{x^2-10x+9} = 0$
A) 14 B) 16 C) 7 D) 23

51. (a5-g15-19) Tenglama nechta ildizga ega?
$\sqrt{10x+1} - \sqrt{4-x} = \sqrt{9x+12} - \sqrt{x-4}$
A) 2 B) 3 C) 1 D) 0

52. (a5-g17-19) Tenglamani yeching.
$\sqrt{x-9} + \sqrt{x} = \frac{36}{\sqrt{x-9}}$
A) 81 B) 25
C) 16; 9 D) 81; 25

53. (a5-g20-10) $\sqrt[4]{5x-4y-11} + \sqrt[8]{2x-5y+16} = 0$ tenglamani qanoatlantiruvchi barcha x va y larning ko'paytmasini toping.
A) –35 B) 42 C) 48 D) 56

54. (a5-g23-10)
$\sqrt{x-3} + \sqrt{65 + 2\cdot\sqrt{x-3}} = 17$
tenglamaning ildizlari yig'indisini toping.
A) 67 B) 784
C) 36 D) 854

55. (a5-g24-10) Tenglamaning ildizlari yig'indisini toping.
$(x^2+x-12)\sqrt{x(x^2-2x-15)} = 0$
A) 1 B) 3 C) 2 D) 0

56. (a5-g25-10) $\sqrt[3]{\frac{2+x}{3-x}} - 8\sqrt[3]{\frac{3-x}{2+x}} = 2$
tenglamaning ildizlari ko'paytmasini toping.
A) $2\frac{12}{13}$ B) $10\frac{6}{7}$
C) –8 D) $3\frac{3}{7}$

57. (a6-g1-10) Tenglamani yeching:
$\sqrt{x+2+2\sqrt{x+1}} + \sqrt{x+2-2\sqrt{x+1}} = 2$.
A) 0 B) {–1; 0}
C) $(-\infty; 0]$ D) [–1; 0]

58. (a6-g6-10) $\frac{\sqrt{5-6x+x^2}}{x-5} = \frac{\sqrt{5-6x+x^2}}{2x-3}$
tenglamaning ildizlari yig'indisini toping.
A) ildizi yo'q
B) –1
C) 1
D) 6

59. (a6-g7-10) Tenglamani yeching:
$\sqrt{x+\sqrt{x}} + \sqrt{x-\sqrt{x}} = 6$.
A) $\frac{288}{37}$ B) $\frac{324}{35}$
C) $\frac{18}{5}$ D) $\frac{\sqrt{2}}{2}$

60. (a6-g8-10) $\sqrt{x^2-5x+4} = x-5$
tenglamani yeching.
A) $\varnothing$
B) 4,2
C) 5
D) cheksiz ko'p yechimga ega

61. (a6-g10-10) Tenglamani yeching:
$\sqrt{x+3} - \sqrt{2x+6} = 2\sqrt{2} - 3$.
A) $\varnothing$ B) $\sqrt{2}-1$
C) $-2\sqrt{2}$ D) $2\sqrt{5}$

62. (a6-g10-14) $y = \sqrt{4-|5-x|} + \frac{x-8}{\sqrt[3]{x-2}}$
funksiyaning aniqlanish sohasiga tegishli butun sonlar nechta?
A) 8
B) 9
C) 7
D) cheksiz ko'p

63. (a6-g11-8) Tenglamanining ildizlari yig'indisini toping: $\sqrt{x^2-8x+15} + \sqrt{2x^2-9x+9} = \sqrt{2x^2-2x-12}$.
A) 4 B) 6 C) 7 D) 9

64. (a6-g13-23) Tenglamaning ildizlari yig'indisini toping: $\sqrt{\frac{x+\sqrt{x-8}}{2}} = 5$.
A) 44
B) 101
C) ildizga ega emas
D) 28

65. (a6-g14-21) $\sqrt{x^2+5x-84} - \sqrt{x^2-x-6} \le 0$ tengsizlikni qanoatlantiruvchi natural sonlar nechta?
A) 7 B) 13 C) 6 D) 14

66. (a6-g16-17) Tenglama nechta ildizga ega $\sqrt{10x+1} - \sqrt{4-x} = \sqrt{9x+12} - \sqrt{x-4}$?
A) 2 B) 3 C) 1 D) 0

67. (a6-g17-10) $\sqrt{\frac{x+2}{5}} + \sqrt[4]{\frac{x+2}{5}} = 6$
tenglamaning ildizlari yig'indisini toping.
A) 78 B) 18 C) 403 D) 481

68. (a6-g18-3) Tenglamaning ildizlari yig'indisini toping $\sqrt{x-3} + \sqrt{x+4} = 7$.
A) 12 B) 7 C) 9 D) 0

69. (a6-g19-26) Tenglama nechta ildizga ega $\sqrt{x^2-7x+12} + \sqrt[4]{x^2-5x+6} = 0$.
A) 4 B) 2 C) 1 D) 0

70. (a6-g21-22) Tengsizlikni yeching:
$\sqrt[3]{x^2-4x+3} > x-3$.
A) $(-\infty; 2)\cup(3; 5)$
B) $(2; 3)\cup(5; \infty)$
C) $(2; 3)\cup(3; 5)$
D) $(-\infty; -2)\cup(5; \infty)$

50. Irratsional tenglamalar sistemasi

1. (a3-g14-9) $\begin{cases}\sqrt{x}+\sqrt{y}=9\\ xy=196\end{cases}$ $(x<y)$
bo'lsa, $x-y=?$
A) 47 B) –45 C) –27 D) –63

2. (a4-g2-8) $\begin{cases}\sqrt{x}+\sqrt{y}=12\\ xy=1024\end{cases}$ $(x<y)$
bo'lsa, $x-y=?$
A) –48 B) 48 C) 96 D) –96

3. (a4-g3-8) Tenglamani yeching.
$\frac{\sqrt{2x+3}}{\sqrt{x+5}-1} = 1$
A) 11; –1 B) 1; 11
C) 11 D) –1

4. (a4-g13-13) Quyidagi tenglamalar sistemasini qanoatlantiruvchi barcha x va y larning yig'indisini toping.
$\begin{cases}\sqrt{2x+y+1}-\sqrt{x+y}=1\\ 3x+2y=4\end{cases}$
A) 5 B) –1 C) 2 D) 1

5. (a6-g1-7) Agar x, y ushbu $\begin{cases} x^2+xy+y^2=84 \\ x+\sqrt{xy}+y=14 \end{cases}$ sistemaning ildizlari bo'lsa, $x-xy+y$ ning qiymatini toping.
A) –6 B) 6 C) 26 D) –26

6. (a6-g4-10) $\begin{cases} \sqrt[3]{x}+\sqrt[3]{y}=5 \\ \sqrt{xy}=8 \end{cases}$ sistemani qanoatlantiruvchi barcha x va y larning yig'indisini toping.
A) 10 B) 130
C) 0 D) 65

51. Irratsional tengsizliklar. Irratsional tengsizliklar sistemasi

1. (a1-g2-11) Tengsizlikning eng katta manfiy va eng kichik musbat yechimlari ayirmasini aniqlang.
$\sqrt{x^2-64} \ge \sqrt{8x+64}$
A) –24 B) 24 C) 0 D) –32

2. (a1-g10-13) Quyidagi tenglama ildizlari yig'indisini toping.
$x-7=\sqrt{2x-1}$
A) $8+\sqrt{14}$
B) $2\sqrt{14}$
C) 50
D) 16

3. (a1-g11-13) Tengsizlik nechta butun yechimga ega?
$\sqrt{3x-9}<3$
A) 4 B) 3
C) 2 D) cheksiz ko'p

4. (a1-g13-11) $\left(x^2+5x-14\right)\sqrt{x-5}=0$ tenglamaning ildizlari yig'indisini toping.
A) ildizga ega emas
B) 5
C) 0
D) 7

5. (a1-g14-11) $\sqrt[3]{x-3}>\sqrt{x-3}$ Tengsizlik uchun quyidagilarning qaysi biri to'g'ri?
A) $x<3$ B) $x>4$
C) $x<4$ D) $3<x<4$

6. (a1-g16-11) Tengsizlikning eng katta butun va eng kichik butun yechimlari ayirmasini aniqlang.
$\sqrt{x^2-81} \le \sqrt{9x+81}$
A) –8 B) 17 C) 9 D) 27

7. (a2-g4-13) Tengsizlik nechta butun yechimga ega?
$\sqrt{9x-20-x^2}<-5$
A) 2 B) 4
C) 0 D) cheksiz ko'p

8. (a2-g6-12) Tengsizlikni yeching
$(x-2)\sqrt{5+4x-x^2} \le 0$
A) $(-\infty; -1] \cup [2; 5]$
B) $[-1; 2] \cup \{5\}$
C) $[-1; 2]$
D) $\{-1\} \cup [2; 5]$

9. (a2-g9-13) Tengsizlik nechta butun yechimga ega?
$\sqrt{3x-9}<3$
A) 4 B) 3 C) 6 D) 2

10. (a2-g11-13) Tengsizlikni yeching.
$\sqrt{x^2-9x}<6$
A) [0; 9]
B) (–3; 12)
C) $(-3; 0] \cup [9; 12)$
D) $(-\infty; -3) \cup (12; \infty)$

11. (a2-g12-13) $x^2\left(x^2+6x+9\right) \cdot \sqrt{81-x^4} \le 0$ tengsizlikning eng katta va eng kichik butun yechimlari ayirmasini toping.
A) 3
B) 0
C) ildizga ega emas
D) 6

12. (a2-g13-15) Tenglamaning ildizlari yig'indisini toping.
$\sqrt{x-\sqrt{x-1}}=1$
A) 1 B) 2 C) 3 D) 4

13. (a2-g14-9) Quyidagi tenglamaning ildizlari o'rta arifmetigini toping.
$\sqrt[4]{\frac{3^{x^2-2x}}{9}}=81$
A) –2 B) 1,5 C) 1 D) –2

14. (a2-g15-13) Tengsizlik nechta butun yechimga ega?
$\sqrt{7x-10-x^2}>-5$
A) 2 B) 4
C) 0 D) cheksiz ko'p

15. (a2-g16-12) $\frac{\sqrt{12-x-x^2}}{2x-5} \le \le \frac{\sqrt{12-x-x^2}}{x+3}$ tengsizlik nechta butun yechimga ega?
A) 5 B) 6 C) 7 D) 8

16. (a2-g17-12) Tenglamaning ildizlari yig'indisini toping.
$6x-4-\sqrt{3x+1}=0$
A) $\frac{7}{12}$ B) $\frac{5}{6}$
C) $1\frac{5}{12}$ D) 1

17. (a2-g18-12) $2\sqrt{x} \ge x-15$ tengsizlikni qanoatlantiruvchi butun sonlar nechta?
A) 17 B) 16
C) 26 D) cheksiz ko'p

18. (a2-g19-12) Tenglamani yeching.
$\sqrt[3]{\frac{x+2}{x-3}}+\sqrt[3]{\frac{x-3}{x+2}}=\frac{10}{3}$
A) $-\frac{7}{27}; \frac{8}{27}$ B) $-\frac{57}{26}; \frac{83}{26}$
C) $-\frac{1}{2}; 2$ D) $-\frac{59}{28}; \frac{19}{14}$

19. (a2-g21-13) Tengsizlikni qanoatlantiruvchi butun sonlar nechta?
$\sqrt{x} \ge x-12$
A) 26 B) 17 C) 16 D) 8

20. (a2-g22-12) $\sqrt{x^2-3x+5}+x^2=3x+7$ tenglamaning ildizlari yig'indisini toping.
A) –3 B) –4 C) 3 D) 4

21. (a2-g23-12) Tengsizlikni yeching.
$\frac{\sqrt{9x-x^2-18}}{x+5} \ge \frac{\sqrt{9x-x^2-18}}{2x-3}$
A) $\varnothing$
B) $(-5; 1,5) \cup [8; \infty)$
C) $\{3; 6\}$
D) $(-\infty; -5) \cup (1,5; 8]$

22. (a3-g1-12) Quyidagi tenglama ildizlari yig'indisini toping.
$2x-5=\sqrt{10x+11}$
A) 7,5 B) 0,5
C) 7 D) 30

23. (a3-g2-12) Tenglamani yeching.
$\sqrt{x-7}=1-\sqrt{x}$
A) 16 B) 2
C) 8 D) ildizi yo'q

24. (a3-g3-13) Tenglamaning ildizlari ko'paytmasini toping.
$(x^2-9) \cdot \sqrt[6]{x^2+4x-5}=0$
A) 9 B) –15
C) –45 D) 45

25. (a3-g6-12) Tengsizlikni yeching.
$\sqrt{x+4}>\sqrt[4]{x-4}$
A) $(4; \infty)$
B) $(-4; -3)$
C) $[4; \infty)$
D) $(-\infty; -4) \cup (-3; \infty)$

26. (a3-g7-11) Tengsizlikni yeching.
$\left(x^2+3x-10\right)\sqrt{3-x} \le 0$
A) $[-5; 3]$
B) $(-\infty; -5] \cup [2; \infty)$
C) $(-\infty; -5] \cup [2; 3]$
D) $[-5; 2] \cup \{3\}$

27. (a3-g8-12) $\left(x^2-64\right)\sqrt{x-1}=0$ tenglama ildizlarining yig'indisini toping.
A) –1 B) 1 C) 9 D) 3

28. (a3-g9-10) $\frac{\sqrt{5x+14-x^2}}{2x-5} \ge \ge \frac{\sqrt{5x+14-x^2}}{x-4}$ tengsizlik nechta butun yechimga ega?
A) 9 B) 6
C) 7 D) cheksiz ko'p

29. (a3-g10-13) Tengsizlikni yeching.
$\sqrt{x^2-6x}<4$
A) (–2; 8)
B) [0; 6]
C) $(-\infty; -2) \cup (8; \infty)$
D) $(-2; 0] \cup [6; 8)$

30. (a3-g12-13) Tengsizlik nechta butun yechimga ega?

$\sqrt{8x-15-x^2} > -2$

A) 3 B) 1
C) 0 D) cheksiz ko'p

31. (a3-g16-12) Tengsizlik nechta butun ildizga ega?

$\sqrt{7x-x^2-10} \ge -2$

A) 0 B) 6
C) 4 D) cheksiz ko'p

32. (a4-g4-11) $\sqrt{|x^2+16|-\sqrt{64x^2}} =$

$= 4 - x$ tenglikni qanoatlantiruvchi natural sonlar nechta?

A) 4 B) 0 C) 3 D) 5

33. (a4-g7-11) $\sqrt{\frac{x^2-7x+12}{x+5}} \cdot \frac{x^2-9}{x-6} \le 0$

tengsizlikni yeching.

A) $(-\infty; -5) \cup \{-3\} \cup [3; 4]$
B) $(-5; -3] \cup \{3\} \cup [4; 6)$
C) $(-\infty; -5) \cup [-3; 4] \cup [6; \infty)$
D) $(-5; -3] \cup [3; 6) \cup (6; \infty)$

34. (a4-g8-13) Tengsizlik nechta butun yechimga ega?

$\sqrt{6x-5-x^2} > -1$

A) 5 B) 4
C) 0 D) cheksiz ko'p

35. (a4-g9-11) Tengsizlikni yeching.

$\sqrt{x^2-5} - \frac{2}{\sqrt{x^2-5}} \ge 1$

A) $\{0\} \cup [3; \infty)$

B) $[3; \infty)$

C) $(-\infty; 3]$

D) $(-\infty; -3] \cup [3; \infty)$

36. (a4-g10-11) Tengsizlikni yeching.

$\sqrt{x^2-8x+12} \ge 4 - x$

A) $(-\infty; 2] \cup [4; \infty)$

B) $(-\infty; 2] \cup [6; \infty)$

C) $[6; \infty)$
D) $\varnothing$

37. (a4-g12-13) Hisoblang .

$\frac{1}{2} + \left(\frac{1}{3} + \frac{2}{3}\right) + \left(\frac{1}{4} + \frac{2}{4} + \frac{3}{4}\right) + \ldots +$

$+ \left(\frac{1}{20} + \frac{2}{20} + \frac{3}{20} + \ldots + \frac{19}{20}\right)$

A) 105 B) 100
C) 90 D) 95

38. (a4-g12-17) n ning qanday qiymatlarida $n^2x + 2 = n + 4x$ tenglama cheksiz ko'p yechimga ega bo'ladi?

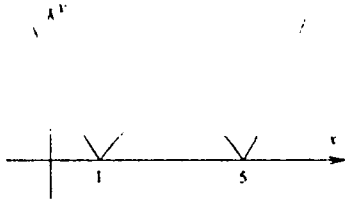
A) $n = \pm 2$ B) $n = 0$
C) $n \ne 1$ D) $n = 2$

39. (a4-g13-5) Tengsizlikni yeching.

$\sqrt{x^2-4x-12} \ge 6 - x$

A) $(-\infty; -2] \cup \{6\}$
B) $(-\infty; 2] \cup [6; \infty)$
C) $[6; \infty)$
D) $[-2; \infty)$

40. (a4-g13-18) Quyidagi grafik qaysi funksiyaga tegishli?



A) $y = |x^2 - 6x + 5|$

B) $y = |2x^2 - 12x + 10|$

C) $y = |3x - 0{,}5x^2 - 2{,}5|$

D) $y = |9x - 1{,}5x^2 - 7{,}5|$

41. (a4-g16-10) Tengsizlikni yeching.

$\frac{4-\sqrt{x}}{\sqrt{x}-2} \le 0$

A) $(-\infty; 4) \cup [16; \infty)$
B) $[0; 4) \cup [16; \infty)$
C) $(4; 16]$
D) $[0; 4) \cup (4; \infty)$

42. (a4-g19-11) $\sqrt{x^2-3x+2} > x - 3$ tengsizlikni yeching.

A) $\left(\frac{7}{3}; \infty\right)$

B) $(-\infty; 1] \cup [2; \infty)$

C) $(-\infty; 1] \cup \left[2; \frac{7}{3}\right)$

D) $\{1; 2\} \cup \left[\frac{7}{3}; \infty\right)$

43. (a5-g3-11) Tenglamaning ildizlari yig'indisini toping.

$\sqrt{7-x} + \frac{2}{\sqrt{7-x}-2} = 5$

A) –2 B) –7
C) –11 D) 7

44. (a5-g5-11) $\sqrt{x^2-25} \le \sqrt{5x+25}$ tengsizlikni qanoatlantiruvchi nechta butun son mavjud?

A) 16 B) 7 C) 6 D) 15

45. (a5-g9-12) Tenglamaning ildizlari yig'indisini toping.

$(x^2-3x-28)(x+5)\sqrt{7x-10-x^2} = 0$

A) 3 B) ildizi yo'q
C) 4 D) 7

46. (a5-g12-10) $\sqrt[3]{x+1} - \sqrt[3]{x-1} = 1$ bo'lsa, $\sqrt[6]{x^2-1}$ ni hisoblang.

A) $\frac{1}{\sqrt[4]{3}}$ B) $\frac{1}{3}$

C) $\frac{2}{3}$ D) $\frac{1}{\sqrt{3}}$

47. (a5-g13-10) $\sqrt[3]{x-5} \le \sqrt[4]{x-5}$ tengsizlikni qanoatlantiruvchi butun sonlar nechta?

A) 1 B) 0
C) cheksiz ko'p D) 2

48. (a5-g14-10) Quyidagi tengsizlik nechta butun yechimga ega?

$\sqrt{2-x} + \sqrt{x-5} \ge 0$

A) 4 B) 0
C) 2 D) cheksiz ko'p

49. (a5-g19-10) Tengsizlikni yeching.

$\frac{\sqrt{x^2-6x+5}}{2x-5} \ge \frac{\sqrt{x^2-6x+5}}{x+3}$

A) $(-\infty; -3) \cup [5; 8]$

B) $(-\infty; -3) \cup \{1; 2{,}5\} \cup [5; 8]$

C) $(-\infty; -3) \cup \{1\} \cup [5; 8]$

D) $(-\infty; -3) \cup (2{,}5; 8]$

50. (a5-g21-10) Tenglamaning ildizlari yig'indisini toping.

$\sqrt{x^2-13x+2} + \sqrt{2x^2-26x-3} = 9$

A) 26 B) 16
C) 13 D) ildizi yo'q

51. (a5-g22-10) Tengsizlik nechta butun yechimga ega?

$(7-x)\sqrt{x-12} > \frac{(x^2+3)\sqrt{4x^2-25}}{x^2+4}$

A) 9 B) cheksiz ko'p
C) 2 D) 0

52. (a6-g2-10) $\frac{\sqrt[3]{x-7}\,(x+2)(x-3)}{(x^2-4)\sqrt{8-x}} \ge 0$

tengsizlikning barcha butun yechimlari yig'indisini toping.

A) 18
B) 27
C) aniqlab bo'lmaydi
D) 10

53. (a6-g3-10) Tengsizlik nechta ildizga ega?

$(x-6)\frac{\sqrt{-x^2-x+12}}{x^2+1} \ge |x-3|$

A) 1
B) 12
C) ildizga ega emas
D) cheksiz ko'p

54. (a6-g5-10) Tengsizlikni yeching:

$\frac{\sqrt{x-3}-5}{3-\sqrt{x+2}} \ge 0$.

A) $(-\infty; 7) \cup [28; \infty)$

B) $[3; 28]$

C) $[3; 7) \cup [28; \infty)$

D) $(7; 28]$

55. (a6-g8-9) $\sqrt{(x-2)^2} + |x+3| = 5$ tenglamaning butun ildizlari yig'indisini toping.

A) 0 B) –2 C) 5 D) –3

56. (a6-g9-10) Tengsizlikni yeching:

$\sqrt[3]{(x+2)^2} \ge 2x^2 + 8x + 7$.

A) $(-\infty; -3] \cup [-1; \infty)$
B) $[-3; -1]$
C) $[-1; 3]$
D) $(-\infty; -1] \cup [3; \infty)$

57. (a6-g11-29) $\left(\sqrt{x}\right)^2 \le 3$ tengsizlikni qanoatlantiruvchi butun sonlar nechta?
A) 4 B) 7 C) 3 D) 6

58. (a6-g12-32) $\frac{x^6 \cdot |x+1| \cdot (x^2-9)}{\sqrt{x^2-2x+1}} < 0$ tengsizlikni qanoatlantiradigan butun sonlar yig'indisini toping.
A) 3 B) –3 C) 0 D) 1

59. (a6-g20-13) Tengsizlikni yeching: $\sqrt{x+4} \le \sqrt{x-4}$.
A) Ø
B) [–4; 2,25]
C) [0; 2,25]
D) [–4; 0]

60. (a6-g22-30) Nechta butun son tengsizlikni qanoatlantiradi $\frac{\sqrt{x^2-5x+4} \cdot (x+4)}{\sqrt[4]{49-x^2} \cdot \sqrt[3]{x-2}} \le 0$.
A) 8 B) 6 C) 11 D) 7

61. (a6-g23-4) Tengsizlikni yeching: $\sqrt{609+\sqrt{x}} - \sqrt{273+\sqrt{x}} \ge 8$.
A) [256; ∞) B) [0; 256]
C) Ø D) {256}

62. (a6-g24-9) Tengsizlikni yeching: $\sqrt{x-1} \ge |x-1|$.
A) Ø B) (0; 1)
C) (1; 2) D) (1; ∞)

63. (a6-g25-7) Tengsizlikni yeching: $\sqrt{x^2-4x} > x-3$
A) $(-\infty; 0] \cup (4,5; \infty)$
B) $(-\infty; 0] \cup [4; 4,5)$
C) $(4,5; \infty)$
D) $\{0; 4\} \cup (4,5; \infty)$

64. (a6-g26-10) Tenglama nechta ildizga ega $\sqrt{x^2-9x+10} + \sqrt[4]{x^2+7x+6} = 0$.
A) 4 B) 2 C) 1 D) 0

10-bob. Progressiya

52. Arifmetik progressiya. Arifmetik progressiyaning n-hadi

1. (a2-g2-14) Hadlari ayirmasi 5 ga teng bo'lgan arifmetik progressiyaning 7- va 10-hadlari yig'indisi 26 ga teng. Shu progressiyaning 9-hadini toping.
A) 15,5 B) 22
C) 14 D) 10,5

2. (a2-g3-18) Kamayuvchi arifmetik progressiyani birinchi va to'rtinchi hadi yig'indisi 0, ikkinchi va uchinchi hadlari ko'paytmasi –1 ga teng bo'lsa, arifmetik progressiyani birinchi hadi nechaga teng?
A) 3 B) –1 C) 1 D) –3

3. (a2-g18-13) Arifmetik progressiyaning yettinchi va birinchi hadlari ayirmasi 15 ga teng. Ikkinchi va to'rtinchi hadlari yig'indisi esa 14 ga teng. Progressiyaning birinchi hadini toping.
A) 2 B) 2,5 C) 4 D) 5

4. (a2-g21-14) Quyida keltirilgan tasdiqlardan qaysilari noto'g'ri?
1) arifmetik progressiyaning hadlari soni uchun $n = \frac{a_n - a_1 - d}{d}$ $(d \ne 0)$ munosabat o'rinli;
2) $\log_2 3$, $\log_2 6$ va $\log_2 12$ sonlar arifmetik progressiyaning ketma-ket hadlari bo'ladi;
3) arifmetik progressiyada dastlabki n ta hadi yig'indisi uchun $S_n = (a_n + a_1) \cdot \frac{n}{2}$ formula o'rinli;
4) $\cos(\alpha+\beta)$, $\cos\alpha \cdot \cos\beta$ va $\cos(\alpha-\beta)$ sonlar geometrik progressiyaning ketma-ket hadlari bo'ladi;
5) cheksiz kamayuvchi geometrik progressiyaning ilk hadi $b_1 = \frac{S}{q-1}$ ga teng.
A) 1, 4, 5 B) 1, 2, 5
C) 2, 3, 4 D) 1, 2, 4

5. (a3-g4-13) n ta hadining yig'indisi $S_n = 2n^2 - 3n$ bo'lgan arifmetik progressiyaning umumiy hadi ko'rinishini toping.
A) $a_n = 2n - 1$
B) $a_n = 4n - 5$
C) $a_n = 10n - 5$
D) $a_n = 2n + 3$

6. (a3-g9-12) Arifmetik progressiyaning 6-hadi 1-hadidan 3 marta katta. Ushbu progressiyaning birinchi hadining ayirmasiga nisbatini topng.
A) 2 B) 0,5 C) 0,4 D) 2,5

7. (a3-g10-14) 4- va 11-hadlari yig'indisi 32 ga teng bo'lgan arifmetik progressiyaning 6-hadi 13 ga teng. Bu progressiyaning ayirmasini toping.
A) 2 B) 4 C) 3 D) 1

8. (a3-g17-12) Arifmetik progressiyaning birinchi va beshinchi hadi yig'indisi –2, ikkinchi va uchinchi hadlari ko'paytmasi 4 ga teng bo'lsa, arifmetik progressiyaning birinchi hadi nechaga teng?
A) –8 B) –1 C) –10 D) –7

9. (a3-g20-12) Hadlari yig'indisi $S_n = n^2 - 6,5n$ ifoda bilan topiladigan arifmetik progressiyaning umumiy hadi formulasini toping.
A) $4n - 13$
B) $2n - 6,5$
C) $2n - 7,5$
D) $4n - 15$

10. (a3-g21-12) 2 va 12 orasiga 14 ta son arifmetik progressiya hosil qiladigan shaklda joylashtirildi. Shu progressiyaning yettinchi hadini toping.
A) 5,75 B) 7
C) 6 D) 6,5

11. (a3-g24-12) Hadlari yig'indisi $S_n = 3n^2 - 5n$ ifoda bilan berilgan ketma-ketlikning umumiy hadi formulasini toping.
A) $a_n = 6n - 8$
B) $a_n = 3n - 4$
C) $a_n = 3n - 5$
D) $a_n = 4n - 6$

12. (a5-g1-12) $a_n = \frac{n^2 - 5n + 6}{n+1}$ ketma-ketlikning nechta hadi manfiy?
A) cheksiz ko'p
B) 3
C) 0
D) 4

13. (a5-g12-11) Arifmetik progressiyada $S_n + a_{n+1} = 1428$ va $S_{n-1} + a_n = 1397$ bo'lsa, $a_7 + a_{2n-5}$ ni hisoblang.
A) 62 B) 70,1 C) 31 D) 35,6

14. (a5-g21-12) Ikki shahar orasidagi masofa xaritada 12 sm ga teng. Xaritaning masshtabi 1:2500000 bo'lsa, shaharlar orasidagi haqiqiy masofa necha km bo'ladi?
A) 300 B) 3
C) 3000 D) 30

15. (a5-g25-11) Hadlari butun sonlardan iborat arifmetik progressiyaning 4- va 5- hadlari ko'paytmasi 460 ga, 7- va 9-hadlari yig'indisi 64 ga teng. Shu progressiyaning 1-hadini toping.
A) 3 B) 20 C) 11 D) 17

16. (a6-g22-18) Arifmetik progressiyaning 3-hadi x ga, ayirmasi d ga teng. Shu progressiyaning dastlabki 4 ta hadi ko'paytmasini toping.
A) $x^4 - 5x^2d^2 + 4x^4$
B) $4x + 2d$
C) $x^3 - 4x^2d + 4xd^2$
D) $x^4 + 2d^3x - x^2d^2 - 2dx^3$

17. (a6-g24-20) Arifmetik progressiyaning 6-hadi 3-hadidan 2 marta katta. Shu progressiyaning nechanchi hadi 6-hadidan 2 marta katta bo'ladi?
A) 12 B) 9 C) 15 D) 10

18. (a6-g26-11) Arifmetik progressiyada $a_9 + a_{12} = 80$ ga va $a_4 + a_7 = 25$ ga teng. Arifmetik progressiyaning ayirmasini toping.
A) 10,5 B) 6
C) 5,5 D) 7,5

53. Arifmetik progressiya xossalari

1. (a1-g2-12) O'suvchi geometrik progressiyani tashkil etuvchi uchta sondan uchinchisi 18 ga teng. Bu son o'rniga 10 soni olinsa, uchta son arifmetik progressiyani tashkil etadi. Quyidagilardan qaysi biri arifmetik progressiyaning 4-hadi bo'ladi?
A) 12 B) 16 C) 13 D) 14

2. (a1-g6-13) Arifmetik progressiyaning uchinchi va oltinchi hadlari yig'indisi 13 ga, o'n birinchi va sakkizinchi hadlari ayirmasi 9 ga teng. Progressiyaning beshinchi hadini toping.
A) 5 B) 10 C) 8 D) 11

3. (a1-g7-10) Agar arifmetik progressiyada $Sn - S_{n-1} = 52$ va $S_{n+1} - S_n = 63$ bo'lsa, uning hadlari ayirmasi qanchaga teng bo'ladi?
A) 14 B) 10
C) 13 D) 11

4. (a1-g12-8) 1 va 35 sonlari orasiga arifmetik progressiya tashkil qiladigan 23 ta son joylashtirildi. Shu progressiyaning 13-hadini toping.
A) 18 B) 16,5
C) 19,5 D) 16

5. (a1-g14-12) Arifmetik progressiyada $a_1 + a_4 = 18$ va $a_1 + a_9 = 33$ bo'lsa a_6 ni toping
A) $\frac{39}{2}$ B) $\frac{37}{2}$ C) $\frac{29}{2}$ D) 18

6. (a2-g6-13) Arifmetik progressiyaning 3-hadini kubi 5-hadiga teng. 2-hadi 4-hadidan 6 ga kam bo'lsa, dastlabki 5 ta hadi o'rta arifmetigini toping.
A) 5 B) 3 C) –4 D) 2

7. (a2-g11-14) 6- va 9-hadlari yig'indisi 24 ga teng bo'lgan arifmetik progressiyaning 7-hadi 10 ga teng. Bu progressiyaning ayirmasini toping.
A) 2 B) 4 C) 3 D) 1

8. (a2-g14-21) Agar arifmetik progressiyada $a_1 + a_2 + a_3 + \ldots + a_{37} = 259$ bo'lsa, $a_{19} = ?$
A) 4 B) 7 C) 14 D) 12

9. (a2-g19-13) Arifmetik progressiyaning to'rtinchi va o'ninchi hadlari yig'indisi 18 ga teng bo'lsa, bu progressiyaning yettinchi hadini toping.
A) 5 B) 4,5 C) 1 D) 9

10. (a3-g16-13) 3, a, b va 13,5 sonlarning ilk uchtasi arifmetik progerssiyani, oxirgi uchtasi geometrik progressiyani tashkil etadi. Arifmetik progressiyaning ayirmasini toping.
A) 4 B) 3 C) 1,5 D) 2

11. (a4-g14-20) Arifmetik progressiyaning ikkinchi va to'rtinchi hadlari o'rta arifmetigi 10 ga teng bo'lsa, uning 1, 3 va 5-hadlari yig'indisini toping.
A) 20 B) 30 C) 40 D) 35

12. (a5-g5-12) 12 va 17 sonlari orasiga shu sonlar bilan birgalikda arifmetik progressiya 11 ta raqam joylashtirildi. Joylashtirilgan sonlar yig'indisini toping.
A) 188,5 B) 377
C) 159,5 D) 319

13. (a5-g21-11) Arifmetik progressiyaning 27 ta hadi bor. Oxirgi uchta hadining yig'indisi 571 ga, o'rtadagi uchta hadining yig'indisi esa 517 ga teng bo'lsa, progressiya ayirmasini toping.
A) 2 B) 1,5
C) 6,5 D) 3

14. (a6-g7-11) Birinchi hadi $8 - 5n$, o'n ikkinchi hadi $6n + 2,5$ bo'lgan arifmetik progressiyaning to'qqizinchi hadini toping.
A) $2n + 3$ B) $3n + 4$
C) $4n + 2,5$ D) $5n - 1$

15. (a6-g9-11) $m + 1$, $2m + 2$ va $8m - 4$ sonlari mos ravishda o'suvchi geometrik progressiyaning ilk uch hadini tashkil etsa, shu progressiyaning uchinchi va beshinchi hadlari ko'paytmasini toping.
A) 1152 B) 288
C) 26^2 D) 24^2

16. (a6-g15-4) Arifmetik progressiyaning uchinchi va beshinchi hadlari o'rta arifmetigi 15 ga teng bo'lsa, uning 2-, 4- va 6-hadlari yig'indisini toping.
A) 30 B) 45
C) 22,5 D) 60

17. (a6-g25-14) Arifmetik progressiyaning birinchi hadi 0,6, to'rtinchi hadi 6,6 ga teng. Shu progressiyaning dastlabki nechta hadi yig'indisi 23 ga teng bo'ladi?
A) 18 B) 7 C) 12 D) 5

54. Arifmetik progressiyaning dastlabki n ta hadi yig'indisi

1. (a1-g3-21) Arifmetik progressiyaning uchinchi hadi 6 ga, beshinchi hadi 9 ga teng. Shu progressiyaning ilk 8 ta hadi yig'indisini toping.
A) 56 B) 66 C) 72 D) 45

2. (a1-g4-13) n ta hadining yig'indisi $n^2 + 2n$ bo'lgan arifmetik progressiyaning umumiy hadi ko'rinishini toping.
A) $a_n = 2n - 1$
B) $a_n = 2n - 3$
C) $a_n = 3n - 2$
D) $a_n = 2n + 1$

3. (a1-g8-3) Ilk n ta hadining yig'indisi $S_n = n^2 + n + 1$ bo'lgan ketma-ketlikning 6-hadini toping.
A) 12 B) 43 C) 36 D) 31

4. (a1-g9-13) Hadlari yig'indisi $S_n = (n^2 - 3n)/2$ formula bilan topiladigan arifmetik progressiyaning umumiy hadi qanday ifodalanadi?
A) $2n + 4$
B) $2n - 4$
C) $n - 2$
D) $3n + 6$

5. (a2-g1-13) Ketma-ketlikning ixtiyoriy n ta hadining yig'indisi $S_n = 16n - n^2$ ifoda orqali aniqlanadi. Shu ketma-ketlikning 7-hadini toping.
A) –3 B) 63 C) 3 D) 60

6. (a2-g4-14) 12 va 28 sonlari orasiga arifmetik progressiya hosil qiladigan 4 ta son joylashtirildi. Bu sonlar yig'indisini toping.
A) 60 B) 120
C) 80 D) 160

7. (a2-g8-14) Arifmetik progrossiyaning yettinchi va yigirma uchinchi hadlari yig'indisi 40 ga teng bo'lsa, uning dastlabki yigirma to'qqizta hadi yig'indisini toping.
A) 580
B) 1160
C) 870
D) berilganlar yetarli emas

8. (a2-g10-14) Umumiy hadining formulasi $a_n = 4n - 2$ bo'lgan ketma-ketlikning dastlabki 28 ta hadi yig'indisini toping.
A) 1512 B) 1680
C) 1584 D) 1568

9. (a2-g12-14) Arifmetik progressiyaning birinchi va uchinchi hadlari yig'indisi 8 ga, ikkinchi va to'rtinchi hadlari ko'paytmasi 40 ga teng bo'lsa, dastlabki 5 ta hadlari yig'indisini toping.
A) 35 B) 48 C) 45 D) 39

10. (a2-g13-14) O'suvchi arifmetik progressiyaning dastlabki 3 ta hadi yig'indisi 15 ga teng. Agar ularga 1, 3 va 9 sonlarini qo'shsak, hosil bo'lgan sonlar o'suvchi geometrik progressiyaning dastlabki 3 ta hadini tashkil etadi. Shu geometrik progressiyaning dastlabki 7 ta hadi yig'indisini toping.
A) 248 B) 418
C) 252 D) 508

11. (a2-g16-13) 7 va 125 sonlari orasiga arifmetik progressiya hosil qiladigan 4 ta son joylashtirildi. Joylashtirilgan sonlar yig'indisini toping.
A) 198 B) 264
C) 330 D) 132

12. (a2-g22-13) Ilk n ta hadining yig'indisi $S_n = n^2 - 3n - 2$ bo'lgan arifmetik progressiyaning oltinchi hadi nechaga teng?
A) 9 B) 8 C) 12 D) 16

13. (a3-g2-13) $x_n = 0,25 \cdot 2^n + n$ sonli ketma-ketlikning dastlabki 6 ta hadi yig'indisini toping.
A) 50,5 B) 52,5
C) 31,5 D) 74,5

14. (a3-g3-14) Arifmetik progressiyaning to'rtinchi va yigirma uchinchi hadlari yig'indisi 78 ga teng bo'lsa, uning dastlabki yigirma yettita hadi yig'indisini toping.
A) 1053
B) 2106
C) 1404
D) Berilganlar yetarli emas.

15. (a3-g9-13) Do'kondan ma'lum miqdordagi pulga 10 ta shokolad va 15 ta bulochka olish mumkin. Shuncha pulga 20 ta shokolad va 8 ta bulochka olish mumkin. Shu pulga faqat bulochka sotib olinsa, nechta bulochka olish mumkin?
A) 22 B) 27 C) 25 D) 32

16. (a3-g13-13) Hadlari $a_n = 2^n - n$ ifoda bilan ifodalanuvchi ketma-ketlikning dastlabki 10 ta hadi yig'indisini toping.
A) 5 B) 7
C) 1991 D) 11

17. (a3-g15-13) Arifmetik progressiyaning oltinchi hadi 10 ga, dastlabki 16 ta hadining yig'indisi 200 ga teng. Bu progressiyaning 9-hadini toping.
A) 14 B) 16 C) 13 D) 18

18. (a3-g19-13) $c_n = \frac{12}{2^n} + n$ sonli ketma-ketlikning dastlabki 5 ta hadi yig'indisini toping.
A) $15\frac{15}{16}$ B) $7\frac{5}{8}$
C) $26\frac{5}{8}$ D) $32\frac{31}{32}$

19. (a3-g22-12) Arifmetik progressiyaning dastlabki beshta hadi yig'indisi 32 ga teng. Shu progressiyaning uchinchi hadini toping.
A) 2 B) 4 C) 16 D) 6,4

20. (a4-g1-13) Yig'indisi 18 ga teng bo'lgan 3 ta son arifmetik progressiyaning dastlabki 3 ta hadidir. Agar shu sonlarning birinchisidan 1 ayrilib, uchinchisiga 4 soni qo'shilsa, hosil bo'lgan sonlar o'suvchi geometrik progressiyaning ketma-ket hadlari bo'ladi. Arifmetik progressiyaning dastlabki 6 ta hadi yig'indisini toping.
A) 36 B) 72 C) 48 D) 54

21. (a4-g3-12) $17 + \cos 2x$ va $2\sin^2 x$ sonlari orasiga arifmetik progressiya hosil qiladigan shaklda 12 ta son yozilgan bo'lsa, bu progressiyaning hamma hadlari yig'indisini toping.
A) 108 B) 126 C) 114 D) 146

22. (a4-g7-12) Arifmetik progressiyaning n ta hadi yig'indisi $S_n = 3n^2 - 5n$ formula yordamida topiladi. $a_7 + a_8 + a_9 + a_{10}$ ni hisoblang.
A) 172 B) 138
C) 250 D) 196

23. (a4-g9-12) Arifmetik progressiyaning ilk to'rt hadi yig'indisi 16 ga, keyingi oltitasi yig'indisi 84 ga teng. Progressiyaning birinchi hadini toping.
A) 1 B) 2 C) –2 D) 4

24. (a4-g16-11) Yig'indini hisoblang.
$17 + 20 + 23 + 26 + \ldots + 9n + 8$
A) $\frac{(3n-2)(9n+25)}{2}$
B) $(2n-6)(9n+25)$
C) $\frac{3(n-3)(5n+23)}{2}$
D) $3(n-1)(9n+25)$

25. (a4-g16-21) $17 + \cos 2x$ va $2\sin^2 x$ sonlari orasiga arifmetik progressiya hosil qiladigan shaklda 16 ta son yozilgan bo'lsa, bu progressiyaning hamma hadlari yig'indisini toping.
A) 174 B) 126
C) 144 D) 162

26. (a4-g17-11) Arifmetik progressiyaning 11-hadi, 1-hadidan 7 marta katta. Bu progressiyaning ayirmasi 3 ga teng bo'lsa, uning dastlabki 20 ta hadi yig'indisini toping.
A) 540 B) 620
C) 670 D) 740

27. (a4-g21-11) Yig'indini hisoblang.
$16 + 19 + 22 + 25 + \ldots + 9n + 7$
A) $\frac{(3n-2)(9n+23)}{2}$
B) $(2n - 6)(9n + 23)$
C) $\frac{3(n-3)(5n+23)}{2}$
D) $3(n - 1)(9n + 23)$

28. (a4-g21-21) $25 + \cos 2x$ va $2\sin^2 x$ sonlari orasiga arifmetik progressiya hosil qiladigan shaklda 20 ta son yozilgan bo'lsa, bu progressiyaning hamma hadlari yig'indisini toping.
A) 240 B) 264
C) 260 D) 286

29. (a5-g2-12) $a - b$, $a + b$, $2a - b$ va 9 sonlari arifmetik progressiyaning ketma-ket to'rtta hadi bo'lsa, shu progressiyaning ilk 10 ta hadi yig'indisini toping.
A) 150 B) 120
C) 90 D) 100

30. (a5-g8-12) Yigirmanchi hadi 62 ga, o'ttiz oltinchi hadi – 2 ga teng bo'lgan arifmetik progressiyaning nechta hadi yig'indisi 0 ga teng?
A) 64 B) 72 C) 70 D) 80

31. (a5-g11-11) Yig'indini hisoblang.
$7 + 11 + 15 + 19 + \ldots + 12n - 1$
A) $18n^2 + 3n - 3$
B) $12n^2 - 2n - 4$
C) $12n^2 + 2n + 6$
D) $18n^2 - 3n - 3$

32. (a5-g14-1) x, y, va z lar ketma-ket juft sonlar bo'lsa, $x + 2y + z + 8$ ifoda quyidagilarning qaysi biriga teng?
A) $4x + 8$ B) $4y + 6$
C) $4y$ D) $4z$

33. (a5-g17-11) $b_n = 3n + 5 + 2^n$ ketma-ketlik berilgan. Shu ketma-ketlikning dastlabki 10 ta hadi yig'indisini toping.
A) 2261 B) 1238
C) 1653 D) 2496

34. (a5-g18-6) $1 + 5 + 9 + \ldots + (8n - 7) + (8n - 3) + (8n - 7) + \ldots + 9 + 5 + 1$ yig'indini hisoblang.
A) $16n^2 - 12n + 3$
B) $16n^2 - 4n$
C) $8n^2 + 4n - 7$
D) $8n^2 - 12n + 5$

35. (a5-g20-11) Yettiga karrali dastlabki yetmishta natural sonning yig'indisini toping.
A) 17395
B) 16905
C) 33810
D) 34790

36. (a6-g8-11) Arifmetik progressiyaning uchinchi va to'qqizinchi hadlarinning yig'indisi $10 - 4x + 2x^2$ uchhadning eng kichik qiymatiga teng. Bu arifmetik progressiyaning dastlabki o'n bitta hadi yig'indisini toping.
A) 88 B) 55
C) 34 D) 44

37. (a6-g10-11) Arifmetik progressiya hadlari uchun $a_{n+1} = 3n + 2c$ va $S_{21} = 714$ bo'lsa, c ni toping.
A) 2 B) –1 C) 5 D) –14

38. (a6-g13-19) $9 + 13 + 17 + 21 + \ldots + 4n + 1 = an^2 + bn + c$ bo'lsa, $a + b + c$ ning qiymatini toping.
A) 10 B) 5 C) 0 D) –5

39. (a6-g17-11) Arifmetik progressiyaning ilk uch hadi yig'indisi 90 ga, oxirgi uch hadi 510 ga teng. Shu progressiyaning hadlari yig'indisi 1600 ga teng bo'lsa, bu progressiyaning nechta hadi mavjud?
A) 12 B) 6 C) 8 D) 16

40. (a6-g18-14) Arifmetik progressiyaning birinchi, ikkinchi va beshinchi hadlari geometrik progressiyani tashkil etadi. Agar arifmetik progressiyaning ayirmasi 4 ga teng bo'lsa, shu progressiyaning beshta hadi yig'indisini toping.
A) 24 B) 20
C) 30 D) 50

41. (a6-g20-14) Yig'indini hisoblang:
$16 + 19 + 22 + 25 + \ldots + 9n + 7$.
A) $3(n-1)(9n+23)$
B) $(2n-6)(9n+23)$
C) $\frac{(3n-2)(9n+23)}{2}$
D) $\frac{3(n-3)(5n+21)}{2}$

42. (a6-g23-28) Umumiy hadi formulasi $a_n = 6n + 5$ bo'lgan arifmetik progressiyaning n ta hadi yig'indisi formulasini toping.
A) $3n^2 + 5n + 7$
B) $3n^2 + 8n$
C) $n^2 - 11n + 7$
D) $n^2 + 11n + 5$

55. Geometrik progressiya. Geometrik progressiyaning n-hadi

1. (a1-g9-12) Geometrik progressiyada ketma-ket uchta had $a-3$, $a+1$ va $a+7$ bo'lsa, a ning qiymatini toping
A) –12 B) 12
C) 11 D) –11

2. (a1-g14-13) a va b musbat sonlar. 4, a, b, 12 sonlarining ilk uchtasi geometrik progressiyani, oxirgi uchtasi arifmetik progressiyani tashkil qilsa, $b-a=?$
A) 1 B) 1,5
C) 2 D) 3

3. (a2-g15-14) Geometrik progressiyada $b_3=\frac{5}{2^4}$ va $b_6=\frac{2^2}{5^2}$ bo'lsa, b_1 ni toping.
A) $\frac{1}{5}$ B) $\frac{5^2}{2^6}$ C) $\frac{5^4}{2^5}$ D) $\frac{5^3}{2^8}$

4. (a3-g12-14) Geometrik progressiyada $b_4=\frac{3^3}{2^2}$ va $b_7=\frac{2}{3^3}$ bo'lsa, b_2 ni toping.
A) $\frac{3^7}{2^4}$ B) $\frac{1}{3}$
C) $\frac{3^5}{2^4}$ D) $\frac{3^9}{2^6}$

5. (a4-g6-12) Arifmetik progressiyaning birinchi, ikkinchi va to'rtinchi hadlari geometrik progressiyaning ketma-ket hadlari bo'lib qolmoqda. Geometrik progressiyaning maxrajini toping.
A) 0,5
B) 2
C) 4
D) aniqlab bo'lmaydi

6. (a5-g15-17) O'suvchi geometrik progressiya tashkil etuvchi uchta sondan ikkinchisi 9 ga teng. Bu son o'rniga 15 soni olinsa, uchta son arifmetik progressiyani tashkil etadi. Quyidagilardan qaysi biri arifmetik progressiyaning 4-hadi bo'ladi?
A) 81 B) 27
C) 45 D) 39

7. (a5-g22-11) Maxraji 2 ga teng bo'lgan geometrik progressiyaning ilk 10 ta hadi ko'paytmasining ilk 5 ta hadi ko'paytmasiga nisbatini toping.
A) 2^{25}
B) 2^5
C) 2^{15}
D) aniqlab bo'lmaydi

8. (a6-g2-11) a, b va c sonlari o'suvchi geometrik, a, $b+2$ va c sonlari esa arifmetik progressiyani tashkil etadi. Agar $a=1$ bo'lsa $a+b+c=?$
A) 11 B) 15
C) 13 D) 7

9. (a6-g3-11) Yig'indisi 312 ga teng bo'lgan uchta son o'suvchi geometrik progressiyani tashkil etadi. O'rtadagi hadga 48 qo'shilsa, bu uch son arifmetik progressiyaga aylanadi. Geometrik progressiyaning to'rtinchi hadini toping.
A) 288
B) 864
C) 648
D) 712

10. (a6-g6-11) Nolga teng bo'lmagan x, y va z sonlar ko'rsatilgan tartibda ishorasi o'zgaruvchi geometrik progressiyani, $2x+y$, $y+2z$ va $2z+4x$ sonlar esa arifmetik progressiyani tashkil etadi, geometrik progressiya maxrajini toping?
A) 3/2 B) –4
C) –3 D) –2

11. (a6-g11-9) Maxraji 3 ga teng bo'lgan geometrik progressiyaning n ta hadi yig'indisining $n-2$ ta hadining yig'indisiga nisbati 9,1 ga teng bo'lsa, n ni toping.
A) 81 B) 7
C) 4 D) 6

56. Geometrik progressiyaning xossalari

1. (a1-g1-10) Geometrik progressiyaning yettinchi hadi 2 ga teng. Shu progressiyaning ilk 9 ta hadi ko'paytmasining ilk to'rtta hadi ko'paytmasiga nisbatini toping.
A) 16 B) 32
C) 81 D) 27

2. (a1-g13-14) Hadlari musbat bo'lgan geometrik progressiyaning ilk uch hadi yig'indisi 49 ga teng. Agar shu progressiyaning ilk uch hadiga mos ravishda 3, 6 va 2 sonlarini qo'shsak, arifmetik progressiya hosil bo'ladi. Geometrik progressiyaning ilk uch hadi ko'paytmasi nechaga teng?
A) 5^3 B) 11^3
C) 12^3 D) 14^3

3. (a1-g16-12) O'suvchi geometrik progressiya tashkil etuvchi uchta sondan uchinchisi 16 ga teng. Bu son o'rniga 12 soni olinsa, uchta son arifmetik progressiyani tashkil etadi. Shu progressiyaning birinchi hadini toping?
A) 4 B) 6 C) 8 D) 2

4. (a2-g23-13) Maxraji 2 ga teng bo'lgan geometrik progressiyaning o'ninchi hadining oltinchi hadiga nisbatini toping.
A) 64 B) 32
C) 8 D) 16

5. (a4-g8-14) Geometrik progressiyada $b_4=\frac{3^7}{2^5}$ va $b_8=\frac{3^{11}}{2^{13}}$ bo'lsa, b_2 ni toping.
A) $\frac{3^5}{2}$ B) $\frac{3}{4}$
C) $\frac{3}{2}$ D) $3^3\cdot 2$

6. (a4-g24-11) b_n – geometrik progressiyaning 16-hadidan 24-hadigacha bo'lgan sonlar ko'paytmasi quyidagilardan qaysi biriga teng?
A) a_{20}^9
B) $a_{20}^{4.5}$
C) $(a_{21}\cdot a_{20})^{4.5}$
D) $(a_{21}\cdot a_{20})^9$

7. (a5-g6-12) 12 va 18 sonlari orasiga shu sonlar bilan birgalikda geometrik progressiya hosil qiluvchi 12 ta son joylashtirildi. Shu sonlar ko'paytmasini toping.
A) 6^{18} B) 6^{36}
C) 6^{19} D) 6^{38}

8. (a5-g7-12) Hadlari musbat sonlardan iborat geometrik progressiyaning 12- va 7-hadlari yig'indisi shu progressiyaning 10- va 5-hadlari yig'indisidan 9 marta katta bo'lsa, bu progressiyaning maxraji nechaga teng?
A) $\sqrt{3}$ B) $\sqrt[3]{9}$
C) $\sqrt[3]{3}$ D) 3

9. (a5-g10-11) Geometrik progressiyaning yettinchi hadi uchinchi hadidan x marta katta. Bu progressiyaning 8-hadi 2-hadidan necha marta katta?
A) $\sqrt[4]{x}$ B) $x^2\sqrt[4]{x}$
C) $x\sqrt{x}$ D) x^2

10. (a5-g24-11) O'nta haddan iborat geometrik progressiyaning dastlabki 5 ta hadi yig'indisi 8 ga, oxirgi 5 ta hadi yig'indisi 1944 ga teng. Progressiyaning birinchi hadini toping.
A) $\frac{8}{81}$ B) $\frac{8}{121}$
C) $\frac{1}{5}$ D) $\frac{4}{47}$

11. (a6-g16-15) O'suvchi geometrik progressiya tashkil etuvchi uchta sondan ikkinchisi 9 ga teng. Bu son o'rniga 15 soni olinsa, uchta son arifmetik progressiyani tashkil etadi. Quyidagilardan qaysi biri arifmetik progressiyaning 4-hadi bo'ladi?
A) 81 B) 27
C) 45 D) 39

57. Geometrik progressiyaning dastlabki n ta hadi yig'indisi

1. (a3-g5-13) Geometrik progressiyaning maxraji 3 ga, dastlabki to'rtta hadlari yig'indisi 40 ga teng. Uning to'rtinchi hadini toping.
A) 81 B) 24 C) 27 D) 54

2. (a3-g7-12) Dastlabki 7 ta hadining yig'indisi 62, dastlabki 8 ta hadining yig'indisi 126 va maxraji 2 ga teng geometrik progressiyaning birinchi hadini toping.
A) 1 B) 2 C) 0,5 D) 4

3. (a3-g14-13) Sakkizta haddan iborat geometrik progressiyaning dastlabki 4 ta hadi yig'indisi 13 ga, oxirgi 4 ta hadi yig'indisi 1053 ga teng. Birinchi hadni toping.

A) $\frac{7}{80}$ B) $\frac{13}{40}$ C) $\frac{3}{10}$ D) $\frac{23}{60}$

4. (a3-g23-12) Hadlari musbat bo'lgan geometrik progressiyaning ilk uch hadi yig'indisi 44 ga teng. Agar shu progressiyaning ilk uch hadiga mos ravishda 1, 4 va 5 sonlarini qo'shsak, arifmetik progressiya hosil bo'ladi. Geometrik progressiyaning ilk uch hadi ko'paytmasi nechaga teng?

A) 5^3 B) 14^3 C) 12^3 D) 11^3

5. (a4-g2-12) O'nta haddan iborat geometrik progressiyaning dastlabki 5 ta hadi yig'indisi 7 ga, oxirgi 5 ta hadi yig'indisi 1701 ga teng. Progressiyaning birinchi hadini toping.

A) $\frac{1}{13}$ B) $\frac{7}{97}$ C) $\frac{7}{121}$ D) $\frac{7}{243}$

6. (a4-g10-12) Dastlabki 5 ta hadining yig'indisi 62, dastlabki 6 ta hadining yig'indisi 126 va maxraji 2 ga teng geometrik progressiyaning birinchi hadini toping.

A) 1 B) 8 C) 4 D) 2

7. (a4-g19-12) $2^{20} + 2^{19} + 2^{18} + \ldots + 1$ yig'indini hisoblang.

A) 2^{21} B) $2^{20} - 1$
C) $2^{20} + 0{,}5$ D) $2^{21} + 1$

8. (a4-g20-12) Dastlabki 5 ta hadining yig'indisi 242 va maxraji 3 ga teng geometrik progressiyaning to'rtinchi hadini toping.

A) 486 B) 162
C) 54 D) 27

9. (a5-g13-11) Hadlari musbat sonlardan iborat kamayuvchi geometrik progressiyaning ilk uch hadi yig'indisi 57 ga teng. Agar shu progressiyaning o'rtadagi hadiga 1,5 qo'shilsa, bu sonlar arifmetik progressiyaning ketma-ket hadlariga aylanadi. Agar Geometrik progressiya cheksiz kamaysa, uning hadlari yig'indisi nechaga teng bo'ladi?

A) 40,5 B) 19,5
C) 38 D) 81

10. (a5-g14-11) Quyidagi mulohazalardan qaysi biri to'g'ri?

A) Birinchi hadi musbat bo'lgan cheksiz kamayuvchi geometrik progressiyaning yig'indisi doimo musbat bo'ladi.
B) Maxraji manfiy bo'lgan geometrik progressiya kamayuvchi hisoblanadi.
C) Ayirmalari teng arifmetik progressiyalarning n ta hadlari yig'indisi teng bo'ladi.
D) O'suvchi arifmetik progressiyaning ixtiyoriy hadi kvadrati doimo o'zidan oldingi ixtiyoriy had kvadratidan katta bo'ladi.

11. (a5-g16-13) $0 < a < 1$ va $a + a^2 + a^3 + \ldots = 8a$ bo'lsa

A) 0,25
B) 0,125
C) 0,75
D) 0,875

12. (a5-g19-11) Cheksiz kamayuvchi geometrik progressiyaning yig'indisi 96 ga teng. Ushbu progressiyaning ilk uch hadi yig'indisi 94,5 ga teng. Shu progressiyaning maxrajini toping.

A) 0,25 B) 0,(3)
C) 0,5 D) 0,(6)

13. (a6-g4-11) 8 haddan iborat geometrik progressiyaning ilk to'rt hadi yig'indisi 18 ga, keyingi to'rttasining yig'indisi esa 1458 ga teng. Shu progressiyaning birinchi hadini toping.

A) 0,9 B) 0,6
C) 3 D) 0,45

14. (a6-g19-11) Birinchi hadi maxrajiga teng bo'lgan cheksiz kamayuvchi geometrik progressiyaning yig'indisi 7 ga teng. Shu progressiyaning ikkinchi hadini toping.

A) $\frac{49}{64}$ B) $\frac{7}{8}$

C) $\frac{6}{7}$ D) $\frac{36}{49}$

58. Cheksiz kamayuvchi geometrik progressiya

1. (a1-g5-13) Hadlari musbat sonlardan iborat cheksiz kamayuvchi geometrik progressiyaning hadlari yig'indisi 40,5 ga, ilk 3 ta hadi yig'indisi 39 ga teng. Shu progressiyaning to'rtinchi hadini toping.

A) 4 B) 3 C) 2 D) 1

2. (a1-g11-14) Hadlari musbat bo'lgan cheksiz kamayuvchi geometrik progressiyaning ikkinchi hadi $\sqrt{2}$ ga va to'rtinchi hadi $\frac{1}{\sqrt{2}}$ ga teng. Ushbu progressiyaning hadlari yig'indisini toping.

A) $3 + 4\sqrt{2}$ B) $\frac{4}{3}$

C) $4 + 2\sqrt{2}$ D) $2\sqrt{2} + 2$

3. (a1-g15-13) Hadlari musbat sonlardan iborat cheksiz kamayuvchi geometrik progressiyaning hadlari yig'indisi 8 ga, ilk 4 ta hadi yig'indisi 7,5 ga teng. Shu progressiyaning uchinchi hadini toping.

A) 2 B) 4 C) 8 D) 1

4. (a3-g1-13) Hadlari musbat sonlardan iborat cheksiz kamayuvchi geometrik progressiyaning hadlari yig'indisi 81 ga, ilk 4 ta hadi yig'indisi 80 ga teng. Shu progressiyaning uchinchi hadini toping.

A) 54 B) 9 C) 27 D) 6

5. (a3-g11-13) Hadlari musbat sonlardan iborat cheksiz kamayuvchi geometrik progressiyaning yig'indisi 81 ga, ilk 4 hadi yig'indisi 80 ga teng. Shu progressiyaning ikkinchi hadini toping.

A) 20 B) 15
C) 18 D) 20

6. (a3-g20-20) Quyidagi mulohazalardan qaysilari to'g'ri?

1) Geometrik progressiyaning maxraji manfiy bo'lsa, bu progressiya kamayuvchi bo'ladi.
2) Funksiyaning grafigi OY o'qiga nisbatan simmetrik bo'lsa, bu funksiya juft.
3) $y = \log_2 x$ funksiyaning grafigi faqatgina I, IV choraklardan o'tadi.
4) Birlik aylanada burchakning OX o'qida hosil qilgan soyasi uzunligi shu burchakning kosinusini ifodalaydi.
5) Funksiyaning hosilasi noldan kichik bo'lgan oraliqlarda argumentning qiymati ortganda funksiyaning qiymati ham ortadi.

A) 2, 3, 4
B) 1, 3, 5
C) 2, 3, 5
D) 1, 4, 5

7. (a4-g25-12) $\frac{1}{4}\cdot\frac{1}{5} + \frac{1}{16}\cdot\frac{1}{25} + \frac{1}{64}\cdot\frac{1}{125} + \ldots$ cheksiz kamayuvchi geometrik progressiyaning yig'indisini toping.

A) $\frac{1}{21}$ B) $\frac{1}{20}$

C) $\frac{1}{19}$ D) $\frac{1}{25}$

8. (a6-g21-25) Umumiy hadi formulasi $a_n = \frac{3^n}{4^{n-1}}$ bo'lgan cheksiz kamayuvchi progressiyaning yig'indisini toping.

A) 1,8 B) 0,25
C) 2,25 D) 4,5

11-bob. Matnli masalalar

59. Sodda mushohada

1. (a1-g3-24) Soat 7:30 da soat va minut millari orasidagi burchak necha gradusni tashkil qiladi?

A) 30° B) 60°
C) 45° D) 150°

2. (a1-g4-14) Go'zal ikki yil oldin, Dono 2 yil kechroq tug'ilganda ularning yoshlari orasidagi farq 7 ga teng bo'lardi. Dono va Go'zalning hozirgi yoshlari yig'indisi 9 ga teng va Go'zal Donodan katta bo'lsa, Dononing hozirgi yoshini toping.

A) 7 B) 5
C) 3 D) 2

3. (a1-g6-14) Otaning yoshi uchta farzandlari yoshi yig'indisidan 3 marta katta. 4 yildan keyin otaning yoshi farzandlari yoshlari yig'indisidan 2 marta katta bo'lib qoladigan bo'lsa, otaning hozirgi yoshini toping.
A) 51 B) 45 C) 30 D) 60

4. (a1-g8-2) Aka-ukaning yoshlari farqi 5 yosh. Akasi ukasining yoshida bo'lgan vaqtda ikkisining yoshlari yig'indisi 23 ga teng bo'lgan. Akaning hozirgi yoshini toping.
A) 14 B) 19 C) 23 D) 28

5. (a1-g9-1) Bitta tuxumfurush tuxumlarni 4 tadan, 5 ta dan va 6 tadan sotganda har safar 2 tadan tuxum sotilmay qolib ketyapti. Bu tuxumfurushning eng kamida nechta tuxumi bor?
A) 42 B) 62 C) 92 D) 122

6. (a1-g14-14) Otaning yoshi 2 ta bolasi yoshlari yig'indisidan 26 ga katta. 2 yildan keyin otaning yoshi bolalarining yoshlari yig'indisining ikki martasidan 6 ga kam bo'lsa, bolalarning hozirgi yoshlari yig'indisini toping.
A) 18 B) 22 C) 26 D) 30

7. (a1-g15-25) 80 minutda soatning soat mili necha gradusga buriladi?
A) 480° B) 192°
C) 40° D) 96°

8. (a1-g17-15) Onasi va qizining yoshlari yig'indisi 48. Onasi qizining yoshida bo'lganida, qizining tug'ilishiga hali 6 yil bor edi. Onasi qizi tug'ilganda necha yosh bo'lgan?
A) 14 B) 18 C) 20 D) 22

9. (a2-g2-15) Qizi tug'ilganida onasi 28 yosh edi. Hozir esa onaning yoshi qizinikidan 5 marta katta. Onaning hozirgi yoshini toping.
A) 32 B) 40 C) 35 D) 36

10. (a2-g3-11) Soatning minut mili 600° ga aylanganda, uning soat mili necha gradusga buriladi?
A) 30° B) 40° C) 45° D) 50°

11. (a2-g4-15) Fermadagi tovuqlar soni qo'ylar sonidan 2 marta ko'p. Agar u yerdagi hayvonlar oyoqlari sonining yig'indisi 600 ta bo'lsa, fermada nechta tovuq mavjud?
A) 104 B) 75
C) 150 D) 136

12. (a2-g5-14) Aka va ukaning yoshlari farqi 10 yosh. Uch yildan keyin aka ukasidan 1,5 marta katta bo'lib qolsa, aka va ukaning hozirgi yoshlari yig'indisini toping.
A) 36 B) 40 C) 44 D) 48

13. (a2-g11-15) Og'li tug'ilganida ota 32 yosh edi. Hozir esa otaning yoshi og'linikidan 3 marta katta. Otaning hozirgi yoshini toping.
A) 48 B) 40 C) 54 D) 64

14. (a2-g12-9) Yerda og'irligi 1 birlik bo'lgan jismning Oydagi og'irligi 0,16 birlikka teng. Oyda jismning og'irligi 32 birlik bo'lishi uchun uning Yerdagi og'irligi qancha bo'lishi kerak?
A) 100 B) 200
C) 150 D) 250

15. (a2-g12-10) Futbol chempionatida jamoalarning barchasi bir-biri bilan bir martadan o'yin o'ynashdi. Hammasi bo'lib 91 ta o'yin o'tkazilgan bo'lsa, chempionatda nechta jamoa ishtirok etgan?
A) 12 B) 13 C) 14 D) 15

16. (a2-g13-11) Ali bilan Vali bir qozon ovqatni 6 daqiqada yeb bo'ladi. Bir qozon ovqatni Vali bilan G'ani 12 daqiqada yeb bo'ladi. Ali bilan G'ani esa 8 daqiqada yeb bo'ladi. Ularning uchalasi uch qozon ovqatni necha daqiqada yeb bo'ladi?
A) $\frac{16}{3}$ B) 8 C) 4 D) 16

17. (a2-g14-3) Fermadagi qo'ylar soni sigirlar sonidan 5 marta ko'p. Ularning umumiy soni quyidagilardan qaysi biriga teng bo'la olmaydi?
A) 1524 B) 3150
C) 2598 D) 1406

18. (a2-g20-25) Bir fermada 1800 ta qo'y, 1200 ta sigir va 600 ta echki bor. Agar bu hayvonlar doira shaklidagi grafikda ko'rsatilsa, sigirlarni ko'rsatuvchi bo'lakning burchagi necha gradus bo'ladi?
A) 120 B) 90
C) 60 D) 150

19. (a3-g4-14) Arslon 2 yil oldin, Po'lat 3 yil keyin tug'ilganida, hozir Arslon Po'latdan 2 marta katta bo'lardi. 11 yil oldin Arslonning yoshi Po'latning yoshidan 3 marta katta bo'lgan bo'lsa, Po'latning hozirgi yoshini toping.
A) 14 B) 20 C) 30 D) 68

20. (a3-g6-14) Otaning yoshi o'g'linikidan 4 marta katta. O'n olti yildan so'ng otasi o'g'lidan ikki marta katta bo'ladigan bo'lsa, o'g'ilning yoshini toping.
A) 4 B) 10 C) 8 D) 6

21. (a3-g7-14) Sinfda 14 ta bola bor. Ular bir-birlari bilan salomlashib ko'rishishdi. Umumiy salomlashishlar soni nechta?
A) 91 B) 192
C) 98 D) 84

22. (a3-g10-15) Qizi tug'ilganida onasi 24 yosh edi. Hozir esa onaning yoshi qizinikidan 4 marta katta. Onaning hozirgi yoshini toping.
A) 30 B) 32 C) 36 D) 42

23. (a3-g13-14) Ota va bola yoshlari farqi 28 ga teng. Besh yildan keyin ota o'g'lidan 4,5 marta katta bo'lsa, ota-bolaning hozirgi yoshlari yig'indisini toping.
A) 34 B) 40 C) 44 D) 38

24. (a3-g16-15) Suv idishining yettidan ikki qismi suv bilan to'la. Agar idishga 30 litr suv quyilsa, idishning yarmi to'ladi. Idishning hajmi necha litr?
A) 140 B) 133
C) 126 D) 154

25. (a4-g3-1) Qopdagi yong'oqlarni 2 tadan, 3 tadan, 5 tadan, 6 tadan va 7 tadan sanaganda har doim 1 ta yong'oq ortib qolgan bo'lsa, bu qopda eng kamida qancha yong'oq bor?
A) 61 B) 71
C) 211 D) 141

26. (a4-g6-14) Bir ishni Abdurauf 10 soatda, Botir 15 soatda, Shamsiddin 12 soatda tugatadi. Ular uchchalasi 3 soat birga ishlagandan keyin Abdurauf ketib qolsa, qolgan ishni Botir va Shamsiddin necha soatda tugatishadi?
A) 2 soat 20 daqiqa
B) 2 soat
C) 1 soat 40 daqiqa
D) 2 soat 40 daqiqa

27. (a4-g10-13) Nonga navbatda turgan Abdurahmondan navbatda nechta odam bor deb so'raldi. U: «Oldimdagilar orqamdagilarning to'rtdan biridan 15 ta ko'p, men esa navbatning o'rtasidaman» – deb javob berdi. Abdurahmon nechanchi navbatda turibdi?
A) 41 B) 21 C) 40 D) 20

28. (a4-g12-15) Savdogar olgan molini 20% foyda bilan sotishni mo'ljallagan edi. Xaridor bilan savdolashish natijasida molni mo'ljallagan narxidan 3000 so'm arzonroq sotdi. Keyinroq hisoblab qarasa, bu savdodan u 5% zarar ko'rganligini aniqladi. Savdogar molni qanchaga sotgan?
A) 11400 B) 12000
C) 13400 D) 10000

29. (a4-g13-24) Bir guruhdagi o'g'il bolalar soni qizlar sonidan 8 marta ko'p bo'lsa, guruhdagi qizlar va og'il bolalarning umumiy soni quyidagilardan qaysi biriga teng bo'la olmaydi?
A) 10215 B) 4005
C) 1206 D) 7106

30. (a4-g15-13) Guli Dilfuzaga: «Pulimdan 5000 so'm olsang, sening puling menikidan 1000 so'm ko'p bo'ladi», – dedi. Dilfuza esa Guliga: «Sen mening pulimdan 2000 so'm olsang, pulim senikining yarmidan 1000 so'm ko'p bo'ladi», – dedi. Dilfuzanining qancha puli bor?
A) 17000 B) 22000
C) 26000 D) 13000

31. (a4-g17-13) Otaning yoshi uch nafar farzandlari yoshlari yig'indisidan 12 ga katta. Necha yildan keyin farzandlar yoshlarining yig'indisi otaning yoshiga teng bo'ladi?
A) 12 B) 8 C) 6 D) 4

32. (a4-g20-13) Matematika xonasida o'quvchilar partalariga 2 tadan o'tirsa, 7 ta o'quvchi joysiz qoladi. 3 tadan o'tirsa, 2 ta parta bo'sh qoladi. Agar o'quvchilar partaga 4 tadan o'tirishsa, yana nechta o'quvchiga joy yetarli bo'ladi?
A) 19 B) 7 C) 15 D) 12

33. (a5-g4-13) Tayoq 24 ta teng bo'lakka bo'lindi. Agar shu tayoq 30 ta teng bo'lakka bo'linganda bo'laklar 6 sm qisqaroq bo'lardi. Tayoqning uzunligi necha m?
A) 9 B) 7,2 C) 9,6 D) 6

34. (a5-g6-13) a yil oldin Nargiz x yoshda bo'lsa, b yildan keyin necha yosh bo'ladi?
A) $x + a - b$
B) $x - a + b$
C) $x - a - b$
D) $a + x + b$

35. (a5-g7-13) Durdona ikki yil oldin, Shoira ikki yil keyin tug'ilganida, Durdona Shoiradan 1,5 marta katta bo'lar edi. Agar ularning hozirgi yoshlari yig'indisi 35 ga teng bo'lsa, Shoiraning yoshi nechada?
A) 12 B) 16 C) 20 D) 21

36. (a5-g8-13) Uch o'quvchining o'rtacha balli 72,6 ga teng, boshqa ikki o'quvchining o'rtacha balli 76,1ga teng. Bu besh o'quvchining o'rtacha balli nechaga teng?
A) 74,0 B) 73,4
C) 74,35 D) 75,2

37. (a5-g11-12) 81 yoshli ota o'g'lining yoshida bo'lganida uning yoshi o'g'lining yoshidan 2 marta katta edi. O'g'ilning hozirgi yoshini toping.
A) 27 B) 39 C) 45 D) 54

38. (a5-g16-11) Ikki shamdan uzuni 12 soatda, qisqasi 15 soatda yonib bo'ladi. Bu shamlar bir vaqtda yoqilgach besh soatdan so'ng ularning uzunliklari teng bo'lib qoldi. Shamlarning yonmasdan oldingi uzunliklari nisbatini toping.
A) 2 B) $\frac{13}{8}$ C) $\frac{9}{7}$ D) $\frac{8}{7}$

39. (a5-g18-14) Ko'p qavatli uyning 4-qavatigacha bo'lgan masofa 12 metr. Shu uyning 12-qavatigacha bo'lgan masofa necha metr?
A) 48 B) 44 C) 36 D) 33

40. (a5-g22-12) Otaning yoshi uch nafar farzandi yoshlari yig'indisidan 24 ga ortiq. Necha yildan so'ng otaning yoshi farzandlari yoshlari yig'indisiga teng bo'ladi?
A) 8
B) 12
C) aniqlab bo'lmaydi
D) 24

41. (a6-g5-11) 20 metr balandlikdan tashlangan koptok har safar avvalgi balandligining 0,8 qismiga ko'tariladi. Koptok yerga uchinchi urilishidan so'ng qanday balandlikka ko'tariladi?
A) 12,8 B) 10,24
C) 8,192 D) 16

42. (a6-g10-12) Bunyodkor va Paxtakor klublarining 11 tadan o'yinchilari va 3 ta hakam maydonga tushgach, har bir klub o'yinchisi raqib o'yinchilari hamda hakamlar bilan qo'l berib so'rashdilar. Agar o'yinchilar o'z klubi a'zosi bilan qo'l berib so'rashmagan hamda hakamlar ham o'zaro so'rashmagan bo'lsalar, jami so'rashishlar soni nechta bo'lgan?
A) 154 B) 308
C) 187 D) 196

43. (a6-g11-14) Alining soati har soatda 2 daqiqa ortda qoladi. Valiniki esa har soatda 1 daqiqa oldinlab ketadi. Agar ular 24-may soat 10:00 da soatlarini to'g'rilab olishgan bo'lsa, qachon ularning soatlari bir xil vaqtni ko'rsatadi (ikkalasida ham strelkali soat)?
A) 13-iyun soat 10:00
B) 3-iyun soat 10:00
C) 4-iyun soat 10:00
D) 14-iyun 10:00

44. (a6-g19-17) Ozoda sinf ro'yxatida 13-o'rinda, orqadan sanaganda 17-o'rinda. Ozoda o'qiydigan sinfda nechta o'quvchi mavjud?
A) 30 B) 31 C) 29 D) 28

45. (a6-g19-24) Malohat Gulhayodan 12 yosh katta. 8 yil oldin Malohat Gulhayodan 3 marta katta bo'lgan bo'lsa, ularning hozirgi yoshlari yig'indisini toping.
A) 24 B) 32 C) 36 D) 40

46. (a6-g21-9) 90. Bu besh o'quvchining o'rtacha balini hisoblang.
A) 80,8 B) 82,(3)
C) 78,2 D) 84

47. (a6-g24-29) 4 yil avval Alining yoshi Muxtorning yoshidan ikki marta katta edi. 6 yildan keyin Alining yoshi Muxtornikidan 8 ga ortiq bo'ladigan bo'lsa, Muxtorning hozirgi yoshini toping.
A) 20 B) 12 C) 24 D) 16

48. (a6-g25-9) Ikkita ikki xonali sonlarning ko'paytmasi 1296 ga teng. Shu sonlardan birining oxirgi raqami 8 dan 6 ga o'zgartirilsa, ko'paytma 1242 ga teng bo'ladi. Ko'paytuvchilarni toping.
A) 16 va 81
B) 72 va 18
C) 48 va 27
D) 24 va 54

49. (a6-g26-12) Abdullo Ziloladan 12 yosh katta. 12 yil oldin Abdullo Ziloladan 3 marta katta bo'lgan bo'lsa, ularning hozirgi yoshlari yig'indisini toping.
A) 48 B) 32 C) 24 D) 40

60. Qismlarda doir masalalar

1. (a1-g3-27) Bir qarzdor avval qarzining 1/3 qismini, keyinroq qolgan qismining yarmini to'ladi. Qarzdor yana 300 so'm to'lab, qarzidan to'la qutildi. Uning qarzi necha so'm bo'lgan?
A) 1200 B) 1000
C) 800 D) 900

2. (a1-g5-14) Kasrning qiymati $\frac{3}{5}$ ga teng. Agar kasrning suratiga 15, maxrajiga 5 qo'shilsa, uning qiymati $\frac{9}{10}$ ga teng bo'lib qoladi. Kasrning maxraj va surati ayirmasini toping.
A) 4 B) 10 C) 16 D) 14

3. (a1-g13-15) Guruhdagi o'quvchilar ichida qizlar sonining barcha o'quvchilar soniga nisbati 3/7 ga teng. Guruhga 5 qiz va 5 bola kelgandan so'ng barcha o'quvchilar soni 38 ta bo'ldi. Dastlab o'g'il bolalar soni nechta edi?
A) 12 B) 16 C) 28 D) 38

4. (a3-g2-15) Abror pulining $\frac{2}{5}$ qismini kitob do'konida sarfladi, qolgan pulining $\frac{2}{3}$ qismiga do'stlari bilan restoranda ovqatlandi, undan qolganining $\frac{7}{10}$ qismiga esa onasi uchun sovg'a sotib oldi. Shundan so'ng unda 15000 so'm pul qolgan bo'lsa, u restoranda qancha sarflagan?
A) 100000 B) 80000
C) 250000 D) 35000

5. (a3-g8-13) $\frac{4}{3}$ va 108 sonlari orasiga uchta musbat son shunday qo'yilganki, u sonlar berilgan sonlar bilan birgalikda geometrik progressiya hosil qiladi. Qo'yilgan sonlar yig'indisini toping.
A) 56 B) 52 C) 49 D) 48

6. (a3-g20-13) Nozima uy ishiga berilgan savollarning $\frac{1}{6}$ qismini o'rtoqlaridan so'rab yechdi. Qolgan qismining $\frac{3}{5}$ qismini o'qituvchisidan so'rab yechdi. Qolgan 52 ta savolni o'zi mustaqil yechdi. Nozimaga nechta savol uy ishiga berilgan?
A) 108 B) 138
C) 144 D) 156

7. (a4-g1-14) Hovuzdagi suvning 5/9 qismini nasos yordamida 6 minutda chiqarish mumkin. Nasos 0,15 soat ichida hovuzdagi suvning qancha qismini chiqarish mumkin?
A) $\frac{5}{6}$ B) $\frac{6}{15}$ C) $\frac{5}{15}$ D) $\frac{7}{30}$

8. (a4-g3-13) To'rt kishi do'kondan 6000 so'mlik savdo qilishdi. Birinchi kishi qolgan uch kishi to'lagan pulning yarmini to'ladi. Ikkinchi kishi qolgan uch kishi to'lagan pulning uchdan birini to'ladi. Uchinchi kishi qolgan uch kishi to'lagan pulning to'rtdan birini to'ladi. To'rtinchi kishi necha pul to'lagan?
A) 1000 B) 1200
C) 1300 D) 1400

9. (a4-g3-14) Traktorning orqa g'ildiragining radiusi old g'ildiragi radiusidan 8/7 marta katta. Traktor 168 m yo'l yurganda, old g'ildirak orqa g'ildirakdan 10 ta ko'p aylangan bo'lsa, old g'ildirakning diametri necha sm? ($\pi = 3$)
A) 80 B) 40 C) 35 D) 70

10. (a4-g5-12) Yuk mashinasi yuki bilan birgalikda a kg. Yukning chorak qismi tushirilgach, massasi b kg ga teng bo'lib qoldi. Yuksiz mashinaning massasi quyidagilardan qaysi biriga teng?
A) $\frac{4b-a}{3}$ B) $4b-3a$
C) $4a-b$ D) $3b-4a$

11. (a5-g1-13) Bir sinfning 5 dan 2 qismi qizlardan iborat. Shu sinfga yana 2 ta o'g'il bola qo'shilgach qizlar sinfning 8 dan 3 qismini tashkil qildi. Dastlab sinfda nechta o'quvchi bo'lgan?
A) 80 B) 32 C) 30 D) 40

12. (a5-g13-12) Tashkilotdagi ishchilarning 2/3 qismi ayollar. Erkak ishchilarning 3/5 qismi oilali va 12 nafari uylanmagan bo'lsa, tashkilotda nechta ishchi ishlamoqda?
A) 90 B) 72 C) 60 D) 50

13. (a6-g6-13) Malika maktabga borish uchun uyidan chiqdi, yo'lning $\frac{4}{9}$ qismini bosib o'tgach matematika kitobini unutganini sezib qolibdi. Malika uyga borib kitobini olib qaytib, maktabga o'z vaqtida yetib borishi uchun endi u o'z tezligini necha marta oshirishi kerak?
A) $\frac{13}{5}$ B) $\frac{13}{9}$ C) $\frac{14}{5}$ D) $\frac{9}{5}$

14. (a6-g7-12) A miqdor pul 12 ta odamga bo'lib berilishi kerak edi. Bu odamlardan 3 tasi kelmay qolgani sababli pul boshqalarga teng miqdorda bo'lib berildi. Shu holda har bir odamning oladigan ulushi A ning qancha qismi miqdorida ortgan?
A) $\frac{1}{36}$
B) $\frac{1}{4}$
C) $\frac{1}{72}$
D) $\frac{1}{108}$

61. To'g'ri va teskari proporsionallikka doir masalalar

1. (a1-g2-13) To'rtta sonning yigindisi 102 ga teng. Agar birinchi va ikkinchi sonning nisbati 3:2 kabi, ikkinchi va uchinchi sonning nisbati 2:5 kabi, uchinchi va to'rtinchi sonlarning nisbati 5:7 kabi bo'lsa, to'rtinchi va birinchi sonlarning ayirmasini toping.
A) 12 B) 42 C) 32 D) 24

2. (a2-g16-14) a va b sonlari 3 va 4 ga to'g'ri proporsional. b va c sonlari 2 va 5 sonlariga teskari proporsional. Bu uch sonning yig'indisi 86 ga teng bo'lsa, b ni toping.
A) 36 B) 40
C) 30 D) 20

3. (a3-g1-14) a va b sonlari 4 va 7 sonlariga proporsional. a va c sonlari esa 5 va 8 sonlariga teskari proporsional. Bu uch sonning yig'indisi 81 ga teng. b sonini toping.
A) 24 B) 42 C) 15 D) 9

4. (a3-g8-14) To'rtta sonning yig'indisi 161 ga teng. Ulardan dastlabki uchtasi 4; 5 va 8 to'g'ri sonlariga proporsional. Ikkinchi va to'rtinchi sonlar esa 6 va 5 ga teskari proporsional. Uchinchi sonni toping.
A) 72 B) 64
C) 48 D) 56

5. (a3-g18-15) Uchta sonning yig'indisi 188 ga teng. Bu sonlardan birinchisining ikkinchisiga nisbati 4:9, ikkinchisining uchinchisiga nisbati 6:7 bo'lsa, bu sonlardan kattasini toping.
A) 72 B) 84
C) 32 D) 96

6. (a4-g2-13) Yig'indisi 231 ga teng bo'lgan 4 ta sondan ilk uchtasi 2; 3 va 4 sonlariga teskari proporsional. Oxirgi ikkitasi esa 10 va 8 sonlariga to'g'ri proporsional. Bu sonlardan eng kattasining qiymatini toping.
A) 97,5 B) 82,5
C) 90 D) 75

7. (a4-g7-14) Dilnoza to'rtta son o'yladi. Ulardan ilk uchtasi 9; 7 va 12 sonlariga to'g'ri proporsional. Oxirgi ikkitasi 5 va 3 sonlariga teskari proporsional. Agar bu sonlarning yig'indisi 288 ga teng bo'lsa, Dilnoza o'ylagan to'rtinchi sonni toping.
A) 54 B) 72
C) 42 D) 120

8. (a5-g22-13) To'rt sondan ilk uchtasi 7; 5 va 9 sonlariga to'g'ri proporsional. Ikkinchi va to'rtinchi sonlar 9 va 15 sonlariga teskari proporsional. Agar bu sonlarning yig'indisi 72 ga teng bo'lsa, to'rtinchi sonni toping.
A) 27
B) 21
C) 21
D) 9

62. Masshtabga doir masalalar

1. (a4-g25-13) Sayyohlar xaritada 21 sm ga teng bo'lgan masofani bosib o'tishlari kerak. Xaritaning masshtabi 1:3 000 000 va sayyohlar mashinasining o'rtacha tezligi 70 km/soat bo'lsa, ular bu masofani necha soatda bosib o'tadilar?
A) 9 B) 7 C) 3,5 D) 4,5

2. (a6-g5-12) Mahmudjonga dadasi sovg'a qilgan globusning masshtabi 1:40000000. Agar yerning radiusi 6400 km bo'lsa, globusning ekvatori uzunligi necha sm bo'ladi?
A) 16π B) 32π
C) 64π D) 48π

3. (a6-g15-21) Sayyohlar xaritada 15 sm ga teng bo'lgan masofani bosib o'tishlari kerak. Xaritaning masshtabi 1:1500000 va sayyohlar mashinasining o'rtacha tezligi 90 km/soat bo'lsa, ular bu masofani necha soatda bosib o'tadilar?
A) 3 B) 2,5
C) 3,5 D) 2

4. (a6-g20-12) Sayyohlar xaritada 14 sm ga teng bo'lgan masofani bosib o'tishlari kerak. Xaritaning masshtabi 1:2000000 va sayyohlar mashinasining o'rtacha tezligi 80 km/soat bo'lsa, ular bu masofani necha soatda bosib o'tadilar?
A) 3,5 B) 2,5
C) 3 D) 2

63. Tenglamalar va tenglamalar sistemasi yordamida yechiladigan masalalar

1. (a1-g8-17) Bir necha sonning arifmetik o'rtachasi ularning soniga teng. Agar bu sonlarning har biriga 2 qo'shilsa, ularning arifmetik o'rtachasi 10 ga teng bo'lib qoladi. Nechta son borligini aniqlang.
A) 10 B) 8 C) 6 D) 12

2. (a1-g9-14) 2 ta tufli, 3 ta futbolka va 4 ta paypoq 67000 so'm turadi. 2 ta tufli, 4 ta futbolka va 6 ta paypoq 92000 so'm bo'lsa, 1 ta tufli, 1 ta futbolka va 1 ta paypoq necha so'm turadi?
A) 18000
B) 20000
C) 21000
D) 40000

3. (a1-g15-14) Kasrning surati maxrajidan 5 ga kam. Agar kasrning maxrajiga 7 qo'shilsa uning qiymati 0,5 ga teng bo'lib qoladi. Shu kasrning suret va maxrajlari yig'indisini toping.
A) 39 B) 29 C) 37 D) 45

4. (a1-g16-13) To'rtta sonning yigindisi 128 ga teng. Agar birinchi va ikkinchi sonning nisbati 1:3 kabi, ikkinchi va

uchinchi sonning nisbati 3:5 kabi, uchinchi va to'rtinchi sonlarning nisbati 5:7 kabi bo'lsa, to'rtinchi va birinchi sonlarning ayirmasini toping.
A) 48 B) 56
C) 32 D) 16

5. (a2-g6-14) 640 so'mni 3 so'mlik va 5 so'mlik pullar yordamida to'lov amalga oshirildi. Bunda pullarning umumiy soni 138 ta. To'lovda necha 5 so'mlik bor?
A) 113 B) 63
C) 25 D) 72

6. (a2-g8-16) (G'iyosiddin Al-Koshiy masalasi) Do'konda uch xil tovar sotilmoqda. Birining 20 tasi 1 dinor, ikkinchisining 30 tasi 1 dinor, uchinchisining 60 tasi 1 dinor turadi. Xaridor har bir tovar turidan bir xil miqdorda sotib olib hammasi uchun 1 dinor to'ladi. U har bir tovar turidan nechtadan olgan?
A) 10 B) 5 C) 6 D) 3

7. (a2-g14-12) Bir sotuvchi donasi 70 so'mdan olgan daftarlarining to'rtdan birini 80 so'mdan, qolganini 100 so'mdan sotib, 11000 so'm foyda qildi. Sotuvchi nechta daftar sotgan?
A) 440 B) 400
C) 444 D) 420

8. (a2-g15-15) Mahmudjon Javohirga 1200 so'm bersa, Mahmudjonning puli Javohirning pulidan 2 marta ko'p bo'ladi. Agar ularning pullari yig'indisi 6000 so'm bo'lsa, Mahmudjonning necha so'm puli bor?
A) 4800
B) 3600
C) 5200
D) 4500

9. (a2-g19-15) Xo'jayin bir kishini 1 yilga yollab, unga 18 so'm pul va bir chakmon berishga kelishibdi, lekin u 7 oy ishlaganidan so'ng ketmoqchi bo'lib xo'jayindan hisob-kitob qilishni so'rabdi. Xo'jayin unga 8 so'm pul bilan chakmon beribdi. Chakmon necha so'm turadi?
A) 3 B) 9 C) 6 D) 12

10. (a3-g3-16) Do'konda uch xil mahsulot sotilmoqda. Birining 12 tasi 1000 so'm, ikkinchisining 18 tasi 1000 so'm, uchinchisining 9 tasi 1000 so'm turadi. Xaridor har bir tovar turidan bir xil miqdorda sotib olib hammasi uchun 1000 so'm to'ladi. U har bir tovar turidan nechtadan olgan?
A) 10 B) 6 C) 4 D) 3

11. (a3-g4-15) Ayol sut va qatiq sotib olib, qatiq ivitadi. Yangi ivitilgan qatiqning 10% i qatiq, qolgan qismi sut. Agar bu ayol sutning litrini 3000 so'mdan, qatiqning litrini 3500 so'mdan sotib olsa, bu ayolga qatiqning litri necha so'mga tushadi?
A) 3250 B) 3100
C) 3050 D) 2950

12. (a3-g8-15) 214 betlik kitobni Ahmad uch kunda o'qib tugatadi. U birinchi kuni ikkinchi kunga qaraganda 1,4 marta kam, ikkinchi kuni esa uchinchi kunga qaraganda 24 bet kam kitob o'qidi. Ikkinchi kuni Ahmad necha bet kitob o'qigan?
A) 74 B) 50 C) 94 D) 70

13. (a3-g12-15) Mahmudjon Javohirga 600 so'm bersa, Mahmudjoning puli Javohirning pulidan 3 marta ko'p bo'ladi. Agar ularning pullari yig'indisi 6000 so'm bo'lsa, Mahmudjonning necha so'm puli bor?
A) 5100 B) 3600
C) 4800 D) 4500

14. (a3-g20-14) Korxonada ishlaydigan ayollarning soni erkaklar sonidan 3 marta ko'p. Agar ayollarning o'rtacha yoshi 30, erkaklarning o'rtacha yoshi 42 yosh bo'lsa, korxonadagi umumiy xodimlarning o'rtacha yoshi nechaga teng bo'ladi?
A) 36 B) 39
C) 33 D) 32

15. (a4-g8-15) Bunyod Shuhratga 800 so'm bersa, Shuhratning puli Bunyodning pulidan 2,5 marta ko'p bo'ladi. Agar ularning pullari yig'indisi 7000 so'm bo'lsa, Shuhratning necha so'm puli bor?
A) 4200
B) 3600
C) 2800
D) 3400

16. (a4-g9-13) Murod bilan Ilhomning pullari yig'indisi x so'm. Murod Ilhomga y so'm bersa, ularning pullari miqdori tenglashadi. Murodning necha so'm puli bor?
A) $\frac{x+3y}{2}$ B) $\frac{x+y}{2}$
C) $\frac{x-y}{2}$ D) $\frac{x+2y}{2}$

17. (a4-g11-3) Ikki musbat ketma-ket juft sonlarning kvadratlarining farqi 132 ga teng. Bu sonlarning kattasini toping.
A) 38 B) 40 C) 34 D) 32

18. (a4-g11-30) Bir fermada 1800 ta qo'y, 1200 ta sigir va 600 ta echki bor. Agar bu hayvonlar doira shaklidagi grafikda ko'rsatilsa, qo'ylarni ko'rsatuvchi bo'lakning burchagi necha gradus bo'ladi?
A) 60 B) 90
C) 180 D) 120

19. (a4-g13-21) Bir maktabning o'quvchilari soni 1100 ta bo'lib, har yili 20 tadan kamaymoqda. Ikkinchi maktabda esa 800 ta o'quvchi bo'lib, har yili 40 tadan ortmoqda. Necha yildan keyin har ikkala maktablardagi o'quvchilar soni tenglashadi?
A) 15 B) 10 C) 5 D) 8

20. (a4-g23-14) Yaxshi qurimagan sovunning 5 tasi 1 kg keladi. Qurigandan so'ng esa 8 tasi 1 kg bo'ladi. Yaxshi qurimagan sovunning kilosini 3000 so'mdan sotib olib, qurigandan so'ng 6400 so'mdan sotgan tijoratchi 16000 so'm foyda qilishi uchun necha dona sovun sotishi kerak?
A) 160 B) 80 C) 40 D) 10

21. (a5-g2-14) Bir odam litrini 120 so'mdan sotib olgan spirtini sotib 8800 so'm foyda ko'rdi. Agar u shu spirtga 10 litr suv qo'shib sotganida 10800 so'm foyda qilar edi. Sotuvchi necha litr spirt sotib olgan?
A) 100 B) 110
C) 200 D) 160

22. (a5-g9-13) O'zidan oldin kelgan barcha natural sonlar yig'indisining 2/51 qismiga teng bo'lgan sonni toping.
A) 50 B) 52
C) 102 D) 100

23. (a5-g9-14) Do'konda ko'ylaklar 25$, shimlar 40$ dan sotilmoqda. Do'kon omborida mavjud ko'ylaklar va shimlarning umumiy qiymati 1880$. Oy oxiriga qadar ko'ylaklarning yarmi, shimlarning uchdan bir qismi sotilib va jami 760$ tushumga ega bo'lingan bo'lsa, omborda yana nechta shim qolgan?
A) 9 B) 12 C) 15 D) 18

24. (a5-g10-12) 10 dona qalamni a so'mga sotib olib, sakkiztasini $a + 3$ so'mga sotayotgan sotuvchi har bir qalamdan 200 so'mdan foyda ko'rmoqda. a nechaga teng?
A) 8015 B) 8000
C) 7985 D) 7975

25. (a5-g14-12) Sotuvchi idishga meva solib sotmoqda. U idishini to'ldirib tortganida 8 kg keldi. U idishning teng yarmini mevaga to'ldirib tortganida esa 5 kg keldi. Agar sotuvchi mevaning kilogramini 2100 so'mdan sotsa, idish to'la meva necha so'm bo'ladi? (Sotuvchi idishni o'zida olib qoladi va faqatgina meva uchun pul oladi)
A) 12600 B) 10500
C) 8400 D) 9450

26. (a5-g17-15) 3 kg olma, 7 kg apelsin va 6 kg no'xat 7860 so'm turadi. 1 kg olma, 5 kg apelsin va 4 kg no'xat esa 5440 so'm turadi. 1 kg olma, 1 kg apelsin va 1 kg no'xat necha so'm bo'ladi?
A) aniqlab bo'lmaydi
B) 1210
C) 2660
D) 2420

27. (a5-g17-27) Kartoshkali pirojki tayyorlanmoqda. Narxi 2000 so'm bo'lgan un 25 dona pirojkiga yetadi. Kilosi 2400 so'mdan olingan kartoshka esa 20 dona pirojkiga yetadi. Har bir

pirojki uchun 100 so'mlik yog' va boshqa mahsulotlar ishlatiladi. Agar shu pirojki 500 so'mdan sotilsa, bu pirojkidan necha foiz foyda qilinadi?
A) 66,(6) B) 40
C) 60 D) 33,(3)

28. (a5-g19-13) 300 kg qog'ozning kilosi 5000 so'mdan olindi. 900 kg esa 4500 so'mdan olindi. Sotuvchi bu qog'ozlarni aralashtirib pachkali qog'oz hosil qildi va bu pachka 2,5 kg ni tashkil etdi. Agar sotuvchi qog'ozning pachkasini 13500 so'mdan sotsa, jami necha so'm foyda qiladi?
A) 1 050 000
B) 930 000
C) 1 230 000
D) 845 000

29. (a5-g20-12) Fermer xo'jaligida yetishtirilgan 200 kg olma kilosi 2250 so'mdan olindi. Bu olmalar supermarketda 5 kg lik yashiklarga joylangan holda kilosi 3500 so'mdan sotilmoqda. Yashiklarning har biriga ketgan xarajat – 1500 so'm. Kamida nechta yashik olma sotilganda (olma va yashik uchun) ketgan xarajatlar qoplanadi?
A) 25 B) 29 C) 30 D) 35

30. (a5-g24-12) Guruhdagi 12 ta bolaning o'rtacha balli 79,6 ga teng. Bu guruhga yana ikki nafar bola qo'shilgach, guruhning o'rtacha balli 80,3 bo'lib qoldi. Bu ikki yangi o'quvchining o'rtacha balli nechaga teng?
A) 88,7 B) 81
C) 92,6 D) 84,5

31. (a6-g2-12) Sotuvchi 1-xaridorga tuxumlarning yarmini va bitta tuxum, 2-xaridorga qolgan tuxumlarning yarmini va yana bir tuxum, 3-xaridorga qolgan tuxumlarning yarmini va yana bitta tuxum sotganidan keyin unda 14 ta tuxum qoldi. Sotuvchi bozorga nechta tuxum olib kelgan?
A) 122 B) 126
C) 62 D) 63

32. (a6-g5-13) Abdulla 1200 so'mga ruchka sotib olib, 1800 so'mga sotdi, keyin shu pulning 1500 so'miga sotib olgan ruchkasini 2000 so'mga sotdi, oxirgi bosqichda esa mavjud pulning 1800 so'miga sotib olganini 2500 so'mga sotdi. Umumiy holda Abdulla bu uch savdodan umumiy necha foiz foyda qildi?
A) 358,(3) B) 108,(3)
C) 200 D) 150

33. (a6-g6-12) Korxonadagi ustalar kuniga 14200 so'mdan, shogirdlar 9500 so'mdan maosh olishadi. Agar har bir ustaning 3 tadan shogirdi bo'lib, ularga 3 kunda ja'mi 896700 pul ajratilsa, korxonada ja'mi nechta ishchi mavjud?
A) 20 B) 28 C) 36 D) 40

34. (a6-g23-9) Kilogrami 20 so'mdan olingan apelsinning 3 kilogramidan 1 kilogramm sharbat olinib, 72 so'mdan sotiladi. Apelsinning kilosining narxi 5 so'm arzonlashsa, foyda foizi o'zgarmasligi uchun sharbatning narxi avvalgi narxidan qanchaga kam bo'lishi kerak?
A) 18 B) 16
C) 15 D) 12

64. Ishga oid masalalar

1. (a1-g6-15) Ikki jo'mrak hovuzni 10 va 15 soatda to'ldiradi. Hovuzning yarmi to'lgunga qadar ikki jo'mrakni ochib qo'yib, yarmi to'lgandan so'ng ikkinchi jo'mrak yopib qo'yilsa, hovuzning to'lishi uchun hammasi bo'lib necha soat vaqt ketadi?
A) 6 B) 8 C) 9 D) 12

2. (a1-g11-15) Hovuzga ikki jo'mrak ulangan. Bu jo'mraklardan birinchisi bo'sh hovuzni 6 soatda, ikkinchisi esa 12 soatda to'ldiradi. Agar birinchi jo'mrak ochilib, hovuzning yarmi to'lgandan so'ng ikkinchi jo'mrak ochilsa, hovuz jami necha soatda to'ladi?
A) 7 B) 9 C) 8 D) 5

3. (a2-g1-15) Bir ishni Ali bilan Vali 12 kunda, Vali bilan G'ani 8 kunda, Ali bilan G'ani 6 kunda tugatishadi. Bu ishni Ali yolg'iz o'zi necha kunda tugatadi?
A) 24 B) 18 C) 16 D) 48

4. (a2-g5-15) Bir ishni Iqbol 6 soatda, Muzaffar 9 soatda tugatadi. Ikkalasi birga ish boshlab, ishni yarmini tugatgandan keyin Muzaffar ketib qolsa, ishni tugashi uchun hammasi bo'lib necha soat vaqt ketadi?
A) 3,6 B) 5,4
C) 2,8 D) 4,8

5. (a2-g9-15) Hovuzga ikki jo'mrak ulangan. Bu jo'mraklardan birinchisi bo'sh hovuzni 6 soatda, ikkinchisi esa 12 soatda to'ldiradi. Agar birinchi jo'mrak ochilib, hovuzning yarmi to'lgandan so'ng ikkinchi jo'mrak ochilsa, hovuz necha soatda to'ladi?
A) 7 B) 9 C) 8 D) 5

6. (a2-g12-12) Hovuzni ikki jo'mrak 3 va 5 soatda to'ldirishadi. Pastdagi teshikdan esa suv 2 soatda oqib chiqib ketadi. Agar uchala jo'mrak birdan ochilib, kuniga 5 soatdan ishlab turib, keyin yopib qo'yilsa, dushanba kuni ishni boshlagan hovuz qaysi kuni to'ladi?
A) payshanba
B) juma
C) shanba
D) yakshanba

7. (a2-g17-14) 15 ga yerni 6 ta traktor 8 soatda ag'darsa, 25 ga yerni 10 soatda ag'darish uchun shunday traktorlardan nechta kerak bo'ladi?
A) 4 B) 5 C) 9 D) 8

8. (a2-g21-16) Mehnat unumdorligi bir xil bo'lgan 24 ta ishchi ishni 15 kunda tugatishadi. Mehnat unumdorligi shunday ishchilar shu ishni 8 kunda tugatishgan bo'lsa, u yerda nechta ishchi ishlagan ?
A) 45 B) 5 C) 36 D) 48

9. (a3-g2-14) Ma'lum bir ishni 12 ta ishchi 15 soatda bajara oladi. Xuddi shu ishning 1/3 qismini bajarish uchun 10 ta ishchi necha soat ishlashi kerak?
A) 4 B) 10 C) 8 D) 6

10. (a3-g5-15) Uchta ishchi bir devorni 8 soatda oqlaydi. Agar ularga usta yordamlashsa, 4 kishi birgalikda shu devorni 6 soatda oqlashadi. Uchta ishchi 2 soat ishlaganidan keyin ularga usta yordamlashsa, ular birgalikda hamma ishni jami necha soatda tugatishadi?
A) 7,5 B) 6,5 C) 5 D) 4,5

11. (a3-g11-14) Ikki jo'mrakdan biri hovuzni 10, ikkinchisi 15 soatda to'ldiradi. Hovuzning yarmi to'lgunga qadar ikki jo'mrak ochib qo'yib, yarmi to'lgandan so'ng ikkinchi jo'mrak yopib qo'yilsa, hovuzning to'lishi uchun hammasi bo'lib necha soat ketadi?
A) 5 B) 8 C) 3 D) 12

12. (a3-g13-15) Hovuzni ikki jo'mrak to'ldiradi. Ulardan biri 6 soatda, ikkinchisi 12 soatda to'ldiradi. Hovuzning yarmi to'lgunga qadar faqat birinchi jo'mrak ochib qo'yilib, yarmi to'lgandan so'ng ikkinchi jo'mrak ham ochilsa, hovuz jami necha soatda to'ladi?
A) 5 soat 40 daqiqa
B) 5 soat
C) 6 soat
D) 4 soat 20 daqiqa

13. (a3-g14-15) Hovuzning o'rtasida suvni chiqarib tashlaydigan quvur o'rnatilgan. Bu quvur to'la hovuzni 6 soatda yarmigacha bo'shatadi. Hovuzga esa 2 ta quvurdan suv kelib ulardan biri bo'sh hovuzni 9 soatda, ikkinchisi esa 18 soatda to'ldiradi. Agar hamma quvurlar bir vaqtda ochilsa, hovuz necha soatda to'ladi?
A) 18 B) 9
C) to'lmaydi D) 12

14. (a3-g15-14) To'rtta ishchi bir devorni 6 soatda oqlaydi. Agar ularga usta yordamlashsa, 5 kishi birgalikda shu devorni 3 soatda oqlashadi. To'rtta ishchi 3 soat ishlaganidan keyin ularga usta yordamlashsa, ular ishni jami necha soatda tugatishadi?
A) 4,5 B) 4 C) 5 D) 5,5

15. (a3-g21-13) Bir ishchi bir miqdor ishni 30 kunda tugatadi. Agar shu ishchi har kuni 2 soatdan kamroq ishlaganida ish yana 10 kunga kechikardi. Bu ishchi kuniga necha soatdan ishlagan?
A) 10 B) 6 C) 7 D) 8

16. (a3-g21-14) Hovuzning ustiga o'rnatilgan jo'mrak 8 soatda to'ldiradi, ostidagi jo'mrak esa 12 soatda bo'shatadi. Ikki jo'mrak ochib qo'yilganidan 6 soatdan keyin ostdagi jo'mrak yopildi. Hovuz to'lishi uchun umumiy holda necha soat vaqt ketadi?
A) 6 B) 8 C) 15 D) 12

17. (a3-g22-13) Usta tikuvchi bir shimni 1 kunda, shogirdi uch kunda tikib bo'ladi. Usta shogird birgalikda 20 ta shimni necha kunda tikib bo'lishadi?
A) 12 B) 15 C) 16 D) 20

18. (a3-g23-14) Bitta hovuzni 2 ta jo'mrak 7 va 8 soatda to'ldiradi. Uchinchi jo'mrak 4 soatda bo'shatadi. Avval birinchi va ikkinchi jo'mrak ochildi. Hovuzning 3/7 qismi to'lgach, uchinchi jo'mrak ochildi. Hovuzning to'lishi uchun hammasi bo'lib necha soat ketgan?
A) 1,6 B) 3,4
C) 16,6 D) 33,6

19. (a4-g10-14) 5 kishi bir ishni bajaryapti. Birinchi, ikkinchi va uchinchi ishchi birga ishlashsa hamma ish 7,5 soatda bajariladi. Birinchi, uchinchi va beshinchi ishchi birga ishlaganda 5 soatda; birinchi, uchinchi va to'rtinchi ishchi birga ishlaganda 6 soatda; ikkinchi, to'rtinchi va beshinchi ishchi birga ishlaganda 4 soatda bajara oladi. Agar hamma ishchilar birga ishlashsa, shu ishni qancha vaqtda tugatar edilar?
A) 1 B) 2 C) 3 D) 1,5

20. (a4-g11-1) Bir ishni Ali, Vali va G'ani a kunda tugatishadi. Shu ishni Ali yolg'iz o'zi $3a$ kunda, Vali esa $4a$ kunda tugatsa, Vali bilan G'ani birgalikda necha kunda tugatishadi?
A) $2,4a$ B) $1,5a$
C) $1,(3)a$ D) $6a$

21. (a4-g19-13) Ikki jo'mrakdan suv oqmoqda. Ulardan biridan ikkinchisiga qaraganda 3 marta tezroq suv oqmoqda. Bu ikki jo'mrak birgalikda bo'sh hovuzni 12 soatda to'ldirsa, tezroq oqayotgan jo'mrakning o'zi bosh hovuzni necha soatda to'ldiradi?
A) 48 B) 24 C) 12 D) 16

22. (a4-g20-14) Bir ishni Abdurahmon 12 kunda, Sardor 16 kunda bajaradi. Ikkalasi birgalikda to'rt kun ishlagach, Sardor ketib qoldi. Qolgan ishni Abdurahmon necha kunda tugatadi?
A) 7 B) 5 C) 3 D) 4

23. (a4-g22-14) 28 ga yerni 8 ta traktor 12 soatda ag'darsa, 35 ga yerni 20 soatda ag'darish uchun shunday traktorlardan nechta kerak bo'ladi?
A) 4 B) 5 C) 9 D) 6

24. (a5-g6-14) Bir ishni Ahmad bilan Mahmud 12 kunda, Mahmud bilan Ali 8 kunda, Ahmad bilan Ali bo'lsa 6 kunda tugatishadi. Bu ishni Ahmadning bir o'zi necha kunda tugatadi?
A) 9,6 B) 24 C) 18 D) 16

25. (a5-g12-13) Zoir ma'lum bir ishni 18 kunda, Abdulla 13,5 kunda bitirishadi. Ular ishning uchdan bir qismini tugatgach, yordamga Mustafo yetib keldi va uchovlon ishni 3 kunda tamomlashdi. Mustafoning bir o'zi bu ishni necha kunda bitiradi?
A) 9,2 B) 4,8
C) 10,8 D) 7,5

26. (a6-g1-12) Bir quvur hovuzni 6 soatda to'ldiradi, ikkinchi quvur esa 8 soatda bo'shatadi. Ikkala quvur birgalikda ma'lum vaqt ochib qo'yildi (bo'sh hovuzga). Shundan keyin birinchi quvur yopildi. Agar ikkinchi quvur hovuzni bir soatda bo'shatgan bo'lsa, dastlab quvurlar birgalikda necha soat ochiq turgan?
A) 3 B) 4 C) 6 D) 12

27. (a6-g22-23) Ofisda ishlayotgan kotiblardan biri kompyuterda 1 daqiqada 50 ta so'z kiritadi, ikkinchisi esa 1 daqiqada 40 ta so'z kiritadi. 12000 so'zdan iborat matnning yarmini birinchi kotib kiritgandan keyin qolganini ikkinchi kotib kiritgan bo'lsa, ular jami qancha vaqt sarflaganlar?
A) 5 soat 20 daqiqa
B) 4 soat 30 daqiqa
C) 6 soat
D) 3 soat 30 daqiqa

65. Prosentlarga doir masalalar

1. (a1-g2-14) Uy bekasi kilosi 280 so'mdan yong'oq sotib oldi. Yong'oqlar qobig'idan tozalangach, umumiy og'irligining 70% i qoldi. Uy bekasi 1 kg tozalangan yong'oq uchun necha so'm sarflagan?
A) 84 B) 196
C) 400 D) 350

2. (a1-g3-25) O'yingohga kirish chiptasining narxi 50 so'm. Chipta narxi arzonlashgandan so'ng tomoshabinlar 60%, chipta sotishdan tushum 30% ortdi. Chipta narxi necha so'mga arzonlashgan?
A) $\frac{325}{8}$ B) 10
C) 40 D) $\frac{75}{8}$

3. (a1-g5-15) Tuxumfurush 150 so'mdan 100 ta tuxum sotib oldi. Tuxumlardan 20 tasi sinib qoldi. Sotuvchi singan tuxumlarni 175 so'mdan, butunini 200 so'mdan sotdi. Bu tijoratda sotuvchi necha foiz foyda qilgan?
A) 25% B) 27,(6)%
C) 30% D) 33,(3)%

4. (a1-g9-15) Stadionga kirish narxi 50 so'm edi. U yerda narxlar arzonlashtirilgach muxlislar soni 50%, pul tushumi esa 25% ortdi. Narx necha so'mga arzonlashgan.
A) $8\frac{1}{3}$ B) 9 C) 10 D) $7\frac{1}{2}$

5. (a1-g10-16) Massasi 400 g va konsentratsiyasi 12% bo'lgan eritmaning konsentratsiyasi 32% bo'lishi uchun qancha suv bug'lanishi kerak?
A) 150
B) 200
C) 250
D) 300

6. (a1-g11-16) O'quvchilarning 66% i matematikani yaxshi o'zlashtirgan. 74% i esa, ingliz tilini yaxshi o'zlashtirgan. O'quvchilarning necha foizi ham matematika ham ingliz tilini yaxshi o'zlashtiradi? (O'quvchilar ikki fandan kamida birini yaxshi o'zlashtirgan deb hisoblansin)
A) 30 B) 25
C) 10 D) 40

7. (a1-g12-28) Shrbat belgilangan narhdan 40% chegirma bilan sotilsa, 20% zarar qilinadi. Bu zarar 600 so'm ekanligi ma'lum. Sharbat chegirma qilinmasdan sotilganda necha so'm foyda qilinadi?
A) 1000
B) 600
C) 1200
D) 800

8. (a1-g13-16) Mahsulotning supermarketdagi narxi uning bozordagi narxidan 20% qimmat. Mahsulotning supermarketdagi narxi 10% ga arzonlashdi. Shundan so'ng uning supermartketdagi narxi 540 so'm bo'ldi. Mahsulotning bozordagi narxini toping.
A) 480 B) 500
C) 540 D) 580

9. (a1-g16-14) Uy bekasi kilosi 270 so'mdan yong'oq sotib oldi. Yong'oqlar qobig'idan tozalangach, umumiy og'irligining 60% i qoldi. Uy bekasi 1 kg tozalangan yong'oq uchun necha so'm sarflagan?
A) 45
B) 450
C) 162
D) 276

10. (a1-g17-14) Do'kon egasi narxlarni 25% arzonlatsa, mol sotishida 40% ortish bo'lishini taxmin qilmoqda. Agar do'konchining taxmini to'g'ri chiqsa, kirimi qanday o'zgaradi?
A) 4% ortadi
B) 4% kamayadi
C) 5% ortadi
D) 5% kamayadi

11. (a2-g2-30) 25 so'mlik tanga 4 marta dumalaganda bosib o'tgan masofani 100 so'mlik tanga 3 marta dumalaganda bosib o'tadi. Agar 25 so'mlik tanga 100 so'mlik tanganing ustiga qo'yilsa, 25 so'mlik tanga yuzasining necha foizi ochiq qoladi?
A) 52% B) 56,25%
C) 43,75% D) 62,5%

12. (a2-g3-9) Bir sonning 20% ortig'i shu sonning 20% kamidan necha foiz ko'p?
A) 20 B) 40 C) 50 D) 60

13. (a2-g4-16) Ho'l meva har kuni o'z miqdorining 20% iga kamayadi. 1 tonna meva 2 kundan so'ng necha kg ga aylanib qoladi?
A) 580 B) 640
C) 710 D) 600

14. (a2-g6-15) Bir sonning 20% ko'pi shu sonning 20% kamidan necha foiz ko'p?
A) 20 B) 40 C) 50 D) 60

15. (a2-g7-14) Sinfdagi o'quvchilarning 54% i rus tilini, 48% i ingliz tilini biladi. 16% i esa ikkala tilni ham bilmaydi. Guruhdagi o'quvchilarning necha foizi faqatgina ingliz tilini biladi?
A) 18 B) 30 C) 36 D) 84

16. (a2-g9-16) O'quvchilarning 66% i matematikani yaxshi o'zlashtiradi. 74% i esa ingliz tilini yaxshi o'zlashtiradi. O'quvchilarning necha foizi ham matematika, ham ingliz tilini yaxshi o'zlashtiradi (o'quvchilar ikki fandan kamida birini yaxshi o'zlashtirgan deb hisoblansin)?
A) 30 B) 25 C) 10 D) 40

17. (a2-g11-30) 10 so'mlik tanga 5 marta dumalaganda bosib o'tgan masofani 50 so'mlik tanga 2 marta dumalaganda bosib o'tadi. Agar 10 so'mlik tanga 50 so'mlik tanganing ustiga qo'yilsa, 50 so'mlik tanga yuzasining necha foizi ochiq qoladi?
A) 80% B) 75%
C) 84% D) 88%

18. (a2-g14-14) Mahsulot *a* so'mga sotilsa 20% foyda olinadi. Agar *b* so'mga sotilsa 20% zarar qilinadi. Bunga ko'ra *a* va *b* qaysi sonlarga proporsional?
A) 2 va 3 B) 3 va 5
C) 3 va 2 D) 5 va 3

19. (a2-g15-16) Ho'l meva har kuni o'z miqdorining 10% iga kamayadi. 1 tonna meva 3 kundan so'ng necha kg ga aylanib qoladi?
A) 700 B) 650
C) 810 D) 729

20. (a2-g18-15) Do'konda narxlar 10% ga orttirildi. Keyin savdo bo'lmagani sababli 5% arzonlashtirildi. Do'kondagi narxlar dastlabki narxga nisbatan qanday o'zgargan?
A) 5% ortgan
B) 4% ortgan
C) 4,5% ortgan
D) 5,5% ortgan

21. (a2-g19-14) O'quvchi 30 ta savoldan 22 tasini to'g'ri topdi. Unga yana 22 ta savol berilganda nechtasini to'g'ri qilsa, umumiy ko'rsatkichi 75% bo'ladi?
A) 17 B) 21 C) 16 D) 14

22. (a2-g20-15) Bir do'konning xaridorlari soni birinchi yili 10%, ikkinchi yili esa 20% ortdi. Uchinchi yil mahsulot sifati tushib ketgani sababli bu do'konning xaridorlari soni 25% ga kamaydi. Oxirgi holatda bu do'konning xaridorlari soni haqidagi fikrlarning qaysi biri to'g'ri.
A) 2% ortgan
B) 1% kamaygan
C) boshidagi bilan bir xil
D) 1% ortgan

23. (a2-g21-15) Guruhdagi o'quvchilarning 20% i uy vazifasini bajarmadi. 24 ta o'quvchi esa uy ishini chala bajardi. Agar uy ishini bajarmagan o'quvchilarning uy ishini to'liq bajargan o'quvchilarga nisbati 3:8 bo'lsa, guruhda nechta o'quvchi ta'lim oladi?
A) 56 B) 90
C) 100 D) 72

24. (a2-g23-14) Bir son ketma-ket ikki marta 20% dan orttirilgach, 216 soni hosil bo'ldi. Bu son qanchaga ortgan?
A) 66 B) 150
C) 155 D) 61

25. (a3-g7-13) Mol belgilangan narxdan 20% chegirma bilan sotilsa, 15% zarar qilinadi. Bu zarar 600 so'm ekanligi ma'lum. Mol chegirma qilinmasdan oldingi narxini toping.
A) 4250 B) 4350
C) 4400 D) 5000

26. (a3-g9-14) Sotuvchi 40% li spirtning litrini 1000 so'mdan sotib olib, unga suv qo'shib 20% li spirtga aylantirmoqda va litrini yana 1000 so'mdan sotmoqda. Bu ishda sotuvchi necha foiz foyda qiladi (qo'shilgan suvni tekin deb hisoblang)?
A) 50 B) 100
C) 200 D) 75

27. (a3-g10-16) Avtomobil radiatori 4 litr sig'imga ega. U 20% li antifriz eritmasi bilan to'ldirilgan. Ushbu eritmaning qanchasi bo'shatilib, o'rniga 100% li antifriz quyilsa, uning konsentratsiyasi 30% bo'ladi?
A) 0,8 B) 0,4
C) 0,5 D) 0,3

28. (a3-g10-30) 10 so'mlik tanga 5 marta dumalaganda bosib o'tgan masofani 25 so'mlik tanga 3 marta dumalaganda bosib o'tadi. Agar 10 so'mlik tanga 25 so'mlik tanganing ustiga qo'yilsa, 25 so'mlik tanga yuzasining necha foizi ochiq qoladi?
A) 60%
B) 64%
C) 72%
D) 80%

29. (a3-g12-16) Ho'l meva har kuni o'z miqdorining 20% iga kamayadi. 1 tonna meva 3 kundan so'ng necha kg ga aylanib qoladi?
A) 526 B) 400
C) 512 D) 600

30. (a3-g14-14) Spirtning 30% li eritmasining 1 litri 240 so'm bo'lsa, sof spirtning 1 litri necha pul turadi (suv tekin deb hisoblansin)?
A) 750 B) 625
C) 1000 D) 800

31. (a3-g15-15) Jumaniyozboy ulgurji bozordan kilosi 2000 so'mdan va 3000 so'mdan bo'lgan ikki xil guruch sotib olib, ularni 3:2 nisbatda aralashtirdi. Bu aralash guruchning kilosini qanchadan sotsa, unga 40% foyda tegadi?
A) 3080 B) 3640
C) 3400 D) 3360

32. (a3-g16-14) O'quvchi berilgan 56 ta savoldan 30 tasini yechdi. Bulardan 10 tasini noto'g'ri yechdi. O'quvchi qolgan savollardan nechtasini to'g'ri yechsa, umumiy savollarning 75% ini to'g'ri yechadi?
A) 26 B) 18 C) 24 D) 22

33. (a3-g17-13) Hovuzning quvuri suvni chiqarib tashlamoqda. Birinchi kuni to'la hovuz suvining 30% ini, ikkinchi kuni qolgan qismining 30% ini bo'shatdi. Ikki kundan so'ng hovuzning necha foizida suv qoladi?
A) 40 B) 49 C) 51 D) 60

34. (a3-g18-14) Yozgi haroratda har kuni idishdagi suvning 10% i bug'lanadi. Agar idishda 1 litr suv bo'lsa, 3 kundan so'ng necha ml suv qoladi?
A) 700 B) 769
C) 729 D) 690

35. (a3-g23-13) O'yinchoqning narxi 1000 so'm edi. U yerda narxlar arzonlashtirilgach, xaridorlar soni 50%, pul tushumi esa 25% ortdi. Narx necha so'mga arzonlashgan?
A) 200 B) $\frac{200}{3}$
C) $\frac{500}{3}$ D) $\frac{2500}{3}$

36. (a4-g1-15) O'quvchi 50 ta savoldan 38 tasini to'g'ri topdi. Unga yana 22 ta savol berilganda nechtasini to'g'ri bajarsa, umumiy ko'rsatkichi 75% bo'ladi?
A) 14 B) 20 C) 16 D) 18

37. (a4-g2-14) Spirtning 36% li eritmasining 1 litri 900 so'm bo'lsa, sof spirtning 1 litri necha pul turadi (suv tekin deb hisoblansin)?
A) 1620 B) 1250
C) 3240 D) 2500

38. (a4-g4-13) Maktabda 140 ta qiz, 260 ta o'g'il bola o'qiydi. Qizlarning 80%, o'g'il bolalarning 70% i yaxshi baho olib o'qishadi. Maktabdagi o'quvchilarning necha foizi yaxshi bahoga o'qishadi?
A) 75 B) 73,5
C) 74,5 D) 72

39. (a4-g6-13) Sevara test sinovida Odildan 6 ta test ko'proq yechdi. Sevaraning foiz ko'rsatkichi Odilnikidan 24% ga ko'p va ularning o'rtacha foiz ko'rsatkichlari 80% bo'lsa, Sevara nechta savolni to'g'ri topgan?
A) 23 B) 17 C) 46 D) 34

40. (a4-g8-16) Ho'l meva massasi har kuni o'z miqdorining 20% iga kamayadi. 1 tonna meva 3 kundan so'ng necha kg ga aylanib qoladi?
A) 526 B) 400
C) 512 D) 600

41. (a4-g12-16) $y = |8 - x| - |x + 2|$ funksiyaning grafigi koordinatalar tekisligining qaysi choraklaridan o'tadi?
A) I va II
B) I, II va III
C) III va IV
D) I, II va IV

42. (a4-g14-12) Shakarning miqdori 50% bo'lgan 150 gr sharbatda shakarning miqdori 37,5% bo'lishi uchun necha gr suv qo'shish kerak?
A) 50 B) 30
C) 120 D) 100

43. (a4-g15-14) Qaysi sonning 5% idan 5 ta ortig'i shu sonning 7% iga teng?
A) 250 B) 200
C) 500 D) 750

44. (a4-g16-14) 20% li tuzli suvga 240 litr suv quyilganda undagi tuzning miqdori 12% bo'ldi. Dastlab tuzli suv necha litr bo'lgan?
A) 360 B) 320
C) 240 D) 600

45. (a4-g17-12) 20% foyda bilan sotilayotgan tovar 10% chegirma bilan sotilib, 320$ foyda qilindi. Tovar chegirma qilinmasdan sotilsa qancha foyda keltiradi?
A) 4000 B) 640
C) 960 D) 800

46. (a4-g18-13) a dona ko'ylakni b so'mga olgan sotuvchi ko'ylaklarni 20% foyda bilan sotmoqda. c so'm puli bor odam nechta ko'ylak olishi mumkin?
A) $\frac{6ac}{5b}$ B) $\frac{ac}{6b}$
C) $\frac{bc}{5a}$ D) $\frac{5ac}{6b}$

47. (a4-g19-14) 80% lik $0{,}5a$ litr spirtli eritmaga 50% lik a litr spirtli eritma aralashtirildi va ustiga $0{,}5a$ litr toza suv qo'shildi. Hosil bo'lgan eritmaning necha foizi spirt?
A) 42 B) 45 C) 30 D) 40

48. (a4-g23-13) Sinfdagi o'quvchilarning 80% i ingliz tilini, 60% i nemis tilini biladi. Sinfdagi barcha o'quvchilar kamida bu ikki tildan birini bilsa va faqatgina bitta chet tilini biladigan o'quvchilar soni 15 ta bo'lsa, sinfda nechta o'quvchi bor?
A) 40 B) 50 C) 25 D) 20

49. (a4-g24-13) 13 ta daftar va 11 ta kitobning puliga 18 ta daftar va 8 ta kitob olish mumkin. Daftarning narxi kitob narxining necha foizini tashkil etadi?
A) 66,(6) B) 60
C) 50 D) 75

50. (a5-g7-14) Uy bekasi bodomning kilosini 4000 dan sotib olib, uni tozalagach, og'irligining 35% i chiqindiga chiqib ketadi. Ayol bu savdodan 30% foyda qilishi uchun tozalangan bodomning kilosini necha puldan sotishi kerak?
A) 5200 B) 6000
C) 8000 D) 3380

51. (a5-g9-15) 250 ml lik Palmolive shampunining 10% i zaytun yog'idan iborat. Shampunning qancha qismi (ml) to'kib tashlanib, o'rniga yog' quyilsa, yog'ning miqdori 15% bo'ladi?
A) $13\frac{8}{9}$ B) $10\frac{7}{9}$
C) $15\frac{2}{9}$ D) $14\frac{5}{9}$

52. (a5-g10-13) a litrlik tuzli suvdagi tuz miqdori b % ni tashkil etadi. Bu suvning yarmi to'kilib, o'rniga 20% li tuzli suv quyilgach, yangi eritmadagi tuz miqdori 40% ni tashkil etdi. b nechaga teng?
A) 60 B) 40
C) 50 D) 20

53. (a5-g11-13) Ishchi maoshining 25% ini tushlik qilishga sarflaydi. Agar oshxonadagi ovqatning narxi o'zgarmasdan, ishchining oyligi 20% orttirilsa, oyligining necha foizini tushlikka sarflaydi?
A) 16 B) $\frac{50}{3}$
C) 20 D) $\frac{125}{6}$

54. (a5-g15-13) Yoz fasli kelgani sababli suvga bo'lgan talab 30% ga, uning narxi 20% ga ortdi. Shu holda suv qadoqlaydigan korxonaning tushumi necha foizga ortgan?
A) 50% B) 4%
C) 56% D) 10%

55. (a5-g18-22) Tijoratchi olgan molining yarmini 10% foyda bilan, to'rtdan bir qismini 40% zarar bilan sotdi. Tijoratchi bu ishdan zararsiz chiqish uchun qolgan molni necha foiz foyda bilan sotishi lozim?
A) 25 B) 20 C) 40 D) 50

56. (a5-g21-13) Mahsulotning supermarketdagi narxi uning bozordagi narxidan 25% qimmat. Mahsulotning supermarketdagi narxi 15% ga arzonlashdi. Shundan so'ng uning supermarketdagi narxi 680 so'm bo'ldi. Mahsulotning bozordagi narxini toping.
A) 722,5 B) 640
C) 625,6 D) 580

57. (a5-g23-13) Bozorboy ulgurji bozordan kilosi 2000 so'mdan va 3000 so'mdan bo'lgan ikki xil guruch sotib olib, ularni 3:2 nisbatda aralashtirdi. Bu aralash guruchning kilosini qanchadan sotsa, unga 50% foyda tegadi?
A) 4500 B) 4000
C) 3600 D) 4200

58. (a5-g24-13) Taksi haydovchisi topgan pulining 40% ini mashina ijarasiga ajratadi. Bir necha yildan so'ng mashinaning ijara haqi tugab, mashina haydovchining o'ziga qoldi. Shu holda haydovchining daromadi necha foiz ortadi?
A) 40% B) 33,(3)
C) 25 D) 66,(6)

59. (a5-g25-12) 8 dona qalam 2500 so'm turadi. Agar qalam 20% arzonlatilsa, 2500 so'mga nechta qalam olish mumkin?
A) 12 B) 9 C) 15 D) 10

60. (a6-g1-13) Qurut tarkibida 6% suv bo'ladi. Agar qurut tayyorlanadigan suzma tarkibida 53% suv bo'lsa, 10 kg qurut olish uchun necha kg suzma kerak?
A) 40 kg B) 20 kg
C) 17 kg D) 23 kg

61. (a6-g2-2) Kasrlarni o'sish tartibida joylashtiring.
$x = \frac{23}{29}$; $y = \frac{76}{100}$; $z = \frac{43}{49}$
A) $z < x < y$ B) $z < y < x$
C) $y < x < z$ D) $y < z < x$

62. (a6-g4-13) Uy bekasi 45000 so'mdan bodom sotib olib, uni tozalab sotmoqda. Tozalash jarayonida bodomning massasi 40% ga kamayadi. Uy bekasi tozalangan bodomni necha so'mdan sotsa, foydasi 20% ni tashkil etadi?
A) 90000 B) 75000
C) 72000 D) 84000

63. (a6-g9-12) A guruhdagi o'quvchilar B guruhdagi o'quvchilardan 50% ortiq. C guruh A guruhdan 50% ga kam. B guruh C guruhning necha foizini tashkil etadi?
A) 133,(3) B) 75
C) 300 D) 33,(3)

64. (a6-g16-11) Yoz fasli kelgani sababli suvga bo'lgan talab 30% ga, uning narxi 20% ga ortdi. Shu holda suv qadoqlaydigan korxonaning tushumi necha foizga ortgan?
A) 50% B) 4%
C) 56% D) 10%

65. (a6-g17-12) Xosiyat imtihonda Baxtinurdan 8 ta ko'p savol to'g'ri yechdi. Xosiyatning bali Baxtinurnikidan 20% ko'p. Ularning o'rtacha balli 85% bo'lsa, Baxtinur nechta savolni to'g'ri topgan?
A) 40 B) 30
C) 38 D) 34

66. (a6-g18-16) Bodomfurush bodomning kilosini 30000 so'mdan olib, uning chaqilgan mag'zi kilosini 72000 so'mdan sotmoqda. Agar bodom vaznining 40% i po'choqqa chiqib ketsa, bodomchi bu ishdan necha foiz foyda qiladi?
A) 56 B) 100
C) 44 D) 140

67. (a6-g21-18) TEAM ingliz tili o'rgatish markazida o'qishning narxi 40%, o'quvchilar soni 20% ortgan bo'lsa, umumiy tushum necha foizga ortadi?
A) 60 B) 48
C) 28 D) 68

68. (a6-g22-17) Uzum tarkibida 15% shakar bor. Uzumdan mayiz qilinganda (quritilganda) uning vazni 70% ga kamayadi. Mayizning necha foizi shakardan iborat bo'ladi?
A) 50% B) 8%
C) 40% D) 80%

69. (a6-g26-13) 400 so'mdan olingan 100 ta tuxumdan 20 donasi sinib qoldi. Sotuvchi umumiy savdodan 20% foyda ko'rishi uchun butun tuxumlarni necha so'mdan sotishi lozim?
A) 600 B) 750
C) 800 D) 500

66. Harakatga doir masalalar

1. (a1-g1-3) Kater va teploxod bir-biriga tomon harakatlanmoqda. Ular orasidagi masofa 780 m. Katerning tezligi teploxodnikidan 60% ga ortiq. Agar ular 15 soniyadan keyin uchrashishgan bo'lsa, katerning tezligini toping.
A) 20 B) 32 C) 10 D) 16

2. (a1-g4-15) Tramvay tezligini har soatda 10 km/s ga orttirib manzilga 3 soatda yetib bordi. Agar shu manzilga tezligini har soatda 10 km/s ga kamaytirib yursaydi, 5 soatda yetib borardi. Tramvayning manzili necha km?
A) 225 B) 245
C) 265 D) 285

3. (a1-g7-17) Ferrari avtomobili o'zidan 120 km oldinda 170 km/soat tezlik bilan ketayotgan Honda mototsiklini 3 soatda quvib o'tishi uchun qanday tezlikda harakatlanishi kerak?
A) $183\frac{1}{3}$ km/soat
B) 210 km/soat
C) 250 km/soat
D) 290 km/soat

4. (a1-g10-15) Uzunligi 400 m bo'lgan poyezd balandligi 40 m bo'lgan ustun yonidan 40 soniyada o'tib ketgan bo'lsa, poyezdning tezligi necha m/s?
A) 10 B) 11
C) 12 D) 13

5. (a1-g12-30) Avtomobil yo'lga chiqqanidan ikki soat o'tgach spidometrga qarab atigi 112 km bosib o'tganligini aniqlandi. Haydovchi chamalab ko'rib, agar shu tezligi bilan yuradigan bo'lsa, manzilga 30 min kechikib borishini aniqladi. Shuning uchun tezlikni orttirdi va muddatidan 30 min oldin yetib keldi. Agar boshlang'ich nuqtadan manzilgacha masofa 280 km bo'lsa, avtomobilning tezlikni oshirgandan keyingi tezligini toping.
A) 60 B) 80
C) 72 D) 84

6. (a1-g15-15) 160 km/soat tezlik bilan harakatlanayotgan «Nexia» avtomobili o'zidan 200 km oldinda ketayotgan «Jaguar» avtomobilini 2 soatda quvib o'tgan bo'lsa, «Jaguar» qanday tezlikda harakatlangan?
A) 75 km/soat
B) 80 km/soat
C) 60 km/soat
D) 100 km/soat

7. (a2-g1-14) Ikki avtomobilning orasidagi masofa 280 km. Agar ular bir-birlariga qarab harakatlansalar 2 soatdan keyin, bir tomonga harakatlansalar 14 soatdan keyin uchrashishadi. Tezroq yurayotgan avtomobilning tezligi necha km/soat?
A) 90 B) 70
C) 80 D) 100

8. (a2-g3-10) Agar avtomobil tezligini $2x$ km/soat ga kamaytirilsa, masofani 10 soatda bosib o'tadi. $3x$ km/soat ga orttirsa, 4 soatda bosib o'tdi. Masofa necha x km?
A) $4\frac{1}{3}$ B) $22\frac{2}{3}$
C) $33\frac{1}{3}$ D) $11\frac{2}{99}$

9. (a2-g7-15) Jamol aka Qorasuvdan Navoiyga taksida 20 minutda, avtobusda 1 soatda yetib keladi. Agar avtobusning o'rtacha tezligi 25 km/soat bo'lsa, taksining o'rtacha tezligini toping.
A) 125 B) 50
C) 90 D) 75

10. (a2-g8-17) 72 km/soat bilan harakatlanayotgan Nexia avtomashinasi o'zidan 12 km oldinda 57 km/soat tezlik bilan ketayotgan Matiz avtomobilini necha minutda quvib o'tadi?
A) 24 B) 36 C) 48 D) 42

11. (a2-g10-15) Uzunligi 500 m bo'lgan poyezd balandligi 50 m bo'lgan ustun yonidan 50 soniyada o'tib ketgan bo'lsa, poyezdning tezligi necha m/s?
A) 10 B) 11 C) 12 D) 13

12. (a2-g16-15) Uzunligi 1 km bo'lgan poyezd 15 m/s tezlik bilan harakatlanmoqda. 20 m/s tezlik bilan ketayotgan avtomashina bu poyezddan qancha vaqtda o'tib ketadi?
A) 2 daqiqa 40 soniya
B) 3 daqiqa
C) 2 daqiqa 30 soniya
D) 3 daqiqa 20 soniya

13. (a2-g22-15) Abdurahmon tepalikka ko'tarilishda 30 km/s tezlik bilan, pastga tushishda esa 70 km/s tezlik bilan harakatlanib 5 soatda borib qaytdi. Abdurahmon tepalikka necha soatda ko'tarilgan?
A) 3,5 B) 3 C) 2 D) 1,5

14. (a2-g23-15) Odam ma'lum bir masofani 120 qadamda bosib o'tadi. Agar odam qadam uzunligini 10 sm qisqartirsa, 150 qadamda bosib o'tmoqda. Masofa necha metr?
A) 54 B) 60 C) 75 D) 90

15. (a3-g1-15) Tezliklari nisbati 2 ga teng bo'lgan ikki jism bir tomonga harakatlanmoqda. Orqadagi jism oldindagi jismga 15 daqiqada yetib oldi. Oradagi masofa shuncha bo'lib, bu jismlar bir-biriga qarab harakatlansa, necha soniyadan so'ng uchrashadi?
A) 7,5 B) 30 C) 5 D) 45

16. (a3-g3-17) 68 km/soat bilan harakatlanayotgan Nexia avtomashinasi o'zidan 9 km oldinda 53 km/soat tezlik bilan ketayotgan Matiz avtomobilini necha minutda quvib o'tadi?
A) 24 B) 36
C) 32 D) 42

17. (a3-g6-15) Avaz oqimga qarshi suzib 200 m masofani 4 minutda, oqim yo'nalishida suzib 300 m ni 2,5 minutda bosib o'tdi. Avazning turg'un suvdagi tezligini toping (m/s da).
A) $\frac{17}{12}$ B) $\frac{4}{3}$
C) $\frac{25}{9}$ D) $\frac{7}{6}$

18. (a3-g6-30) Nexia avtomashinasi g'ildiragining radiusi 30 sm. G'ildirak 1 sekundda 12 marta aylanayotgan bo'lsa, mashina qanday tezlikda harakatlanmoqda? ($\pi = 3$ deb olinsin)
A) 10,8 m/s
B) 14,4 m/s
C) 21,6 m/s
D) 24 m/s

19. (a3-g11-15) Azim aka Qoratoshdan Navoiygacha avtobusda 10 minutda, piyoda 0,5 soatda yetib keladi. Agar avtobusning o'rtacha tezligi 60 km/soat bo'lsa, Azim akaning piyoda yurgandagi o'rtacha tezligini toping.
A) 30 km/soat
B) 20 km/soat
C) 12 km/soat
D) 40 km/soat

20. (a3-g17-14) A nuqtadan B nuqtaga $2v$ tezlik bilan ketgan avtobus qaytishda $3v$ tezlik bilan yurdi. Umumiy yo'lga 7 soat vaqt ketgan bo'lsa, avtobus A dan B ga necha soatda yetib borgan?

A) 3 soat 48 minut
B) 4 soat 20 minut
C) 3 soat 40 minut
D) 4 soat 12 minut

21. (a3-g19-15) Yangi tezyurar poyezd Toshkentdan Buxoroga borishda 144 km/soat o'rtacha tezlik bilan, qaytishda esa o'rtacha 135 km/soat bilan harakatlandi. Qaytishda poyezd borishdagiga qaraganda 15 minut ko'p vaqt sarflagan bo'lsa, har gal u qancha masofa bosib o'tgan?
A) 510 B) 540
C) 534 D) 504

22. (a3-g22-14) 30 km/soat tezlik bilan ketayotgan poyezd uzunligi 7 km bo'lgan tunneldan 15 minutda o'tib ketgan bo'lsa, poyezdning uzunligi necha metr?
A) 500 B) 400
C) 300 D) 250

23. (a3-g24-13) Bosit viloyatdan Toshkentga yo'lga tushganidan ikki soat o'tgach, spidometrga qarab atigi 112 km bosib o'tganligini aniqladi. U chamalab ko'rib, agar shu tezligi bilan yuradigan bo'lsa, belgilangan vaqtdan 30 minut kechikib borishini bildi. Shuning uchun tezlikni orttirdi va Toshkentga muddatidan 30 minut oldin yetib keldi. Agar viloyatdan Toshkentgacha bo'lgan masofa 280 km bo'lsa, Bositning mashinasi dastlabki va keyingi tezliklari yig'indisini toping.
A) 100 B) 120
C) 140 D) 84

24. (a4-g5-13) Sohildagi A va B nuqtalar orasidagi masofa 192 km. Qayiqqa A nuqtadan B nuqtaga 16 soatda yetib borib, 32 soatda ortga qaytib kelsa, qayiq tezligining oqim tezligiga nisbatini toping.
A) 3 B) 2 C) 1,75 D) 4

25. (a4-g7-13) Dilnoza buvisini ziyorat qilish maqsadida yo'lga chiqdi. Uning hisobiga ko'ra buvisining uyiga 30 daqiqada yetib borishi kerak edi. Lekin avtobus u o'ylagan o'rtacha tezlikdan 10 km/soat sekinroq yurgani sababli Dilnoza buvisining uyiga 35 daqiqada yetib bordi. Avtobus o'rtacha qanday tezlik bilan harakatlangan?
A) 80 B) 60 C) 70 D) 35

26. (a4-g9-14) Tezligi 80 km/soat bo'lgan mashina A nuqtadan, tezligi 50 km/soat bo'lgan mashina B nuqtadan bir-biriga qarab harakatlanib, 3 soatda uchrashishadi. Agar bu mashinalar A va B nuqtadan bir tomonga (tezligi katta mashina orqaroqda) harakatni boshlashganida necha soatdan keyin uchrashishar edi?
A) 8 B) 11 C) 13 D) 16

27. (a4-g18-14) Salohiddin Umidjondan 1,5 marta tezroq suzadi. Umidjon 15 daqiqa suzib, 5 daqiqa dam oladi. Salohiddin bir soat davomida tinimsiz suzib, 1500 metr suzdi. Bu vaqt davomida Umidjon necha metr suzgan?
A) 800 B) 1000
C) 750 D) 600

28. (a4-g24-12) Abdulloh 50 metr masofani suzib bo'lgach, Muhammad suzishni boshladi. Ular 500 metrlik marraga bir vaqtda yetib kelishdi. Shu suzishda davom etishsa, Abdulloh 700-metrini suzib bo'lganida Muhammad necha metr suzgan bo'ladi?
A) 675 B) 727,(77)
C) 777,(7) D) 775

29. (a5-g4-14) Avtomobil 850 km lik masofaning asfalt qilinmagan qismini 50 km/soat tezlik bilan, asfaltlangan qismini 100 km/soat tezlik bilan jami 12 soatda bosib o'tdi. Yo'lning necha km asfalt qilinmagan?
A) 450 B) 350
C) 400 D) 500

30. (a5-g5-14) A va B nuqtalar orasidagi masofa a km. Ikki ulov AB chiziq bo'yicha bir yo'nalishda ayni vaqtda harakat boshladilar. A dan harakatlana boshlagan ulovning tezligi B dan harakat boshlagan ulovning tezligidan b ($b > 1$) marta katta. A dagi ulov B dagi ulovga yetib olganida, B nuqtadan qancha uzoqlikda bo'lishadi?

A) $\frac{ab}{b+1}$ B) $\frac{a}{b+1}$

C) $\frac{ab}{b-1}$ D) $\frac{a}{b-1}$

31. (a5-g8-14) Oralaridagi masofa 20 km bo'lgan ikki avtomobildan orqadagisining tezligi oldindagi avtomobilning tezligidan 3 km/soat ortiq. Necha soatdan so'ng bu ikki avtomobil orasidagi masofa 8 km ni tashkil etadi?
A) 4 B) 6,(6)
C) 2,(6) D) 3

32. (a5-g12-12) «Nexia» avtomashinasi 1 km ga 160 so'mlik benzin sarflaydi. Yoqilg'i xarajatlarini kamaytirish maqsadida 1 mln 800 ming so'mga metan gaz tizimi o'rnatildi. Shundan so'ng mashina 21 ming so'mlik gaz bilan 300 km masofani bosib o'tmoqda. Avtomashina necha km yo'l bosib o'tgach, gaz tizimi uchun sarflagan pulini tejab qoladi?
A) 30000 B) 24000
C) 28000 D) 20000

33. (a5-g14-13) Abdurahmon Xorazmgacha bo'lgan 1200 km lik yo'lning ma'lum bir qismini 80 km/s tezlik bilan, qolgan qismini 120 km/s tezlik bilan bosib o'tdi. Umumiy yo'lga 14 soat vaqt sarflagan bo'lsa, necha km yo'lni 80 km/s tezlik bilan bosib o'tgan?
A) 840 B) 1120
C) 560 D) 960

34. (a5-g15-27) Samarqanddan Toshkentgacha masofa 300 km. Samarqanddan «Vaz 2106» avtomashinasi yo'lga chiqqanidan 2 soatdan keyin «Nexia» avtomobili harakatlandi va ikki avtomobil bir vaqtda Toshkentga yetib keldi. Agar ularning o'rtacha tezliklari orasidagi farq 40 km/s bo'lsa, «Nexia» avtomobilining tezligini toping.
A) 100 B) 80 C) 75 D) 60

35. (a5-g16-12) A va B nuqtalar orasidagi yo'lni A nuqtadan yo'lga chiqqan yo'lovchi 2 soat 24 daqiqada, ikkinchisi (B nuqtadan yo'lga chiqqan) esa 3 soatda bosib o'tadi. Bu ikki yo'lovchi bir vaqtda yo'lga chiqishsa, necha daqiqadan keyin uchrashishadi?
A) 81 B) 60 C) 80 D) 72

36. (a5-g25-13) Avtomobil 440 km lik masofaning ma'lum bir qismini 80 km/soat tezlik bilan, qolgan qismini 60 km/soat tezlik bilan 6 soatda bosib o'tdi. Avtomobil 60 km/soat tezlik bilan necha soat harakatlangan?
A) 3,6 B) 2,4
C) 2. D) 4

37. (a6-g2-13) Qayiq ma'lum masofani oqim bo'ylab 40 soniyada, oqimga qarshi 1,5 daqiqada bosib o'tadi. Shu masofani oqmaydigan suvda necha soniyada bosib o'tadi?

A) $\frac{720}{13}$ B) $\frac{640}{13}$

C) $\frac{680}{13}$ D) $\frac{840}{13}$

38. (a6-g3-13) Yo'lovchi mototsiklda yo'lning 32% ini 16 km/soat tezlik bilan, 28% ini esa 20 km/soat tezlik bilan, qolgan qismini 25 km/soat tezlik bilan jami 8 soatda bosib o'tdi. Yo'lovchi necha km masofani bosib o'tgan?
A) 320 B) 80 C) 160 D) 200

39. (a6-g4-12) Umidjon va Umida ishdan soat 18:00 da chiqib ketishdi. Umidjonning tezligi Umidaning tezligidan 1,5 barovar tez. Umidjonning uyi ish joyidan 8 km uzoqlikda, Umidaning uyi esa 12 km uzoqlikda joylashgan. Agar Umidjon uyiga soat 19:30 da yetib borgan bo'lsa, Umida soat nechada uyiga yetib boradi?
A) 21:23
B) 20:30
C) 20:38
D) 21:00

40. (a6-g7-13) Orasida 480 km bo'lgan A va B shaharlardan bir-biriga qarab yo'lga chiqqan ikki avtomobil 3 soatdan keyin uchrashishdi. Agar bu avtomobillar bir xil yo'nalishda harakatlanishganida ular 6 soatdan keyin uchrashishar edi. Tezroq yurayotgan mashina tezligini toping.
A) 120 B) 90 C) 80 D) 140

41. (a6-g8-13) Velosipedchi 96 km ni mo'ljaldagidan 2 soat kamroq vaqtda bosib o'tdi. Bunda u har soatda 1 soat-u 15 daqiqada bosib o'tadigan yo'lidan 1 km ortiq yurdi. U qanday tezlik (km/soat) bilan harakatlangan?
A) 12 B) 20
C) 16 D) 24

42. (a6-g10-13) Toshkent va Samarqand stansiyalari orasi 420 km. Afrosiyob tezyurar poyezdi jadval bo'yicha bu masofani 2 soat 20 minutda bosib o'tishi kerak edi. Texnik sabablar tufayli poyezd 10 minut kech yo'lga chiqdi hamda oxirgi 150 km da tezlikni jadvaldagidan 20 km/soat ortiq tezlik bilan o'tdi. Poyezd manzilga jadvaldagidan qancha vaqt farqi bilan keldi?
A) 5 minut oldin
B) 10 minut oldin
C) 15 minut keyin
D) 5 minut keyin

43. (a6-g16-24) Namangandan Toshkentgacha masofa 300 km. Namangandan Vaz 2106 avtomashinasi yo'lga chiqqanidan 2 soat keyin Nexia avtomobili yo'lga chiqdi va ikki avtomobil bir vaqtda Toshkentga yetib keldi. Agar ularning o'rtacha tezliklari orasidagi farq 40 km/s bo'lsa, Nexia avtomobilining tezligini toping.
A) 100 B) 80
C) 75 D) 60

44. (a6-g17-13) Dilnoza buvisini ziyorat qilish maqsadida yo'lga chiqdi. Uning hisobiga ko'ra buvisining uyiga 40 daqiqada yetib borishi kerak edi. Lekin avtobus u o'ylagan o'rtacha tezlikdan 10 km/soat tezroq yurgani sababli Dilnoza buvisining uyiga 30 daqiqada yetib bordi. Avtobus o'rtacha qanday tezlik bilan harakatlangan?
A) 80 B) 60
C) 40 D) 30

67. Aralashmaga doir masalalar

1. (a1-g7-11) Massasi 300 g va konsentratsiyasi 25% bo'lgan eritmaga qancha suv (g) qo'shilsa, uning konsentratsiyasi 10% bo'ladi?
A) 350 B) 400
C) 450 D) 500

2. (a1-g14-15) Tuz foizi 5% bo'lgan 40 litr suvga qancha toza suv qo'shilsa, tuzning foizi 2% bo'lib qoladi?
A) 40 B) 60
C) 80 D) 100

3. (a2-g2-16) Avtomobil radiatori 8 litr sig'imga ega. U 30% li antifriz eritmasi bilan to'ldirilgan. Ushbu eritmaning qanchasi bo'shatilib o'rniga 100% li antifriz quyilsa, uning konsentratsiyasi 40% bo'ladi?
A) $2\frac{2}{7}$ B) $1\frac{6}{7}$ C) $1\frac{1}{7}$ D) $2\frac{1}{7}$

4. (a2-g10-16) Massasi 300 g va konsentratsiyasi 25% bo'lgan eritmaga qancha suv (g) qo'shilsa, uning konsentratsiyasi 10% bo'ladi?
A) 350 B) 400
C) 450 D) 500

5. (a2-g11-16) Avtomobil radiatori 16 litr sig'imga ega. U 25% li antifriz eritmasi bilan to'ldirilgan. Ushbu eritmaning qanchasi bo'shatilib o'rniga 100% li antifriz quyilsa, uning konsentratsiyasi 35% bo'ladi?
A) $3\frac{7}{30}$ B) $2\frac{2}{15}$
C) $1\frac{14}{15}$ D) $2\frac{2}{5}$

6. (a2-g17-15) 20% li tuzli suvga 240 litr suv quyilganda undagi tuzning miqdori 12% bo'ldi. Dastlab tuzli suv necha litr bo'lgan?
A) 240 B) 320
C) 360 D) 600

7. (a3-g24-14) Yog'liligi 3% bo'lgan 70 litr sut bilan yog'liligi 6% bo'lgan necha litr sut aralashtirilsa, yog'liligi 4% bo'lgan sut olish mumkin?
A) 70 B) 35
C) 105 D) 50

8. (a4-g4-14) x, y va z moddalardan tashkil topadigan aralashmada x ning y ga nisbati 4:9 va y ning z ga nisbati 2:3 kabi. Laboratoriyada y moddadan 70 gr, y moddadan 144 gr va z moddadan 250 gr bo'lsa, eng ko'pi bilan necha gramlik aralashma hosil qilish mumkin?
A) 416 B) 424
C) 444 D) 464

9. (a4-g11-27) 100 gramm un bilan 10 gramm tuz aralashtirlyapti. Bu aralashmaning 1 gramida necha gram un bo'ladi?
A) $\frac{10}{11}$ B) $\frac{9}{10}$
C) $\frac{8}{9}$ D) $\frac{9}{11}$.

10. (a4-g21-14) 20% li tuzli suvga 300 litr suv quyilganda undagi tuzning miqdori 12% bo'ldi. Dastlab tuzli suv necha litr bo'lgan?
A) 450 B) 320
C) 360 D) 600

11. (a4-g22-15) 30% li tuzli suvga 390 litr suv quyilganda undagi tuzning miqdori 12% bo'ldi. Dastlab tuzli suv necha litr bo'lgan?
A) 450 B) 130
C) 260 D) 600

12. (a4-g25-14) Sement, qum va suvdan iborat 1 tonnalik beton qorishmasida qum 60% ni tashkil etadi. Qorishmadagi qum miqdori 40% bo'lishi uchun unga necha kg suv qo'shish kerak bo'ladi?
A) 500 B) 750
C) 400 D) 600

13. (a5-g1-14) Mis va kumush qotishmasidagi kumushning massasi 8 g. Unga 10 g toza mis qo'shilganda kumushning ulushi 4% ga kamaydi. Dastlab qotishmada necha g mis bo'lgan?
A) 32 B) 40 C) 24 D) 64

14. (a5-g3-14) 15% li tuzli suvga 160 litr suv quyilganda undagi tuzning konsentratsiyasi 9% bo'ldi. Dastlab tuzli suv necha litr bo'lgan?
A) 320 B) 240
C) 200 D) 280

15. (a5-g20-13) Beton qorishmasining 20% i sement, 40% i shag'al va yana 40% i suvdan iborat. Beton qotishi jarayonida suvning 70% i bug'lanib ketdi. Qotgan beton tarkibida sementning foiz miqdorini aniqlang.
A) 25,(5)%
B) 27,(7)%
C) 33,(3)%
D) 22,(2)%

12-bob. Funksiyalar

68. Funksiya argumenti va aniqlanish sohasi

1. (a1-g2-21) Funksiyaning aniqlanish sohasini ko'rsating.

$$f(x)=\frac{\sqrt[4]{x+2}}{\ln(5-x)}$$

A) $(-\infty; -2]\cup(5; \infty)$
B) $[-2; 5]$
C) $[-2; 5)$
D) $[-2; 4)\cup(4; 5)$

2. (a1-g4-16) Funksiyaning aniqlanish sohasini toping. $y=\sqrt{5-x-\frac{6}{x}}$

A) $\left(-\infty; 0\right]\cup\left[3; \infty\right)$
B) $\left(-\infty; 0\right)\cup\left[2; 3\right]$
C) $\left[2; 3\right]$
D) $\left(0; 2\right)\cup\left[3; \infty\right)$

3. (a1-g7-12) Funksiyaning aniqlanish sohasini ko'rsating.

$$f(x)=\frac{\sqrt[4]{x+1}}{\ln(2-x)}.$$

A) $(-\infty; -1]\cup[2; \infty)$
B) $[-1; 1)\cup(1; 2)$
C) $[-1; 2)$
D) $[0; 2]$

4. (a2-g6-16) Funksiyaning aniqlanish sohasini toping.

$$y=\sqrt{7-x-\frac{10}{x}}$$

A) $(-\infty; 0]\cup[5; \infty)$
B) $(-\infty; 0)\cup[2; 5]$
C) $[2; 5]$
D) $(0; 2]\cup[5; \infty)$

5. (a2-g12-22)
$f(x)=\arccos(\log_2(2x-4))+\frac{1}{\sqrt{25-4x^2}}$ funksiyaning aniqlanish sohasini toping.
A) $(-2,5;\ 2)$
B) $[2,25;\ 3]$
C) $[2,25;\ 2,5)$
D) $(2;\ 2,5)$

6. (a2-g19-16) Berilgan funksiyaning aniqlanish sohasini toping.
$y=\sqrt{-4-x+\frac{12}{x}}$
A) $(-\infty;\ -6]\cup(0;\ 2]$
B) $[-6;\ 0)\cup[2;\ \infty)$
C) $(-\infty;\ -6]\cup[2;\ \infty)$
D) $[-6;\ 2]$

7. (a3-g16-16) Quyidagi funksiyaning aniqlanish sohasini toping.
$y=\sqrt{x+7}-\sqrt[3]{2-x}$
A) $(-\infty;\ -7]$
B) $[-7;\ 2]$
C) $[-7;\ \infty)$
D) $[-7;\ 0)$

8. (a3-g17-15) Quyidagi funksiyaning aniqlanish sohasini toping.
$f(x)=\frac{\sqrt[3]{x-5}}{x+2}-\sqrt{x^2+16x+63}$
A) $[5;\ \infty)$
B) $(-\infty;\ -9]\cup[-7;\ -2)\cup(-2;\ \infty)$
C) $[-9;\ -7]\cup\{5\}$
D) $(-\infty;\ -9]\cup[-7;\ \infty)$

9. (a4-g19-16) $y=\frac{\sqrt{3-|x-2|}}{x+1}$ funksiyaning aniqlanish sohasiga kiruvchi butun sonlar nechta?
A) 6 B) 5
C) 7 D) cheksiz ko'p

10. (a5-g21-15) Quyidagi funksiyaning aniqlanish sohasini toping.
$y=\sqrt[4]{7-x^2+6x}+\sqrt[3]{\frac{x}{x-3}}$
A) $[-1;\ 3)\cup(3;\ 7]$
B) $[-1;\ 0]\cup(3;\ 7]$
C) $(-\infty;\ -1]\cup[7;\ \infty)$
D) $[-7;\ 1]$

11. (a5-g22-14) $y=\frac{2015}{2-\frac{1}{2-\frac{1}{x-2}}}-\frac{2016}{1-\frac{3}{1-\frac{3}{1-x}}}$ funksiya x ning nechta qiymatida aniqlanmagan?
A) 2 B) 4 C) 5 D) 6

69. Funksiyaning juft va toqligi

1. (a1-g6-16) Quyidagi funksiyalardan qaysilari juft funksiya?
I) $f(x)=(x-4)^2+8x$; II) $f(x)=x^3+x$;
III) $f(x)=x^4+3x^2+5$;
IV) $f(x)=x^2-4x+4$;
V) $f(x)=\frac{x^4-16}{(x-2)(x+2)}$
A) II va IV
B) I va III
C) I, III va V
D) II, IV va V

2. (a2-g5-16) Quyidagi funksiyalardan qaysi biri toq funksiya.
1) $f(x)=(x-4)^2+8x$; 2) $f(x)=x^3+x$;
3) $f(x)=x^4+3x^2+5$;
4) $f(x)=x^2-4x+4$;
5) $f(x)=\frac{x^4-16}{(x-2)(x+2)}$.
A) faqat 1
B) 1 va 3
C) 1, 3 va 5
D) 2, 4 va 5

3. (a2-g21-17) Quyidagilardan qaysi biri juft funksiya?
A) $y=3x|x|+2$
B) $y=\frac{(x-6)^2}{5}$
C) $y=\frac{x^2-5}{2x}$
D) $y=\frac{2x^2-x^4-6}{|x|}$

4. (a2-g23-16) Quyidagi funksiyalardan qaysi biri juft funksiya?
A) $y=\frac{|x-2|}{|x+2|}$
B) $y=(x+2)^2$
C) $y=x^2-x$
D) $y=|2+x|+|x-2|$

5. (a3-g1-2) Quyidagi mulohazalardan qaysilari to'g'ri?
1) arifmetik progressiyada ketma-ket kelgan uchta hadning yig'indisi o'rtadagi hadning ikkilanganiga teng;
2) juft funksiyaning grafigi OY o'qiga nisbatan simmetrik bo'ladi;
3) logarifmik funksiyaning asosi birdan katta bo'lganida, argumentning qiymati ortgan sari funksiyaning qiymati kamayib boradi;
4) $y=\sin x+\cos x$ funksiya birdan katta qiymat qabul qilishi mumkin;
5) jismning tezlanish formulasini topish uchun uning tezlik formulasidan bir marta hosila olish yetarli.
A) 1, 3, 4
B) 2, 4, 5
C) 3, 4, 5
D) 1, 2, 5

6. (a3-g4-16) Quyidagilardan nechtasi juft funksiya?
1) $y=(x+4)^2-8x$; 2) $y=7^{-x}+7^x$;
3) $y=x^2-|x|+5$;
4) $y=(5-x)^3+(5+x)^3$.
A) 1 B) 2 C) 3 D) 4

7. (a4-g16-15) Quyidagi funksiyalardan nechtasi juft?
1) $y=\frac{\sqrt{25-x^2}}{|x|}$; 2) $y=(x+3)^2-6x$;
3) $y=\frac{3^x-3^x}{x^2}$; 4) $y=\frac{x+x^3}{(x-1)^2+2x}$.
A) 1 B) 2 C) 3 D) 4

8. (a4-g21-15) Quyidagi funksiyalardan nechtasi juft?
1) $y=\frac{\sqrt{36+x^2}}{|x|}$; 2) $y=(x-7)^2+14x$;
3) $y=\frac{3^{-x}-3^x}{x^2}$; 4) $y=\frac{x+x^3}{(x-1)^2+2x}$;
5) $y=\frac{\arcsin x}{\sin x}$.
A) 2 B) 3 C) 4 D) 5

9. (a5-g23-14) Quyidagi mulohazalardan qaysilari to'g'ri?
1) juft funksiyaning grafigi OY o'qiga nisbatan simmetrik;
2) toq funksiyaning grafigi OX o'qiga nisbatan simmetrik;
3) funksiyaning OX o'qini kesib o'tganida funksiyaning argumenti nol qiymatini qabul qiladi;
4) funksiyaning grafigi OX o'qini nechta nuqtada kesib o'tsa, shuncha nolga ega bo'ladi;
5) OX o'qiga parallel to'g'ri chiziqning tenglamasi $y=a$ ko'rinishida bo'ladi.
A) 1, 3, 4
B) 1, 4, 5
C) 2, 3, 4
D) 2, 4, 5

10. (a6-g2-14) $y=\frac{3x-7}{x+3}-4$ funksiyaning qiymatlar sohasini toping.
A) $(-\infty;\ -1)\cup(-1;\ \infty)$
B) $(-\infty;\ -4)\cup(-4;\ \infty)$
C) $(-\infty;\ 1)\cup(1;\ \infty)$
D) $(-\infty;\ -3)\cup(-3;\ \infty)$

11. (a6-g3-14) Quyidagi funksiyalardan nechtasi juft?
1) $y=|x-3|+x+3$;
2) $y=(x-3)^3-x^3-27x$;
3) $y=|5x|-3+x^2$;
4) $y=(x+3)^2-x^2-9$;
5) $y=x^2-8x+16$.
A) 1 B) 2 C) 3 D) 4

12. (a6-g8-14) Quyidagi funksiyalardan nechtasi juft?
1) $y=x(|x|+1)$; 2) $y=\begin{cases}x^2, & x\le 0\\ -x^2, & x>0\end{cases}$;

3) $y=\begin{cases}x, & x\le 0\\ -x, & x>0\end{cases}$; 4) $y=-x^2+2$;

5) $y=x^3+\frac{1}{x^3}$; 6) $y=\frac{x(x^2-x-2)}{(x-2)(x+1)}$.

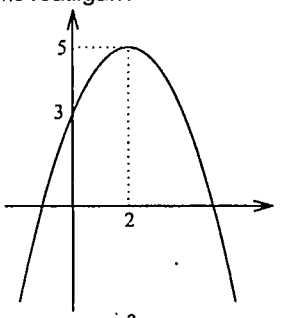
A) 6 B) 2 C) 3 D) 4

13. (a6-g22-24) Quyidagi funksiyalardan qaysilari toq funksiya?
1) $f(x)=(x-4)^2+8x$;
2) $f(x)=x^3+x$; 3) $f(x)=x^4+3x^2+5$;
4) $f(x)=x^2-4x+4$;
5) $f(x)=\frac{x^4-16}{(x-2)(x+2)}$.

A) II va IV
B) I va III
C) faqat II
D) II, IV va V

70. Funksiya grafigi, eng katta qiymati, qiymatlar sohasi

1. (a1-g9-17) Rasmda berilgan funksiyaning grafigi qaysi javobda ko'rsatilgan?



A) $-2(x-2)^2+3$
B) $5-0{,}5\cdot(x-2)^2$
C) $3-2(x+5)^2$
D) $0{,}5\cdot(x+3)^2+5$

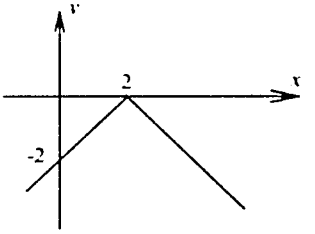
2. (a1-g11-18) $y=3x-1$ va $y=-4x-3$ funksiyalarning grafiklari koordinata tekisligining qaysi choragida kesishadi?
A) I B) II C) III D) IV

3. (a1-g11-19) Quyidagi funksiyalardan qaysilari OX o'qini kesib o'tmaydi?
1) $y=3^x+3$; 2) $y=2\cdot3^x-5$;
3) $y=5\cdot3^x$; 4) $y=3^x-1$.
A) hech biri kesib o'tmaydi
B) 2, 4
C) 1, 3
D) 1, 2, 4

4. (a1-g17-17) Quyidagi funksiyalardan qaysi birining grafigi (2; 20) nuqtadan o'tadi?
A) $y=x^2-5x+2$
B) $y=x^3-4x+7$
C) $y=x^4+2x$
D) $y=x^5+8$

5. (a2-g2-18) $y=|4+x|-|x-9|$ funksiyaning qiymatlar sohasini toping.
A) $[-13;\infty)$
B) $(-\infty;13]$
C) $(-\infty;-13]\cup[13;\infty)$
D) $[-13;13]$

6. (a2-g3-24) Yuqorida ko'rsatilgan grafik qaysi funksiyaga tegishli?



A) $y=|x|-2$
B) $y=|x-2|$
C) $y=-|2-x|$
D) $y=2-|x-2|$

7. (a2-g4-18) $y=|x^2-4x+3|$ funksiyaning qiymatlar sohasini toping.
A) $[1;\infty)$ B) $[-1;1]$
C) $[-1;\infty]$ D) $[0;\infty)$

8. (a2-g6-17) $y=|x-7|+|x+6|$ funksiyaning qiymatlar sohasini toping.
A) $[-6;7]$ B) $[13;\infty)$
C) $[1;\infty)$ D) $[-7;6]$

9. (a2-g7-17) $y=\frac{-3}{x-2}-2$ funksiya qaysi choraklaridan o'tadi?
A) II, IV B) I, II, III
C) I, II, III, IV D) I, III, IV

10. (a2-g11-17) Quyidagi funksiyalardan qaysi biri $(-2;14)$ nuqtadan o'tadi?
A) $y=2x^3-7$
B) $y=3x^2-x$
C) $y=x^4-x$
D) $y=2x^3+6$

11. (a2-g11-18) $y=|5-x|-|x+7|$ funksiyaning qiymatlar sohasini toping.
A) $[-12;\infty)$
B) $(-\infty;12]$
C) $(-\infty;-12]\cup[12;\infty)$
D) $[-12;12]$

12. (a2-g12-17) $y=|x^2-9|+x^2-3$ funksiyaning qiymatlar to'plamini toping.
A) $[-6;\infty]$ B) $[6;\infty)$
C) $[4;\infty)$ D) $|\vec{a}-\vec{b}|>|\vec{a}+\vec{b}|$

13. (a2-g12-28) Agar $A\left(\frac{m^2}{n};\frac{n}{m}\right)$ nuqta II chorakka tegishli bo'lsa, $(m;n)$ nuqta qaysi chorakda yotadi?
A) I B) II C) III D) IV

14. (a2-g23-17) $y=x^2-3x+2$ va $y=2x-5$ funksiyalar koordinata tekisligining qaysi choraklarida kesishadi?
A) I va II
B) I va III
C) kesishmaydi
D) II va IV

15. (a3-g5-17) $y=|2x-5|-|2x+3|$ funksiyaning qiymatlar sohasini toping.
A) $[-8;8]$
B) $(-\infty;-8]\cup[8;\infty)$
C) $[8;\infty)$
D) $(-\infty;-8]$

16. (a3-g7-16) $y=(x+1)\cdot(x+2)\cdot(x-3)\cdot(x-4)+4$ funksiyaning qiymatlar sohasini toping.
A) $[-2{,}25;\infty)$
B) $[-2;4]$
C) $[4;\infty)$
D) $[6{,}25;\infty)$

17. (a3-g7-19) Quyidagi mulohazalardan qaysilari to'g'ri?
1) funksiyaning grafigi OX o'qini $y=0$ qiymatga erishganda kesib o'tadi;
2) ko'rsatkichli funksiyaning asosi 1 dan kichik bo'lganda, argument manfiy son bo'lsa, funksiyaning qiymati 1 dan katta bo'ladi;
3) logarifmik funksiyaning grafigi doimo (0; 1) nuqtadan o'tadi;
4) qo'shni burchaklar tangenslari yig'indisi nolga teng;
5) jism tezlik tenglamasining boshlang'ichi uning tezlanish tenglamasini beradi.
A) 1, 2, 3 B) 1, 2, 4
C) 2, 3, 4 D) 2, 4, 5

18. (a3-g9-16) $y=x^3+b^2-5b+14$ funksiyaning grafigi OY o'qini $y=8$ nuqtada kesib o'tadi. Bu funksiya OX o'qini qaysi nuqtada kesib o'tadi?
A) $x=-2$ B) $x=2$
C) $x=8$ D) $x=4$

19. (a3-g9-20) Quyidagi mulohazalardan qaysilari to'g'ri?
1) funksiyaning grafigi OX o'qini bir necha nuqtada kesib o'tishi mumkin;
2) asosi birdan kichik bo'lgan ko'rsatkichli funksiya x ning musbat qiymatlarida birdan kichik qiymatlarni qabul qiladi;
3) $y=\log_4 x$ funksiya juft funksiya;
4) $y=\sin x$ funksiyaning aniqlanish sohasiga barcha haqiqiy sonlar kiradi;
5) funksiyaning hosilasi nolga teng bo'lganida funksiya o'zining eng katta qiymatiga erishadi.
A) 2, 3 va 5
B) 2, 4 va 5
C) 1, 2 va 4
D) 1, 2 va 3

20. (a3-g10-17) Quyidagi funksiyalardan qaysi biri $(-3;30)$ nuqtadan o'tadi?
A) $y=2x^3-7$
B) $y=3x^2-x$
C) $y=x^3+x$
D) $y=2x^3+6$

21. (a3-g10-18) $y=|8-x|-|x+3|$ funksiyaning qiymatlar sohasini toping.
A) $[-11;\infty)$
B) $(-\infty;11]$
C) $(-\infty;-11]\cup[11;\infty)$
D) $[-11;11]$

22. (a3-g21-16)

Yuqorida $f(x)$ funksiyaning grafigi keltirilgan. $f(x) \geq 0$ tengsizlikni yeching.

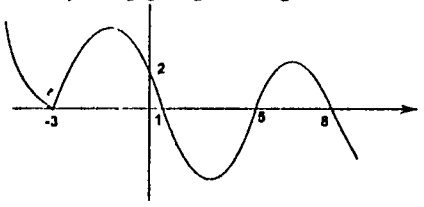
A) $(-\infty; -5] \cup [-3; 4] \cup [6; \infty)$
B) $[-5; -3] \cup \{2\} \cup [4; 6]$
C) $(-\infty; -5] \cup [-3; 2) \cup (2; 4] \cup [6; \infty)$
D) $[-5; -3] \cup [2; 4] \cup [6; \infty)$

23. (a3-g22-15) Quyidagi funksiyalardan qaysi biri A(7; 5) nuqtadan o'tadi?
A) $y = 2x - 3$
B) $y = 3x - 16$
C) $y = 4x - 13$
D) $y = x + 2$

24. (a4-g4-16) $y = (x-5)^2(x^2 - 5x - 104)$ funksiyaning grafigi OX o'qi bilan nechta umumiy nuqtaga ega?
A) 3 B) 4 C) 1 D) 2

25. (a4-g7-16) $y = \frac{-2}{x+3} + 4$ funksiyaning grafigi qaysi choraklardan o'tadi?
A) I, II, III
B) I, II, III, IV
C) I, II, IV
D) II, III, IV

26. (a4-g10-9) Quyidagi rasmda $f(x)$ funksiyaning grafigi keltirilgan.



$(x-5)f(x) \geq 0$ tengsizlikni yeching.

A) $[1; 2] \cup \{-3; 5\} \cup [8; \infty)$
B) $\{-3\} \cup [1; 8]$
C) $(-\infty; -3] \cup \{1; 5\} \cup [2; 8]$
D) $(-\infty; -1] \cup \{5\} \cup [8; \infty)$

27. (a4-g17-16) Quyidagi mulohazalardan qaysilari to'g'ri?
1) $y = a^x$ $(a > 0)$ funksiya koordinata o'qlarini kesib o'tmaydi;
2) $y = \log_a x$ $(a > 0)$ OX o'qini kesib, OY o'qini kesib o'tmaydi;
3) $y = \frac{k}{x}$ $(k \neq 0)$ funksiya koordinata o'qlarini kesib o'tmaydi;
4) $y = \log_a x$ $(0 < a < 1)$ funksiya x ning barcha qiymatlarida kamayadi;
5) $y = \frac{k}{x}$ $(k < 0)$ funksiya x ning barcha qiymatlarida kamayadi.
A) 2, 3, 5 B) 1, 2, 5
C) 1, 3, 5 D) 2, 3, 4

28. (a4-g20-9) $f(x)$ funksiya OX o'qini $(-1; 0)$ va $(3; 0)$ nuqtalarda, OY o'qini $(0; -2)$ nuqtada kesib o'tadi. $x = 5$ nuqtada esa OX o'qiga urinadi. $f(x) \leq 0$ tengsizlikni qanoatlantiruvchi butun son nechta?
A) cheksiz ko'p B) 10
C) 6 D) 5

29. (a4-g24-23) Quyidagi mulohazalardan qaysilari to'g'ri?
1) grafigi OY o'qiga nisbatan simmetrik bo'lgan funksiyalar juft hisoblanadi;
2) kvadrat tenglamaning ozod hadi manfiy qiymatga ega bo'lganida bu tenglama doimo ikkita haqiqiy ildizga ega bo'ladi;
3) ikki sonning ayirmasi moduli bu sonlar modullari ayirmasidan kichik qiymat qabul qilmaydi;
4) ishoralari bir tomonga yo'nalgan tengsizliklarni qo'shganda tengsizlik ishorasi o'zgarmaydi;
5) sonli tengsizlikning ikki tarafiga bir xil manfiy son qo'shilganda tengsizlik ishorasi teskari tomonga o'zgaradi.
A) 1, 3, 5 B) 2, 3, 4
C) 1, 3, 4 D) 2, 4, 5

30. (a5-g9-17) $y = \frac{3}{7-x} - 9$ funksiyaning qiymatlar sohasini toping.
A) $(-\infty; 7) \cup (7; \infty)$
B) $(-\infty; -7) \cup (-7; \infty)$
C) $(-\infty; -9) \cup (-9; \infty)$
D) $(-\infty; 9) \cup (9; \infty)$

31. (a5-g14-15) $y = \frac{3}{4-x} - 5$ funksiyaning grafigi qaysi choraklardan o'tadi?
A) I, III va IV B) I, II va IV
C) II va IV D) I va II

32. (a5-g17-16) $y = \left(\sqrt{x-5}\right)^2$ funksiyaning grafigi qaysi choraklardan o'tadi?
A) I va II B) I, III va IV
C) faqat I D) I, II va IV

33. (a5-g20-15) $y = x^4 - 8x^3 + 12x^2$ funksiya grafigi OX o'qi bilan nechta umumiy nuqtaga ega?
A) 0 B) 4 C) 2 D) 3

34. (a5-g22-15) $y = f(x)$ funksiyaning grafigi koordinata boshiga nisbatan simmetrik va (3; 7) va (–4; –2) nuqtalarda o'tadi. $f(-3) + f(4)$ ning qiymatini toping.
A) –5 B) –9 C) 5 D) 9

35. (a5-g23-15) $y = \frac{3x-4}{x-2}$ funksiyaning grafigi qaysi choraklardan o'tadi?
A) barcha choraklardan
B) I, II va III
C) I va III
D) I, II va IV

36. (a5-g24-14) $y = (x-7)(x+2) - 4x + 5$ funksiyaning grafigi OY o'qini y ning qanday qiymatida kesib o'tadi?
A) –9 B) –17 C) 0 D) 1

37. (a5-g25-15) $f(x) = \frac{1-2x}{x-3}$ funksiya koordinata o'qlarini nechta nuqtada kesib o'tadi?
A) 1 B) 2 C) 3 D) 0

38. (a6-g18-7) $y = \frac{x^2+6x+43}{x^2+6x+13}$ funksiyaning qiymatlar sohasini toping.
A) $\left(0; \frac{43}{13}\right]$ B) $(0; 7{,}5]$
C) $(1; 8{,}5]$ D) $\left(1; \frac{43}{13}\right]$

39. (a6-g18-22) Quyidagi mulohazalardan nechtasi to'g'ri?
1) funksiyaning grafigi koordinata o'qlarining hech birini kesib o'tmasligi mumkin.
2) juft funksiyaning grafigi koordinata boshiga nisbatan simmetrik bo'ladi.
3) $x = 0$ bo'lganda funksiya OX o'qini kesib o'tadi.
4) $y = -x$ chiziq koordinata boshiga nisbatan simmetrik.
5) $y = |x - 5|$ funksiya juft.
A) 1 B) 2 C) 3 D) 4

71. Chiziqli funksiya va uning xossalari. Funksiyaning berilish usullari. Nuqtadan to'g'ri chiziqqacha bo'lgan masofa

1. (a1-g2-15) Koordinata boshiga nisbatan $y = 5x - 3$ to'g'ri chiziqqa simmetrik bo'lgan to'g'ri chiziqning tenglamasini ko'rsating.
A) $y = 5x - 3$
B) $y = -5x - 3$
C) $y = 5x + 3$
D) $y = -5x + 3$

2. (a1-g4-33) A$(a; -1)$, B$(a + 3; 8)$ va C$(-3; a - 1)$ nuqtalar bir to'g'ri chiziqda yotsa, a ning qiymati nechaga teng.
A) $-\frac{5}{4}$ B) $\frac{5}{4}$ C) 0 D) $-\frac{9}{4}$

3. (a1-g5-32) A(3; 3), B(–1; –3) va C(0; 2k) nuqtalar bir to'g'ri chiziqda yotsa, k nechaga teng?
A) 3
B) 2
C) –0,75
D) –1

4. (a1-g16-15) OY o'qqa nisbatan $y = 5x + 2$ to'g'ri chiziqqa simmetrik bo'lgan to'g'ri chiziqning tenglamasini ko'rsating.
A) $y = -5x + 2$
B) $y = -5x - 2$
C) $y = 5x - 2$
D) $y = 5x + 2$

5. (a2-g1-17) Quyidagi funksiyalardan qaysi biri $y = 0{,}2x + 5$ to'g'ri chiziqqa parallel?
A) $y = 5x - 7$ B) $y = 3x + 5$
C) $y = \frac{x-7}{5}$ D) $y = \frac{x+7}{2}$

6. (a2-g2-17) Quyidagi chiziqlardan qaysining $y = 0{,}5x + 7$ to'g'ri chiziqqa perpendikulyar?
A) $y = 2x - 7$
B) $y = 0{,}5x + 3$
C) $y = -2x + 12$
D) $y = -0{,}5x - 7$

7. (a2-g4-17) $y = -0{,}5x + 7$ to'g'ri chiziq koordinatalar tekisligining qaysi choraklaridan o'tadi?
A) I, II, III B) II, III, IV
C) I, III, IV D) I, II, IV

8. (a2-g7-32) B(4; 5; 12) nuqta OZ o'qidan qanday uzoqlikda joylashgan?
A) 13 B) $\sqrt{158}$
C) $\frac{4}{9}$ D) $\sqrt{185}$

9. (a2-g8-19) $y = 2x + k - 1$ funksiya k ning qanday qiymatida A(3; 8) nuqtadan o'tadi?
A) –19 B) 12 C) –3 D) 3

10. (a2-g8-33) A(5; 8) va B (k; –2) nuqtalar berilgan. k ning qanday qiymatida AB kesma koordinata boshidan o'tadi?
A) –0,8 B) –1,2
C) –1,25 D) 1,2

11. (a2-g9-18) $y = 3x - 1$ va $y = -4x - 3$ funksiyalarning grafiklari koordinata tekisligining qaysi choragida kesishadi?
A) I B) II C) III D) IV

12. (a2-g11-32) A(–3; 4; 5) nuqtadan OX o'qigacha bo'lgan masofani toping.
A) $\sqrt{41}$ B) 5
C) $\sqrt{34}$ D) $5\sqrt{2}$

13. (a2-g12-18) Quyidagi to'g'ri chiziqlarning burchak koeffitsiyentlarini kamayish tartibida joylashtiring.
1) $y + 2x = 0$; 2) $5x + 2y = 1$;
3) $2y - x = 6$; 4) $7y = 5x - 6$.
A) $k_4 > k_3 > k_1 > k_2$
B) $a = \sqrt{13} - \sqrt{11}$
C) $b = \sqrt{7} - \sqrt{5}$
D) $|\vec{a} - \vec{b}| < |\vec{a} + \vec{b}|$

14. (a2-g13-20) Koordinata boshidan $x + y = 6$ chiziqqacha bo'lgan masofani toping.
A) $3\sqrt{2}$ B) 3
C) $\sqrt{3}$ D) 2

15. (a2-g15-17) k va b ning qanday qiymatlarida $y = kx + b$ funksiya koordinata tekisligining II, III va IV choraklaridan o'tadi?
A) $k < 0$ va $b < 0$
B) $k < 0$ va $b > 0$
C) $k > 0$ va $b > 0$
D) $k > 0$ va $b < 0$

16. (a2-g21-32) $K\left(-10; 5; 4\sqrt{6}\right)$ nuqtadan OY o'qqacha bo'lgan masofani toping.
A) 13 B) 14 C) 15 D) 16

17. (a3-g2-16) m ning qanday qiymatlarida $y = 2x - mx - 5 + m$ funksiyaning grafigi koordinata tekisligining I, III va IV choraklaridan o'tadi?
A) $2 < m < 5$
B) $m > 5$
C) $m < 2$
D) bunday qiymatlar yo'q.

18. (a3-g3-33) A(5; 8) va B (k; –2) nuqtalar berilgan. k ning qanday qiymatida AB kesma koordinata boshidan o'tadi?
A) –0,8 B) –1,2
C) –1,25 D) 1,2

19. (a3-g6-16) $y = x$ to'g'ri chiziqqa nisbatan $y = 4x + 7$ ga simmetrik bo'lgan to'g'ri chiziq tenglamasini ko'rsating.
A) $y = \frac{x+7}{4}$ B) $y = \frac{x+4}{7}$
C) $y = -4x - 7$ D) $y = \frac{x-7}{4}$

20. (a3-g7-32) A(2; 4), B(–2; 0), C(4; k) nuqtalar bir to'g'ri chiziqda yotsa, k = ?
A) 6 B) –2 C) 8 D) 4

21. (a3-g9-15) $y = ax + b$ ($a < 0$ va $b < 0$) to'g'ri chiziq koordianata tekisligining qaysi choraklaridan o'tadi?
A) I, III va IV
B) I, II va III
C) II, III va IV
D) I, II va IV

22. (a3-g10-32) A(5; –2; –4) nuqtadan OY o'qigacha bo'lgan masofani toping.
A) $\sqrt{41}$ B) $2\sqrt{5}$
C) $3\sqrt{5}$ D) $\sqrt{29}$

23. (a3-g12-17) k va b ning qanday qiymatlarida $y = kx + b$ funksiya koordinata tekisligining I, III va IV choraklaridan o'tadi?
A) $k < 0$ va $b < 0$
B) $k < 0$ va $b > 0$
C) $k > 0$ va $b > 0$
D) $k > 0$ va $b < 0$

24. (a3-g13-16) Chiziqli funksiya (0; 0) va (2; 3) nuqtalardan o'tsa, bu funksiya grafigining burchak koeffitsiyentini toping.
A) $\frac{9}{4}$ B) $\frac{3}{2}$ C) $\frac{4}{9}$ D) $\frac{2}{3}$

25. (a3-g20-15) $y = kx + b$ funksiyaning grafigi koordinata boshidan va (3; 5) nuqtadan o'tadi. b ning qiymatini toping.
A) 0,6 B) 0
C) 1,(6) D) –0,6

26. (a3-g21-15) $y = 3x - 1$ to'g'ri chiziqqa perpendikulyar chiziqni ko'rsating.
A) $3x - y + 1 = 0$
B) $3x - y + 12 = 0$
C) $x + 3y + 8 = 0$
D) $-x + 3y + 6 = 0$

27. (a3-g23-15) $y = mx + 1$ to'g'ri chizig'i bilan x o'qi orasidagi burchak $y = (n + 3)x + 3$ to'g'ri chizig'i bilan x o'qi orasidagi burchakka teng bo'lsa, $n - m$ = ?
A) 3 B) –3 C) 2 D) –2

28. (a3-g24-16) Koordinata o'qlari $\frac{y}{12} = \frac{x}{5} + 1$ to'g'ri chiziqdan qanday uzunlikdagi kesma ajratadi?
A) 15 B) 17 C) 13 D) 14

29. (a4-g3-34) $\sqrt{3}x - y = 0$ va $x + y = 0$ to'g'ri chiziqlar orasidagi burchakni toping.
A) 150° B) 105°
C) 120° D) 75°

30. (a4-g4-32) A($k - 4$; $k + 1$) nuqta koordinatalar tekisligining 2-choragida joylashgan bo'lsa, k nechta butun qiymatni qabul qiladi?
A) 6 B) 4 C) 3 D) 5

31. (a4-g6-15) Chiziqli funksiya grafigi absissa o'qining musbat yo'nalishi bilan hosil qilgan burchagi sinusi $0{,}4\sqrt{5}$ ga teng. Agar bu chiziq (2; 7) nuqtadan o'tsa, bu funksiyani toping.
A) $y = 0{,}5x + 6$
B) $y = 2x + 3$
C) $y = -2x + 11$
D) $y = -0{,}5x + 8$

32. (a4-g6-32) A(a, –1), B($a + 3$, 8) va C(–3, $a - 1$) nuqtalar bir to'g'ri chiziqda yotsa, a ning qiymati nechaga teng?
A) $-\frac{5}{4}$ B) $\frac{5}{4}$ C) 0 D) $-\frac{9}{4}$

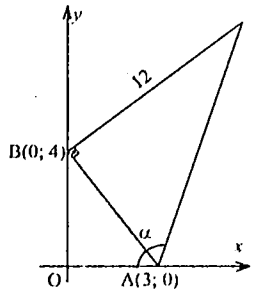
33. (a4-g8-17) k va b ning qanday qiymatlarida $y = kx + b$ funksiya koordinata tekisligining II, III va IV choraklaridan o'tadi?
A) $k < 0$ va $b < 0$
B) $k < 0$ va $b > 0$
C) $k > 0$ va $b > 0$
D) $k > 0$ va $b < 0$

34. (a4-g17-14) $f(x)$ – chiziqli funksiya. $f(2x - 5) + f(3x + 5) = 7x - 16$ bo'lsa, $f(x)$ funksiya quyidagilardan qaysi biriga teng?
A) $f(x) = 1{,}4x - 8$
B) $f(x) = 7x - 8$
C) $f(x) = 3{,}5x - 16$
D) $f(x) = 2{,}8x - 4$

35. (a4-g20-15) $y = kx + b$ funksiyaning grafigi II, III va IV choraklardan o'tadi. Quyidagi tengsizliklardan qaysi biri to'g'ri?
A) $k > 0$, $b < 0$ B) $k < 0$, $b < 0$
C) $k < 0$, $b > 0$ D) $k > 0$, $b > 0$

36. (a5-g1-16) $f(x)$ OX o'qining musbat yo'nalishi bilan o'tmas burchak hosil qiluvchi chiziqli funksiya. $f(f(x)) = 9x + 4$ bo'lsa, $f(1) = ?$
A) 1 B) –3 C) –5 D) 3

37. (a5-g5-19) Rasmdan α burchakni toping.



A) $\pi - \text{arctg}\frac{56}{33}$ B) $-\text{arctg}\frac{33}{56}$
C) $\arcsin\frac{56}{65}$ D) $\arcsin\frac{49}{65}$

38. (a5-g8-32) A(2; –1) va B(–1; –2) nuqtadan o'tuvchi to'g'ri chiziqqa perpendikulyar va B nuqtadan o'tuvchi to'g'ri chiziq tenglamasini toping.
A) $y = 0{,}(3)x - 2{,}(6)$
B) $y = -3x - 5$
C) $y = -0{,}(3)x - 2{,}(3)$
D) $y = 3x + 1$

39. (a5-g9-16) M(4; –5) va N(–3; 4) nuqtalardan o'tuvchi to'g'ri chiziqning burchak koeffitsiyentini (k) toping.
A) $k = -\frac{7}{9}$ B) $k = -1$
C) $k = -\frac{9}{7}$ D) $k = \frac{5}{3}$

40. (a5-g11-14) $y = 0{,}75x + 4$ to'g'ri chiziqqa parallel va bu chiziqdan 3 ga teng masofadan o'tuvchi to'g'ri chiziqlardan birining tenglamasini ko'rsating.
A) $y = 0{,}75x + 7{,}75$
B) $y = 0{,}75x - 7{,}25$
C) $y = 0{,}75x + 7$
D) $y = -1{,}(3)x + 7$

41. (a5-g12-27) A(1; 3), B(–1; 2) va C(2; –4) nuqtalar berilgan. BC ga perpendikulyar va A nuqtadan o'tuvchi to'g'ri chiziq tenglamasini tuzing.
A) $x - y + 5 = 0$
B) $x - 2y + 5 = 0$
C) $2x - y + 5 = 0$
D) $5x - 3y + 1 = 0$

42. (a5-g14-14) $f(3x - 4) = 5x - 7$ bo'lsa, $f(x)$ funksiya bilan ifodalanuvchi to'g'ri chiziq OX o'qining musbat yo'nalishi bilan hosil qilgan burchagi tangensini toping.
A) 0,6 B) 5 C) 3 D) 1,(6)

43. (a5-g20-14) Grafigi $3x - 2y = 8$ funksiya grafigiga perpendikulyar bo'lgan funksiyani ko'rsating.
A) $2x + 3y - 7 = 0$
B) $3x + 2y = 9$
C) $2x - 3y + 12 = 0$
D) $3y - 2x = 10$

44. (a6-g1-14) $y = 0{,}5x + 7$ to'g'ri chiziqqa perpendikulyar va OY o'qini $y = 6$ nuqtada kesib o'tuvchi to'g'ri chiziq tenglamasini tuzing.
A) $2y + x - 6 = 0$
B) $y + 2x - 6 = 0$
C) $y - 2x + 6 = 0$
D) $2y - x - 6 = 0$

45. (a6-g5-14) $5x + 12y - 7 = 0$ va $5x + 12y - 17 = 0$ to'g'ri chiziqlar orasidagi masofani toping.
A) 10 B) $\frac{5}{13}$ C) $\frac{10}{13}$ D) $\frac{20}{13}$

46. (a6-g6-14) m ning qanday qiymatlarida $(m+3)x + 2y - 2 = 0$, $(m-3)x - 3y + 4 = 0$ to'g'ri chiziqlar perpendikulyar bo'ladi?
A) $\sqrt{15}$ B) Ø
C) $\pm\sqrt{15}$ D) $-\sqrt{15}$

47. (a6-g9-14) k va b ning qanday qiymatlarida $y = kx + b$ funksiya koordinata tekisligining I, III va IV choraklaridan o'tadi?
A) $k < 0$ va $b < 0$
B) $k < 0$ va $b > 0$
C) $k > 0$ va $b > 0$
D) $k > 0$ va $b < 0$

48. (a6-g19-12) Agar a, b va c manfiy sonlar bo'lsa, $ax + by + c = 0$ to'g'ri chiziq qaysi choraklardan o'tadi?
A) II, III va IV
B) I, III va IV
C) I, II va III
D) I, II va IV

49. (a6-g24-13) a ning qanday qiymatlarida $y = 4\cdot(2ax - 5) + 12x$ to'g'ri chiziq OX o'qining musbat yo'nalishi bilan o'tkir burchak hosil qiladi?
A) $a > -1{,}5$ B) $a > 0$
C) $a < 1{,}5$ D) $a < 0$

72. Kvadrat funksiya va uning xossalari

1. (a1-g10-17) $y = 3x^2 + 2x - 7$ parabolani $\vec{b}(-3; 4)$ vektor bo'yicha parallel ko'chirish natijasida hosil bo'lgan parabolaning tenglamasini ko'rsating.
A) $y = 3x^2 + 20x + 22$
B) $y = 3x^2 - 16x + 10$
C) $y = -9x^2 - 6x - 3$
D) $y = 3x^2 + 20x + 30$

2. (a1-g12-16) $y = -3x^2 + 4x - 5$ funksiyaning grafigi qaysi choraklardan o'tadi?
A) I, II, III, IV
B) III, IV
C) I, III, IV
D) II, III, IV

3. (a1-g14-16) $f(x) = x^2 - 2x + m^2 + 5m + 3$ parabola OX o'qini –1 nuqtada kesib o'tadi. Shu funksiya grafigi OY o'qini y ning qanday qiymatida kesib o'tadi?
A) 1 B) –3 C) 2 D) –1

4. (a2-g3-15) $x = -1$ to'g'ri chiziq $y = (a+1)x^2 - 2(a+3)x + a + 1$ parabolaning simmetriya o'qi bo'lishi uchun a ning qiymati nimaga teng?
A) –1 B) 0 C) 1 D) –2

5. (a2-g10-17) $y = 2x^2 - 5x + 3$ parabolani $\vec{b}$ (5; –4) vektor bo'yicha parallel ko'chirish natijasida hosil bo'lgan parabolaning tenglamasini ko'rsating.
A) $y = 2x^2 + 15x + 32$
B) $y = 2x^2 - 25x + 74$
C) $y = 2x^2 + 25x + 82$
D) $y = 10x^2 - 15x - 1$

6. (a2-g14-30) $y = 2x^2 + ax + 2$ parabola x o'qiga urinsa, $a = ?$
A) ±1 B) ±2 C) ±3 D) ±4

7. (a2-g16-16) k ning qanday qiymatlarida $y = k^2x + 2k$ funksiya (2; 12) nuqtadan o'tadi?
A) 3; –2 B) –3; –2
C) 2; –3 D) 2; 3

8. (a2-g17-17) k ning nechta butun qiymatida $y = 4x^2 - 2kx + 3$ va $y = kx + 2$ funksiyalar kesishmaydi?
A) 1 B) 3 C) 4 D) 5

9. (a2-g18-17) Parabola $x = 3$ nuqtada OX o'qiga urinadi. OY o'qini esa $y = 4{,}5$ nuqtada kesib o'tadi. Bu parabolaning tenglamasini ko'rsating.
A) $y = 0{,}5(x+3)^2$
B) $y = 0{,}5(x-3)^2$
C) $y = 2(x+3)^2$
D) $y = 2(x-3)^2$

10. (a3-g3-18) $y = 6 + 5x - x^2$ parabolaning Oy o'qiga nisbatan simmetrigini toping.
A) $y = x^2 - 5x - 6$
B) $y = 5x - x^2 - 6$
C) $y = 6 - 5x - x^2$
D) $y = x^2 + 5x - 6$

11. (a3-g4-17) $x = -3$ to'g'ri chiziq $y = (a+1)x^2 - 2(a+3)x + a + 1$ parabolaning simmetriya o'qi bo'lishi uchun a ning qiymati nimaga teng?
A) –1,5 B) 0 C) 1 D) –2

12. (a3-g8-17) $y = x^2 - 14x + 34$ parabola uchining koordinatalari ko'paytmasini toping.
A) 105 B) –105
C) 8 D) –8

13. (a3-g11-17) $y = 2x^2 - 5x + 3$ parabolani $\vec{b}(5; -4)$ vektor bo'yicha parallel ko'chirish natijasida hosil bo'lgan parabolaning tenglamasini ko'rsating.
A) $y = 2x^2 + 15x + 32$
B) $y = 2x^2 - 25x + 74$
C) $y = 2x^2 + 25x + 82$
D) $y = 10x^2 - 15x - 1$

14. (a3-g14-16) $y = -x^2 + 6x - 2$ funksiyaning qiymatlar sohasini toping.
A) $(-\infty; -3]$ B) $[7; \infty)$
C) $(-\infty; 7]$ D) $[-3; \infty)$

15. (a3-g18-17) $y = ax^2 + bx + c$ funksiyada $a > 0$; $b > 0$ va $c < 0$ bo'lsa, bu funksiyaning grafigi qaysi choraklardan o'tadi?
A) I, II va III
B) I va II
C) I, II, III va IV
D) I, II va IV

16. (a3-g19-16) n ning qanday qiymatida $y = x^2 - 4x + n + 2$ funksiyaning eng kichik qiymati 3 ga teng bo'ladi?
A) 2 B) –2 C) –3 D) 5

17. (a4-g2-15) $y = -x^2 + 10x + 16$ funksiyaning qiymatlar sohasini toping.
A) $(-\infty; 41]$ B) $(-\infty; -5]$
C) $[-5; \infty)$ D) $[41; \infty)$

18. (a4-g4-15) Quyidagilardan qaysi biri doimo to'g'ri?
A) Parabola OX o'qini doimo 2 nuqtada kesib o'tadi.
B) To'g'ri chiziq parabola bilan faqat bitta nuqtada kesisha oladi.
C) Ikki parabola eng ko'pi bilan 2 nuqtada kesishadi.
D) Agar parabola shoxlari tepaga qaragan bo'lsa, uning bosh koeffitsiyenti manfiy bo'ladi.

19. (a4-g5-15) $y = x^2 - (m - 5)x + 4$ parabola OX o'qining manfiy tarafiga urinsa, m ning qiymati nechaga teng?
A) 4 B) 9 C) 1 D) 7

20. (a4-g10-15) $f(x) = x^2 - ax + 2$ funksiya barcha x lar uchun –7 dan katta bo'lsa, a ning eng kichik butun qiymatini toping.
A) –5 B) –6 C) –7 D) 7

21. (a4-g15-15) $y = x^2 + 5x - 7$ funksiyaning grafigi qaysi choraklardan o'tadi?
A) I, II va III
B) II, III va IV
C) I va II
D) I, II, III va IV

22. (a4-g15-23) $f'(x) = 9x^2 - 4x + 3$ va $f(1) = 7$ bo'lsa $f(2) = ?$
A) 25 B) 19 C) 23 D) 30

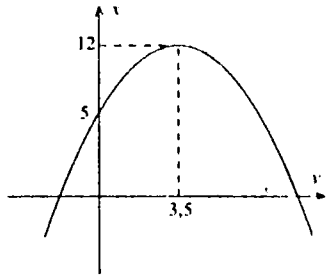
23. (a4-g16-23) $f'(x) = 3x^2 - 4x + 5$ va $f(2) = 15$ bo'lsa, $f(3) = ?$
A) 9 B) 5 C) 29 D) 18

24. (a4-g18-15) $y = 2x^2 + mx + 1$ parabolaning uchi $y = -x$ to'g'ri chiziqda yotsa, m ning olishi mumkin bo'lgan qiymatlari yig'indisini toping.
A) –4 B) –2 C) 0 D) 2

25. (a4-g20-16) $y = ax^2 + bx + c$ parabola OX o'qini (5; 0) va (1; 0) nuqtalarda kesib o'tadi. Oy o'qini esa (0; –3) nuqtada kesib o'tadi. Ushbu parabola uchining ordinatasini toping.
A) –4 B) –2,4
C) 2,4 D) 4

26. (a4-g25-15) $y = 4x^2 - 5x + 1$ funksiya haqida berilgan fikrlardan qaysilari to'g'ri?
1) OY o'qini (1; 0) nuqtada kesib o'tadi;
2) uning uchi koordinata tekisligining III choragida yotadi;
3) $[-7; -2]$ oraliqda kamayadi;
4) aniqlanish sohasi $(-\infty; \infty)$;
5) OX o'qini musbat yo'nalishda ikki nuqtada kesib o'tadi.
A) 1, 2, 4 B) 1, 4, 5
C) 2, 3, 5 D) 3, 4, 5

27. (a5-g6-15) Rasmda tasvirlangan grafikning funksiyasini ko'rsating.



A) $y = -2(x + 3,5)^2 + 12$

B) $y = -\frac{3}{2}(x - 3,5)^2 + 5$

C) $y = 12 - \frac{4}{7}(x - 3,5)^2$

D) $y = 5 - \frac{4}{7}(x + 3,5)^2$

28. (a5-g7-15) $y = -3(x - 2)^2 + 5$ funksiyaning qiymatlar sohasini toping.
A) $[5; \infty)$ B) $(-\infty; 5]$
C) $[2; \infty)$ D) $(-\infty; 2]$

29. (a5-g8-23) $y = x^2 - 1$ va $y = -x + 5$ to'g'ri chiziqlar kesishishidan hosil bo'lgan soha yuzini toping.
A) $\frac{118}{3}$ B) $\frac{125}{6}$
C) $\frac{155}{6}$ D) $\frac{119}{6}$

30. (a5-g15-12) $a < 0$, $c < 0$ bo'lsa, $y = ax^2 + bx + c$ funksiyaning grafigi qaysi choraklardan o'tadi?
A) III, IV
B) I, III, IV
C) aniqlab bo'lmaydi
D) II, III, IV

31. (a5-g16-15) $f(x) = ax^2 + bx + c$ parabolaning uchi $(-1; -4)$ nuqtada joylashgan. $a - b + c$ ning qiymatini toping.
A) –4
B) 0
C) –2
D) aniqlab bo'lmaydi

32. (a5-g17-28) Parabolaning uchi to'rtinchi chorakda joylashgan va bu parabola barcha choraklardan o'tadi. Agar parabolaning tenglamasi $y = ax^2 + bx + c$ ko'rinishida bo'lsa, quyidagilardan qaysi biri to'g'ri?
A) $ac > 0$ B) $abc > 0$
C) $ab > 0$ D) $bc < 0$

33. (a5-g18-15) $y = (2x - 3)^2 + 14$ parabola uchining koordinatalarini ko'rsating.
A) (1,5; 23) B) (3; 17)
C) (1,5; 14) D) (1,5; 23)

34. (a5-g23-20) $y = kx^2$ pastga qaragan parabola, $y = 0$ va $x = 2$ chiziqlar hosil qilgan sohaning yuzi 16 ga teng bo'lsa, k ning qiymatini toping.
A) 6 B) –3 C) 3 D) –6

35. (a6-g4-15) $y = x^2 - 5x + 7$ funksiyaning OY o'qiga nisbatan simmetrigini toping.
A) $y = -x^2 + 5x - 7$
B) $y = -x^2 - 5x - 7$
C) $y = x^2 + 5x + 7$
D) $y = -x^2 + 5x + 7$

36. (a6-g8-19) $y = \frac{1}{9}x^2 + \frac{1}{3}x$ parabolaga qaysi nuqtadan o'tkazilgan urinma abssissalar o'qi bilan 45° li burchak hosil qiladi?
A) $\left(-\frac{3}{2}; -\frac{1}{4}\right)$ B) (–3; 0)
C) (3; 2) D) $\left(1; \frac{4}{9}\right)$

37. (a6-g9-15) ln2,71 sonining qiymati qaysi oraliqda yotadi?
A) $(-\infty; 0)$ B) [1; 2)
C) (0; 1) D) $(2; \infty)$

38. (a6-g9-16) $[\log_2 3] + [\log_2 4] + [\log_2 5] + \ldots + [\log_2 16]$ ni hisoblang. ($[a]$ – a sonining butun qismi)
A) 34 B) 37 C) 33 D) 38

39. (a6-g16-10) $a < 0$, $c < 0$ bo'lsa, $y = ax^2 + bx + c$ funksiyaning grafigi qaysi choraklardan o'tadi?
A) III, IV
B) I, III, IV
C) Aniqlab bo'lmaydi.
D) II, III, IV

40. (a6-g17-14) $y = -x^2 - 12x + 16$ funksiyaning qiymatlar sohasini toping.
A) [52; ∞)
B) $(-\infty; 52]$
C) $(-\infty; -6) \cup (-6; \infty)$
D) $(-\infty; -92]$

41. (a6-g20-2) $y = 7 - 2(x - 3)^2$ funksiyaning qiymatlar sohasini toping.
A) $(-\infty; 7)$ B) $(7; \infty)$
C) $(-\infty; 3,5)$ D) $(3,5; \infty)$

42. (a6-g21-7) $y = ax^2 + bx + c$ funksiya berilgan. $b > 2\sqrt{ac}$ va $ac > 0$ bo'lsa, bu funksiya grafigi koordinata tekisligining nechta choragidan o'tadi?
A) 2
B) 3
C) 4
D) aniqlab bo'lmaydi

43. (a6-g23-13) a ning qanday qiymatida $x = 2$ to'g'ri chiziq $y = (a + 1)x^2 - 2(a + 3)x + a + 1$ parabolaning simmetriya o'qidan 3 birlik o'ngda turadi.
A) –1 B) 0 C) –2 D) –0,5

73. Funksiyani tekshirish. Teskari funksiya

1. (a1-g1-16) $f(2x-3)=\frac{x+1}{x-1}$ bo'lsa, $f(x)$ quyidagilardan qaysi biriga teng?

A) $\frac{x+1}{x+3}$ B) $\frac{x+3}{x-5}$

C) $\frac{x-1}{x+1}$ D) $\frac{x+5}{x+1}$

2. (a1-g3-26) $y=x^2-6x+12$ funksiyaga $(-\infty;3]$ oraliqdagi teskari funksiyani ko'rsating.

A) $y=3\pm\sqrt{x-3}$

B) $y=\sqrt{x-3}+3$

C) $y=3-\sqrt{x-3}$

D) $y=3+\sqrt{3-x}$

3. (a1-g8-18) $f\left(\frac{3x+1}{x-1}\right)=x+2$ bog'lanish berilgan. $f(x)$ ga teskari funksiyaning -1 nuqtadagi qiymatini toping.

A) 0 B) 2 C) 4 D) 1

4. (a1-g9-16) $f(x)=x^2-4x+3$ funksiyaga teskari funksiyaning $x=3$ nuqtadagi qiymatini toping.

A) 2 B) 3

C) 4 D) -4

5. (a1-g10-18) $y=\frac{7x-3}{5-4x}$ funksiyaning teskari funksiyasini toping

A) $y=\frac{4x-5}{3-7x}$ B) $y=\frac{3x+5}{4x+7}$

C) $y=\frac{3x-7}{5x-4}$ D) $y=\frac{5x+3}{4x+7}$

6. (a1-g13-17) Qaysi nuqta $y=x^3+5x-2$ funksiyaga teskari funksiya grafigiga tegishli?

A) (0; –2)

B) (2; 16)

C) (4; 1/82)

D) (40; 3)

7. (a1-g14-17) Quyidagilardan qaysi biri $y=\frac{3}{2-x}-1$ funksiyaga teskari funksiya.

A) $y=x-2$ B) $y=\frac{x-2}{3}+1$

C) $y=\frac{x-3}{2}+1$ D) $y=2-\frac{3}{x+1}$

8. (a1-g15-17) Quyidagilardan qaysi biri $y=\frac{3}{2+x}+1$ funksiyaga teskari funksiya.

A) $y=\frac{3}{x-1}-2$ B) $y=3-\frac{2}{1-x}$

C) $y=2+\frac{3}{x-1}$ D) $\frac{3}{x-2}+1$

9. (a2-g1-16) $f(x)=\frac{3\cdot f(x)-3}{x+2}$ ifoda berilgan. $f(x)$ funksiyaga teskari funksiyani toping.

A) $\frac{x-3}{x}$ B) $\frac{x}{x-3}$

C) $\frac{x+3}{x}$ D) $\frac{3x+3}{x}$

10. (a2-g3-14) Quyidagi funksiyalardan qaysi birining teskarisi o'ziga teng?

A) $y=x+3$ B) $y=-3x+1$

C) $y=e^x$ D) $y=-x+3$

11. (a2-g5-17) $y=\frac{2x+9}{3x+4}$ funksiyaga teskari funksiyani toping

A) $y=\frac{4x-9}{2-3x}$ B) $y=\frac{9x-4}{2x-3}$

C) $y=\frac{4x-9}{3x-2}$ D) $y=\frac{3x+4}{2x+9}$

12. (a2-g12-19) $f(x)=2^x-50$ funksiyaga teskari funksiyaning $x=14$ nuqtadagi qiymatini toping.

A) 4 B) 5 C) 6 D) 8

13. (a2-g13-29) $y=x^2-4x+7$ funksiyaning $(-\infty;2]$ oraliqdagi teskari funksiyasini ko'rsating.

A) $2\pm\sqrt{x-3}$

B) $2+\sqrt{x-3}$

C) $2\pm\sqrt{3-x}$

D) $2-\sqrt{x-3}$

14. (a2-g15-18) $y=\frac{2x^3-4}{5}$ funksiyaga teskari funksiyani toping.

A) $y=\sqrt[3]{\frac{5x+4}{2}}$

B) $y=\sqrt[3]{\frac{2x+5}{4}}$

C) $y=\sqrt[3]{\frac{4-5x}{2}}$

D) $y=\sqrt[3]{\frac{5-2x}{4}}-4$

15. (a2-g19-17) $y=\frac{2x^3+4}{3}$ funksiyaga teskari funksiyani toping.

A) $y=\sqrt[3]{\frac{3x-4}{2}}$

B) $y=\sqrt[3]{\frac{2x+3}{4}}$

C) $y=\sqrt[3]{\frac{4+3x}{2}}$

D) $y=\sqrt[3]{\frac{3-2x}{4}}+4$

16. (a2-g20-16) Qaysi nuqta $y=x^3+5x-2$ funksiyaga teskari funksiya grafigiga tegishli?

A) (4; 1) B) (0; –2)

C) (–2; 1) D) (2; 1)

17. (a2-g20-23) $y=\frac{e^x}{x}$ egri chiziq quyidagi oraliqlarning qaysi birida o'suvchi bo'ladi?

A) $[-1;0)\cup(0;1]$

B) $[1;\infty)$

C) $(-\infty;-1]$

D) $[-1;\infty)$

18. (a3-g12-18) $y=\frac{5-3x^3}{4}$ funksiyaga teskari funksiyani toping.

A) $y=\sqrt[3]{\frac{4-5x}{3}}$

B) $y=\sqrt[3]{\frac{5x-3}{4}}$

C) $y=\sqrt[3]{\frac{5-4x}{3}}$

D) $y=\sqrt[3]{\frac{3x-4}{5}}+3$

19. (a3-g18-16) Quyidagi nuqtalardan qaysi biri $y=\sqrt[3]{\frac{5x-3}{4}}$ funksiyaning teskari funksiyasiga tegishli?

A) (3; 22,2) B) $(3;\sqrt[3]{3})$

C) (7; 2) D) (1,4; 1)

20. (a4-g3-15) $f(4)=3$ va $f^{-1}(2)=1$ bo'lsa, $\frac{f^{-1}(3)}{f(1)}=?$

($f^{-1}(x)$ – $f(x)$ ga teskari funksiya)

A) 6

B) 2

C) 3

D) Aniqlab bo'lmaydi.

21. (a4-g3-17) $f(x)=\ln(x-4)$ va $g(x)=2x+1$ bo'lsa, $f^{-1}(g(2))=?$

($f^{-1}(x)$ – $f(x)$ ga teskari funksiya)

A) e^5 B) e^5-4

C) e^5+4 D) $e+4$

22. (a4-g8-18) $y=\frac{7-4x^3}{3}$ funksiyaga teskari funksiyani toping.

A) $y=\sqrt[3]{\frac{3-7x}{4}}$

B) $y=\sqrt[3]{\frac{7x-4}{3}}$

C) $y=\sqrt[3]{\frac{7-3x}{4}}$

D) $y=\sqrt[3]{\frac{3x-7}{5}}+3$

23. (a4-g11-2) $f(x)=x^2+6x+24$ funksiyaga $[-3;\infty)$ oraliqdagi teskari funksiyani ko'rsating.

A) $f(x)=\sqrt{x-9}+7$

B) $f(x)=-\sqrt{x-15}-3$

C) $f(x)=-7-\sqrt{x-9}$

D) $f(x)=\sqrt{x-15}-3$

24. (a4-g14-13) 13. $f(x)=\frac{2x+m}{n}$ funksiyada barcha x lar uchun $f(x)=f^{-1}(x)$ tenglik o'rinli bo'lsa, $n=?$ ($f^{-1}(x)-f(x)$ funksiyaning teskari funksiyasi)
A) –2 B) –1 C) 1 D) 2

25. (a4-g18-16) $f(x)=\frac{3f(x)-3}{x+2}$ bo'lsa, $f(x)$ ga teskari funksiyani toping.
A) $\frac{3x-3}{x}$ B) $\frac{x-3}{x}$
C) $\frac{3x+3}{x}$ D) $\frac{3x+3}{x}$

26. (a4-g23-16) $y=x^2+6x+4$ funksiyaga $(-\infty;-3]$ oraliqdagi teskari funksiyasini toping.
A) $y=\sqrt{x+5}-3$
B) $y=\sqrt{x+5}+3$
C) $y=3\pm\sqrt{x+5}$
D) $y=-3-\sqrt{x+5}$

27. (a4-g25-17) $y=2^{\frac{x}{4}}+5$ funksiyaga teskari funksiyani ko'psating.
A) $y=4\log_2 x+5$
B) $y=4(\log_2 x-5)$
C) $y=4\log_2 x-5$
D) $y=4\log_2(x-5)$

28. (a5-g5-16) $f^{-1}(x-2)=3x-1$ va $f(x)=4$ bo'lsa, a ning qiymatini toping. ($f^{-1}(x)-f(x)$ ga teskari funksiya)
A) 2,(3) B) 3,(6)
C) 17 D) 12

29. (a5-g12-17) Quyidagilardan qaysi biri davriy funksiya?
1) $y=[x]$ ($[x]-x$ sonining butun qismi);
2) $y=\{x\}$ ($\{x\}-x$ sonining kasr qismi);
3) $y=\cos|x|$ 4) $y=\sin|x|$.
A) 2, 3
B) hammasi
C) 2, 3, 4
D) 1, 3

30. (a5-g13-15) $g(x)$ funksiya $f(x)=\frac{4x+3}{x}$ funksiyaga teskari funksiya bo'lsa, $g(5)$ ni hisoblang.
A) 2 B) 4,6 C) 3 D) $\frac{5}{23}$

31. (a5-g15-21) Quyida berilgan funksiyaga teskari funksiyani toping.
$y=\frac{x^5-3x^4+x^3+2x^2-6x+2}{x^2-3x+1}$
A) $y=\sqrt[3]{x}-2$
B) $y=\sqrt[3]{x}+2$
C) $y=\sqrt[3]{x-2}$
D) $y=\sqrt[3]{x+2}$

32. (a5-g18-36) $y=x^2+6x+20$ funksiyaning $(-\infty;-3]$ oraliqdagi teskari funksiyasini toping.
A) $y=\pm\sqrt{x-11}-3$
B) $y=\sqrt{x-11}-3$
C) $y=\sqrt{x+3}-11$
D) $y=-3-\sqrt{x-11}$

33. (a5-g19-14) $f^{-1}(x)$ funksiya $f(x)$ ga teskari funksiya. $f(3)=7$, $f(7)=8$ va $f^{-1}(4)=5$ bo'lsa, $\frac{f^{-1}(7)+f^{-1}(8)}{f(5)}$ ni hisoblang.
A) 3 B) 2,5
C) 2,2 D) 4

34. (a6-g11-7) $f\left(\frac{2x+5}{x-3}\right)=3x+5$ berilgan. $f(x)$ ga teskari funksiyani toping.
A) $\frac{-3x+20}{3x-9}$ B) $\frac{2x+5}{x-14}$
C) $\frac{5+3x}{x-2}$ D) $\frac{-3x+5}{x+2}$

35. (a6-g14-13) $y=x^2-10x+27$ funksiyaning $(-\infty;5]$ oraliqdagi teskarisini toping.
A) $5-\sqrt{x-2}$
B) $-5+\sqrt{x-2}$
C) $5+\sqrt{x-2}$
D) $-5-\sqrt{x-2}$

36. (a6-g20-30) $y=\frac{2x+9}{3x+4}$ funksiyaga teskari funksiyani toping.
A) $y=\frac{4x-9}{2-3x}$
B) $y=\frac{9x-4}{2x-3}$
C) $y=\frac{4x-9}{3x-2}$
D) $y=\frac{3x+4}{2x+9}$

37. (a6-g24-18) $f(x)=\frac{2f(x)+1}{3x-1}$ bo'lsa, $f(x)$ ga teskari funksiyani toping.
A) $\frac{3x+1}{3x}$ B) $\frac{3x-1}{x}$
C) $\frac{x+1}{3x}$ D) $\frac{x+1}{3}$

74. Murakkab funksiya. Aralash bo'lim

1. (a1-g3-1) Agar $f(x)=\left(2x+\frac{1}{2}\right)(3x-5)$ bo'lsa, $f\left(-\frac{5}{6}\right)$ ni toping.
A) 4,25 B) 8,75
C) –8,75 D) –4,25

2. (a1-g5-16) $f(x)=\frac{x+2}{x-3}$; $f(g(x))=4x-5$ bo'lsa, $g(f(5,5))=?$
A) $\frac{23}{6}$ B) $\frac{17}{3}$
C) –4 D) $\frac{1}{2}$

3. (a1-g5-17) $y=-\frac{4}{x+3}$ funksiyaning grafigi qaysi choraklardan o'tadi?
A) II va IV
B) I, II va IV
C) II, III va IV
D) I va III

4. (a1-g7-16) $f(2x+3)=x^2+1$ bo'lsa $f(3)=?$
A) 9 B) 10 C) 1 D) 4

5. (a1-g8-1) $f(x+2)=3x-a$ va $f(4)=11$ bo'lsa, a ning qiymatini toping.
A) –2 B) 1 C) –5 D) 6

6. (a1-g12-29) $f(x)=\begin{cases}2x-5, & x\ge 4\\ 4x^2+3, & x<4\end{cases}$ va $g(x)=\frac{x-29}{3}$ funksiyalar berilgan. $f(g(-31))=?$
A) 3 B) 67
C) –1 D) 1603

7. (a1-g13-12) $f(x+4)+f(3x)=x^2-5x$ bo'lsa, $f(6)=?$
A) –3
B) –6
C) 6
D) aniqlab bo'lmaydi

8. (a1-g15-16) Agar $f(x)=2x^2-4$ bo'lsa, $f(x+2)=14$ tenglama ildizlari yig'indisini toping?
A) –6 B) –2
C) –4 D) 4

9. (a1-g17-16) $3x+f(x-3)=4\cdot f(x)+1$ tenglik berilgan. $f(7)=6$ bo'lsa, $f(1)$ ni toping.
A) 5
B) 4
C) 3
D) 0

10. (a2-g3-13) $f(x+1)=2f(x)-f(x-1)$, $f(1)=6$ va $f(2)=5$ bo'lsa, $f(5)=?$
A) 4 B) 2 C) 3 D) 1

11. (a2-g8-18) $f(x)=\begin{cases}2x+3, & x\ge 4\\ 4x^2-3, & x<4\end{cases}$ va $g(x)=\frac{x+29}{3}$ funksiyalar berilgan. $f(g(11))=?$
A) 4 B) $\frac{40}{3}$ C) $\frac{89}{3}$ D) 11

$f(8)=?$
A) 4,5 B) 1,5
C) 6 D) 3

13. (a2-g17-16) Agar $\varphi(x)=\frac{3}{2-5x}$ va $f(\varphi(x))=\frac{4x}{x+1}$ bo'lsa, $f(x)$ ni toping.

A) $f(x)=\frac{12}{5-5x}$ B) $f(x)=\frac{8x-12}{7x-3}$

C) $f(x)=\frac{5x-3}{20x}$ D) $f(x)=\frac{5x}{8x-3}$

14. (a2-g18-16) $y=\frac{-2}{x+3}$ funksiya ordinata o'qini nechta nuqtada kesib o'tadi?

A) kesib o'tmaydi B) 1
C) 2 D) 4

15. (a2-g22-17) $f(g(x))=\frac{4x-3}{x-12}$ va $f(x)=2x+4$ bo'lsa, $g(x)$ = ?

A) $\frac{8x-26}{x-12}$ B) $\frac{45}{2x-24}$

C) $\frac{51}{2x-24}$ D) $\frac{-8x+26}{x-12}$

16. (a3-g1-16) $f(x)=4x^2-2x+8$ bo'lsa, $f(3)$ = ?

A) 8 B) 30 C) 36 D) 38

17. (a3-g1-17) $f(x+2)=\frac{x^2+4x+4}{x}$ bo'lsa, $f(x)$ = ?

A) $\frac{x^2}{x-2}$ B) $\frac{x^2+8x+16}{x+2}$

C) $\frac{x^2}{x+2}$ D) $\frac{x^2+8x+16}{x-2}$

18. (a3-g5-16) Agar $f(x)=\sqrt[3]{x}+x-5$ bo'lsa, $f(27)$ ni toping.

A) 5^2 B) 20 C) 35 D) 2^5

19. (a3-g8-16) k va l ning qanday qiymatlarida $y=\frac{k}{x}$ giperbola va $y=kx+l$ to'g'ri chiziq M(–3; –9) nuqtadan o'tadi?

A) –27; 72
B) 27; –90
C) 27; 90
D) 27; 72

20. (a3-g11-16) $f(3x-2)=x^2-1$ bo'lsa, $f(x)$ funksiya quyidagilardan qaysi biriga teng.

A) $\frac{x^2+4x-5}{9}$ B) $\frac{x^2+4x+5}{9}$

C) $\frac{x^2+4x+3}{9}$ D) $9x^2-12x+3$

21. (a3-g14-17) Agar $f(x+2)=\frac{2x-1}{x+5}$ bo'lsa, $f(f(3))$ ning qiymatini toping.

A) $-\frac{28}{19}$ B) $\frac{13}{19}$

C) $-\frac{23}{28}$ D) $-\frac{15}{28}$

22. (a3-g15-17) Agar $f(x)=\sqrt[4]{x+1}+x-1$ bo'lsa, $f(15)$ ni toping.

A) 3^2 B) 4^2
C) 2^3 D) $4\cdot2$

23. (a3-g17-16) Agar $f(x)=4^x$ va $g(x)=x-2$ bo'lsa, $f(g(x))$ quyidagilardan qaysi biriga teng?

A) $\frac{f(x)}{4}$ B) $4f(x)$

C) $\frac{f(x)}{16}$ D) $16f(x)$

24. (a3-g20-16) $f(x)=x^3-5x-1$ va $g(x)=x^5-7x^3+5$ bo'lsa, $g(f(2))$ ni hisoblang.

A) 59 B) 49
C) –59 D) –49

25. (a3-g23-16) $f(2x-3)=\frac{x+1}{x-1}$ bo'lsa, $f(x)$ = ?

A) $\frac{x+1}{x+3}$ B) $\frac{x+5}{x+1}$

C) $\frac{x-1}{x+3}$ D) $\frac{x+3}{x-5}$

26. (a4-g1-16) $f(x)=\begin{cases}2x-5, & x\ge 3\\ 5x^2+3, & x<3\end{cases}$ va $g(x)=\frac{2x+29}{5}$ funksiyalar berilgan. $f(g(-12))$ = ?

A) –3 B) 8 C) 5 D) 11

27. (a4-g2-16) Agar $f(x+2)=\frac{3x+1}{x-4}$ bo'lsa, $f(f(4))$ning qiymatini toping.

A) $\frac{19}{7}$ B) $\frac{31}{19}$

C) $-\frac{27}{7}$ D) mavjud emas

28. (a4-g5-16) $f\left(\frac{x-3}{2}\right)=\frac{x-1}{x-3}$ va $g(x-a)=\frac{x}{3}$ funksiyalar berilgan. $h(x)=f(x)+g(x)$ va $h(3)=2$ bo'lsa, a ning qiymati nechaga teng?

A) –3 B) –1
C) 2 D) 5

29. (a4-g9-15) $f\left(\frac{3x+1}{2x-4}\right)=x+1$ bo'lsa, $f(2)$ = ?

A) 10 B) 3 C) 2 D) –2

30. (a4-g9-16) $f(g(x))=\begin{cases}-3x+10, & x<3\\ 3x-8, & x\ge 3\end{cases}$ va $f(x)=3x+1$ bo'lsa, $g(x)$ funksiya quyidagilardan qaysi biriga teng?

A) $3|x-1|$
B) $|x|-3$
C) $3|x|-1$
D) $|x-3|$

31. (a4-g13-17) $f(g(x))=\frac{3x+5}{x-12}$ va $f(x)=2x-3$ bo'lsa, $g(x)$ = ?

A) $\frac{-31}{2x-24}$ B) $\frac{6x-41}{2x+24}$

C) $\frac{6x-31}{2x-24}$ D) $\frac{-9x+26}{x+12}$

32. (a4-g16-16) $f\left(\frac{2x+5}{3}\right)=2x^2+5x-2$ bo'lsa, $f(x)$ = ?

A) $4{,}5x^2-15x+6$
B) $9x^2-7{,}5x+11$
C) $4{,}5x^2-7{,}5x-2$
D) $9x^2-15x+4$

33. (a4-g19-15) $f(x)=2x-3$ va $f(g(x))=6x+1$ bo'lsa, $g(2)$ = ?

A) –3 B) 2
C) 8 D) 10

34. (a4-g21-16) $f\left(\frac{2x+5}{3}\right)=4x^2-6x+3$ bo'lsa, $f(x)$ = ?

A) $9x^2-78x+50$
B) $18x^2-39x+22$
C) $9x^2-39x+43$
D) $18x^2-78x+18$

35. (a4-g21-23) $f(x)=3x^2-4x+5$ va $f(2)=15$ bo'lsa, $f(3)$ = ?

A) 9 B) 5 C) 29 D) 18

36. (a4-g22-16) Agar $\varphi(x)=\frac{3}{2-5x}$ va $f(\varphi(x))=\frac{4x}{x+1}$ bo'lsa, $f(x)$ ni toping.

A) $f(x)=\frac{12}{5-5x}$

B) $f(x)=\frac{8x-12}{7x-3}$

C) $f(x)=\frac{5x-3}{20x}$

D) $f(x)=\frac{5x}{8x-3}$

37. (a4-g23-15) $f(x+1)=f(x)+x^2-x$ funksiya berilgan bo'lsa, $f(5)-f(3)$ ni hisoblang.

A) aniqlab bo'lmaydi.
B) 18
C) 6
D) 12

38. (a4-g24-14) $f(x)=x\cdot f(x)+1$ bo'lsa, $f(6)$ ni toping.

A) $\frac{1}{7}$ B) –5 C) 7 D) $-\frac{1}{5}$

39. (a5-g1-15) $f(x)+g(x)=x^2-x+1$ va $f(x)=3x+2$ bo'lsa, $g(3)$ = ?

A) –4 B) –3
C) 3 D) 4

40. (a5-g1-17) $f(x)=4^{3x-2}$ va $g(x)=\log_2(x+1)$ bo'lsa, $f(g(3))$ ni hisoblang.

A) 4 B) 16
C) 1 D) 256

41. (a5-g2-15) $f(x) = 2f(x+2) - 5$ va $f(1) = 3$ bo'lsa, $f(5) = ?$
A) 4,5 B) 7 C) 3 D) 1,5

42. (a5-g2-16) $f\left(\frac{1+\sqrt{x}}{\sqrt{x}}\right) = \frac{1}{x} - 1$ bo'lsa, $f(x)$ quyidagilardan qaysi biriga teng?
A) $(x-1)^2 + 1$
B) $x^2 + 1$
C) $x^2 + 2x$
D) $x^2 - 2x$

43. (a5-g3-15) $f(x) = \begin{cases} 4x - 5, & x \geq 5 \\ 5x^2 + 3, & x < 5 \end{cases}$ va $g(x) = \frac{x+28}{3}$ funksiyalar berilgan. $f(g(11)) = ?$
A) 47 B) 848
C) $\frac{67}{3}$ D) $\frac{76}{3}$

44. (a5-g5-15) $f(x+1) = 3f(x) - f(x-1) + 2x$, $f(1) = 6$ va $f(2) = 5$ bo'lsa, $f(5) = ?$
A) 115
B) 40
C) 52
D) 65

45. (a5-g8-15) $f\left(\frac{2x-3}{5}\right) = \frac{x^2-4x}{x+2}$ bo'lsa, $f(3) = ?$
A) 4 B) $\frac{58}{9}$ C) $\frac{45}{11}$ D) 3

46. (a5-g10-14) Funksiyalar orasida $f(g(x)) = 2x$ va $g(h(x)) = 3x + 1$ munosabatlar mavjud. $\frac{f(4)}{h(1)}$ ning qiymatini toping.
A) 4 B) 2 C) 1 D) 0

47. (a5-g16-14) $g(x) = 3x - 5$ va $g(f(x)) = 5x + 2 \cdot f(x)$ bo'lsa, $f(2) = ?$
A) 4,5 B) 12
C) 15 D) 6

48. (a5-g25-14) $f(x) = 2x - 3$ funksiya berilgan. $f(2x)$ funksiyani $f(3x)$ funksiya orqali ifodalang.
A) $2f(3x)$ B) $\frac{3f(3x)-1}{3}$
C) $\frac{1-2f(3x)}{6-f(3x)}$ D) $\frac{2f(3x)-3}{3}$

49. (a6-g2-15) $\frac{3}{f(2x)} - \frac{1}{x} = \frac{4}{f(2x)} - \frac{2}{3x}$ bo'lsa, $f(4) = ?$
A) 6 B) –6
C) 0,1(6) D) –12

50. (a6-g7-14) $f(x) = 3x^2 - 5x + 10$ va $g(f(x)) = 18x^2 - 30x + 15$ bo'lsa, $g(x) = ?$
A) $6x + 15$
B) $3x + 45$
C) $6x - 45$
D) $3x + 15$

51. (a6-g11-18) $y = \frac{ax^3}{3} + 2x^2 + ax + 2$ funksiya doimo kamayuvchi bo'lsa, a ning qabul qilishi mumkin bo'lgan qiymatlarini toping.
A) $(-\infty; -2)$ B) $(2; \infty)$
C) $(0; 2)$ D) $(-2; 0)$

52. (a6-g11-31) $f(x) = \begin{cases} 2x - 7, & x \leq 2 \\ 5 - 3x, & x > 2 \end{cases}$ bo'lsa, $f(f(1))$ ni hisoblang.
A) –17 B) 20 C) –3 D) –1

53. (a6-g12-3) $f(g(x)) = \frac{2x^2-14}{x+1996}$ va $g(x) = x - 3$ bo'lsa, $f(x) = ?$
A) $\frac{4x^2+24x+22}{x+1993}$
B) $\frac{4x^2-24x+22}{x+1999}$
C) $\frac{2x^2+12x+4}{x+1999}$
D) $\frac{2x^2-12x+4}{x+1993}$

54. (a6-g13-27) $f(x) = 3x - 5$ va $f(g(x)) = \frac{2x+3}{x-5}$ bo'lsa, g(3) ni hisoblang.
A) $\frac{1}{6}$ B) $\frac{1}{3}$ C) 1 D) 3

55. (a6-g15-18) $\frac{f(x-4)}{g(x-3)} = x^2 - 5x + 10$ munosabat o'rinli bo'lib, $f(x)$ ko'phadning ozod hadi 12 ga teng bo'lsa, $g(x)$ ko'phadning koeffitsiyentlar yig'indisini toping.
A) 1 B) 2 C) 3 D) 0

56. (a6-g17-15) $f(2x-3) = \frac{x+3}{x-2}$ bo'lsa, $f(f(7)) = ?$
A) 5 B) 2,(6)
C) 7 D) 3,(3)

57. (a6-g22-9) $\frac{4}{f(4x)} - \frac{3}{2x} = \frac{3}{f(4x)} - \frac{4}{3x}$ bo'lsa, $f(6) = ?$
A) 0,(1) B) 36
C) –36 D) 9

58. (a6-g23-8) $f(x) = \frac{x-3}{2}$ bo'lsa, $f(4x-1)$ quyidagilardan qaysi biriga teng?
A) $4f(x) + 4$
B) $4f(x) + 1$
C) $f(x) + 4$
D) $4f(x) - 1$

59. (a6-g25-2) $f(x) = 3x - 7$ va $g(x) = \frac{4x+3}{4}$ funksiyalar berilgan. $g(f(x))$ funksiyaga teskari funksiyani toping.
A) $y = \frac{4}{12x+25}$
B) $y = \frac{4x+19}{12}$
C) $y = \frac{12x+25}{4}$
D) $y = \frac{4x+25}{12}$

60. (a6-g26-14) $f(x+1) + 2 \cdot f(x) = 12$ va $f(2) = 7$ bo'lsa, $f(4)$ ning qiymatini toping.
A) –2 B) 8 C) 12 D) 16

13-bob. Ko'rsatkichli va logarifmik funksiyalar

75. Ko'rsatkichli funksiya va uning xossalari

1. (a2-g2-19) k ning qanday qiymatlarida $y = 27^{kx^2} - 3$ funksiya A(3; 6) nuqtadan o'tadi?
A) 0,(6) B) 0,(4)
C) 0,(8) D) 0,(5)

2. (a2-g9-19) Quyidagi funksiyalardan qaysilari OX o'qini kesib o'tmaydi?
1) $y = 3^x + 3$; 2) $y = 2 \cdot 3^x - 5$;
3) $y = 5 \cdot 3^x$; 4) $y = 3^x - 1$.
A) hech biri kesib o'tmaydi
B) 2, 4
C) 1, 3
D) 1, 2, 4

3. (a2-g11-4) 7^{4x-2} soni 49^{2x-2} sonidan necha marta katta?
A) 1 B) 7 C) 49 D) 1/49

4. (a2-g11-19) k ning qanday qiymatlarida $y = 32^{kx+2} + 3$ funksiya A(4; 7) nuqtadan o'tadi?
A) –0,4
B) 0,5
C) –0,6
D) 0,8

5. (a2-g15-19) $y = 9 - 0{,}5^x$ funksiyaning qiymatlar sohasini toping.
A) $(9; \infty)$ B) $(-\infty; 9)$
C) $(-\infty; \infty)$ D) $(0; \infty)$

6. (a2-g16-18) Quyidagi mulohazalardan qaysi biri noto'g'ri?
1) $y = a^x$ funksiya har doim (1; 0) nuqtadan o'tadi;
2) $y = \log_a x$ $(a > 0)$ funksiya (1; 0) nuqtadan o'tadi;
3) $y = \log_a x + c$ $(a>0)$ funksiyaning qiymatlar sohasi barcha haqiqiy sonlar to'plami;
4) $y = a^x + k$ funksiya $(0; k)$ nuqtadan o'tadi;
5) $a > 1$ va $0 < x < 1$ bo'lsa, $y = a^x$ funksiyaning qiymati 1 dan kichik bo'ladi.
A) 1, 4, 5 B) 1, 2, 4
C) 1, 3, 4 D) 2, 3, 5

7. (a3-g2-17) Funksiyaning qiymatlar sohasini ko'rsating.
$f(x) = 5^{x^2} + 14$
A) $(2; \infty)$ B) $(14; \infty)$
C) $(-\infty; 14)$ D) $[5; \infty)$

8. (a3-g4-18) Quyidagi mulohazalardan qaysilari to'g'ri?
1) ko'rsatkichli funksiyaning aniqlanish sohasiga manfiy sonlar kiradi;
2) $y = a^x$ ($a > 0$) funksiyaning grafigi OY o'qini kesib o'tmaydi;
3) $y = \log_a x$ funksiyaning grafigi III chorakdan o'tmaydi;
4) grafigi OX o'qiga simmetrik bo'lgan funksiya mavjud emas;
5) logarifmik funksiyaning qiymatlar sohasi faqatgina musbat haqiqiy sonlar to'plamidan iborat.
A) 1, 3, 5 B) 2, 4, 5
C) 1, 3, 4 D) 2, 3, 4

9. (a3-g8-18) $y = \left(\frac{1}{5}\right)^x - 8$ funksiyaning qiymatlar to'plamini toping.
A) $(-\infty; -8)$ B) $(-\infty; \infty)$
C) $(0; \infty)$ D) $(-8; \infty)$

10. (a3-g10-4) 6^{6x-1} soni 36^{3x-2} sonidan necha marta katta?
A) 1 B) 6 C) 36 D) 216

11. (a3-g10-19) k ning qanday qiymatlarida $y = 27^{kx-2} - 3$ funksiya A(3; 6) nuqtadan o'tadi?
A) 0,(6) B) 0,(4)
C) 0,(8) D) 0,(5)

12. (a3-g11-23) Argumentning nechta butun qiymati $f(x) = 3^{x^3-7x^2-5x+6}$ funksiyaning kamayish oralig'ida bo'ladi?
A) 5 B) 4
C) 6 D) cheksiz ko'p.

13. (a3-g12-19) $y = 7 - 3^x$ funksiyaning qiymatlar sohasini toping.
A) $(7; \infty)$ B) $(-\infty; 7)$
C) $(-\infty; \infty)$ D) $(0; \infty)$

14. (a3-g15-18) x ning qanday qiymatlarida $f(x) = 5^x - 125$ funksiya nomanfiy qiymatlar qabul qiladi?
A) $x \le 3$ B) $x < 3$
C) $x \le 2$ D) $x \ge 3$

15. (a3-g18-18) $y = 4^{\sqrt{8-x}}$ funksiyaning qiymatlar sohasini ko'rsating.
A) $(-\infty; 64]$ B) $[1; 64]$
C) $(0; 64]$ D) $[1; \infty)$

16. (a3-g20-17) $y = 2^{-x} - 16$ funksiya x ning qanday qiymatlarida musbat qiymatlar qabul qiladi.
A) $x < 4$ B) $x > 4$
C) $x < -4$ D) $x > -4$

17. (a4-g8-19) $y = 16 - 3^x$ funksiyaning qiymatlar sohasini toping.
A) $(16; \infty)$ B) $(-\infty; 16)$
C) $(-\infty; \infty)$ D) $(0; \infty)$

18. (a4-g12-19) Agar $\lg 3 = a$ va $\lg 2 = b$ bo'lsa, $\log_{45} 24$ ni a va b orqali ifodalang.
A) $\frac{a+3b}{2a-b+1}$ B) $\frac{a+4b}{a+2b-1}$
C) $\frac{a+b^3}{2a+1-b}$ D) $\frac{a+2b}{a-2b+1}$

19. (a4-g16-12) Quyidagi mulohazalardan qaysi biri noto'g'ri?
A) Toq ildiz ko'rsatkichli ifodada ildiz ostida manfiy son bo'lishi mumkin.
B) Juft ildiz ko'rsatkichli son doimo musbat bo'ladi.
C) Kvadrat tenglama ikkitadan ko'p ildizga ega bo'la olmaydi.
D) Chiziqli tenglama bittadan ko'p ildizga ega bo'la olmaydi.

20. (a4-g20-3) 64^{3x+5} soni 8^{6x+7} sonidan necha marta katta?
A) 512 B) 4
C) 64 D) 128

21. (a4-g25-18) $a = 5^{\log_3 7} - \frac{4}{7}$, $b = 25^{\log_9 7} - \frac{2}{3}$, $c = 7^{\log_3 5} - \frac{3}{5}$ sonlarini o'sish tartibida joylashtiring.
A) $c < b < a$
B) $b < c < a$
C) $a < b < c$
D) $b < a < c$

22. (a6-g13-35) $y = 7^x + 8^x$ funksiyaning qiymatlar sohasini toping.
A) $[1; \infty)$ B) $(0; \infty)$
C) $(1; \infty)$ D) $[2; \infty)$

23. (a6-g23-6) Quyidagi funksiyaning qiymatlar sohasini toping $y = 3^{|x+2|} + 3^{|x-2|}$.
A) $[18; \infty)$ B) $[0; \infty]$
C) $[2; \infty)$ D) $[81; \infty)$

76. Ko'rsatkichli tenglamalar

1. (a1-g2-16) Tenglamaning nechta ildizi bor?
$3^{5-2x^2} - 4 \cdot 3^{-x^2-5} = -3^{-14}$
A) 0 B) 1 C) 2 D) 4

2. (a1-g4-17) Quyidagi tenglamaning yechimlari nechta?
$3^{x^2-x} + 3^{2+x-x^2} = 10$
A) 4 B) 3 C) 2 D) 5

3. (a1-g8-21) Tenglamani yeching.
$\sqrt{\frac{15}{4^{1-x}} + 4^{x-1}} = 32$
A) 4,5 B) 4
C) 5,5 D) 5

4. (a1-g9-18) $3^{x^2-x} + 3^{2+x-x^2} = 10$ tenglamaning ildizlari kvadratlari yig'indisini toping.
A) 5 B) 6 C) 13 D) 10

5. (a1-g14-18) $9^{x+1} - 3^{x+3} + 5 \cdot 3^{x+1} + 3 = 0$ tenglamaning yechimlari yig'indisini toping.
A) –1 B) –2/3
C) 1/3 D) 1

6. (a2-g1-18) Tenglamani yeching.
$\frac{625^x \cdot 5^{4x-1}}{25^{3-x} \cdot 125^{3x+1}} = 0{,}04$
A) –8 B) 12
C) –12 D) 8

7. (a2-g3-4) $5^n = 2\,40^x = 128$ bo'lsa, n ni x orqali ifodalang.
A) $\frac{x}{7-x}$
B) $\frac{x}{7-3x}$
C) $\frac{x-7}{3x}$
D) $\frac{x}{3x-7}$

8. (a2-g3-12) Tenglamani yeching.
$\sqrt{\sqrt[3]{2^{5x} \cdot \sqrt[x]{8^{-1}}}} = \sqrt{16}\sqrt[9]{8}$
A) 3 B) 4 C) 2 D) 1

9. (a2-g6-18) Quyidagi tenglamaning katta ildizi va kichik ildizi ayirmasini toping.
$\left(\sqrt{2+\sqrt{3}}\right)^x + \left(\sqrt{2-\sqrt{3}}\right)^x = 4$
A) 4 B) 2 C) 0 D) 1

10. (a2-g7-18) Tenglamaning ildizlari ko'paytmasini toping.
$3^{x^2-2x+2} + 3^{2x-x^2-1} = \frac{28}{3}$
A) 2 B) 0
C) 4 D) 0,(3)

11. (a2-g8-20) Tenglamaning ildizlari yig'indisini toping.
$81^{2x+1} = \frac{1}{9^{x-3}}$
A) $\frac{7}{10}$ B) $\frac{1}{5}$
C) $-\frac{3}{5}$ D) $\frac{1}{10}$

12. (a2-g14-7) $1 - \frac{1}{196^x} = m$ va $1 - \frac{1}{14^x} = n$ bo'lsa, $m + n^2 = ?$
A) n B) m C) $2n$ D) $-2n$

13. (a2-g18-18) Quyidagi tenglama nechta ildizga ega?
$2^x = x^2 - 3$
A) 0 B) 1 C) 2 D) 3

14. (a2-g23-19) Tenglamani yeching.
$8^{\log_2 x} + x^{\log_2 8} = 128$
A) 8 B) 2 C) 1 D) 4

15. (a3-g1-18) Tenglamaning ildizlari ko'paytmasini toping.
$256^{\frac{x}{2}+\frac{1}{2}} + 4^{2x} = \frac{17}{16}$
A) 1 B) 3 C) $\frac{1}{2}$ D) –1

16. (a3-g2-18) $\sqrt[5]{\frac{\left(\frac{1}{4}\right)^x}{2^{4-4x}}} = \sqrt[5]{8^{2x-1}}$
Tenglamaning barcha yechimlari yig'indisini toping.
A) –0,5 B) –1
C) –1,5 D) –2

17. (a3-g3-20) Tenglamaning ildizlari yig'indisini toping.

$27^{2x+1} = \frac{1}{9^{x-2}}$

A) $\frac{7}{12}$ B) $-\frac{1}{12}$

C) $-\frac{3}{4}$ D) $\frac{1}{8}$

18. (a3-g5-19) Tenglamani yeching.

$81^{\lg x} \cdot 9^{\lg x} = 27$

A) $10\sqrt{10}$ B) 10

C) $\sqrt{10}$ D) 100

19. (a3-g6-18) $27^x(27^x - 12) = -27$

Tenglama yechimlarining ko'paytmasini toping.

A) $-\frac{11}{3}$ B) $\frac{1}{3}$

C) $\frac{2}{9}$ D) $\frac{2}{3}$

20. (a3-g7-17) Quyidagi tenglamaning ildizlari ko'paytmasini toping.

$2^{x^2-x+1} + 2^{x^2-x-2} - 2^{x^2-x-1} = 112$

A) 2 B) –6

C) 6 D) –2

21. (a3-g9-17) Quyidagi tenglama nechta ildizga ega ?

$3^{-x} = 3 - x^2$

A) 0 B) 1 C) 2 D) 3

22. (a3-g11-18) Tengsizlik x ning nechta butun qiymatida o'rinli?

$4 \cdot (0,2)^{x^2+x-2} - 15 \cdot (0,2)^{x^2+x-1} \geq 1$

A) 3 B) 4

C) 5 D) Cheksiz ko'p.

23. (a3-g14-18) Tenglamani yeching.

$2^{2x} = \sqrt[4]{2 \cdot \sqrt[4]{2 \cdot \sqrt[4]{2 \cdot \ldots}}}$

A) $\frac{1}{10}$ B) $\frac{1}{5}$

C) $\frac{1}{6}$ D) $\frac{1}{8}$

24. (a3-g16-18) Tenglamani yeching.

$9^{\log_3 x} + x^{\log_3 9} = 162$

A) 27 B) 9 C) 1 D) 3

25. (a3-g20-19) $(x^2 - 15)^{x^2-5x+6} = 1$

tenglikni qanoatlantiruvchi butun sonlar nechta?

A) 0 B) 1 C) 2 D) 4

26. (a3-g21-17) Tenglamani yeching.

$\frac{625^x \cdot 5^{4x-1}}{25^{3-x} \cdot 125^{3x+1}} = 0,04$

A) –8 B) 12

C) –12 D) 8

27. (a3-g22-17) Tenglama ildizlarining ko'paytmasini toping.

$3^{x^2-2} = 0,(3)^x$

A) –2 B) –1 C) 2 D) 1

28. (a3-g23-17) $9^{x+1} - 3^{x+3} + 5 \cdot 3^{x+1} + 3 = 0$ tenglamaning yechimlari yig'indisini toping.

A) –1 B) 3^{-1}

C) 10 D) $4 \cdot 3^{-1}$

29. (a4-g1-22) $4^{\sin x} = 20 - 16^{\sin x}$ tenglamani yeching.

A) $\frac{\pi}{2} + \pi k$ B) $\frac{\pi}{2} + 2\pi k$

C) πk D) $\frac{\pi}{3} + 2\pi k$

30. (a4-g2-17) Tenglamani yeching.

$3^{3x} = \sqrt[4]{3 \cdot \sqrt[4]{3 \cdot \sqrt[4]{3 \cdot \ldots}}}$

A) 1 B) $\frac{1}{9}$ C) $\frac{1}{12}$ D) $\frac{3}{4}$

31. (a4-g4-18) Quyidagi tenglamaning yechimlari nechta?

$3^{x^2-x} + 3^{2+x-x^2} = 1$

A) 4 B) 2 C) 3 D) 1

32. (a4-g5-18) $e^{x+\ln 2} + 6e^{-x} =$ tenglamaning ildizlarini ko'rs

A) ln2 B) 0; ln3

C) 0 D) ln3

33. (a4-g6-17) $3^{x^2-x+1} + 3^{x^2}$ 30 tenglamaning ildizlari yig'indisini toping.

A) 1 B) 2 C) –1 D) 3

34. (a4-g9-18) $9^{\log_{27}(x+1)} = 2$ tenglamani yeching.

A) $2\sqrt{2} - 1$ B) $3\sqrt{2} - 2$

C) $2\sqrt{3} + 1$ D) $\sqrt{3} - 1$

35. (a4-g13-6) Tenglamaning ko'paytmasini toping.

$x^{\log_5 x} = 5^{2\log_5^2 x - 6\log_5 x + 5}$

A) 5^7 B) 5^5

C) 5^6 D) 5^8

36. (a4-g14-8) $\frac{4^x + 4^x}{5^x + 5^x + 5^x + 5^x + 5^x} = 0,32$ bo'lsa, $x^2 + 1 = ?$

A) 2 B) 10 C) 5 D) 17

37. (a4-g15-17) $5^{2x+1} - 126 \cdot 5^x + 25 = 0$ tenglamaning ildizlari yig'indisi nechaga teng?

A) –1 B) –2

C) 2 D) 1

38. (a4-g17-17) Tenglamaning ildizlari ko'paytmasini toping.

$2^{x^2-x+5} + 2^{x^2-x+3} = 160$

A) 1 B) 3 C) 5 D) –2

39. (a4-g18-17) Tenglamaning ildizlari yig'indisini toping.

$\frac{4^x}{16} = \sqrt{(0,5^{x-2})^x}$

A) 2 B) –2 C) –4 D) –6

40. (a4-g18-18) $9^{\log_3(-x)} - 5^{\log_5 9} = 36^{\log_6 4}$ tenglamaning ildizlari ko'paytmasini toping.

A) 5 B) –25

C) –5 D) 0

41. (a4-g22-18) $3^{x+6} + 2^{y-3} = 5$ tenglamani qanoatlantiruvchi x va y larning barcha butun qiymatlari yig'indisini toping.

A) –1 B) 2

C) –3 D) 4

42. (a4-g23-17) Tenglamani y

$\frac{8^{\frac{1}{2}} \cdot 4^{\frac{1}{4}}}{64^{\frac{1}{6}}} = 16^x$

A) 0,5 B) 1

C) 2 D) 0,25

43. (a4-g24-16) $x^{\log_3 x} - 27x^2 = 0$ tenglamaning ildizlari ko'paytmasini toping.

A) 27 B) 0,(3)

C) 9 D) –1

44. (a5-g3-17) $36^{x-4} = 121$ bo'lsa, 6^{x-3} ni hisoblang.

A) $\frac{8}{11}$ B) $\frac{1}{66}$

56 D) $\frac{11}{6}$

45. (a5-g5-17) Tenglamani yeching.

$4^x - 3^{x-0,5} = 3^{x+0,5} - 2^{2x-1}$

A) 1,5 B) 1

C) –1 D) –2

46. (a5-g7-17) $9^{\quad 2} + 9^{x\ 3} = 10^{x\ 2}$ tenglamaning ild ini toping.

A) 2

B) ildizi yo'q

C) 1

D) 3

47. (a5-g9-19) $x^{1+\lg x} = 100^{\quad}$ tenglamaning ildizlari ko'paytm sini toping.

A) 0,1 B) 0,01

C) 100 D) 10

48. (a5-g10-16) Tenglamani ye ing.

$\sqrt{\frac{15}{4^{1-x}} + 4^{x-1}} = 16$

A) 2 B) 3 C) 4 D) 0

49. (a5-g20-5) $\sqrt[4]{2\sqrt{8\sqrt[3]{4}}} = 4^n$ bo'l

n ning qiymatini toping.

A) $\frac{17}{48}$ B) $\frac{11}{12}$

C) $\frac{17}{24}$ D) $\frac{11}{24}$

50. (a5-g21-4) $(0,00016)^4 \cdot (1250000)^5 =$ $= 2^x \cdot 5^y$ bo'lsa (x, y – butun sonlar), xy ni toping.

A) 240 B) 192

C) 180 D) 256

51. (a5-g21-16) $\sqrt[3]{x^{6\log_3 x}} = 27x$ tenglamaning ildizlari ko'paytma toping.

A) $9\sqrt{3}$ B) $3\sqrt{3}$

C) $\sqrt{3}$ D) $\frac{1}{3}$

52. (a5-g23-16) Tenglamani yeching.
$4^x - 5\cdot 2^x + 6 = 0$
A) 1
B) 3; 1
C) 2; $\log_2 3$
D) $\log_2 3$; 1

53. (a6-g3-16) $4^x = \log_4 x - 1$ tenglama nechta ildizga ega?
A) 2 B) 1 C) 0 D) 3

54. (a6-g5-16) $(x^2 - 7x + 6)^{x-3} =$
$= x^2 - 7x + 6$ tenglama nechta haqiqiy ildizga ega?
A) 4 B) 5 C) 3 D) 6

55. (a6-g14-18) $25\cdot 2^{x^2} + 5\cdot 3^{2x} =$
$= 25\cdot 9^x + 5\cdot 2^{x^2}$ tenglikni qanoatlantiruvchi barcha x larni toping.
A) 0
B) 0; 1; $\log_2 9$
C) 1
D) 0; $\log_2 9$

56. (a6-g17-16) Tenglamani yeching:
$\left(\frac{3}{4}\right)^{\log_4 x} + \left(\frac{4}{3}\right)^{\log_4 x} = \frac{25}{12}$.
A) 0,25; 4
B) 1
C) 1,(3); 0,75
D) 0,5; 2

57. (a6-g18-11) $9^{\log_3(x-5)} = 27$ tenglamaning ildizlari yig'indisini toping.
A) 10
B) $5 - 3\sqrt{3}$
C) $5 + 3\sqrt{3}$
D) ildizga ega emas

58. (a6-g20-16) $7^x = -x^2 + 4x - 3$ tenglama nechta ildizga ega?
A) 2 B) 1 C) 4 D) 0

59. (a6-g22-12) Tenglamani yeching:
$\sqrt{\sqrt[4]{\sqrt[8]{\sqrt[16]{\sqrt[32]{\sqrt[64]{4}}}}}} = 32^x$.
A) $\frac{2^{20}}{5}$
B) 2^{-4}
C) $\frac{2^{22}}{5}$
D) $2^{-4,5}$

60. (a6-g23-12) $7^{x+7} = 8^x$ tenglamaning ildizi $x = \log_b 7^7$ bo'lsa, b ni toping.
A) $\frac{7}{15}$ B) $\frac{8}{7}$
C) $\frac{7}{8}$ D) $\frac{8}{15}$

61. (a6-g24-17) $\frac{4^{x+y}}{8^x} = 16^{x-y}$ bo'lsa, quyidagilardan qaysi biri to'g'ri?
A) $x + y = 3$
B) $5x - 6y = 0$
C) $x - y = 0$
D) $7x + 4y = 0$

77. Ko'rsatkichli tenglamalar sistemasi

1. (a1-g16-16) Tenglamaning katta ildizini toping.
$3^{5\cdot 2x^2} - 4\cdot 3^{-x^2-5} = -3^{-14}$
A) –3
B) 3
C) $\sqrt{10}$
D) $-\sqrt{10}$

2. (a3-g17-17) $\begin{cases} 3^{3x-1} + 4^y = 21 \\ -27^{2x} + 2^{2y} = 11 \end{cases}$
bo'lsa, x ga teskari sonni toping.
A) 3^{-1} B) 0,5
C) 3 D) 2

3. (a3-g19-18) $\begin{cases} 3^{2x-y} = \sqrt[3]{27^2} \\ 9^x \cdot 9^y = 3^{14} \end{cases}$
Tenglamani qanoatlantiruvchi barcha x va y larning yig'indisini toping.
A) 8 B) 20
C) 9 D) 7

4. (a4-g9-17) $\begin{cases} 3^m + 2\cdot 4^{n+1} = 17 \\ 4^n - 5\cdot 3^m = -44 \end{cases}$
bo'lsa, $m + n = ?$
A) 2 B) 3
C) 5 D) 7

5. (a5-g19-16) Tengsizlikni yeching.
$\left(\frac{1}{3}\right)^{x^2+2x} + \left(\frac{1}{3}\right)^{x^2+2x-2} > \frac{10}{27}$
A) $(1; \infty)$
B) $(-3; 1)$
C) $(0; 3)$
D) $(-\infty; -3) \cup (1; \infty)$

6. (a5-g24-16) $\left(4^{\sqrt{x-6}} - 1\right)\left(3\cdot 2^x - 96\right) < 0$
tengsizlikni yeching.
A) (5; 6)
B) (6; ∞)
C) Ø
D) [6; ∞)

7. (a6-g4-16) $\left(4^{\sqrt{x-4}} - 1\right)\left(3\cdot 2^x - 96\right) \geq 0$
tengsizlikni qanoatlantiruvchi eng kichik natural sonni toping.
A) 5 B) 4 C) 6 D) 0

8. (a6-g7-18) Tengsizlikni yeching:
$\left(\sqrt{\pi} - 1\right)^{\ln(2\sin x)} \geq 1; \quad x \in [0; 2\pi]$.
A) $\left(0; \frac{\pi}{6}\right] \cup \left[\frac{5\pi}{6}; \pi\right)$
B) $\left[\frac{\pi}{6}; \frac{5\pi}{6}\right]$
C) $\left(0; \frac{\pi}{6}\right] \cup \left[\frac{5\pi}{6}; 2\pi\right)$
D) $\left(0; \frac{\pi}{6}\right] \cup \left[\frac{11\pi}{6}; 2\pi\right)$

78. Ko'rsatkichli tengsizliklar. Tengsizliklar sistemasi

1. (a1-g1-11) $0,(3)^{12-5x} < 27$ tengsizlikning nechta natural yechimi mavjud?
A) 0 B) 2
C) 3 D) cheksiz ko'p

2. (a1-g6-18) Tengsizlik x ning nechta butun qiymatida o'rinli?
$4\cdot(0,2)^{x^2+x-2} - 15\cdot(0,2)^{x^2+x-1} \geq 1$
A) 2 B) 4
C) 3 D) cheksiz ko'p

3. (a1-g9-11) Quyidagi tenglamaning ildizlari nisbatini toping
$\left(\sqrt{2+\sqrt{3}}\right)^x + \left(\sqrt{2-\sqrt{3}}\right)^x = 4$
A) –1 B) –2
C) –3 D) 1

4. (a1-g10-19) $25 < 3^{2x-3} < 90$ tengsizlikni qanoatlantiruvchi nechta butun son mavjud?
A) 0 B) 1
C) 2 D) 3

5. (a1-g12-9) Tengsizlikni yeching.
$\left(\frac{1}{3}\right)^{5-2x} \geq 27$
A) (2,5; 4]
B) (–∞; 4]
C) [4; ∞)
D) (–∞; ∞)

6. (a1-g12-34) $(x+2)^{\log_2(x^2+1)} <$
$< (x+2)^{\log_2(2x+9)}$ tengsizlikni yeching.
A) (–2; 4)
B) (–4,5; ∞)
C) (–1; 4)
D) (4; ∞)

7. (a1-g15-18) $8 < 3^{2x-3} < 90$ tengsizlikni qanoatlantiruvchi nechta butun son mavjud?
A) 0 B) 3 C) 2 D) 1

8. (a2-g5-19) Tengsizlik x ning nechta butun qiymatida o'rinli?
$(0,5)^{x^2-x-4} - 3\cdot(0,5)^{x^2-x-2} > 1$
A) 1
B) 2
C) 4
D) cheksiz ko'p

9. (a2-g10-19) $30 < 2^{2x+5} < 70$ tengsizlikni qanoatlantiruvchi nechta butun son mavjud?
A) 0 B) 2 C) 1 D) 3

10. (a2-g12-21) Tengsizlikni yeching.
$\left(\frac{\pi}{2} - \frac{\theta}{3}\right)^{\ln(2\cos x)} \geq 1$
$x \in [0; 2\pi]$
A) $\left[\frac{\pi}{3}; \frac{\pi}{2}\right) \cup \left(\frac{3\pi}{2}; \frac{5\pi}{3}\right]$

B) $\left[\frac{\pi}{3};\frac{5\pi}{3}\right]$

C) $\left[\frac{\pi}{3};\frac{\pi}{2}\right]$

D) $\left[\frac{\pi}{6};\frac{\pi}{2}\right)\cup\left(\frac{3\pi}{2};\frac{5\pi}{6}\right]$

11. (a2-g14-17) Tengsizlikni yeching.

$$\left(\frac{4}{5}\right)^{\sin^2 x}\cdot\left(\frac{25}{16}\right)^{\cos x}<2^2\cdot 5^{-1}$$

A) $-\frac{\pi}{2}+2\pi k<x<\frac{\pi}{2}+2\pi k$

B) $2\pi k<x<\pi+2\pi k$

C) $\frac{\pi}{2}+2\pi k<x<\frac{3\pi}{2}+2\pi k$

D) $-\pi+2\pi k<x<2\pi k$

12. (a2-g21-19) Quyidagi tenglama nechta ildizga ega ?

$3^x=x^2+3$

A) 0 B) 1 C) 2 D) 3

13. (a3-g13-18) Tengsizlik x ning nechta butun qiymatida o'rinli?

$2^{x^2-x-6}+3\cdot 2^{x^2-x-4}>13$

A) 4 B) 3
C) 5 D) cheksiz ko'p.

14. (a4-g7-17) $(x-2)^{x^2-6}>(x-2)^{10}$ tengsizlikni yeching.

A) $(4;\infty)$
B) $(-\infty;4)\cup(4;\infty)$
C) $(2;4)$
D) $(2;3)\cup(4;\infty)$

15. (a4-g19-17) Quyidagi sonlardan qaysilari birdan katta?

1) $0{,}2^x\cdot 5^y$ $x>1$ va $y<0$;
2) $0{,}75^x\cdot 1{,}(3)^y$ $x<0$ va $y>0$;
3) $0{,}4^x\cdot 2{,}5^y$ $x>y>0$;
4) $0{,}(3)^x\cdot 3^y$ $x<y<0$;
5) $0{,}8^x\cdot 1{,}25^x$ $x>1$.

A) 2, 3, 5 B) 1, 3
C) 2, 4 D) 3, 5

16. (a5-g12-16) $18<5^{x-2}<4012$ tengsizlikni qanoatlantiruvchi butun sonlar yig'indisini toping.

A) 14 B) 18 C) 15 D) 22

17. (a5-g14-16) Quyidagi tengsizlik nechta natural ildizga ega?

$$\left(\frac{25}{49}\right)^{x-10}\geq\left(\frac{7}{5}\right)^{2x-20}$$

A) cheksiz ko'p B) 11
C) 10 D) 9

79. Logarifmik funksiya va uning xossalari

1. (a2-g8-21) $y=\log_3(2x+3)$ funksiya grafigi koordinata tekisligining qaysi choraklaridan o'tadi?

A) I, II va III
B) I va IV
C) II, III va IV
D) I, II, III va IV

2. (a3-g3-21) $y=\log_3(3-2x)$ funksiya grafigi koordinata tekisligining qaysi choraklaridan o'tadi?

A) I, II va IV
B) I va II
C) barcha choraklardan
D) I va IV

3. (a3-g19-21) Quyidagi berilgan ifodalardan qaysi biri ma'noga ega emas?

A) $\log_2(\sin 3)$

B) $\sqrt{3\cos 2}$

C) $\ln(\operatorname{tg}\frac{6\pi}{5})$

D) $\sqrt{arc\cos(-0{,}3)}$

4. (a3-g24-17) k ning qanday qiymatida $f(x)=|\log_7(k+x)|$ va $g(x)=-|x-8|$ funksiyalarning grafiklari absissalar oqida yotgan nuqtada kesishadi?

A) 9 B) –7 C) –8 D) –9

5. (a4-g14-24) Quyidagi funksiyaning aniqlanish sohasini toping.

$$f(x)=\frac{\sqrt[4]{x^2-1}+\sqrt{x}+\sqrt[3]{x+2}}{\sqrt[3]{\log_{x-1}4-\sqrt[3]{2}}}$$

A) $(1;2)\cup(2;\infty)$
B) $(0;1]\cup[1;2)\cup(2;\infty)$
C) $(-\infty;1]\cup(1;3)\cup(3;\infty)$
D) $(1;2)\cup(2;3)\cup(3;\infty)$

6. (a4-g17-18) $y=\log_a x$ funksiyaning grafigi (5; –2) nuqtadan o'tadi. $\log_a 625$ ning qiymatini toping.

A) –2 B) –4
C) –8 D) –16

7. (a6-g2-16) $y=|\ln(-x)|+1$ funksiya grafigi koordinata tekisligining qaysi choraklaridan o'tadi?

A) I; IV B) II; III
C) faqat I D) faqat II

8. (a6-g8-15) $y=\log_{\frac{1}{2}}\frac{1}{x}$ funksiyaning grafigi to'grisidagi fikrlardan qaysi biri to'g'ri?

A) I, II chorakda yotadi, o'suvchi
B) I, II chorakda yotadi, kamayuvchi
C) I, IV chorakda yotadi, o'suvchi
D) I, IV chorakda yotadi, kamayuvchi

80. Logarifmik funksiyaning aniqlanish sohasi. Logarifmik funksiyaning qiymatlar sohasi

1. (a2-g4-19) $y=9-\log_3 x$ funksiyaning qiymatlar sohasini toping.

A) $(9;\infty)$
B) $(-\infty;9)$
C) $(-\infty;\infty)$
D) $(0;\infty)$

2. (a2-g14-22) Quyidagi funksiyaning aniqlanish sohasiga tegishli barcha butun sonlar o'rta arifmetigining 50% ini toping.

$$f(x)=\frac{\lg(x-4)(15x-36-x^2)}{\sqrt{x(9-x)}\cdot\left(2^x-8\right)}$$

A) 6,5 B) 6,(6)
C) 3,(3) D) 3,75

3. (a2-g19-18) n ning qanday qiymatlarida $\lg(nx^2-6x+1)$ funksiyaning aniqlanish sohasi $\left(-\infty;\frac{1}{5}\right]\cup[1;\infty)$ bo'ladi

A) 1 B) 5 C) 4 D) Ø

4. (a3-g14-19) Funksiyaning aniqlanish sohasini toping.

$$y=\sqrt{2-\lg(x-3)}+\frac{x-5}{|\lg(x-6)|}$$

A) $(3;6)\cup(7;103]$
B) $(3;5)\cup(5;6)\cup(6;7)\cup(7;103]$
C) $(3;7)\cup(7;\infty)$
D) $(6;7)\cup(7;103]$

5. (a3-g19-17) Funksiyaning qiymatlar sohasini ko'rsating.

$f(x)=\log_3(x-3)+15$

A) $(3;\infty)$ B) $(-\infty;\infty)$
C) $[15;\infty)$ D) $(-\infty;15]$

6. (a4-g2-18) Funksiyaning aniqlanish sohasini toping.

$$y=\sqrt{3-\lg(x+5)}+\frac{x-2}{\lg|x-3|}$$

A) $(-5;3)\cup(3;995]$
B) $(-5;2)\cup(2;3)\cup(3;4)\cup(4;995]$
C) $(-4;995]$
D) $(-5;995)\cup(995;\infty)$

7. (a4-g4-17) Quyidagi funksiyaning aniqlanish sohasini toping.

$y=\sqrt{\log_2 x}-\sqrt{4-x^2}$

A) $[2;\infty)$
B) $(0;1)\cup(1;2]$
C) $(0;2]$
D) $[1;2]$

8. (a5-g7-18) k ning qanday qiymatlarida $y=\log_2(x^2-kx-10)$ funksiyaning aniqlanish sohasi $(-\infty;-2]\cup[5;\infty)$ dan iborat bo'ladi?

A) 3
B) –3
C) hech qanday qiymatida
D) 7

9. (a5-g18-21) $y=\log_{7-x}(x^2-3x-10)$ funksiyaning aniqlanish sohasini toping.

A) $(5;6)\cup(6;7)$

B) $(-\infty;-2)\cup(5;7)$

C) $(-\infty;-2)\cup(5;\infty)$

D) $(-\infty;-2)\cup(5;6)\cup(6;7)$

10. (a6-g7-16) $f(x)=\log_{(5-x)}(6x-x^2)$ funksiyaning aniqlanish sohasiga kiruvchi butun sonlar yig'indisini toping.

A) 4 B) 10 C) 3 D) 6

11. (a6-g9-18) Funksiyaning aniqlanish sohasini toping:
$y = \log_{\cos x} \sin x + \log_{\operatorname{tg} x} \operatorname{ctg} x$.

A) $\left(2\pi n; \frac{\pi}{2} + 2\pi n\right),\ n \in Z$

B) $\left(\pi n; \frac{\pi}{2} + \pi n\right),\ n \in Z$

C) $\left(2\pi n; \frac{\pi}{4} + 2\pi n\right) \cup \left(\frac{\pi}{4} + 2\pi n; \frac{\pi}{2} + 2\pi n\right),\ n \in Z$

D) $\left(\pi n; \frac{\pi}{4} + \pi n\right) \cup \left(\frac{\pi}{4} + \pi n; \frac{\pi}{2} + \pi n\right),\ n \in Z$

12. (a6-g20-4) Funksiyaning aniqlanish sohasini toping $y = \log_{x-2}\left(x^2 + 7x - 8\right)$.

A) $(2; 3) \cup (3; \infty)$
B) $(8; \infty)$
C) $(-\infty; -8) \cup (2; 3) \cup (3; \infty)$
D) $(-\infty; -1) \cup (8; \infty)$

13. (a6-g21-13) $y = \log_3(x^2 - 6x + 15) - 1$ funksiyaning qiymatlar sohasini toping.
A) $(-\infty; \infty)$
B) $[1; \infty)$
C) $[\log_3 2; \infty)$
D) $(0; \infty)$

81. Sonning logarifmi va uning xossalari logarifmik ifodalarni shakl almashtirish

1. (a1-g1-31) $\log_3(x \cdot y) - \log_9\left(\frac{x}{y}\right) = \log_a 1$ bo'lsa, $\log_y x = ?$ $(a > 0)$
A) 0 B) –1
C) –2 D) –3

2. (a1-g2-17) Hisoblang: $\frac{\log_7 729}{\log_7 81}$.
A) 5 B) 1,5
C) 2 D) 2,5

3. (a1-g3-28) $\log_m a = 6$ va $\log_n a = 9$ bo'lsa, $\log_{mn} a$ nechaga teng?
A) $\frac{5}{18}$ B) 3,6
C) $\frac{1}{18}$ D) 1,8

4. (a1-g4-18) Quyidagilardan nechtasi to'g'ri?
I) $\log_5 125 = 3$;
II) $\log_{\frac{1}{5}} \frac{1}{25} = -2$;
III) $\log_2 \frac{1}{8} = -3$;
IV) $\log_{\sqrt{3}} \sqrt[3]{81} = 1$.
A) 0 B) 1 C) 2 D) 3

5. (a1-g5-18) $\log_7 3 = a$ bo'lsa, $\log_{27} 441$ ning qiymati nechaga teng?
A) $\frac{2}{3}(1-a)$ B) $\frac{2a-1}{3}$
C) $\frac{2}{3}(a+1)$ D) $\frac{2a+2}{3a}$

6. (a1-g6-19) Agar $\lg 5 = a$ va $\lg 3 = b$ bo'lsa, $\log_{750} 180$ ni a va b orqali ifodalang.
A) $\frac{2b+2-a}{2a+b+1}$
B) $\frac{1-a+2b}{a+2b+1}$
C) $\frac{2b-2+a}{1+b+2a}$
D) $\frac{2a-2b-1}{2a+2b+1}$

7. (a1-g7-14) $\log_3 \log_2 \log_5 25^4 = ?$
A) 4 B) 3 C) 2 D) 1

8. (a1-g8-19) $a = \log_3 33$, $b = \log_4 44$ va $c = \log_5 55$ bo'lsa, quyidagilardan qaysi biri o'rinli?
A) $c < b < a$
B) $a = b = c$
C) $a < b < c$
D) $b < a < c$

9. (a1-g9-19) $\log_5 27 = a$ bo'lsa, $\log_9 15 = ?$
A) $a + 3$ B) $\frac{a+3}{2a}$
C) $\frac{a}{a+3}$ D) $\frac{a+3}{a+2}$

10. (a1-g11-20) Hisoblang.
$\log_{25} 32 \cdot \log_{27} 625 \cdot \log_{128} 81$
A) $\frac{21}{40}$ B) $1\frac{19}{21}$
C) $\frac{5}{42}$ D) $8\frac{2}{5}$

11. (a1-g12-19) $a = \log_5 \frac{1}{3} - \log_5 \frac{1}{15}$, $b = \log_{\frac{1}{2}} 4 + \log_{\frac{1}{2}} 2$ va $c = \log_{\frac{1}{3}} 27 - \log_{\frac{1}{3}} 9$ sonlarni kamayib borish tartibida yozing.
A) $b > c > a$
B) $b > a > c$
C) $a > c > b$
D) $a > b > c$

12. (a1-g13-19) Agar $\ln(ab) = 2x$ va $\ln\left(\frac{a}{b}\right) = 2y$ bo'lsa, $b = ?$
A) e^{xy} B) e^{x+y}
C) e^{x-y} D) e^{-x-y}

13. (a1-g16-17) Hisoblang.
$\frac{\log_5 1024}{\log_5 16}$
A) 5 B) 1,5 C) 2 D) 2,5

14. (a1-g17-18) Hisoblang.
$27^{\log_3 2} + 49^{\log_7 3}$
A) 5 B) 10 C) 81 D) 17

15. (a2-g3-17) $\log_a[\log_5(\log_2 a - 6\log_a 2)] = 0$ bo'lsa, a ning qiymatini toping.
A) 4 B) 64
C) 64; 4 D) 0,5; 64

16. (a2-g5-18) Agar $\log_5 3 = m$ va $\log_5 7 = n$ bo'lsa, $\log_{75} 315$ ni m va n orqali ifodalang.
A) $\frac{2m+n+2}{2n+1}$ B) $\frac{2m+n+2}{n+2}$
C) $\frac{2m+n+1}{m+2}$ D) $\frac{m+n+1}{2m+1}$

17. (a2-g6-19) Hisoblang.
$\log_6\left(1-\frac{1}{2}\right) + \log_6\left(1-\frac{1}{3}\right) + \log_6\left(1-\frac{1}{4}\right) + \ldots + \log_6\left(1-\frac{1}{216}\right) = ?$
A) –1 B) –3
C) 0 D) 1

18. (a2-g7-19) Quyidagi ko'paytmalarning ishoralarini toping.
$a = \log_{\frac{2}{3}} \frac{4}{3} \cdot \log_{\frac{1}{2}} \frac{3}{2}$; $b = \log_{\frac{1}{3}} \frac{1}{3} \cdot \log_{\frac{1}{2}} \frac{5}{3}$;
$c = \log_{\frac{2}{5}} \frac{1}{3} \cdot \log_{\frac{1}{4}} \frac{2}{3}$; $d = \log_{\frac{1}{6}} \frac{6}{7} \cdot \log_{\frac{3}{4}} \frac{5}{2}$.
A) +, –, +, –
B) –, –, +, +
C) –, +, –, +
D) +, –, –, +

19. (a2-g9-20) Hisoblang.
$\log_{25} 32 \cdot \log_{27} 625 \cdot \log_{128} 81$
A) $\frac{21}{40}$ B) $1\frac{19}{21}$
C) $\frac{5}{42}$ D) $8\frac{2}{5}$

20. (a2-g12-16) $[-\pi; \pi]$ bo'lsa a^2 ni toping.
A) 1 B) 81
C) $\sqrt{3}$ D) $3\sqrt{3}$

21. (a2-g13-13) Hisoblang.
$\frac{8^{\frac{1}{\log_3 2}} - 5^{\frac{1}{\log_7 5}}}{3^{\frac{1}{\log_5 3}} - 2^{\frac{1}{\log_3 2}}}$
A) 6 B) 10 C) 15 D) 18

22. (a2-g15-20) Agar $\lg 4 = a$ va $\lg 9 = b$ bo'lsa, $\log_{15} 4{,}8$ ni a va b orqali ifodalang.
A) $\frac{2a+b-1}{a-b+2}$ B) $\frac{4a+2b-1}{a-b+2}$
C) $\frac{a-2b+2}{4a-b+1}$ D) $\frac{4a+b-2}{b-a+2}$

23. (a2-g17-19) $\log_2 5 = a$ va $\log_3 2 = b$ bo'lsa, $\log_{18} 100$ ni a va b orqali ifodalang.
A) $\frac{2ab+2b}{b+2}$ B) $\frac{2a+b}{ab+2a}$
C) $\frac{2+2ab}{b+1}$ D) $\frac{4ab+2b}{2b+1}$

24. (a2-g20-19) Hisoblang.

$$\log_7\left(1-\frac{1}{2}\right)+\log_7\left(1-\frac{1}{3}\right)+$$

$$+\log_7\left(1-\frac{1}{4}\right)+\ldots+\log_7\left(1-\frac{1}{49}\right)$$

A) -1 B) -2
C) $\log_7 48$ D) 1

25. (a2-g22-19) Agar $\ln(ab)=2x$ va $\ln\left(\frac{a}{b}\right)=2y$ bo'lsa, b = ?

A) e^{x+y} B) $e^{x\cdot y}$
C) e^{y-x} D) e^{x-y}

26. (a2-g23-18) $0<a<b<1<c$ shartni qanoatlantirsa, quyidagilarni tartiblang: $x=\log_a 5$; $y=\log_b 5$; $z=\log_c 5$

A) $z>y>x$
B) $z>x>y$
C) $y>z>x$
D) $y>x>z$

27. (a3-g1-19) $\lg 5=m$ va $\lg 7=n$ bo'lsa $\log_4 245$ ni m va n orqali ifodalang.

A) $\frac{2n+1}{m}$ B) $\frac{2m+n}{2+n}$
C) $\frac{2m+n}{2-2m}$ D) $\frac{m+2n}{2-2m}$

28. (a3-g2-19) Soddalashtiring.

$\log_{625}620\cdot\log_{620}615\cdot$
$\cdot\log_{615}610\cdot\ldots\cdot\log_{130}125$

A) $\frac{4}{3}$ B) $\frac{1}{5}$
C) 5 D) $\frac{3}{4}$

29. (a3-g6-19) Agar $\log_{48}15=a$ va $\lg 2=b$ bo'lsa, $\lg 3$ ni a va b orqali ifodalang.

A) $\frac{b-1-4ab}{a-1}$ B) $\frac{ab+b-1}{2b-1}$
C) $\frac{2ab-b+1}{2a-b}$ D) $\frac{4ab+b-1}{1-a}$

30. (a3-g11-19) Agar $\lg 5=a$ va $\lg 3=b$ bo'lsa, $\log_{750}180$ ni a va b orqali ifodalang.

A) $\frac{2b+2-a}{2a+b+1}$ B) $\frac{1-a+2b}{a+2b+1}$
C) $\frac{2b-2+a}{1+b+2a}$ D) $\frac{2a-2b-1}{2a+2b+1}$

31. (a3-g12-20) Agar $\lg 3=a$ va $\lg 8=b$ bo'lsa, $\log_{0,6}45$ ni a va b orqali ifodalang.

A) $\frac{2a+3b-1}{6a-2+b}$
B) $\frac{6a-b+3}{3a+b-3}$
C) $\frac{2b-3a+1}{6b+2a-1}$
D) $\frac{3a+b+3}{6b+3-a}$

32. (a3-g13-19) Agar $\lg 5=a$ va $\lg 9=b$ bo'lsa, $\log_{180}450$ ni a va b orqali ifodalang.

A) $\frac{a+b+1}{a-2}$
B)
C) $\frac{2-a+b}{a-b+2}$
D) $\frac{a+2b+1}{2+b-a}$

33. (a3-g16-19) Hisoblang.

$$\log_4\left(1-\frac{1}{2}\right)+\log_4\left(1-\frac{1}{3}\right)+$$

$$+\log_4\left(1-\frac{1}{4}\right)+\ldots+\log\left(1-\frac{1}{64}\right)$$

A) 3 B) -3 C) 2 D) $-2,5$

34. (a3-g19-19) Soddalashtiring.

$$\frac{\log_{32}30\cdot\log_{30}28\cdot\log_{28}26\cdot\ldots\cdot\log_6 4}{\log_{27}25\cdot\log_{25}23\cdot\log_{23}21\cdot\ldots\cdot\log_{11}9}$$

A) $\frac{3}{5}$ B) $\frac{5}{3}$ C) $\frac{3}{8}$ D) $\frac{2}{3}$

35. (a3-g20-18) $\log_3 x=0,23$ va $\log_3 y=2,27$ bo'lsa, xy ning qiymatini toping.

A) $9\sqrt{3}$ B) 3
C) 9 D) $3\sqrt{3}$

36. (a3-g22-18) $\log_3 4=x$ va $\log_4 5=y$ bo'lsa, $\log_{20}12$ ni x va y orqali ifodalang.

A) $\frac{1+x}{1+y}$ B) $\frac{xy+y}{x+1}$
C) $\frac{x+xy}{x+1}$ D) $\frac{1+x}{x+xy}$

37. (a3-g23-18) $\frac{4}{\log_2 12}+\frac{2}{\log_3 12}=?$

A) $\log_2 6$
B) $\log_3 2-2$
C) $\log_3 2+\log_2 3$
D) 2

38. (a3-g24-18) $\log_3 5=a$ bo'lsa, $\log_{225}75$ quyidagilarning qaysi biriga teng?

A) $\frac{2a+1}{2a+2}$ B) $\frac{2a+3}{2(a+1)}$
C) $\frac{3+2a}{3+a}$ D) $\frac{a+3}{2a-1}$

39. (a4-g4-19) Hisoblang.

$$\frac{2}{\log_2 6}+\frac{1}{\log_9 6}$$

A) 1 B) 2 C) 3 D) 6

40. (a4-g5-17) $\log_x m=a$ va $\log_y m=b$ bo'lsa, b quyidagilardan qaysi biriga teng?

A) $\frac{\lg x}{a\lg y}$ B) $\frac{a\lg y}{\lg x}$
C) $\frac{a\lg x}{\lg y}$ D) $\frac{\lg y}{a\lg x}$

41. (a4-g7-18) $\log_5 6=a$ bo'lsa, $\log_{180}750$ ni a orqali ifodalang.

A) $\frac{a+3}{2a+1}$ B) $\frac{2a+2}{2a-1}$
C) $\frac{3a+1}{2a+1}$ D) $\frac{4-2a}{3a+1}$

42. (a4-g8-20) Agar $\lg 3=a$ va $\lg 8=b$ bo'lsa, $\log_{0,6}45$ ni a va b orqali ifodalang.

A) $\frac{2a+3b-1}{6a-2+b}$ B) $\frac{6a-b+3}{3a+b-3}$
C) $\frac{2b-3a+1}{6b+2a-1}$ D) $\frac{3a+b+3}{6b+3-a}$

43. (a4-g11-36) Agar $\ln(ab)=2x$ va $\ln\left(\frac{a}{b}\right)=2y$ bo'lsa, a = ?

A) e^{x+y}
B) e^{x-y}
C) e^{y-x}
D) e^{-x-y}

44. (a4-g12-20) Soddalashtiring.

$$\frac{\cos^4\alpha+\sin^2\alpha-\cos^2\alpha}{\sin^4\alpha-\sin^2\alpha+\cos^2\alpha}$$

A) $\mathrm{tg}^2\alpha$
B) $\mathrm{ctg}^4\alpha$
C) $\mathrm{tg}^4\alpha$
D) $\cos^2 2\alpha$

45. (a4-g13-3) $\sqrt{\log_a b+\log_b a+2}\cdot$
$\cdot\log_{ab}a\cdot\sqrt{\log_a^3 b}=?$ $(a>b>1)$

A) 1
B) $\log_a b$
C) $\log_b a$
D) $\log_a^2 b$

46. (a4-g14-17) $\log_5 9\cdot\log_3 e\cdot\ln 25=\log_x 16$ bo'lsa, x = ?

A) 2 B) 4
C) $\ln 3$ D) $\ln 5$

47. (a4-g14-21) $\log_3 x=12,5$; $\log_3 y=3,2$ va $\log_3 z=11,7$ bo'lsa, $\frac{xy}{z}=?$

A) 27 B) 3 C) 81 D) 9

48. (a4-g15-18) Quyidagi funksiyaning aniqlanish sohasini toping.

$y=\sqrt[4]{\lg|x-5|-3}$

A) $[-995;\ 5)\cup(5;\ 1005]$

B) $(\infty;\ -995]\cup[1005;\ \infty)$

C) $(-\infty;\ 1005)\cup(1005;\ \infty)$

D) $[-995;\ 1005)$

49. (a4-g22-19) $\log_2 5=a$ va $\log_3 2=b$ bo'lsa, $\log_{18}100$ ni a va b orqali ifodalang.

A) $\frac{2ab+2b}{b+2}$ B) $\frac{2a+b}{ab+2a}$
C) $\frac{2+2ab}{b+1}$ D) $\frac{4ab+2b}{2b+1}$

50. (a4-g24-17) $\log_a b = x$ bo'lsa, $\log_{a^2b} a^3b^2$ quyidagilardan qaysi biriga teng.

A) $\frac{2x+3}{x+2}$ B) $\frac{x+3}{2x+2}$

C) $\frac{3x+2}{x+2}$ D) $\frac{x+2}{2x+3}$

51. (a5-g2-17) $x^x \cdot x^y = 3$ bo'lsa, $\log_9 x$ quyidagilardan qaysi biriga teng?

A) $\frac{2}{x+y}$ B) $\frac{x+y}{2}$

C) $\frac{1}{2(x+y)}$ D) $x+y$

52. (a5-g4-18) Agar $\lg 5 = a$ va $\lg 3 = b$ bo'lsa, $\log_{750}180$ ni a va b orqali ifodalang.

A) $\frac{1-a+2b}{a+2b+1}$

B) $\frac{2b+2-a}{2a+b+1}$

C) $\frac{2b-2+a}{1+b+2a}$

D) $\frac{2a-2b-1}{2a+2b+1}$.

53. (a5-g6-18) Agar $\ln(ab) = 2y$ va $\ln\left(\frac{a}{b}\right)^2 = 2x$ bo'lsa, b = ?

A) e^{x+y} B) e^{x-y}

C) e^{y-x} D) e^{x-y}

54. (a5-g11-16) Ifodani soddalashtiring ($k > 1$).

$$\frac{\log_k 216 - \log_k 27}{\log_k 32 + \log_k 16}$$

A) $\frac{2}{5}$ B) $\frac{1}{3}$

C) $\frac{3}{20}$ D) $\frac{1}{64}$

55. (a5-g13-16) $\log_3 0{,}001$ sonining butun qismini toping.

A) –6 B) –5

C) –8 D) –7

56. (a5-g15-14) Soddalashtiring:

$$\frac{\log_{32} 30 \cdot \log_{30} 28 \cdot \log_{28} 26 \cdot \ldots \cdot \log_6 4}{\log_{27} 25 \cdot \log_{25} 23 \cdot \log_{23} 21 \cdot \ldots \cdot \log_{11} 9}.$$

A) $\frac{3}{5}$ B) $\frac{5}{3}$

C) $\frac{3}{8}$ D) $\frac{2}{3}$

57. (a5-g16-16) $a = \log_{10}\sqrt{8}$, $b = \log_8 \frac{1}{3}$, $c = \log_{12} 16$, bo'lsa, a, b va c larni o'sib borish tartibida joylashtiring.

A) $c < a < b$

B) $a < c < b$

C) $b < c < a$

D) $b < a < c$

58. (a5-g25-16) $x^x \cdot x^y = 3$ bo'lsa, $\log_9 x$ quyidagilardan qaysi biriga teng?

A) $\frac{1}{2(x+y)}$ B) $\frac{1}{x+y}$

C) $2x+2y$ D) $x+y$

59. (a6-g11-35) Ifodani soddalashtiring:

$$1+\frac{1}{1+\frac{1}{\log_3 5}}.$$

A) $\log_{75}15$ B) $\log_5 75$

C) $\log_{75}5$ D) $\log_{15}75$

60. (a6-g12-12) Hisoblang:

$$\lg\frac{9000^4}{50^9} + \lg\frac{1250^3}{1024000} + \lg\frac{3200^2}{810^2}.$$

A) 3 B) 4 C) 5 D) 6

61. (a6-g14-10) Yig'indini hisoblang:

$$\log_{0,5}\frac{1}{\sqrt{2}} + \log_{0,5}\frac{1}{\sqrt[4]{2}} + \log_{0,5}\frac{1}{\sqrt[8]{2}} + \log_{0,5}\frac{1}{\sqrt[16]{2}} + \ldots.$$

A) 0,25 B) 0,5

C) 1 D) 2

62. (a6-g15-28) Quyidagi berilgan ifodalardan qaysi biri ma'noga ega emas?

A) $\log_{\frac{1}{3}}(\sin 2)$

B) $\sqrt[4]{4\cos 6}$,

C) $\lg(\operatorname{tg}\frac{5\pi}{6})$

D) $\sqrt{\arccos(-0{,}6)}$

63. (a6-g16-12) Soddalashtiring:

$$\frac{\log_{32} 30 \cdot \log_{30} 28 \cdot \log_{28} 26 \cdot \ldots \cdot \log_6 4}{\log_{27} 25 \cdot \log_{25} 23 \cdot \log_{23} 21 \cdot \ldots \cdot \log_{11} 9}.$$

A) $\frac{3}{5}$ B) $\frac{5}{3}$ C) $\frac{3}{8}$ D) $\frac{2}{3}$

64. (a6-g19-29) Soddalashtiring:

$$\left(\frac{4\lg 2 + 2\lg 25}{\lg 1100 - \lg 1{,}1}\right)^{-1}.$$

A) 0,75 B) 1,(3)

C) 10 D) 0,1

65. (a6-g24-6) $2\lg a - \frac{1}{3}\lg b + \frac{3}{2}\lg c$ ifodasi quyidagilardan qaysi biriga teng?

A) $\lg\frac{a^3b^2}{\sqrt[6]{bc}}$

B) $\lg\frac{\sqrt{a}\cdot c^3}{\sqrt{b^3}}$

C) $\lg\frac{a^2\cdot\sqrt[3]{b}}{\sqrt{c^3}}$

D) $\lg\frac{a^2c\sqrt{c}}{\sqrt[3]{b}}$

66. (a6-g25-3) $\log_4 64 + \log_4 64^2 + \log_4 64^3 + \ldots + \log_4 64^{20}$ ni hisoblang.

A) 945 B) 630

C) 625 D) 256

67. (a6-g26-16) Soddalashtiring:

$$\left(\frac{4\lg 25 + 2\lg 16}{\lg 1700 - \lg 0{,}017}\right)^{-1}.$$

A) 1,6

B) 1,25

C) 10

D) 0,625

82. Logarifmik tenglamalar

1. (a1-g2-18) Tenglamani yeching. (bu yerda $a > 0$, $a \neq 1$)

$\log_{a^4} x^3 + \log_{a^{12}} x^5 - \log_{a^{36}} x^6 = 2$

A) a^2 B) 0 C) a D) 1

2. (a1-g9-20) Tenglamani yeching.

$\log_4(x+3) + \log_4(x-3) = 2$

A) ±5 B) 3

C) ±4 D) 5

3. (a1-g16-18) Tenglamani yeching (bu yerda $a > 0$, $a \neq 1$)

$\log_{a^3} x^2 + \log_{a^9} x^4 - \log_{a^{27}} x^3 = 1$

A) a^2 B) 0 C) a D) 1

4. (a1-g17-19) $\log_x 27 + \log_3 x = 4$ tenglamaning ildizlari yig'indisini toping.

A) 30 B) 4

C) 18 D) 3

5. (a2-g2-20) $\log_x(x^2+2x) = 3$ tenglama nechta ildizga ega?

A) 0 B) 1 C) 2 D) 3

6. (a2-g4-20) $\log_5 9 \cdot \log_3 e \cdot \ln 25 = \log_x 16$ bo'lsa, x nechaga teng?

A) 2

B) 8

C) ln3

D) $\log_3 5$

7. (a2-g13-16) $\log_x y + \log_y x = 2$ va $x^2 = 3y + 10$ bo'lsa, $x + y$ = ?

A) 1 B) 6

C) 10 D) 12

8. (a2-g13-26) 40% i 10 ga teng son $\lg x = 2$ tenglama yechimining necha foizini tashkil etadi?

A) 4 B) 15

C) 20 D) 25

9. (a2-g16-19) $\log_2(x-4) + \log_2(x-1) = 2$ tenglama nechta ildizga ega?

A) 0 B) 1 C) 2 D) 4

10. (a3-g9-18) Tenglamaning ildizlari yig'indisini toping.

$\log_3^2 x - 4\log_3 x + 3 = 0$

A) 4 B) 30

C) 81 D) 27

11. (a4-g6-18) $\log_3 x = 3^x$ tenglama nechta ildizga ega?

A) 0 B) 1 C) 2 D) 4

12. (a4-g10-17) $|x-1|^{\log_2 x - \log_2 x^2} = |x-1|^3$ tenglama nechta yechimga ega?

A) 1 B) 2

C) 3 D) 4

13. (a4-g13-15) $\log_2 \sqrt[3]{4\sqrt[3]{4\sqrt[3]{4\sqrt[3]{4...}}}} = ?$

A) $\frac{1}{3}$ B) 1 C) 1,5 D) 2

14. (a4-g16-18) Tenglamani yeching.
$\log_x(\log_x 256) = \log_2 8$
A) 9 B) 3 C) 4 D) 2

15. (a4-g20-18) $\log_2(x-2) - x^2 + 2x - 3 = 0$ tenglama nechta yechimga ega?
A) 1 B) 2
C) 3 D) 0

16. (a4-g21-17) $5^x + \log_5 x = 0$ tenglama nechta ildizga ega?
A) 0 B) 2
C) 4 D) 1

18. (a5-g2-18) $\lg\left(\frac{1}{\log_2 x}\right) + 1 = 0$ tenglamaning ildizini toping.
A) 2^{-10} B) $\sqrt[10]{2}$
C) $\sqrt[10]{0,5}$ D) 2^{10}

19. (a5-g3-18) Tenglamaning ildizlari yig'indisini toping.
$\log_4(5x-6)\cdot\log_x 256 = 8$
A) 2 B) 5
C) 3 D) –2

20. (a5-g6-21) Tengsizlikni yeching.
$\left(\frac{\pi}{2}+\frac{e}{3}\right)^{\ln(2\sin x)} \geq 1,\ x \in [-\pi;\pi]$

A) $\left(-\pi;\frac{\pi}{6}\right]\cup\left[\frac{5\pi}{6};\pi\right)$

B) $\left[\frac{\pi}{6};\frac{5\pi}{6}\right]$

C) $\left[\frac{\pi}{6};\frac{\pi}{2}\right]$

D) $\left(0;\frac{\pi}{6}\right]\cup\left[\frac{5\pi}{6};\pi\right)$

21. (a5-g17-8) $\log_{2\sqrt{3}} x + \log_{2\sqrt{3}}(x-1) = 2$ tenglamaning ildizlari yig'indisini toping.
A) 3 B) –1
C) 1 D) 4

22. (a5-g20-16) Tenglamaning ildizlari yig'indisini toping.
$\log_x 3\cdot\log_4 6\cdot\log_5 4\cdot\log_3 5\cdot$
$\cdot\log_6(5x+6) = \log_6 36$
A) 5 B) 6 C) 7 D) 2

23. (a5-g22-16) k ning qanday qiymatlarida $(2014x-k)\cdot\log_{2014}(x-1) = 0$ tenglama bitta ildizga ega bo'ladi?
A) $k \geq 2014$
B) $k \leq 2014,\ k = 4028$
C) $k = 4028,\ k \leq 1$
D) $k \leq 0,\ k = 4028$

24. (a6-g4-14) $y = \sqrt[5]{x^2-7x+10} + \lg|x^2-5x+4|$ funksiyaning aniqlanish sohasini toping.
A) $(-\infty;\infty)$
B) $(-\infty;1)\cup(1;2]\cup[5;\infty)$
C) $(-\infty;1)\cup(1;4)\cup(4;\infty)$
D) $(-\infty;1]\cup[4;\infty)$

25. (a6-g8-16) $\lg^2 x^2 - \lg^2(-x) = 27$ tenglamani yeching.
A) –1000 va –0,001
B) 1000 va 0,001
C) 10^9 va 10^{-9}
D) -10^9 va -10^{-9}

26. (a6-g10-16) Tenglamani yeching:
$\lg(0,5^x)+\lg(0,125^x)+\lg(0,03125^x) = \lg(0,25^2)+\lg(0,0625^3)$.
A) $1\frac{1}{3}$ B) 1,(7)
C) 0,75 D) 0,5625

27. (a6-g11-13) $\log_3^2(x^2-7x+7) + \log_4^2(x^2-12x+12) = 0$ tenglama nechta ildizga ega?
A) 0 B) 1
C) 3 D) 4

28. (a6-g14-17) Tenglamaning ildizlari yig'indisini toping
$2(\lg\sqrt{x}-\lg 2) = \lg(\sqrt{x}-1)$.
A) 4 B) 16
C) 20 D) 9

29. (a6-g15-6) $\log_x y + \log_y x = 2$ va $x^2 = 3y + 10$ bo'lsa, $x + y = ?$
A) 1 B) 6
C) 10 D) 12

83. Logarifmik tengsizliklar

1. (a1-g5-19) Tengsizlikni yeching.
$\log_{\frac{1}{3}}(x^2-2x+3) - \log_{\frac{1}{3}} 6 > 0$
A) (–1; 1,3)
B) $(-\infty;\infty)$
C) (–1; 3)
D) (1; 2)

2. (a1-g10-20) Tengsizlikni yeching.
$\log_2(x^2-5x+4) < 2$
A) (0; 5)
B) Ø
C) $(-\infty;0)\cup(5;\infty)$
D) $(0;1)\cup(4;5)$

3. (a1-g15-19) Tengsizlikni yeching.
$\log_2(x^2-9x+8) < 3$
A) (0; 9)
B) Ø
C) $(-\infty;0)\cup(9;\infty)$
D) $(0;1)\cup(8;9)$

4. (a2-g1-19) Tengsizlikni yeching.
$\log_3(x^2-2x) \leq 1$
A) (0; 2)
B) [–1; 3]
C) (1; ∞)
D) $[-1;0)\cup(2;3]$

5. (a2-g3-25) Tengsizlikni yeching.
$\log_2\left(\log_3\left(\frac{x-3}{2}\right)\right) < 0$
A) $0 < x < 9$
B) $5 < x < 9$
C) $3 < x < 9$
D) $x < 9$

6. (a2-g10-20) Tengsizlikni yeching.
$\log_4(x^2-10x+16) < 2$
A) Ø
B) $(0;2)\cup(8;10)$
C) $(-\infty;0)\cup(10;\infty)$
D) (0; 10)

7. (a2-g11-20) Nechta butun son $\log_3(x^2-8x) \leq 2$ tengsizlikni qanoatlantiradi?
A) 8 B) 4 C) 2 D) 0

8. (a2-g12-15) Tengsizlikning butun yechimlari nechta?
$\frac{\left(x-\frac{1}{2}\right)\cdot(3-x)}{\log_2|x-1|} > 0$
A) 1
B) 2
C) 3
D) butun yechimi yo'q

9. (a2-g18-19) Tengsizlikni yeching.
$\log_3(x-5) < 3$
A) $(-\infty;32)$
B) (5; 32)
C) $(5;\infty)$
D) [5; 32)

10. (a2-g19-19) $\left|1-\log_{\frac{1}{3}}(x-2)\right| < 3$ tengsizlikni qanoatlantiruvchi nechta butun son bor?
A) 8 B) 5 C) 80 D) 7

11. (a2-g21-20) $3^{\log_3(7-x)} \leq 2$ tengsizlikni yeching
A) $x \geq 5$
B) $5 \leq x \leq 7$
C) $x \leq 5$
D) $5 \leq x < 7$

12. (a3-g4-19) Tengsizlikni yeching:
$\frac{1+\log_2 x}{1-\log_4 x} \leq 2$
A) $\left(-\infty;\sqrt{2}\right]\cup(4;\infty)$
B) $\left[\sqrt{2};4\right)$
C) $\left(0;\sqrt{2}\right]\cup(4;\infty)$
D) $(4;\infty)$

13. (a3-g7-18) Tengsizlikni yeching.
$\log_{x-2}(x^2-3) > 0$
A) $(2;3)\cup(3;\infty)$
B) $(2;3)\cup(4;\infty)$
C) (2; 3)
D) (3; ∞)

14. (a3-g8-19) Tengsizlikni yeching.
$\log_{\frac{1}{\sqrt{3}}}(x-9)+2\log_{\sqrt{3}}(x-9)<4$
A) (5; 14) B) (6; 15)
C) (9; 18) D) (5; 81)

15. (a3-g9-19) Tengsizlikni qanoatlantiruvchi nechta butun son mavjud?
$7^{\log_7(x^2-3x)}<4$
A) cheksiz ko'p
B) 0
C) 4
D) 2

16. (a3-g10-20) Nechta butun son $\log_2(x^2-7x)<3$ tengsizlikni qanoatlantiradi?
A) 8 B) 4 C) 2 D) 0

17. (a3-g15-19) $\log_{\frac{2}{3}}\frac{x}{4}\le\log_{\frac{1}{9}}(x-3)$
tengsizlikni yeching.
A) (3; 4] ∪ [12; ∞)
B) (−∞; 4] ∪ [12; ∞)
C) (0; 3) ∪ (3; 4]
D) (−∞; 3) ∪ (3; ∞)

18. (a3-g17-18) $\log_3(x^2-2x)\le 1$
tengsizlik nechta butun yechimga ega?
A) 2
B) 4
C) 12
D) cheksiz ko'p

19. (a3-g18-19) Tengsizlikni yeching.
$\log_{\frac{1}{5}}(x^2-2x+4)-\log_{\frac{1}{5}}19>0$
A) (3; 5)
B) {−3; 1; 5}
C) (−3; 5)
D) (−∞; −3) ∪ (5; ∞)

20. (a3-g21-18) Tengsizlikni yeching.
$\log_{x-1}(x^2-x+1)\ge 2$
A) (1; 2) ∪ (2; ∞)
B) [0; ∞)
C) (2; ∞)
D) Ø

21. (a4-g1-19) Tengsizlikni yeching.
$\frac{1-\log_5 x}{1+\log_5 x}\ge\frac{1}{3}$
A) $\left(-\infty;\frac{1}{5}\right)\cup[5;\infty)$
B) $(0{,}2;\sqrt{5}]$
C) $(0;0{,}2)\cup[\sqrt{5};\infty)$
D) $(0{,}04;\sqrt{5}]$

22. (a4-g10-18)
$|x-8|\left(\log_5(x^2-3x-4)+\frac{2}{\log_3 0{,}2}\right)\le 0$
tengsizlik yechimlarining nechtasi butun sondan iborat?
A) 2 B) 5
C) Ø D) 3

23. (a4-g13-9) Tengsizlikni yeching.
$\log_x 2\cdot\log_{\frac{x}{16}}2>\frac{1}{\log_2 x-6}$
A) (4; 8) ∪ (8; 16) ∪ (64; ∞)
B) (0; 1) ∪ (4; 8) ∪ (16; 64)
C) (0; 1) ∪ (4; 8) ∪ (16; 32)
D) (2; 3) ∪ (4; 8) ∪ (16; 64)

24. (a4-g14-18) Tengsizlikni yeching.
$\log_{\frac{1}{3}}(x^2-2x)\ge -1$
A) [−1; 0) ∪ (2; 3]
B) [−1; 3]
C) (−∞; −1)
D) (0; 2)

25. (a4-g14-22) Tengsizlikni yeching.
$\left(\frac{\pi}{2}-\frac{\theta}{3}\right)^{\ln(2\cos x)}\ge 1\ (x\in 0;2\pi)$
A) $\left[\frac{\pi}{3};\frac{\pi}{2}\right)\cup\left(\frac{3\pi}{2};\frac{5\pi}{3}\right]$
B) $\left[\frac{\pi}{3};\frac{5\pi}{3}\right]$
C) $\left[\frac{\pi}{3};\frac{\pi}{2}\right]$
D) $\left[\frac{\pi}{6};\frac{\pi}{2}\right)\cup\left(\frac{3\pi}{2};\frac{11\pi}{6}\right]$

26. (a4-g19-18) $\log_{x^2-x}(3x^2-6x-3)=1$
tenglama ildizlarining yig'indisini toping.
A) 0
B) 2,5
C) 3
D) 1

27. (a4-g23-18) Tengsizlikni yeching.
$\log_5(x+1)+\log_5(x-1)\le 3$
A) $\left[-\sqrt{126};-1\right)\cup\left(1;\sqrt{126}\right]$
B) $\left[-\sqrt{126};\sqrt{126}\right]$
C) $\left(1;\sqrt{126}\right]$
D) $\left(-\infty;-\sqrt{126}\right]\cup\left[\sqrt{126};\infty\right)$

28. (a5-g1-18) Tengsizlikni yeching.
$\log_{0,5}(x^2-4)<\log_{0,5}3x$
A) (−∞; 1) ∪ (4; ∞)
B) (4; ∞)
C) (−∞; −2) ∪ (4; ∞)
D) (0; 4)

29. (a5-g5-18) Quyidagi tengsizlikning barcha butun sonlardan iborat yechimlari yig'indisini toping.
$\sqrt{5-x}\left(\log_{\frac{1}{3}}(2x-4)+\frac{1}{\log_x 3}\right)\ge 0$
A) 12
B) 14
C) 7
D) 9

30. (a5-g8-18) $\frac{5}{\lg^2 x-9}\ge\frac{1}{\lg x-3}$
tengsizlikni yeching.
A) $(-\infty;100]$
B) $(0{,}001;100]\cup(1000;\infty)$
C) $(0;0{,}001)\cup[100;1000)$
D) $(0;100]$

31. (a5-g10-17) $|1-\log_{1/2}(x-3)|<2$ tengsizlikni qanoatlantiruvchi nechta butun son bor?
A) 4 B) 3
C) 2 D) 1

32. (a6-g1-16) Tengsizlikni yeching:
$\log_{x-1}\frac{1}{3x-5}\le -2$.
A) (1; 2) ∪ (2; 3)
B) (2; 3)
C) $\left(\frac{5}{3};2\right)\cup(2;3]$
D) $\left(\frac{5}{3};2\right)$

33. (a6-g6-16) Tengzislikning butun sonlardan iborat yechimlari yig'indisini toping.
$\left(\frac{x-5}{\log_x^2 3}\right)\left(\frac{\log_4 6-\log_6 4}{\log_{0,2015}7-\log_{0,2015}4}\right)>0$
A) 10
B) 9
C) 14
D) 15

34. (a6-g12-6) Tengsizlikni yeching:
$\log_2\left(1+\log_{\frac{1}{9}}x-\log_9 x\right)<1$.
A) (0; 3)
B) $\left(\frac{1}{3};3\right)$
C) $\left(\frac{1}{3};3\right)\cup(3;\infty)$
D) (3; ∞)

35. (a6-g13-6) $\log_{\frac{1}{12}}(x^2-25)<-2$
tengsizlikni yeching.
A) (−13; 13)
B) (−∞; −13) ∪ (13; ∞)
C) (−∞; −5) ∪ (5; ∞)
D) (−13; −5) ∪ 5(7; 13)

36. (a6-g22-29) $\log_4\left(\arccos\frac{2x+3}{4}\right)\ge$
$\ge\log_{16}\frac{\pi^2}{9}$ tengsizlikni yeching.
A) [−1,5; −0,5]
B) (−1,5; 0,5]
C) [−0,5; 0,5]
D) [−3,5; 0,5]

14-bob. Trigonometriya

84. Birchakning gradus va radian o'lchovi. Nuqtani burish

1. (a1-g9-30) Soat 15:25 da soat millari orasidagi burchak necha gradusni tashkil qiladi?
A) 10° B) 60°
C) 45,5° D) 47,5°

2. (a1-g10-21) sin132°, cos80°, tg176° va ctg243°larning ishoralarini toping.
A) +, +, +, + B) +, –, +, –
C) +, +, +, – D) +, +, –, +

3. (a1-g12-36) Soat 12:25 da soatning soat va minut strelkalari orasidagi burchak qanchaga teng?
A) 125° B) 137,5°
C) 150° D) 162,5°

4. (a2-g2-21) Birlik aylanaga tegishli va radian o'lchovi $4\pi/3$ bo'lgan nuqtaning koordinatalari qaysi javobda to'g'ri ko'rsatilgan?
A) $\left(\frac{1}{2}; -\frac{\sqrt{3}}{2}\right)$ B) $\left(-\frac{\sqrt{3}}{2}; \frac{1}{2}\right)$
C) $\left(-\frac{1}{2}; -\frac{\sqrt{3}}{2}\right)$ D) $\left(-\frac{\sqrt{3}}{2}; -\frac{1}{2}\right)$

5. (a2-g11-21) Birlik aylanaga tegishli va radian o'lchovi $2\pi/3$ bo'lgan nuqtaning koordinatalari qaysi javobda to'g'ri ko'rsatilgan?
A) $\left(\frac{1}{2}; -\frac{\sqrt{3}}{2}\right)$ B) $\left(-\frac{\sqrt{3}}{2}; \frac{1}{2}\right)$
C) $\left(-\frac{1}{2}; \frac{\sqrt{3}}{2}\right)$ D) $\left(\frac{\sqrt{3}}{2}; -\frac{1}{2}\right)$

6. (a2-g18-25) Soat 3:40 da soatning daqiqa va soat millari orasidagi burchak necha gradus bo'ladi?
A) 150° B) 240° C) 60° D) 130°

7. (a3-g2-25) 50 minutda soatning soat mili necha gradusga buriladi?
A) 30° B) 28° C) 25° D) 100°

8. (a3-g7-20) $a = cos1$, $b = sin2$; $c = sin3$ bo'lsa, quyidagilardan qaysi biri o'rinli?
A) $a = b = c$
B) $a < b < c$
C) $b < c < a$
D) $c < a < b$

9. (a3-g8-20) Quyidagi sonlardan qaysi biri manfiy?
A) tg247°·sin125°
B) tg135°·ctg340°
C) tg215°·cos300°
D) sin247°·cos275°

10. (a3-g19-25) Toshkentda soat 9:40 bo'lganda Kurant soatining soat va minut millari orasidagi burchak necha gradus bo'ladi?
A) 60° B) 70° C) 50° D) 85°

11. (a4-g4-20) Quyidagilardan qaysi biri noto'g'ri?
A) Birinchi chorakda $y = tgx$ funksiya ortadi.
B) Ikkinchi chorakda $y = cosx$ funksiya kamayadi.
C) Uchinchi chorakda $y = sinx$ funksiya kamayadi.
D) To'rtinchi chorakda $y = ctgx$ funksiya ortadi.

12. (a4-g6-19) Quyidagilarni o'sish tartibida joylashtiring.
$a = sin39°$ $b = cos54°$ $c = tg1$
A) $a < b < c$ B) $c < b < a$
C) $b < a < c$ D) $c < a < b$

13. (a4-g7-19) Quyidagi sonlarning ishoralari ketma-ketligini ko'rsating.
$a = cos3$; $b = sin7$; $c = tg9$
A) –; –; – B) +; +; –
C) –; +; – D) +; –; +

14. (a4-g22-21) sin1977°, tg2011°, cos2088° lar ishoralarining ketma-ketligini toping.
A) +, +, + B) –, +, –
C) –, –, + D) +, –, –

15. (a5-g5-13) Soatning minut va soat mili orasidagi farq kamida necha minutda 154° ga o'zgaradi?
A) 31 B) 45 C) 30 D) 28

16. (a5-g13-13) Soat 3:10. Necha daqiqadan so'ng minut va soat strelkalari orasidagi burchak 185° ni tashkil etadi?
A) 40 B) 50 C) 46 D) 36

17. (a5-g22-17) $a = sin1760°$, $b = cos1430°$, $c = sin495°$, $d = cos760°$ sonlarini o'sish tartibida yozing.
A) $a < c < b < d$
B) $b < c < a < d$
C) $a < c < d < b$
D) $b < a < c < d$

85. Trigonometrik funksiyalarning juft va toqligi. Choraklardagi ishoralari

1. (a2-g4-21) Agar $\sin\alpha \cdot \cos\alpha < 0$ bo'lsa, α qaysi chorakka tegishli?
A) I yoki III B) III yoki IV
C) I yoki II D) II yoki IV

2. (a2-g7-20) Quyidagilardan qaysi birining ishorasi manfiy?
A) $\cos 1372° \cdot \sin\frac{16\pi}{3}$
B) $\sin 812° \cdot \cos\frac{11\pi}{3}$
C) $\text{tg}656° \cdot \text{ctg}\frac{19\pi}{5}$
D) $\text{ctg}1156° \cdot \text{tg}\frac{17\pi}{5}$

3. (a2-g8-22) cos(–52°) quyidagilarning qaysi biriga teng emas?
A) sin142° B) cos232°
C) –cos128° D) –sin218°

4. (a2-g10-21) sin(–850°), cos380°, tg550° va ctg(–530°) larning ishoralarini toping.
A) –, +, +, – B) –, +, –, –
C) –, +, +, + D) –, +, –, +

5. (a2-g22-20) Quyidagi trigonometrik ifodalarning ishoralari qaysi javobda to'g'ri ko'rsatilgan?
1) sin365°; 2) cos170°; 3) tg280°; 4) ctg110°.
A) +, –, +, – B) –, +, –, +
C) –, –, +, – D) +, –, –, –

6. (a3-g3-22) sin(–32°) quyidagilarning qaysi biriga teng emas?
A) sin328° B) sin148°
C) cos238° D) –cos58°

7. (a3-g5-20) Quyidagi javoblarda keltirilgan ifodalardan qaysi birining ishora ketma-ketligi –, +, +, – ko'rinishida bo'ladi?
A) cos95°, sin355°, tg265°, ctg275°
B) cos95°, sin175°, tg265°, ctg275°
C) cos195°, sin185°, tg275°, ctg265°
D) cos355°, sin275°, tg265°, ctg275°

8. (a3-g14-21) Quyidagi funksiyalardan qaysi biri juft?
A) $y = \pi x \cdot \sin(5\pi - x)$
B) $y = \pi x \cdot \cos(3\pi + x)$
C) $y = x^2 \cdot \text{tg}(\pi + x)$
D) $y = x^2 \cdot \pi \cdot \text{ctg}(\pi + x)$

9. (a3-g15-20) $x = sin265°$, $y = tg420°$ va $z = cos(–240°)$ qiymatlarining ishoralari ketma-ketligi qaysi javobda to'g'ri ko'rsatilgan?
A) –; +; – B) –; –; +
C) +; –; – D) –; –; –

10. (a3-g23-20) Toq funksiyani ko'rsating.
A) $\frac{1+sinx}{arcsinx}$
B) $x\,|\,x\,| + sinx$
C) $\frac{arccosx}{x}$
D) $\frac{arcctgx}{sinx}$

11. (a4-g2-20) Quyidagi funksiyalardan qaysi biri toq?
A) $y = \pi x^3 \cdot \sin(3\pi + x)$
B) $y = \pi x^4 \cdot \cos(2\pi - x)$
C) $y = x^2 \cdot \text{tg}(\pi + x)$
D) $y = \pi x \cdot \text{ctg}(3\pi - x)$

12. (a4-g10-19) Quyidagi funksiyalardan qaysi biri toq?
A) $f(x) = \frac{\cos 5x + 1}{|x|}$
B) $f(x) = \frac{\sin^2 x}{x^2 - 1}$
C) $f(x) = \frac{\cos^2 x}{x^2 \cdot (x^2 - 1)}$
D) $f(x) = \frac{\sin\frac{x}{2}}{x^4}$

13. (a4-g15-20) Quyidagilardan qaysi biri juft funksiya?

A) $f(x)=\dfrac{\cos x}{x^{10}-5}$

B) $f(x)=\dfrac{1-\cos 2\left(x+\dfrac{\pi}{3}\right)}{x^2-1}$

C) $\dfrac{\sin^5 x}{x^4-x^2+1}$

D) $f(x)=\dfrac{\sin 5x+1}{x^2}$

14. (a5-g4-19) sin1500° ning qiymatini toping.

A) $\frac{1}{2}$ B) $-\frac{\sqrt{3}}{2}$

C) $-\frac{1}{2}$ D) $\frac{\sqrt{3}}{2}$

15. (a5-g4-20) Quyidagi funksiyalarning nechtasi toq?

1) $y=\dfrac{(\sin 3x+2)\cdot(\sin 3x-2)}{\cos^2 x-\sin^2 x}$;

2) $y=\dfrac{\arcsin x}{\arccos x}$; 3) $y=\dfrac{|x|}{x^3+x}$;

4) $y=\dfrac{\sin x}{x}\cdot\cos x$; 5) $\dfrac{x^2}{\sqrt{x^4+4x^2+4}}$.

A) 0 B) 1 C) 2 D) 3

86. Asosiy trigonometrik ayniyatlar

1. (a1-g2-19) sinα + cosα = k bo'lsa, $\sin^6\alpha+\cos^6\alpha=?$

A) $\dfrac{k^6+3k^3-4}{6}$

B) $k^6+9k^4-6k^2+2$

C) $-\dfrac{3k^4-6k^2-1}{4}$

D) k^4-2k^2+3k+1

2. (a1-g5-21) Hisoblang:

$$4\cos 20^\circ-\frac{\sqrt{3}}{\sin 80^\circ}$$

A) $\sqrt{3}$ B) $-\frac{\sqrt{3}}{2}$

C) 2 D) 1

3. (a1-g7-18) Quyidagi tengliklardan qaysilari ayniyat?

1) $\sin\left(\frac{\pi}{2}-\alpha\right)=-\cos(\pi-\alpha)$;

2) $\cos\left(\frac{3\pi}{2}+\alpha\right)=\sin(3\pi+\alpha)$;

3) $\operatorname{tg}(\pi+\alpha)=-\operatorname{ctg}\left(\frac{3\pi}{2}-\alpha\right)$;

4) $\operatorname{ctg}\left(\frac{5\pi}{2}-\alpha\right)=\operatorname{tg}(\pi+\alpha)$

A) 1; 3 B) 2, 4 C) 2; 3 D) 1; 4

4. (a1-g7-19) Soddalashtiring.

$$\frac{\sin^4 x-\cos^4 x}{\sin^3 x\cdot\cos x+\cos^3 x\cdot\sin x}$$

A) –ctg2x B) 2tg2x

C) –2ctg2x D) –2tgx

5. (a1-g16-19) $tg\alpha+ctg\alpha=k$ bo'lsa, $tg^6\alpha+ctg^6\alpha=?$

A) $k^6-6k^4+9k^2-2$

B) $k^6+9k^4-6k^2+2$

C) $9k^6-6k^4+9k^2+2$

D) $k^6-6k^4+9k^2+2$

6. (a1-g17-20) Hisoblang:

$$4\cos 20^\circ-\frac{\sqrt{3}}{\sin 80^\circ}$$

A) 2 B) $-\frac{\sqrt{3}}{2}$

C) $\sqrt{3}$ D) 1

7. (a2-g8-23) Soddalashtiring.

$$\frac{1+tg^2\left(\frac{\pi}{4}+\alpha\right)}{1-tg^2\left(\frac{\pi}{4}+\alpha\right)}$$

A) $\frac{2}{5}$ B) $\dfrac{-1}{\sin 2\alpha}$

C) $\dfrac{1}{\cos 2\alpha}$ D) –1

8. (a2-g14-15) Soddalashtiring.

$$\frac{\sin^2 m-\sin^2 n}{\cos^2 m-\cos^2 n}$$

A) tgm B) ctgm C) 1 D) –1

9. (a2-g15-21) Soddalashtiring.

$$\frac{\cos\alpha}{1+\sin\alpha}+\frac{1+\sin\alpha}{\cos\alpha}$$

A) $\dfrac{2}{\cos\alpha}$ B) $\dfrac{1}{1+\sin\alpha}$

C) $\dfrac{1}{\sin\alpha}$ D) $\dfrac{2}{\cos\alpha+1}$

10. (a2-g16-20)

$\cos=\frac{7}{25}\left(-\frac{\pi}{2}<\alpha<0\right)$ bo'lsa,

$\dfrac{2\cos\alpha-\sin 2\alpha}{2\cos\alpha+\sin 2\alpha}$ ni hisoblang.

A) $\frac{1}{49}$ B) 49

C) $\frac{16}{9}$ D) $\frac{9}{16}$

11. (a2-g17-20) $\operatorname{tg}\alpha=\frac{1}{2}$ bo'lsa,

$\left(0<\alpha<\frac{\pi}{2}\right)$ $\dfrac{\sin\alpha+2\cos\alpha}{\cos 2\alpha}$ ni hisoblang.

A) $\frac{3\sqrt{5}}{5}$ B) $\frac{5\sqrt{5}}{3}$

C) $\sqrt{5}$ D) $\frac{2\sqrt{5}}{3}$

12. (a2-g18-20) Agar $\cos x+\sin x=\frac{5}{4}$, bo'lsa, sin2x ni hisoblang.

A) $\frac{1}{4}$ B) $\frac{16}{25}$

C) $\frac{9}{16}$ D) $\frac{7}{16}$

13. (a2-g19-20) Agar ctgα = 2,5 bo'lsa, $\dfrac{3\cos\alpha+7\sin\alpha}{1-\operatorname{tg}\alpha}$ ni hisoblang.

$\left(0<\alpha<\frac{\pi}{2}\right)$

A) $\frac{5\sqrt{29}}{2}$ B) $\frac{5\sqrt{29}}{3}$

C) $\frac{2\sqrt{29}}{3}$ D) $\frac{3}{5\sqrt{29}}$

14. (a2-g21-21) Agar ctgα = 3 bo'lsa, $\dfrac{4\cos\alpha+8\sin\alpha}{1-\operatorname{tg}\alpha}$ ni hisoblang.

$\left(0<\alpha<\frac{\pi}{2}\right)$

A) $\frac{36}{13}$ B) $3\sqrt{10}$

C) $1{,}5\sqrt{10}$ D) $\frac{29}{13}$

15. (a3-g2-20) sinα + cosα = m bo'lsa, sin4α ni m orqali ifodalang.

A) $4(m^3+m)\sqrt{2-m^2}$

B) $2(m^3-m)\sqrt{2-m^2}$

C) $2(m^3-m)\sqrt{m^2+2}$

D) $(m^3-m)\sqrt{2-m^2}$

16. (a3-g5-22) Ifodani soddalashtiring.

$$\frac{\operatorname{tg}x+\sin x}{\operatorname{tg}x}$$

A) $\operatorname{tg}^2\frac{x}{2}$ B) $2\sin^2\frac{x}{2}$

C) $2\cos^2\frac{x}{2}$ D) $\operatorname{ctg}^2\frac{x}{2}$

17. (a3-g6-22)

$\sin^4 x-\cos^4 x=\frac{1}{2}$ tenglama $[-2\pi;\ 2\pi]$ kesmada nechta ildizga ega?

A) 9 B) 8 C) 7 D) 10

18. (a3-g11-22) Soddalashtiring.

$\sin^4 40^\circ-\cos^4 40^\circ$

A) cos80° B) sin80°

C) cos100° D) – sin100°

19. (a3-g14-20) Agar tgα = 0,5 bo'lsa, $\dfrac{2\sin\alpha}{10\sin^3\alpha+5\cos^3\alpha}$ ning qiymatini hisoblang.

A) $\frac{1}{5}$ B) $\frac{2}{5}$

C) $\frac{1}{2}$ D) $\frac{5}{2}$

20. (a3-g18-20) $\operatorname{tg}\alpha = -0{,}(3)$ $\left(\frac{\pi}{2} < \alpha < \pi\right)$ bo'lsa, $\frac{\operatorname{tg}2\alpha}{\cos 2\alpha + \sin 2\alpha}$ ni hisoblang.

A) $\frac{15}{4}$ B) $-\frac{15}{4}$
C) $\frac{15}{28}$ D) $-\frac{15}{28}$

21. (a3-g21-19) Agar $\sin 22° = a$ bo'lsa, $\operatorname{tg}46°$ ni hisoblang.

A) $\frac{2a\sqrt{1-a^2}}{1-2a^2}$ B) $\frac{2-a^2}{2a\sqrt{1-a^2}}$
C) $\frac{2a\sqrt{1-a^2}}{2-a^2}$ D) $\frac{1-2a^2}{2a\sqrt{1-a^2}}$

22. (a3-g22-19) Soddalashtiring.

$\frac{1+\sin 2\alpha}{\cos^4\alpha - \sin^4\alpha}$

A) $\frac{\cos\alpha + \sin\alpha}{\cos\alpha - \sin\alpha}$ B) $\frac{\cos\alpha - \sin\alpha}{\cos\alpha + \sin\alpha}$
C) $\frac{1}{\cos\alpha + \sin\alpha}$ D) $\cos\alpha + \sin\alpha$

23. (a4-g1-20) $tg\alpha + ctg\alpha = 3$ bo'lsa, $tg^6\alpha + ctg^6\alpha = ?$

A) 322 B) 65 C) 729 D) 702

24. (a4-g2-19) Agar $\operatorname{tg}\alpha = 0{,}5$ bo'lsa, $\frac{3\sin\alpha}{15\cos^3\alpha + 10\sin^3\alpha}$ ning qiymatini toping.

A) $\frac{3}{4}$ B) $\frac{1}{13}$
C) $\frac{3}{26}$ D) $\frac{5}{18}$

25. (a4-g6-20) $\sin 13° = a$ bo'lsa, $\operatorname{tg}64°$ quyidagilardan qaysi biriga teng?

A) $\frac{\sqrt{2-a^2}}{2}$ B) $\frac{2\sqrt{1-2a^2}}{a}$
C) $\frac{2\sqrt{1-a^2}}{\sqrt{2-a^2}}$ D) $\frac{1-2a^2}{2a\sqrt{1-a^2}}$

26. (a4-g17-19) $2\cos 130°\cdot\sin(-50°)$ ifodaning qiymati quyidagilardan qaysi biriga teng emas?

A) $-\cos 10°$ B) $-\cos 190°$
C) $\sin 80°$ D) $-\sin(-80°)$

27. (a4-g19-19) $\sin 40° = a$ bo'lsa, $\cos 110°$ ni hisoblang.

A) $-\sqrt{\frac{1-\sqrt{1-a^2}}{2}}$
B) $-\sqrt{\frac{1+\sqrt{1-a^2}}{2}}$
C) $-\sqrt{\frac{1-a}{2}}$
D) $-\sqrt{\frac{1+a}{2}}$

28. (a4-g22-20) $\operatorname{tg}\alpha = \frac{1}{2}$ bo'lsa, $\left(0 < \alpha < \frac{\pi}{2}\right)$, $\frac{\sin\alpha + 2\cos\alpha}{\cos 2\alpha}$ ifodaning qiymatini hisoblang.

A) $\frac{3\sqrt{5}}{5}$ B) $\frac{5\sqrt{5}}{3}$
C) $\sqrt{5}$ D) $\frac{2\sqrt{5}}{3}$

29. (a5-g2-20) Agar $\sin 13° = a$ bo'lsa, $\cos 64° = ?$

A) $\frac{2\sqrt{1-a^2}}{\sqrt{a}}$ B) $\frac{a}{2\sqrt{1-a^2}}$
C) $\frac{a\sqrt{1-a^2}}{2}$ D) $2a\sqrt{1-a^2}$

30. (a5-g3-20) $\frac{\cos^2 7x - \cos^2 x}{\sin^2 7x - \sin^2 x} = ?$

A) 1 B) –1
C) $\operatorname{ctg}4x$ D) $-\operatorname{tg}4x$

31. (a5-g9-20) Agar $\operatorname{tg}\alpha = -0{,}4$ va $90° < \alpha < 180°$ bo'lsa, $\frac{1}{\cos\alpha} + \frac{2}{\sin\alpha}$ ifodaning qiymatini toping.

A) $\frac{6\sqrt{29}}{5}$ B) $-\frac{\sqrt{29}}{5}$
C) $\frac{3}{4}$ D) $\frac{4\sqrt{29}}{5}$

32. (a5-g11-17) Ifodani soddalashtiring.

$\frac{\cos\frac{7\pi}{18} + \sin\frac{14\pi}{18}}{\cos\frac{\pi}{18}}$

A) $\frac{\sqrt{3}}{2}$ B) 2 C) 1 D) $\sqrt{3}$

33. (a5-g14-17) Agar $\operatorname{tg}\alpha = 3$ $\left(\pi < \alpha < \frac{3\pi}{2}\right)$ bo'lsa, $\frac{6\sin\alpha + 2\cos\alpha}{1 + 2\operatorname{ctg}\alpha}$ ni hisoblang.

A) 3,6 B) $-1{,}2\sqrt{10}$
C) $1{,}2\sqrt{10}$ D) –3,6

34. (a5-g19-17) Ifodani hisoblang.

$\cos^4\frac{\pi}{12} + \cos^4\frac{5\pi}{12} + \cos^4\frac{7\pi}{12} + \cos^4\frac{11\pi}{12}$

A) 1 B) $\frac{3}{2}$ C) $\frac{7}{4}$ D) $\frac{3}{4}$

35. (a6-g4-17) $\sin 45° + \sin 15°$ quyidagilardan qaysi biriga teng?

A) $\frac{\sqrt{6}+\sqrt{2}}{2}$ B) $\frac{\sqrt{3}+1}{2}$
C) $\frac{\sqrt{6}+\sqrt{2}}{4}$ D) $\frac{\sqrt{3}+\sqrt{2}}{2}$

36. (a6-g5-17) Hisoblang:

$\frac{\operatorname{tg}54° + \operatorname{ctg}54°}{\operatorname{tg}36° + \operatorname{ctg}36°}$.

A) 4 B) $2\sin 72°$
C) 1 D) $\sin^2 72°$

37. (a6-g20-10) Hisoblang:
$\cos^2 33° + \cos^2 45° - \sin^2 60° + \cos^2 57°$.

A) 0,5 B) 2,25
C) 1,5 D) 0,75

38. (a6-g23-14) Ifodani soddalashtiring: $\frac{\operatorname{tg}^2 x - \sin^2 x}{\operatorname{tg}^2 x \cdot \sin^2 x}$.

A) $\operatorname{tg}^2 x$
B) $\operatorname{ctg}^2 x$
C) –1
D) 1

39. (a6-g24-25) $\cos^2\frac{3\pi}{8} + \sin^2\frac{9\pi}{8}$ ni hisoblang.

A) $\frac{2+\sqrt{2}}{2}$ B) $\frac{\sqrt{2}}{2}$
C) $\frac{2-\sqrt{2}}{2}$ D) 1

87. Keltirish formulalari

1. (a1-g3-13) $\sin\alpha = 0{,}6$ bo'lsa, $\cos(3{,}5\pi + \alpha)$ nimaga teng?

A) 0,8 B) –0,8 C) 0,6 D) –0,6

2. (a1-g15-20) Quyidagi tengliklardan qaysilari ayniyat emas?

1) $\sin\left(\frac{5\pi}{2} - \alpha\right) = \cos(5\pi - \alpha)$;

2) $\cos\left(\frac{3\pi}{2} + \alpha\right) = -\sin(3\pi - \alpha)$;

3) $\operatorname{tg}\left(\frac{\pi}{2} + \alpha\right) = -\operatorname{ctg}(\pi + \alpha)$;

4) $\operatorname{ctg}\left(\frac{\pi}{2} - \alpha\right) = -\operatorname{tg}(\pi - \alpha)$.

A) 1; 2 B) 2; 3
C) 3; 4 D) 2; 4

3. (a2-g1-20) $\sin 9° = a$ va $\cos 9° = b$ bo'lsa, $\cos 72°$ quyidagilardan qaysi biriga teng?

A) $b^2 - a^2$ B) $2b^2 - a$
C) $2ab$ D) ab

4. (a2-g12-23) Quyidagilardan qaysi biri noto'g'ri?

A) $\cos(\pi + a) = -\sin\left(\frac{\pi}{2} - a\right)$

B) $\sin(\pi - a) = \cos\left(\frac{\pi}{2} - a\right)$

C) $\sin\left(\frac{\pi}{2} + a\right) = \sin\left(\frac{\pi}{2} - a\right)$

D) $\sin\left(\frac{3\pi}{2} + a\right) = \sin\left(\frac{\pi}{2} - a\right)$

5. (a3-g3-23) Soddalashtiring.

$$\frac{1+tg^2\left(\frac{\pi}{4}-\alpha\right)}{1-tg^2\left(\frac{\pi}{4}-\alpha\right)}$$

A) $\frac{1}{\sin 2\alpha}$ B) $\frac{1}{\cos 2\alpha}$
C) -1 D) 1

6. (a3-g6-20) Hisoblang: $\sin\frac{11\pi}{4}$

A) $\frac{\sqrt{2}}{2}$ B) $-\frac{\sqrt{2}}{2}$
C) $\frac{\sqrt{3}}{2}$ D) $-\frac{1}{2}$

7. (a3-g6-21) Soddalashtiring.

$$\frac{(ctg44^\circ + tg226^\circ)\cdot\cos 406^\circ}{\cos 316^\circ} + tg(-405^\circ)$$

A) 3 B) 1 C) 2 D) 0

8. (a6-g2-17) Ifodani soddalashtiring:

$$\cos^2(\pi-\alpha)\cdot tg(\pi+\alpha)\cdot tg\left(\frac{3\pi}{2}-\alpha\right)+$$
$$+\sin(2\pi-\alpha)\cdot\cos\left(\frac{\pi}{2}+\alpha\right)$$

A) -1 B) $\cos 2\alpha$
C) 1 D) $-\cos 2\alpha$

88. Qo'shish formulalari

1. (a1-g1-25) $\frac{\sin 6x}{\cos 2x}+\frac{\cos 6x}{\sin 2x}$ ni soddalashtiring.

A) $tg4x$ B) $0{,}5tgx$
C) $2ctg4x$ D) $0{,}5ctg4x$

2. (a1-g4-19) Hisoblang:

$$\sin\frac{\pi}{12}\cdot\sin\frac{\pi}{6}-\cos\frac{\pi}{6}\cdot\cos\frac{\pi}{12}$$

A) $8\frac{4}{7}$ B) $-\frac{\sqrt{3}}{2}$
C) $-\frac{1}{2}$ D) $\frac{\sqrt{3}}{2}$

3. (a1-g10-22) Hisoblang:

$$\frac{1}{\sin 20^\circ}+\frac{\sqrt{3}}{\cos 20^\circ}$$

A) $2tg40^\circ$ B) $2ctg40^\circ$
C) $4ctg40^\circ$ D) $4ctg20^\circ$

4. (a1-g11-22) Ifodani soddalashtiring. $\cos^2(x+y)-\cos^2(x-y)=?$

A) $\cos x\cdot\cos y$ B) $-\sin x\cdot\sin y$
C) $\sin 2x\cdot\sin 2y$ D) $-\sin 2x\cdot\sin 2y$

5. (a1-g12-24) Soddalashtiring.

$$\frac{\sqrt{3}\sin\alpha+\cos\alpha}{\sqrt{3}\cos 2\alpha+\sin 2\alpha}$$

A) $2\sin\left(\frac{\pi}{6}+\alpha\right)$

B) $2\cos\left(\frac{\pi}{6}+\alpha\right)$

C) $\frac{1}{2\sin\left(\frac{\pi}{6}+\alpha\right)}$

D) $\frac{1}{2\cos\left(\frac{\pi}{6}+\alpha\right)}$

6. (a1-g13-21) Soddalashtiring.

$$\frac{\sin 7x\cdot\sin 3x-\sin 8x\cdot\sin 2x}{\sin 5x}=?$$

A) $-\sin x$ B) $-\cos x$
C) $\sin x$ D) $\cos x$

7. (a2-g11-22) $\sin 50^\circ - \cos 20^\circ + \sin 10^\circ + 1$ ni hisoblang.

A) $\cos 20^\circ$ B) 1
C) -1 D) $\sin 20^\circ$

8. (a2-g22-21) Soddalashtiring.

$$\frac{\sin 16^\circ+\sin 36^\circ+\sin 56^\circ}{\cos 16^\circ+\cos 36^\circ+\cos 56^\circ}$$

A) $\cos 36^\circ$ B) $\sin 36^\circ$
C) $tg36^\circ$ D) $tg18^\circ$

9. (a3-g1-21) $\sin 64^\circ = a$ bo'lsa, $\sin 13^\circ$ ni a orqali ifodalang.

A) $\frac{\sqrt{2+a}}{2}$

B) $\frac{\sqrt{2-a}}{2}$

C) $\sqrt{\frac{1+a}{2}}$

D) $\sqrt{\frac{1-a}{2}}$

10. (a3-g8-21) Agar $tg\left(\frac{\pi}{4}+\alpha\right)=-11$ bo'lsa, $ctg\alpha$ ning qiymatini toping.

A) $-\frac{6}{5}$ B) $\frac{6}{5}$ C) $\frac{5}{6}$ D) $-\frac{5}{6}$

11. (a3-g10-22) $\sin 40^\circ - \cos 10^\circ + \sin 20^\circ - 1$ ni hisoblang.

A) $\cos 20^\circ$ B) 1
C) -1 D) $\sin 20^\circ$

12. (a4-g12-22) Tengsizlikni yeching.

$$\cos^2\frac{x}{6}>\frac{1}{2}+\sin^2\frac{x}{6}$$

A) $\left(-\frac{\pi}{9}+\frac{2\pi n}{3};\frac{\pi}{9}+\frac{2\pi n}{3}\right),\ n\in Z$

B) $\left(-\frac{\pi}{3}+2\pi n;\frac{\pi}{3}+2\pi n\right),\ n\in Z$

C) $\left(\frac{\pi}{6}+\pi n;\frac{7\pi}{6}+\pi n\right),\ n\in Z$

D) $(-\pi+6\pi n;\pi+6\pi n),\ n\in Z$

13. (a4-g18-19) $\cos 48^\circ = a$ bo'lsa, $\cos 6^\circ$ quyidagilardan qaysi biriga teng?

A) $\frac{a}{8}$ B) $a\sqrt{1-a^2}$

C) $2a\sqrt{1-a^2}$ D) $\frac{a}{14}$

14. (a5-g7-19) Hisoblang:

$$\sin\frac{7\pi}{12}-\sin\frac{\pi}{12}$$

A) $\frac{\sqrt{6}}{2}$ B) $\sqrt{2}$
C) $\frac{\sqrt{3}}{2}$ D) $\frac{\sqrt{2}}{2}$

15. (a5-g8-19) Soddalashtiring.

$$\frac{\sin\frac{5\pi}{18}\cdot\cos\frac{\pi}{9}-\sin\frac{\pi}{9}\cdot\cos\frac{5\pi}{18}}{\cos\frac{5\pi}{12}\cdot\sin\frac{7\pi}{12}-\cos\frac{\pi}{12}\cdot\cos\frac{7\pi}{12}}$$

A) 1 B) $\frac{1}{\sqrt{3}}$
C) $\sqrt{3}$ D) $\frac{1}{2}$

16. (a5-g24-17) Hisoblang:

$$\frac{\sin\frac{5\pi}{18}\cdot\cos\frac{\pi}{9}-\sin\frac{\pi}{9}\cdot\cos\frac{5\pi}{18}}{\cos\frac{5\pi}{12}\cdot\sin\frac{7\pi}{12}-\cos\frac{\pi}{12}\cdot\cos\frac{7\pi}{12}}$$

A) 0,5 B) 1 C) $\sqrt{3}$ D) 1,5

17. (a6-g18-24) Ifodani soddalashtiring: $\frac{\sin x-\cos x}{\sin x+\cos x}$.

A) $tg\left(x-\frac{\pi}{4}\right)$

B) $tg\left(\frac{\pi}{4}+x\right)$

C) $tg\frac{\pi}{4}+tgx$

D) $tg\frac{\pi}{4}-tgx$

89. Ikkilangan burchak formulalari. Uchlangan burchak formulalari

1. (a1-g2-20) $\sin^2\alpha+\sin^2\beta=1$ $\left(0<\alpha<\frac{\pi}{2};\ 0<\beta<\frac{\pi}{2}\right)$ bo'lsa,

$$\alpha^2+\beta^2+2\alpha\beta+\frac{\pi^2}{2}=?$$

A) 2 B) $\frac{3\pi^2}{4}$ C) $\frac{\pi^2}{4}$ D) π^2

2. (a1-g6-20) $\frac{\pi}{2}<x<\pi$, $\sin x=\frac{2}{5}$ bo'lsa, $\sin 2x=?$

A) $\frac{4\sqrt{21}}{25}$ B) $-\frac{\sqrt{21}}{5}$
C) $-\frac{4\sqrt{21}}{25}$ D) $\frac{\sqrt{21}}{5}$

3. (a1-g12-13) Agar $\sin^2\alpha=0{,}75$ bo'lsa, $\cos 2\alpha$ ni hisoblang.

A) $-0{,}5$ B) 0,5
C) $\frac{\sqrt{3}}{2}$ D) $-\frac{\sqrt{3}}{2}$

4. (a2-g2-22) $\cos80° - \cos20° + \cos40° + 1$ ni hisoblang.
A) $\cos20°$ B) 1
C) -1 D) $\sin20°$

5. (a2-g5-20) $\frac{\pi}{2} < x < \pi$, $\sin x = \frac{2}{5}$ bo'lsa, $\cos2x$ = ?
A) $\frac{\sqrt{21}}{5}$ B) $-\frac{\sqrt{21}}{5}$
C) $\frac{17}{25}$ D) $-0{,}68$

6. (a2-g6-20) Soddalashtiring.
$\frac{\sin^4\alpha + \cos^4\alpha - 1}{\sin^6\alpha + \cos^6\alpha - 1}$
A) $\frac{1}{3}$ B) $\frac{3}{4}$ C) $\frac{2}{3}$ D) $\frac{1}{2}$

7. (a3-g1-20)
$\frac{\sin^4 x - \cos^4 x + \cos^2 x + 1}{2\sin^2 x + \cos^2 x} = ?$
A) $\sin x$
B) 1
C) -1
D) 0

8. (a3-g4-20) $\frac{\pi}{2} < x < \pi$, $\sin x = \frac{2}{7}$ bo'lsa, $\cos2x$ = ?
A) $\frac{3\sqrt{5}}{7}$ B) $-\frac{41}{49}$
C) $-\frac{3\sqrt{5}}{7}$ D) $\frac{41}{49}$

9. (a3-g19-20) $\sin\alpha - \cos\alpha = \frac{2}{\sqrt{5}}$ bo'lsa, $\cos4\alpha$ ning qiymatini toping.
A) $\frac{1}{5}$ B) $\frac{24}{25}$ C) $\frac{23}{25}$ D) $\frac{4}{5}$

10. (a4-g9-19) $\cos x + \sin x = \frac{5}{4}$ bo'lsa, $\cos^2 2x$ quyidagilardan qaysi biriga teng?
A) $\frac{9}{25}$ B) $\frac{175}{256}$
C) $\frac{256}{625}$ D) $\frac{81}{256}$

11. (a5-g3-19) $\frac{\pi}{2} < x < \pi$, $\sin x = \frac{4}{7}$ bo'lsa, $\cos2x$ = ?
A) $-\frac{8\sqrt{33}}{49}$ B) $-\frac{17}{49}$
C) $\frac{17}{49}$ D) $\frac{8\sqrt{33}}{49}$

12. (a6-g6-17) Ifodani soddalashtiring:
$\frac{\sin^3 x \cdot \cos x - \cos^3 x \cdot \sin x}{\cos^2 2x - \sin^2 2x}$
A) $\frac{\sin4x}{\cos2x}$ B) $\frac{-\text{tg}4x}{4}$
C) $\frac{\text{ctg}4x}{4}$ D) $-\frac{\text{ctg}4x}{2}$

13. (a6-g8-17) Agar $\sin\alpha = -08$ va $\alpha \in \left(-3\pi; -\frac{5}{2}\pi\right)$ bo'lsa, $\text{tg}\frac{\alpha}{2}$ ni hisoblang.
A) 2 B) -1 C) 1,5 D) -2

14. (a6-g17-17) Ifodani soddalashtiring: $\frac{2\sin x - \sin2x}{2\sin x + \sin2x}$.
A) 1
B) $\text{tg}x$
C) $\text{tg}^2 0{,}5x$
D) $\text{ctg}^2 0{,}5x$

15. (a6-g19-30) Ifodani soddalashtiring: $\frac{2\sin x + \sin2x}{2\sin x - \sin2x}$.
A) 1 B) $\text{ctg}^2 0{,}5x$
C) $\text{tg}^2 0{,}5x$ D) $\text{tg}x$

90. Trigonometrik funksiyalar yig'indisi va ayirmasi uchun formulalar

1. (a1-g3-12) Agar $\text{ctg}3{,}5 = a$ bo'lsa, $\frac{\sin5 + \sin7 + \sin9}{\cos5 + \cos7 + \cos9}$ ni hisoblang.
A) $\frac{2a}{a^2 - 1}$ B) $\frac{2}{a}$
C) $\frac{a^2 - 1}{a^2 + 1}$ D) $\frac{a^2 + 1}{a^2 - 1}$

2. (a1-g15-21) Soddalashtiring.
$\frac{\cos3\alpha + \cos7\alpha + \cos11\alpha}{\sin3\alpha + \sin7\alpha + \sin11\alpha}$
A) $\text{tg}7\alpha$ B) $\text{ctg}7\alpha$
C) $\text{ctg}4\alpha$ D) $\text{tg}4\alpha$

3. (a2-g3-20) $\sin18° + \sin234° = ?$
A) $-\frac{1}{4}$ B) $-\frac{1}{2}$ C) $\frac{1}{8}$ D) $\frac{1}{4}$

4. (a2-g7-21) Soddalashtiring.
$\frac{\sin^2 5x - \sin^2 3x}{\sin8x \cdot \sin2x + \cos6x \cdot \cos4x}$
A) $2\text{tg}4x$
B) $\text{tg}4x \cdot \text{tg}2x$
C) $4\cos^2 2x$
D) $4\sin^2 2x$

5. (a2-g9-22) Ifodani soddalashtiring.
$\cos^2(x + y) - \cos^2(x - y) = ?$
A) $\cos x \cdot \cos y$ B) $-\sin x \cdot \sin y$
C) $\sin2x \cdot \sin2y$ D) $-\sin2x \cdot \sin2y$

6. (a2-g10-22) Hisoblang:
$\sin^2 35° + \sin^2 125°$
A) $\frac{1}{2}$ B) 1
C) $\frac{1}{\sqrt{2}}$ D) $\sin^2 35°$

7. (a2-g12-20) $\frac{3\sin10^0 - \sqrt{3}\cos10^0}{3\cos70^0} = ?$
A) $-\frac{\sqrt{3}}{2}$ B) $-\frac{2}{\sqrt{3}}$
C) $\frac{\sqrt{3}}{2}$ D) $\frac{2}{\sqrt{3}}$

8. (a3-g17-20)
Agar $\alpha = \frac{\pi}{15}$ bo'lsa, $\frac{\cos7\alpha + \cos5\alpha}{\cos\alpha \cdot \cos9\alpha} = ?$
A) -2 B) 0 C) 1 D) -1

9. (a3-g24-19) $3x = \frac{\pi}{4}$ bo'lsa, $\frac{\cos11x + \cos9x}{\sin5x \cdot \sin8x} = ?$
A) -2 B) -1
C) 0 D) 1

10. (a4-g3-20) Ifodani soddalashtiring.
$\frac{\sin6° + \sin24° + \sin42°}{\cos6° + \cos24° + \cos42°}$
A) $\cos24°$ B) $\sin24°$
C) 1 D) $\text{tg}24°$

11. (a4-g5-20) Soddalashtiring.
$\frac{\sin10°}{\sin40° - \cos40°}$
A) $\sin5°$ B) $-2\sqrt{3}$
C) $-\sqrt{2}\cos5°$ D) $-\cos5°$

12. (a4-g9-20) Hisoblang:
$\frac{\sin50° + \cos80°}{\sin80° + \cos50°}$
A) $\frac{\sqrt{2}}{2}$ B) $\frac{\sqrt{3}}{3}$
C) $\frac{\sqrt{3}}{2}$ D) $\frac{2\sqrt{2}}{3}$

13. (a4-g13-1) Soddalashtiring.
$\frac{\cos8\alpha + \cos10\alpha + \cos12\alpha + \cos14\alpha + \cos16\alpha}{\sin8\alpha + \sin10\alpha + \sin12\alpha + \sin14\alpha + \sin16\alpha}$
A) $\text{ctg}12\alpha$ B) $\text{tg}12\alpha$
C) $\text{tg}6\alpha$ D) $\text{ctg}6\alpha$

14. (a4-g14-14) $\sin x \cdot \cos x = A$ va $\sin x - \cos x = B$ bo'lsa, quyidagi bog'lanishlardan qaysi biri o'rinli?
A) $A^2 + B^2 = 1$ B) $2A + B^2 = 1$
C) $A^2 + B = 1$ D) $A^2 + 2B = 1$

15. (a4-g14-15) Hisoblang:
$\frac{\cos6x - \sin4x - \cos2x}{\sin6x + \sin4x + \sin2x}$
A) 1 B) -1
C) $\text{tg}4x$ D) $\frac{-2\sin2x - 1}{2\cos x + 1}$

16. (a4-g16-19) Hisoblang:
$\cos^2 54° + \cos^2 60° + \cos^2 45° + \cos^2 36°$.
A) 1,75 B) 2
C) 2,25 D) 2,5

17. (a4-g20-19) Soddalashtiring.
$\frac{\cos12\alpha + \cos10\alpha + \cos8\alpha + \cos6\alpha + \cos4\alpha}{\sin12\alpha + \sin10\alpha + \sin8\alpha + \sin6\alpha + \sin4\alpha}$
A) $\text{ctg}8\alpha$ B) $\text{tg}8\alpha$
C) $\text{ctg}4\alpha$ D) $\text{tg}4\alpha$

18. (a4-g21-19) $\cos^2 50° + \cos^2 30° + \sin^2 45° + \cos^2 40° = ?$
A) 2,25 B) 2
C) 1,75 D) 2,5

19. (a5-g16-17) Soddalashtiring.
$\frac{\sin 13x - \sin x}{\sin 10x - \sin 4x}$
A) tg3x B) 2cos3x
C) 2sin3x D) 2tg3x

20. (a5-g17-4) Hisoblang:
$\frac{\cos 36^\circ + \cos^2 72^\circ}{\sin^2 72^\circ}$
A) $-tg^2 18^\circ$ B) $ctg^2 18^\circ$
C) 0,5 D) 1

21. (a5-g18-30) Agar
$tg\alpha = \frac{5}{2}\left(\alpha \in \left(0; \frac{\pi}{2}\right)\right)$ bo'lsa,
$\frac{\sin 2\alpha + \cos 2\alpha}{\sin\alpha + \cos\alpha}$ ni hisoblang.
A) $\frac{-1}{7\sqrt{29}}$
B) $\frac{17 + 4\sqrt{21}}{5\left(2 + \sqrt{21}\right)}$
C) $\frac{4\sqrt{21} - 17}{5\left(2 + \sqrt{21}\right)}$
D) $\frac{41}{7\sqrt{29}}$

22. (a5-g23-17) Ifodani soddalashtiring.
$\frac{\sin 15^\circ - \cos 15^\circ}{\sin 15^\circ + \cos 15^\circ}$
A) $-\frac{1}{2}$ B) $-\frac{\sqrt{3}}{3}$
C) $-\frac{\sqrt{2}}{2}$ D) $\frac{\sqrt{6}}{2}$

23. (a6-g3-17) Ifodani hisoblang: $\frac{\sin 61^\circ - \cos 61^\circ}{\sin 32^\circ}$.
A) $\frac{\sqrt{3}}{2\sin 16^\circ}$ B) $\frac{\sqrt{2}}{2\cos 16^\circ}$
C) $\frac{\sqrt{3}}{2\cos 16^\circ}$ D) $\frac{\sqrt{2}}{2\sin 16^\circ}$

24. (a6-g12-5) Soddalashtiring:
$\frac{\cos 6x\cos x - \cos 5x\cos 2x}{\sin 5x - \sin 3x}$.
A) $-0{,}5tg4x$ B) $-0{,}5ctgx$
C) $-tg4x$ D) $-ctg4x$

25. (a6-g14-27) Hisoblang:
$\frac{\sin\frac{\alpha}{2} - \cos\frac{\alpha}{2}}{\sin\frac{\alpha}{2} + \cos\frac{\alpha}{2}}$.
A) $tg\left(45^\circ - \frac{\alpha}{2}\right)$
B) $tg\left(\frac{\alpha}{2} - 45^\circ\right)$
C) $-\sin\alpha$
D) $\sin 2\alpha$

91. Trigonometrik funksiyalar ko'paytmasi uchun formulalar

1. (a1-g8-24) Hisoblang:
$\cos\frac{\pi}{5}\cdot\cos\frac{2\pi}{5}$
A) $-\frac{1}{2}$ B) $\frac{1}{4}$
C) $\frac{\sqrt{3}-1}{2}$ D) $\frac{\sqrt{2}+1}{2}$

2. (a2-g13-19) Quyidagi ko'paytmaning qiymatini toping.
$a = \sin(-45^\circ)\cdot\sin(-40^\circ)\cdot\sin(-35^\circ)\cdot\ldots$
$\cdot\sin(35^\circ)\cdot\sin(40^\circ)\cdot\sin(45^\circ)$
A) $\frac{35}{12}$ B) $\frac{35}{64}$ C) 1 D) 0

3. (a3-g15-21) $12\cdot\sin 6^\circ\cdot\cos 12^\circ\cdot\cos 6^\circ = a$ bo'lsa, $tg66^\circ$ ni a orqali ifodalang.
A) $\frac{a}{\sqrt{9-a^2}}$
B) $\frac{\sqrt{9-a^2}}{a}$
C) $\frac{3}{a}$
D) $\frac{\sqrt{a^2-9}}{3}$

4. (a3-g23-19) Hisoblang:
$\cos 55^\circ\cdot\cos 65^\circ\cdot\cos 175^\circ = ?$
A) $-\frac{1}{8}$
B) $-\frac{\sqrt{3}}{8}$
C) $-\frac{1}{8}\sqrt{2+\sqrt{3}}$
D) $-\frac{1}{8}\sqrt{2-\sqrt{3}}$

5. (a4-g10-20) $tg11^\circ = a$ bo'lsa,
$\frac{\sin 22^\circ\cdot ctg191^\circ}{\sin 79^\circ\cdot\cos 349^\circ} = ?$
A) a^2 B) $\frac{a^2+1}{a}$
C) $\frac{a}{a^2+1}$ D) 2

6. (a4-g18-20) $3 - \sin x\cdot\cos x\cdot\cos 2x$ ifodaning eng katta qiymatini toping.
A) $\frac{13}{4}$ B) 4 C) 3 D) $\frac{11}{4}$

7. (a4-g19-21) $7tg3x\cdot\cos 3x + 6ctg3x\cdot\sin 3x$ ifodaning eng katta qiymatini toping.
A) 7 B) 6 C) 13 D) $\sqrt{85}$

8. (a5-g10-18)
$\sin 70^\circ\cdot\sin 130^\circ\cdot\cos 80^\circ = ?$
A) $\frac{1}{8}$ B) $\frac{1}{4\sqrt{2}}$
C) $\frac{1}{\sqrt{2}}$ D) $\frac{1}{2}$

9. (a5-g13-18) Hisoblang:
$\cos 55\cdot\cos 65\cdot\cos 175$
A) $-\frac{1}{8}$
B) $-\frac{\sqrt{3}}{8}$
C) $-\frac{1}{8}\sqrt{2-\sqrt{3}}$
D) $-\frac{1}{8}\sqrt{2+\sqrt{3}}$

10. (a5-g18-3) Tenglamani yeching.
$\cos 2x\cdot\sin 5x + \sin x\cdot\cos 2x +$
$+\cos x\cdot\sin 2x - \sin 2x\cdot\cos 5x = 0$
A) $\frac{\pi}{6} + \frac{\pi n}{3},\ n \in Z$
B) $\frac{\pi n}{3},\ n \in Z$
C) $\frac{\pi}{18} + \frac{\pi n}{3}; \frac{\pi}{2} + \pi n\ \ n \in Z$
D) $\frac{\pi n}{3}; \frac{\pi}{2} + 2\pi n,\ n \in Z$

11. (a6-g7-17) Hisoblang:
$\cos\frac{3\pi}{8}\cdot\cos\frac{\pi}{8}$.
A) $\frac{\sqrt{2}}{2}$
B) $-\frac{\sqrt{2}}{2}$
C) $-\frac{\sqrt{2}}{4}$
D) $\frac{\sqrt{2}}{4}$

92. Trigonometrik formulalar, funksiyalarning qiymatlar to'plami

1. (a1-g2-23) Quyidagi funksiyaning qiymatlar sohasini aniqlang.
$y = 3\cos 2x + 8\sin x\cos x$
A) [–1; 1]
B) $\left[-\sqrt{73}; \sqrt{73}\right]$
C) [–5; 5]
D) $\left[-4\sqrt{3}; 4\sqrt{3}\right]$

2. (a1-g4-20) Hisoblang:
$\frac{\cos 74^\circ - \cos 14^\circ}{\sin 44^\circ}$
A) $\frac{1}{4}$ B) –1
C) $-\frac{1}{2}$ D) 1

3. (a1-g14-20) Soddalashtiring.
$\frac{1}{1+tgx} + \frac{1}{1+ctgx}$
A) 1 B) $\sin x$
C) $ctgx$ D) tgx

4. (a1-g16-20) $\sin^2\alpha+\sin^2\beta=1$ va $(0<\alpha<\frac{\pi}{2};\ 0<\beta<\frac{\pi}{2})$ bo'lsa,

$\alpha^3+\beta^3+3\alpha\beta\frac{\pi}{2}=?$

A) $\frac{\pi}{4}$ B) $\frac{\pi^2}{4}$

C) $\frac{\pi^3}{8}$ D) $\frac{4\pi}{5}$

5. (a2-g4-22) tg12° = *a* bo'lsa, tg69° ni *a* orqali ifodalang.

A) $\frac{a^2-2a+2}{(a+1)^2}$

B) $\frac{(a-1)^2}{(a+1)^2}$

C) $\frac{a^2+2a-2}{a^2-2a-1}$

D) $\frac{a^2-2a-1}{a^2+2a-1}$

6. (a2-g13-17) Ifodani soddalashtiring.

$$\frac{tg\left(\frac{3\pi}{2}-\alpha\right)+tg^3\left(\frac{\pi}{2}+\alpha\right)}{ctg^3\left(\frac{5\pi}{2}-\alpha\right)+ctg\left(\frac{3\pi}{2}+\alpha\right)}$$

A) $ctg^4\alpha$ B) $ctg4\alpha$
C) $tg^4\alpha$ D) $sin^4\alpha$

7. (a2-g18-21) Soddalashtiring.

$$\frac{\cos^2 7x-\cos^2 5x}{\sin 10x\cdot\sin 2x+\cos 8x\cdot\cos 4x}$$

A) 2tg6*x*
B) 2sin6*x*·tg2*x*
C) $4\cos^2 3x$
D) –2sin6*x*·tg2*x*

8. (a3-g12-21) Soddalashtiring.

$$\frac{\sin^2\alpha}{1-\sin\alpha}+\frac{\sin^2\alpha}{1+\sin\alpha}$$

A) $2ctg^2\alpha$ B) $2tg^2\alpha$
C) $2\sin^2\alpha$ D) $2\cos^2\alpha$

9. (a4-g8-21) Soddalashtiring.

$$\frac{\cos^2\alpha}{1-\cos\alpha}+\frac{\cos^2\alpha}{1+\cos\alpha}$$

A) $2ctg^2\alpha$ B) $2tg^2\alpha$
C) $2\sin^2\alpha$ D) $2\cos^2\alpha$

10. (a4-g12-21) tg(α + β) = 6 va tgα = 2 bo'lsa, tgβ ni hisoblang.

A) 3 B) 4

C) $\frac{4}{13}$ D) $\frac{2}{3}$

11. (a4-g15-19) Soddalashtiring.

$$\frac{4+2\sin^2 x-\cos^2 x}{2\sin^2 x+\cos^2 x}$$

A) 3
B) 1 + sin*x*
C) 2
D) cos2*x*

12. (a4-g24-18)

Agar $a-b=\frac{\pi}{4}$ bo'lsa, $(\sin a-\sin b)^2+$ $+(\cos a-\cos b)^2$ ning qiymatini toping.

A) $2-\sqrt{2}$ B) $1-\frac{\sqrt{2}}{2}$

C) 1 D) $\frac{1}{2}$

13. (a4-g25-19) $tg\alpha=\frac{\sqrt{2}}{\sqrt{5}}$; $tg\beta=\frac{x}{\sqrt{5}}$ va $\alpha+\beta=45^\circ$ bo'lsa, *x* ning qiymatini toping.

A) $\frac{7\sqrt{5}-10\sqrt{2}}{3}$

B) $\sin 6x+\sin 2x=\frac{tg2x}{2}$

C) $\frac{5\sqrt{5}+5\sqrt{2}}{7}$

D) $\frac{7\sqrt{5}-10\sqrt{2}}{7}$

14. (a5-g6-19) tg20° + 4sin20° = ?

A) $2\sqrt{3}$ B) $\sqrt{6}$

C) $\sqrt{6}$ D) $2\sqrt{6}$

15. (a5-g6-20) (sin3*x* + 4)(5 – sin3*x*) ko'paytma olishi mumkin bo'lgan eng katta qiymat nechaga teng?

A) 19,75 B) 20
C) 20,25 D) 18

16. (a5-g13-17) $\frac{2\sin 3x-4}{2}$ ifodaning eng katta va eng kichik qiymatlari yig'indisini hisoblang.

A) –2 B) 1
C) –1 D) –4

17. (a5-g20-17) To'g'ri burchakli uchburchakning o'tkir burchaklari α va β uchun quyidagi ifodani soddalashtiring.

$$\frac{\cos^2\alpha+\cos^2\beta+tg\alpha\cdot tg\beta}{\sin^2\alpha+\sin^2\beta}$$

A) 2 B) 3 C) 1 D) 0

18. (a5-g25-17) $\frac{3\cos x+2\sin x}{\cos x-\sin x}=4$ bo'lsa, ctg*x* ning qiymatini toping.

A) 4 B) 2 C) 6 D) 1

19. (a6-g1-17) Ifodaning qiymatini toping: $\frac{\sqrt{3}}{4\cos 50^\circ}-\cos 80^\circ$.

A) 1 B) $\sqrt{3}$

C) 0,5 D) $\frac{\sqrt{3}}{2}$

20. (a6-g10-17) cos37° – sin67° + + cos83° – cos143° ni hisoblang.

A) 0 B) cos37°

C) $\frac{\sqrt{2}}{2}$ D) –sin67°

21. (a6-g21-24) $y=6\sin^2 x-4\cos^2 x$ funksiyaning eng kichik qiymatini toping.

A) $-2\sqrt{13}$ B) –4
C) 2 D) –10

22. (a6-g22-20) $y=7+5\cos x$ funksiyaning $\left[\frac{\pi}{6};\ \frac{5\pi}{3}\right]$ oraliqdagi eng katta qiymatini toping

A) $7-2,5\sqrt{3}$
B) 9,5
C) $2,5\sqrt{3}+7$
D) 12

23. (a6-g24-11) $7\cos^2 x-3\cos x+5$ ifodaning eng kichik qiymatini toping.

A) 5 B) $\frac{131}{28}$

C) 9 D) $\frac{3}{14}$

24. (a6-g25-19) $\sin^2\alpha(1+ctg^2\alpha)-\cos^2\alpha$ ni soddalashtiring.

A) 1 B) –cos2α
C) $\sin^2\alpha$ D) $-\cos^2\alpha$

25. (a6-g25-29) $f(x)=\sin 3x$ va $f(60-x)+f(90+x)=\frac{2}{3}$ bo'lsa, $f(x+30)\cdot f(120-x)=?$

A) $\frac{5}{18}$ B) $-\frac{5}{18}$

C) $-\frac{2}{3}$ D) $\frac{2}{3}$

93. Arksinus, arkkosinus, arktangens va arkkatangens. Xossalari. Teskari trigonometric funksiyalarga doir tenglama va tengsizliklar

1. (a1-g1-26) Hisoblang:

$\sin\left(\arccos\frac{1}{3}+\arcsin\frac{3}{4}\right)$

A) $\frac{6\sqrt{2}+\sqrt{7}}{12}$

B) $\frac{4\sqrt{7}+3\sqrt{2}}{12}$

C) $\frac{2\sqrt{7}+2}{12}$

D) $\frac{2\sqrt{14}+3}{12}$

2. (a1-g3-31) sin(2arctg0,75) ni hisoblang.

A) 0,6 B) 0,8 C) 0,24 D) 0,96

3. (a1-g13-20) $arctg\frac{1}{2}+arctg\frac{1}{3}=?$

A) $\frac{\pi}{2}$ B) $\frac{\pi}{3}$

C) $\frac{\pi}{4}$ D) $\frac{\pi}{6}$

4. (a2-g6-21) $\cos\left(2\operatorname{arcctg}\frac{1}{2}\right)=?$

A) $-\frac{3}{5}$ B) $-\frac{1}{4}$

C) $\frac{1}{4}$ D) $\frac{3}{5}$

5. (a2-g7-22) Hisoblang:

$\cos\left(\arcsin\frac{2}{3}+\arccos\frac{3}{4}\right)$

A) $\frac{3\sqrt{7}-2\sqrt{5}}{12}$

B) $\angle ECD = z$

C) $\frac{3\sqrt{5}-2\sqrt{7}}{12}$

D) $\angle DBC = x$

6. (a2-g13-27) $\sin(2\operatorname{arctg}2)=?$

A) 0,7 B) 0,8 C) 1 D) 2

7. (a2-g15-23) Hisoblang:

$\sin\left(2\operatorname{arctg}\frac{3}{4}\right)$

A) $\frac{24}{25}$ B) $\frac{7}{25}$

C) $\frac{5}{13}$ D) $\frac{9}{16}$

8. (a2-g16-21)

$\sin\left(2\arccos\frac{3}{5}+90\right)=?$

A) $\frac{24}{25}$ B) $-\frac{24}{25}$

C) $\frac{7}{25}$ D) $-\frac{7}{25}$

9. (a2-g18-22) Hisoblang:

$\cos\left(\arcsin\frac{1}{3}+\arccos\frac{3}{4}\right)$

A) $\frac{6\sqrt{2}-\sqrt{7}}{12}$ B) $\frac{4\sqrt{7}+3\sqrt{2}}{12}$

C) $\frac{2\sqrt{7}+2}{12}$ D) $\frac{2\sqrt{14}-3}{12}$

10. (a2-g19-21) $\cos\left(\frac{1}{2}\operatorname{arcctg}\frac{5}{12}\right)$ ni hisoblang.

A) $\frac{2}{\sqrt{13}}$ B) $\frac{12}{13}$

C) $\frac{3}{\sqrt{13}}$ D) $\frac{5}{13}$

11. (a2-g20-21) $\operatorname{arctg}\frac{1}{2}+\operatorname{arctg}\frac{1}{3}=?$

A) $\frac{\pi}{2}$ B) $\frac{\pi}{3}$

C) $\frac{\pi}{4}$ D) $\frac{\pi}{6}$

12. (a2-g21-22) Hisoblang:

$\sin\left(2\arccos\frac{3}{4}\right)$

A) $\frac{2\sqrt{7}}{16}$ B) $\frac{\sqrt{7}}{4}$

C) $\frac{5\sqrt{7}}{16}$ D) $\frac{3\sqrt{7}}{8}$

13. (a2-g23-22) Hisoblang:

$\operatorname{tg}\left(\arcsin\left(\frac{4}{5}\right)+\pi\right)$.

A) $-\frac{4}{5}$ B) $-\frac{4}{3}$

C) $\frac{3}{4}$ D) $\frac{4}{3}$

14. (a3-g3-24) Tenglamani yeching.

$\arccos 2x = \operatorname{arctg}4$

A) $\frac{3\sqrt{17}}{16}$ B) $\frac{2\sqrt{17}}{17}$

C) $\frac{\sqrt{17}}{4}$ D) $\frac{\sqrt{17}}{34}$

15. (a3-g5-21) $\arcsin 3x = \operatorname{arctg}5x$ tenglamani yeching.

A) $\frac{8}{15}$ B) $\frac{3}{20}$

C) $\frac{4}{15}$ D) $\frac{3}{10}$

16. (a3-g9-21) $\sin\left(\arccos\frac{3}{4}\right)$ ni hisoblang.

A) $\frac{3}{5}$ B) $\frac{\sqrt{7}}{5}$

C) $\frac{4}{5}$ D) $\frac{\sqrt{7}}{4}$

17. (a3-g12-23) Hisoblang:

$\sin\left(2\operatorname{arctg}\frac{2}{3}\right)$

A) $\frac{5}{13}$ B) $\frac{5}{6}$

C) $\frac{12}{13}$ D) $\frac{13}{14}$

18. (a3-g13-20) Hisoblang:

$\sin\left(\arcsin\frac{12}{13}-\operatorname{arctg}\frac{3}{4}\right)$

A) $\frac{63}{65}$ B) $-\frac{63}{65}$

C) $\frac{33}{65}$ D) $-\frac{33}{65}$

19. (a3-g15-22)

$\arccos\frac{2}{3}+\arcsin\frac{4}{5}=\operatorname{arctg}x$

tenglamani yeching.

A) $\frac{3\sqrt{5}-8}{4\sqrt{5}+6}$ B) $\frac{4\sqrt{5}+6}{8-3\sqrt{5}}$

C) $\frac{3\sqrt{5}+8}{6-4\sqrt{5}}$ D) $\frac{6\sqrt{5}+8}{3\sqrt{5}-4}$

20. (a3-g16-22) Hisoblang:

$\sin\left(\frac{\pi}{2}+\arcsin\frac{5}{13}\right)$

A) $\frac{5}{12}$ B) $\frac{12}{5}$

C) $\frac{12}{13}$ D) $\frac{5}{13}$

21. (a3-g22-20) $y = \operatorname{arctg}(x-1)$ funksiyaning grafigi qaysi choraklardan o'tadi?

A) I, III va IV

B) II va IV

C) I, II va III

D) I va III

22. (a4-g1-21) $\cos\left(2\operatorname{arcctg}\frac{1}{3}\right)=?$

A) $\frac{3}{5}$ B) $-\frac{3}{8}$

C) $-\frac{4}{5}$ D) $-\frac{3}{5}$

23. (a4-g2-21) Tenglamani yeching.

$(3x+2)\cdot\cos\left(2\arccos\frac{3}{5}\right)+$

$+(x+3)\sin\left(2\arcsin\frac{3}{5}\right)=\frac{4}{5}$

A) $-\frac{38}{3}$ B) $-\frac{38}{45}$

C) -22 D) $-\frac{22}{45}$

24. (a4-g7-20) $\arcsin x = \operatorname{arctg}3x$ tenglamani yeching.

A) $\pm\frac{5}{9}$ B) $\pm\frac{2\sqrt{2}}{3}$

C) $\pm\frac{\sqrt{5}}{3}$ D) $\pm\frac{8}{9}$

25. (a4-g8-23) Hisoblang:

$\sin\left(2\operatorname{arctg}\frac{2}{5}\right)$

A) $\frac{5}{13}$ B) $\frac{3}{5}$

C) $\frac{20}{29}$ D) $\frac{18}{35}$

26. (a4-g17-21) Hisoblang:

$\operatorname{tg}\left(\operatorname{arctg}\frac{1}{2}+\operatorname{arcctg}\frac{1}{3}\right)$

A) 1 B) -7

C) -1 D) $\frac{1}{7}$

27. (a4-g25-20) Hisoblang:

$\arccos\left(\cos\frac{9\pi}{7}\right)+\arcsin\left(\sin\frac{4\pi}{5}\right)$

A) $\frac{73\pi}{35}$ B) $\frac{3\pi}{35}$

C) $\frac{32\pi}{35}$ D) $\frac{17\pi}{35}$

28. (a5-g1-20) Hisoblang:

$\operatorname{tg}\left(\arcsin\frac{\sqrt{11}}{6}\right)$

A) $\frac{5}{6}$ B) $\frac{11}{3}$

C) $\frac{\sqrt{11}}{5}$ D) $\frac{\sqrt{11}}{6}$

29. (a5-g5-20) Hisoblang:

$\cos\left(\frac{1}{2}\arcsin\frac{1}{3}\right)$

A) $\frac{4\sqrt{2}}{9}$ B) $\frac{\sqrt{12}+\sqrt{6}}{6}$

C) $\frac{7}{9}$ D) $\sqrt{\frac{3-2\sqrt{2}}{6}}$

30. (a5-g7-20) Hisoblang:

$\arccos\frac{1}{3}+\arccos\left(-\frac{1}{3}\right)$

A) π B) $\frac{\pi}{2}$

C) 0 D) 2π

31. (a5-g8-20) Hisoblang: arcsin(sin6)

A) 6 B) $6-2\pi$

C) $\pi-6$ D) $2\pi-6$

32. (a5-g23-18) Tenglamani yeching.

$\arccos\frac{3}{4}+\arcsin\frac{3}{5}=\operatorname{arctg}x$

A) $\frac{4\sqrt{7}-9}{3\sqrt{7}+12}$

B) $\frac{4\sqrt{7}+9}{12-3\sqrt{7}}$

C) $\frac{3\sqrt{7}+7}{4\sqrt{7}-12}$

D) $\frac{3\sqrt{7}+9}{4\sqrt{7}-12}$

33. (a6-g2-18) Hisoblang:

$\arcsin\left(\sin\frac{75\pi}{13}\right)+\arccos\left(\cos\left(-\frac{74\pi}{9}\right)\right)$.

A) $\frac{116\pi}{117}$ B) $\frac{53\pi}{117}$

C) $\frac{64\pi}{117}$ D) $-\frac{\pi}{117}$

34. (a6-g11-10) arcsin(cos12) quyidagilardan qaysi biriga teng?

A) $4\pi-12$ B) $12-3{,}5\pi$

C) $12-4\pi$ D) $3{,}5\pi-12$

35. (a6-g14-7) Hisoblang:

$\sin\left(3\operatorname{arctg}\frac{1}{\sqrt{11}}\right)-\cos\left(3\operatorname{arcctg}\frac{1}{\sqrt{11}}\right)$.

A) $\sqrt{3}$ B) $\frac{8\sqrt{3}}{9}$

C) 0 D) $\frac{3\sqrt{3}-2}{3}$

36. (a6-g15-27) Hisoblang:

$\arcsin\left(\sin\frac{5\pi}{6}\right)+\arccos\left(\cos\frac{9\pi}{8}\right)$.

A) $\frac{47\pi}{24}$ B) $\frac{7\pi}{24}$

C) $\frac{25\pi}{24}$ D) $\frac{\pi}{24}$

37. (a6-g20-29) Hisoblang:

$\sin\left(\arccos\frac{1}{3}+\arcsin\frac{3}{4}\right)$.

A) $\frac{6\sqrt{2}+\sqrt{7}}{12}$

B) $\frac{4\sqrt{7}+3\sqrt{2}}{12}$

C) $\frac{2\sqrt{7}+2}{12}$

D) $\frac{2\sqrt{14}+3}{12}$

94. Trigonometrik tenglamalar. Trigonometrik tenglamalar sistemasi

1. (a1-g4-21) Tenglamani yeching.

$\cos\left(3x+\frac{\pi}{4}\right)=\frac{\sqrt{2}}{2}$

A) $\frac{\pi}{6}+\frac{2\pi k}{3}; -\frac{\pi}{12}+\frac{2\pi k}{3}, k\in Z$

B) $\frac{\pi}{12}+2\pi k; -\frac{\pi}{4}+2\pi k, k\in Z$

C) $6\frac{3}{7}$

D) $\frac{2\pi k}{3}; -\frac{\pi}{6}+\frac{2\pi k}{3}, k\in Z$

2. (a1-g5-22) Nechta o'tkir burchak $\sin6x-\cos3x=0$ tenglikni qanoatlantiradi?

A) 2 B) 3 C) 4 D) 5

3. (a1-g8-23) Tenglamani yeching.

$\operatorname{tg}^2x-\left(\frac{\sqrt{3}}{3}+1\right)\operatorname{tg}x+\frac{\sqrt{3}}{3}=0$

A) $\frac{\pi}{4}+\pi k; \frac{\pi}{6}+\pi k, k\in Z$

B) $\frac{\pi}{4}+2\pi k; \frac{\pi}{6}+2\pi k, k\in Z$

C) $\frac{\pi}{6}+\frac{\pi k}{3}; \frac{\pi}{4}+\pi k, k\in Z$

D) $\pm\frac{\pi}{4}+2\pi k; \pm\frac{\pi}{6}+2\pi k, k\in Z$

4. (a1-g9-21) Quyidagilardan qaysi biri $\sin\left(\frac{3\pi}{2}+x\right)$ ga teng.

A) $\cos(-x)$

B) $\sin(\pi-x)$

C) $\sin(\pi+x)$

D) $\cos(\pi+x)$

5. (a1-g9-22)

$\frac{\sin5x}{\sin3x}+\frac{\cos5x}{\cos3x}=2$ tenglikni qanoatlantiruvchi x ning eng kichik musbat yechimini toping.

A) $\frac{\pi}{24}$ B) $y\ C\cdot e^3$

C) $\frac{\pi}{12}$ D) $\frac{\pi}{8}$

6. (a1-g11-23) Tenglamani yeching

$\sqrt{\sin x}\cdot\cos x=0$

A) $\frac{\pi k}{2}$

B) $\frac{\pi}{2}+\pi k$

C) $\pi k; \frac{\pi}{2}+2\pi k$

D) $2\pi k; \frac{\pi}{2}+\pi k$

7. (a1-g14-22) $3\sin5x-2\cos5x=3$ tenglamani yeching.

A) $\frac{\pi}{10}+\frac{2}{5}\pi k; \frac{2}{5}\operatorname{arctg}5+\frac{2}{5}\pi k$

B) $\frac{\pi}{10}+\frac{\pi}{5}k; \frac{1}{5}\operatorname{arctg}5+\frac{\pi}{5}k$

C) $\frac{\pi}{5}+\frac{2}{5}\pi k; \frac{2}{5}\operatorname{arctg}5+\frac{2\pi}{5}k$

D) $\frac{2\pi}{10}+\frac{2}{5}\pi k; \frac{2}{5}\operatorname{arctg}5+\frac{2\pi k}{5}$

8. (a1-g15-22) Tenglamani yeching.

$\sin2x-4\cos2x=4$

A) $\pi n; arctg8+\pi n, n\in Z$

B) $\frac{\pi}{2}+\pi n; arctg4+\pi n, n\in Z$

C) $\frac{\pi}{4}+\frac{\pi n}{2}; arctg4+\frac{\pi n}{2}, n\in Z$

D) $\frac{\pi n}{2}; arctg+\frac{\pi n}{2}; n\in Z$

9. (a1-g16-27) $7\sin2x+19\cos x=26$ tenglama $[-\pi; 2\pi]$ oraliqda nechta ildizga ega?

A) ildizga ega emas

B) 3

C) 2

D) 4

10. (a1-g17-22) $\cos^2 2x=\sin^2 x$ tenglamani yeching.

A) $\frac{\pi}{2}+\pi n; \pm\frac{\pi}{6}+\pi n$

B) $\pi n; \frac{\pi}{12}+\pi n$

C) $2\pi n; \pm\frac{\pi}{3}+2\pi n$

D) $\pi+2\pi n; \pm\frac{\pi}{3}+2\pi n$

11. (a2-g1-22) $x\in(0;\pi)$ $\cos x=\sin(30+2x)$ tenglama nechta ildizga ega?

A) 0 B) 2 C) 3 D) 4

12. (a2-g2-23) $\sin 3x + \sin 6x = 0$ tenglama $[0; 2\pi]$ oraliqda nechta ildizga ega?
A) 13 B) 9 C) 11 D) 15

13. (a2-g8-24) Tenglamani yeching. $\arccos 2x = \operatorname{arctg} 3$
A) $\frac{3\sqrt{10}}{5}$ B) $\frac{3\sqrt{10}}{20}$
C) $\frac{\sqrt{10}}{5}$ D) $\frac{\sqrt{10}}{20}$

14. (a2-g9-23) Tenglamani yeching $\sqrt{\sin x \cdot \cos x} = 0$
A) $\frac{\pi k}{2}$ B) $\frac{\pi}{2} + \pi k$
C) $\sqrt[4]{17 - 12\sqrt{2}}$ D) $2\pi k; \frac{\pi}{2} + \pi k$

15. (a2-g11-23) $\sin 2x + \sin 4x = 0$ tenglama $[0; 2\pi]$ oraliqda nechta ildizga ega?
A) 6 B) 9 C) 8 D) 7

16. (a2-g14-18) Quyidagilardan qaysi biri $\sin x - \cos x = \frac{\sqrt{2}}{2}$ tenglikni qanoatlantiradi?
A) 75° B) 15°
C) 135° D) 65°

17. (a2-g16-22) Tenglamani yeching. $3\sin 3x + 2\cos 3x = 3$
A) $\frac{\pi}{6} + \frac{2\pi n}{3}$
B) $\frac{\pi}{4} + \pi n$
C) $\frac{\pi}{6} + \frac{2\pi n}{3}; \frac{2}{3}\operatorname{arctg} 0{,}2 + \frac{2\pi n}{3}$
D) $\frac{\pi}{12} + \frac{\pi n}{3}; \frac{1}{3}\operatorname{arctg} 5 + \frac{\pi n}{3}$

18. (a2-g19-22) $2\sin x + \cos x = \pi$ $[-\pi; \pi]$ oraliqda tenglama nechta ildizga ega?
A) 0 B) 2 C) 3 D) 4

19. (a2-g20-20) Tenglamaning eng kichik musbat yechimini toping.
$\frac{1}{\sin^2 x} + \frac{1}{\cos^2 x} = \frac{16}{3}$
A) $\frac{\pi}{8}$ B) $\frac{\pi}{6}$ C) $\frac{\pi}{3}$ D) $\frac{\pi}{12}$

20. (a2-g22-22) Tenglamani yeching. $\cos 2x - 5\sin x - 3 = 0$
A) $(-1)^n \cdot \frac{\pi}{6} + \pi n$
B) $(-1)^{n+1} \cdot \frac{\pi}{6} + \pi n$
C) $\pm\frac{\pi}{6} + 2\pi n$
D) $\pm\frac{\pi}{6} + \pi n$

21. (a2-g23-21) $1 - \cos 6x = \operatorname{tg} 3x$ tenglamani yeching.
A) $\frac{\pi}{3}n; \frac{\pi}{12} + \frac{\pi n}{3}$
B) $\frac{\pi}{3}n; \frac{\pi}{6}(4n+1)$
C) $\frac{\pi}{3}n; \frac{\pi}{6}(2n+1)$
D) $\frac{\pi}{6}n; \frac{\pi}{12}(4n-1)$

22. (a3-g2-21) $\frac{\cos 2x}{tgx + 1} = 0$ tenglamaning $[0; 6\pi]$ oraliqdagi yechimlari nechta?
A) 3 B) 12 C) 6 D) 9

23. (a3-g7-22) $x \cdot \sin x = 2$ tenglama nechta ildizga ega?
A) Yechimga ega emas.
B) Cheksiz ko'p.
C) 2
D) 8

24. (a3-g10-23) $\sin 2x + \sin 4x = 0$ tenglama $[0; 3\pi]$ oraliqda nechta ildizga ega?
A) 12 B) 9 C) 10 D) 13

25. (a3-g14-22) Tenglamani yeching.
$(2x-1)\cos\left(2\arcsin\frac{3}{5}\right) + (x-3)\sin\left(2\arccos\frac{3}{5}\right) = \frac{3}{5}$
A) $\frac{7}{24}$ B) $\frac{47}{19}$ C) $\frac{23}{15}$ D) $\frac{25}{7}$

26. (a3-g16-21) $\cos 2x + \sin x = 0$ tenglamaning $[0; 2\pi]$ oraliqda nechta ildizi bor?
A) 4 B) 7 C) 1 D) 3

27. (a3-g17-19) $12\cos x + 5\sin x = 0$ $(90° < x < 180)$ bo'lsa, $\sin x$ quyidagilardan qaysi biriga teng?
A) $\frac{5}{13}$ B) $-\frac{5}{13}$
C) $\frac{12}{13}$ D) $-\frac{12}{13}$

28. (a3-g17-21) $\sin 8x = \cos 42°$ tenglikni qanoatlantiruvchi o'tkir buchaklar yig'indisini toping.
A) 112,5° B) 135°
C) 123° D) 157,5°

29. (a3-g18-22) Tengsizlikning $[0; 2\pi]$ oraliqdagi yechimini toping.
$12\sin^2 x + 7\sin x - 10 < 0$
A) $\left(\arcsin\frac{2}{3}; \pi - \arcsin\frac{2}{3}\right)$
B) $\left(0; \frac{\pi}{6}\right) \cup \left(\frac{5\pi}{6}; 2\pi\right)$
C) $\left[0; \arcsin\frac{2}{3}\right) \cup \left(\pi - \arcsin\frac{2}{3}; 2\pi\right]$
D) $\left[0; \pi - \arcsin\frac{2}{3}\right) \cup \left(\pi + \arcsin\frac{2}{3}; 2\pi\right]$

30. (a3-g20-22) $x \cdot \cos 50° + \sin 50° + x = 0$ bo'lsa, x ni toping.
A) $\sin 25°$ B) $-\operatorname{tg} 25°$
C) $-\cos 25°$ D) $\operatorname{ctg} 25°$

31. (a3-g21-21) Tenglamani yeching. $3\sin 5x + 2\cos 5x = 5$
A) $\frac{\pi n}{5}$ B) Ø
C) $\frac{\pi}{10} + \frac{2\pi n}{5}$ D) $\frac{2\pi n}{5}$

32. (a3-g23-21) $\sin^3 x + \cos^3 x = 1$ tenglama $[-2\pi; 2\pi]$ oraliqda nechta yechimga ega?
A) Ø B) 2 C) 4 D) 5

33. (a3-g24-21) $2\cos^2 x + 7\sin x - 5 = 0$ tenglama $[0; 3\pi]$ oraliqda nechta ildizga ega?
A) 2 B) 3 C) 4 D) 1

34. (a4-g3-21) $\cos 2x - 3\cos x - 1 = 0$ tenglama $[0; 2\pi]$ oraliqda nechta ildizga ega bo'ladi?
A) 2 B) 1 C) 4 D) 3

35. (a4-g4-21) Quyidagilardan qaysi biri $\sin\left(x - \frac{\pi}{5}\right) = \cos x$ tenglikni qanoatlantiradi?
A) $\frac{18\pi}{25}$ B) $\frac{5\pi}{18}$
C) $\frac{7\pi}{20}$ D) $\frac{9\pi}{11}$

36. (a4-g5-19) $\cos x + \sin x = 1{,}(3)$ bo'lsa, $\cos^2 2x$ ni hisoblang.
A) $\frac{16}{25}$ B) $\frac{42}{65}$
C) $\frac{49}{64}$ D) $\frac{32}{81}$

37. (a4-g6-21) Tenglamani yeching.
$\cos\left(3x + \frac{\pi}{4}\right) = \frac{\sqrt{2}}{2}$
A) $\frac{\pi}{6} + \frac{2\pi k}{3}; -\frac{\pi}{12} + \frac{2\pi k}{3}, k \in Z$
B) $\frac{\pi}{12} + 2\pi k; -\frac{\pi}{4} + 2\pi k, k \in Z$
C) $\pm\frac{\pi}{6} + \frac{2\pi k}{3}, k \in Z$
D) $\frac{2\pi k}{3}; -\frac{\pi}{6} + \frac{2\pi k}{3}, k \in Z$

38. (a4-g9-21) $\sin x + \sin 2x + \sin 3x = 0$ tenglama $[0; 2\pi]$ oraliqda nechta ildizga ega?
A) 6 B) 9 C) 7 D) 5

39. (a4-g11-24) Tenglamaning eng kichik musbat yechimini toping.
$\frac{1}{\sin^2 x} + \frac{1}{\cos^2 x} = \frac{16}{3}$
A) $\frac{\pi}{8}$ B) $\frac{\pi}{6}$ C) $\frac{\pi}{3}$ D) $\frac{\pi}{4}$

40. (a4-g13-12) Tenglamani yeching. $\cos 2x - 2\sin x + 3 = 0$

A) $-\frac{\pi}{2} + 2\pi n$ B) $(-1)^n \cdot \frac{\pi}{6} + \pi n$

C) $\frac{\pi}{2} + 2\pi n$ D) Ø

41. (a4-g14-16) $\cos 2x + \sin x = 0$ tenglamaning $[0; 3\pi]$ da nechta ildizi mavjud?

A) 1 B) 2 C) 3 D) 4

42. (a4-g15-21) $3\sin^2 x - \sin x \cdot \cos x - 2\cos^2 x = 0$ tenglamaning $(\pi; 2\pi)$ oraliqda nechta yechimi mavjud?

A) 4 B) 2 C) 3 D) 1

43. (a4-g17-20) $\sin 5x = \cos 35°$ tenglikni qanoatlantiruvchi nechta o'tkir burchak mavjud?

A) 1 B) 3 C) 5 D) 2

44. (a4-g18-21) Tenglamani yeching.

$$\cos 5x = \sin\left(\frac{\pi}{2} - 3x\right)$$

A) $\frac{\pi k}{3},\ k \in Z$

B) $\frac{\pi k}{3},\ k \in Z$

C) $\frac{3\pi k}{2}; \frac{\pi k}{5},\ k \in Z$

D) $\frac{\pi k}{4},\ k \in Z$

45. (a4-g19-20) $\sin 3x = \frac{2}{x}$ tenglama $[-\pi; \pi]$ oraliqda nechta ildizga ega?

A) 6 B) 2 C) 4 D) 0

46. (a4-g20-21) Tenglamani yeching. $\cos x - \sqrt{3}\sin x = \cos 3x$

A) $2\pi n;\ (-1)^n \frac{\pi}{6} + \frac{\pi n}{2}$

B) $\pi n;\ (-1)^n \frac{\pi}{6} + \frac{\pi n}{2}$

C) $\pi n;\ (-1)^n \frac{\pi}{6} + \pi n$

D) πn

47. (a4-g23-19) $7\cos^2 x + 4\sin^2 x = 5$ bo'lsa, $\cos 2x$ ning qiymatini toping.

A) $-\frac{1}{3}$ B) -1

C) $\frac{1}{3}$ D) 1

48. (a4-g23-21) $\sqrt{3}\sin 2x + 2\sin^2 x - 3 = 0$ tenglikni qanoatlantiruvchi dastlabki ikki musbat ildizlari yig'indisini toping.

A) 75° B) 240°
C) 300° D) 330°

49. (a4-g24-20) Tenglamani yeching.

$$\cos^4 x + \sin^4 x = \frac{5}{8}$$

A) $\pm\frac{\pi}{6} + \pi n,\ (n \in Z)$

B) $(-1)^n \cdot \frac{\pi}{3} + \pi n$

C) $\pm\frac{\pi}{6} + \frac{\pi n}{2},\ (n \in Z)$

D) $(-1)^n \cdot \frac{\pi}{6} + \frac{\pi n}{2},\ (n \in Z)$

50. (a4-g25-21) $\operatorname{ctg} 4x = (0{,}3)^{-2x}$ tenglama $[0; 2\pi]$ oraliqda nechta yechimga ega?

A) 8 B) 0 C) 2 D) 4

51. (a5-g2-19) Quyidagi o'tkir burchaklardan qaysi biri $\frac{\sin x \cdot \cos x}{\sin 5° + \cos 5°} = \frac{\sqrt{2}}{4}$ tenglikni qanoatlantiradi?

A) 45° B) 65° C) 50° D) 20°

52. (a5-g2-21) $2\sin x - \sqrt{3}\operatorname{tg} x = 0$ tenglamani yeching.

A) $2\pi n;\ \pm\frac{\pi}{3} + 2\pi n,\ (n \in Z)$

B) $\pi n;\ \pm\frac{\pi}{6} + 2\pi n$

C) $2\pi n;\ \pm\frac{\pi}{6} + 2\pi n$

D) $\pi n;\ \pm\frac{\pi}{3} + 2\pi n$

53. (a5-g4-21) $2\sin x - 3\cos x = 2$ tenglamani yeching.

A) $\frac{\pi}{2} + 2\pi n;\ -2\operatorname{arctg} 5 + 2\pi n,\ n \in Z$

B) $-\frac{\pi}{2} + 2\pi n;\ 2\operatorname{arctg} 5 + 2\pi n,\ n \in Z$

C) $-\frac{\pi}{4} + \pi n;\ \operatorname{arcctg}\frac{1}{5} + \pi n,\ n \in Z$

D) $\frac{\pi}{4} + \pi n;\ -\operatorname{arcctg}\frac{1}{5} + \pi n,\ n \in Z$

54. (a5-g5-21) Tenglamani yeching. $\sin 12x = 3\sin 4x$

A) $\frac{\pi k}{4}; \pm\frac{1}{8}\arccos\frac{2}{3} + \frac{\pi k}{16}$

B) $\frac{\pi k}{4}$

C) $\pm\frac{\pi k}{16}$

D) Ø

55. (a5-g7-21) $1 - \operatorname{tg} x = \operatorname{tg}\left(\frac{\pi}{4} - x\right)$ tenglama $[0; 2\pi]$ kesmada nechta ildizga ega?

A) 4 B) 3 C) 5 D) 6

56. (a5-g10-20) $\sin^2 x \cdot \cos^2 x + \sin^2 x + \cos^4 x = 1$ tenglama $[0; 2\pi]$ oraliqda nechta ildizga ega?

A) 2 B) 4
C) 0 D) cheksiz ko'p

57. (a5-g11-18) $\sin 6x + \sin 2x = \frac{\operatorname{tg} 2x}{2}$ tenglama $[0; 2\pi]$ oraliqda nechta ildizga ega?

A) 4 B) 8
C) 6 D) 9

58. (a5-g14-18) Quyidagi tenglama nechta ildizga ega?

$\cos x = x^2 - \pi x - 2\pi^2$

A) 1 B) 2
C) 4 D) 0

59. (a5-g16-18) $2 + \cos 2x = 3\cos x$ tenglama $[0; 4\pi]$ oraliqda nechta ildizga ega?

A) 6 B) 7
C) 2 D) 4

60. (a5-g20-18) $\sin x + 2\sin 2x + \sin 3x = 0$ tenglama $[-2\pi; \pi]$ oraliqda necha yechimga ega?

A) 6 B) 5 C) 7 D) 9

61. (a5-g21-17) Tenglama nechta ildizga ega?

$$\sin\left(x + \frac{\pi}{2}\right) = \frac{x-2}{15}$$

A) 10 B) 11
C) 8 D) 9

62. (a5-g24-18) Tenglamani yeching. $\sin 3x = \cos 2x$

A) $\pi + 2\pi n;\ \frac{\pi}{5} + \frac{2\pi n}{5},\ n \in Z$

B) $\frac{2\pi n}{5},\ n \in Z$

C) $\frac{\pi}{2} + \pi n;\ \frac{\pi}{10} + \frac{\pi n}{5},\ n \in Z$

D) $\frac{\pi}{2} + 2\pi n;\ \frac{\pi}{10} + \frac{2\pi n}{5},\ n \in Z$

63. (a6-g5-18) Tenglamani yeching: $\cos^2 x + 2\operatorname{tg} x \cdot \operatorname{ctg} x = 2\sin x$.

A) $\frac{\pi}{2} + 2\pi n$

B) $(-1)^n \arcsin\frac{1}{3} + \pi n$

C) $2\pi n$

D) Ø

64. (a6-g8-18) $\left(\sqrt{8}\cos\left(\frac{7\pi}{2} + \pi x\right) - \sqrt{2}\right) \cdot (3\cos \pi x - \pi) = 0$ tenglamani yeching.

A) $\pm\frac{1}{3} + 2n,\ n \in Z$

B) $\frac{(-1)^n}{6} + n,\ n \in Z$

C) $\pm\frac{1}{3} + 2n;\ \pm\frac{1}{6} + 2n,\ n \in Z$

D) $\frac{(-1)^n}{4} + n,\ n \in Z$

65. (a6-g10-18)
$\sqrt{\cos^2 x - \frac{1-\operatorname{tg}^2 x}{1+\operatorname{tg}^2 x}} = 1$ tenglama $[0; 2\pi]$ oraliqda nechta ildizga ega?
A) 2 B) 4 C) 5 D) 0

66. (a6-g11-15) $2^x - 0{,}5 = |\sin x|$ tenglama nechta haqiqiy ildizga ega?
A) cheksiz ko'p B) 0
C) 1 D) 3

67. (a6-g12-13) $2\sin\frac{x}{10} = 2^x + 2^{-x}$ tenglama nechta ildizga ega?
A) ildizi yo'q B) 1
C) 2 D) cheksiz ko'p

68. (a6-g13-13)
$\left(\sin^2\alpha - \frac{1}{2}\right)\sqrt{-\sin^2\alpha + \frac{\sqrt{3}}{2}\sin\alpha} = 0$ tenglama $[-\pi; \pi]$ oraliqda nechta ildizga ega?
A) 8 B) 7 C) 6 D) 9

69. (a6-g15-13) Quyidagi tenglama $[0; 2\pi]$ oraliqda nechta yechimga ega?
$\sin\frac{x}{2} + \cos x - 1 = 0$
A) 3 B) 4 C) 2 D) 5

70. (a6-g17-18) $\cos 5x = \sin 30°$ tenglikni qanoatlantiruvchi nechta o'tkir burchak mavjud?
A) 4 B) 2 C) 6 D) 3

71. (a6-g18-4) Tenglamani yeching: $3\sin 7x + 2\cos 7x = 2$.
A) $\frac{\pi}{7} + \frac{2\pi n}{7}$; $\frac{2}{7}\operatorname{arctg}0{,}(6) + \frac{2\pi n}{7}$
B) $\frac{\pi n}{7}$; $\frac{1}{7}\operatorname{arctg}1{,}5 + \frac{\pi n}{7}$
C) $\frac{\pi}{14} + \frac{\pi n}{7}$; $\frac{1}{7}\operatorname{arctg}0{,}(6) + \frac{\pi n}{7}$
D) $\frac{2\pi n}{7}$; $\frac{2}{7}\operatorname{arctg}1{,}5 + \frac{2\pi n}{7}$

72. (a6-g21-21) Tenglamani yeching:
$\sin x + \cos x = \frac{1}{\sin x}$.
A) $\frac{\pi}{4} + \pi n$
B) $-\frac{\pi}{4} + \pi n$
C) $\frac{\pi}{4} + \pi n$; $\frac{\pi}{2} + \pi n$
D) πn; $-\frac{\pi}{4} + \pi n$

73. (a6-g26-17) $4\sin x + 7\cos x = 0$ tenglik o'rinli bo'lsa, $\sin 2x$ ning qiymatini toping.
A) $\frac{33}{65}$ B) $-\frac{6}{13}$
C) $-\frac{56}{65}$ D) $-\frac{28}{65}$

95. Trigonometrik tengsizliklar. Tengsizliklar sistemasi

1. (a1-g1-27) Tengsizlikni yeching.
$\sqrt{3}\operatorname{ctg}3x + 1 \ge 0$
A) $\left(\frac{\pi n}{3}; \frac{\pi}{3} + \frac{\pi n}{3}\right]$, $n \in Z$
B) $\left[\frac{\pi}{9} + \frac{\pi n}{3}; \frac{2\pi}{9} + \frac{\pi n}{3}\right]$, $n \in Z$
C) $\left(\frac{\pi n}{3}; \frac{5\pi}{18} + \frac{\pi n}{3}\right]$, $n \in Z$
D) $\left(\frac{\pi n}{3}; \frac{2\pi}{9} + \frac{\pi n}{3}\right]$, $n \in Z$

2. (a1-g2-22) $\sin x \ge \cos x$ tengsizlikni yeching.
A) $\left[\frac{\pi}{4} + \pi k; \frac{5\pi}{4} + \pi k\right]$
B) $\left[-\frac{5\pi}{4} + 2\pi k; \frac{\pi}{4} + 2\pi k\right]$
C) $\left[\frac{\pi}{4} + 2\pi k; \frac{5\pi}{4} + 2\pi k\right]$
D) $\left[\frac{3\pi}{4} + \pi k; \frac{5\pi}{4} + \pi k\right]$

3. (a1-g6-22) Tengsizlik sistemasini yeching.
$\begin{cases} \sin x > \frac{\sqrt{3}}{2} \\ \cos x > \frac{\sqrt{3}}{2} \end{cases}$
A) $\left(\frac{2\pi}{3} + 2\pi n; \frac{11\pi}{6} + 2\pi n\right)$
B) $\left(\frac{2\pi}{3} + 2\pi n; \frac{4\pi}{3} + 2\pi n\right)$
C) $\varnothing$
D) $\left(\frac{5\pi}{6} + 2\pi n; \frac{5\pi}{3} + 2\pi n\right)$

4. (a1-g7-20) Tengsizlikni yeching. $(0 \le \alpha \le \pi)$
$\operatorname{tg}\alpha - \frac{1}{\sqrt{3}} \le \frac{1}{\sqrt{3}\operatorname{tg}\alpha} - 1$
A) $\left(0; \frac{\pi}{6}\right] \cup \left[\frac{3\pi}{4}; \pi\right)$
B) $\left[\frac{\pi}{6}; \frac{\pi}{2}\right) \cup \left[\frac{3\pi}{4}; \pi\right)$
C) $\left[\frac{\pi}{4}; \frac{\pi}{2}\right) \cup \left[\frac{5\pi}{6}; \pi\right)$
D) $\left(0; \frac{\pi}{6}\right] \cup \left(\frac{\pi}{2}; \frac{3\pi}{4}\right]$

5. (a1-g9-23) Tengsizlikni yeching.
$\cos x < \sin x$
A) $\left(\frac{\pi}{4} + \pi k; \frac{3\pi}{4} + \pi k\right)$
B) $\frac{240}{11}$
C) $\left(\frac{\pi}{4} + 2\pi k; \frac{5\pi}{4} + 2\pi k\right)$
D) $\frac{120}{11}\sqrt{3}$

6. (a1-g10-23) Tengsizlikni yeching. $\left(-\frac{\pi}{2} \le \alpha \le \frac{\pi}{2}\right)$
$\operatorname{tg}\alpha + \frac{1}{\sqrt{3}} \ge -\frac{1}{\operatorname{tg}\alpha} - \sqrt{3}$
A) $\left[-\frac{\pi}{3}; -\frac{\pi}{6}\right]$
B) $\left(-\frac{\pi}{2}; -\frac{\pi}{3}\right] \cup \left[-\frac{\pi}{6}; 0\right) \cup \left(0; \frac{\pi}{2}\right)$
C) $\frac{17}{12}$
D) $\left[-\frac{\pi}{3}; -\frac{\pi}{6}\right] \cup \left(0; \frac{\pi}{2}\right)$

7. (a1-g12-25) $\sin x - 5\cos x > 0$ tengsizlikni yeching.
A) $(arctg5 + \pi n; \pi(n+1) - arctg5)$
B) $(arctg5 + 2\pi n; \pi + arctg5 + 2\pi n)$
C) $(arctg5 + 2\pi n; \pi - arctg5 + 2\pi n)$
D) $\left(arctg5 + 2\pi n; \frac{\pi}{2} + arctg5 + 2\pi n\right)$

8. (a1-g13-22) Tengsizlikni yeching.
$1 - 2\cos 2x > \sin^2 2x$
A) $\left(\frac{\pi}{4} + \pi k; \frac{3\pi}{4} + \pi k\right)$, $k \in Z$
B) $\left(\frac{\pi}{6} + \pi k; \frac{\pi}{3} + \pi k\right)$, $k \in Z$
C) $\left(\frac{\pi}{8} + \pi k; \frac{3\pi}{8} + \pi k\right)$, $k \in Z$
D) $\left(-\frac{\pi}{4} + \pi k; \frac{\pi}{4} + \pi k\right)$, $k \in Z$

9. (a1-g16-22) $\sin x \ge \cos x$ tengsizlikni yeching.
A) $\left[\frac{\pi}{4} + \pi k; \frac{5\pi}{4} + \pi k\right]$
B) $\left[-\frac{5\pi}{4} + 2\pi k; \frac{\pi}{4} + 2\pi k\right]$
C) $\left[\frac{\pi}{4} + 2\pi k; \frac{5\pi}{4} + 2\pi k\right]$
D) $\left[\frac{3\pi}{4} + \pi k; \frac{5\pi}{4} + \pi k\right]$

10. (a2-g3-26) $\frac{1+tgx}{1+ctgx} = \sqrt{3}$ tengsizlik $0 < x < \frac{\pi}{2}$ oraliqda nechta ildizga ega?
A) 1 B) Ø
C) 2 D) 3

11. (a2-g4-23) Tengsizlikni yeching.
$\cos 15x + 5\cos 5x > 0$

A) $\left(-\frac{\pi}{2}+2\pi k;\ \frac{\pi}{2}+2\pi k\right),\ k\in Z$

B) $\left(\frac{\pi}{2}+2\pi k;\ \frac{3\pi}{2}+2\pi k\right),\ k\in Z$

C) $\left(\frac{\pi}{10}+\frac{2\pi k}{5};\ \frac{3\pi}{10}+\frac{2\pi k}{5}\right),\ k\in Z$

D) $\left(-\frac{\pi}{10}+\frac{2\pi}{5}k;\ \frac{\pi}{10}+\frac{2\pi k}{5}\right),\ k\in Z$

12. (a2-g5-22) Tengsizlik sistemasini yeching.

$$\begin{cases}\sin x>\frac{1}{2}\\ \cos x>\frac{1}{2}\end{cases}$$

A) $\left(\frac{\pi}{6}+2\pi n;\ \frac{\pi}{3}+2\pi n\right)$

B) $\left(\frac{\pi}{3}+2\pi n;\ \frac{2\pi}{3}+2\pi n\right)$

C) $\left(\frac{\pi}{6}+2\pi n;\ \frac{5\pi}{6}+2\pi n\right)$

D) $\left(\frac{\pi}{6}+2\pi n;\ \frac{2\pi}{3}+2\pi n\right)$

13. (a2-g6-22) Tengsizlikni yeching.
$\sin 12x-7\sin 4x>0$

A) $\left(-\frac{\pi}{8}+\frac{\pi n}{2};\ \frac{\pi}{8}+\frac{\pi n}{2}\right),\ n\in Z$

B) $\left(\frac{\pi n}{2};\ \frac{\pi}{4}+\frac{\pi n}{2}\right),\ n\in Z$

C) $\left(-\frac{\pi}{4}+\frac{\pi n}{2};\ \frac{\pi n}{2}\right),\ n\in Z$

D) $\left(\frac{\pi}{8}+\frac{\pi n}{2};\ \frac{3\pi}{8}+\frac{\pi n}{2}\right),\ n\in Z$

14. (a2-g10-23) Tengsizlikni yeching.

$\left(-\frac{\pi}{2}\le\alpha\le\frac{\pi}{2}\right)$

$$\operatorname{tg}\alpha\le\frac{3}{\operatorname{tg}\alpha}$$

A) $\left(-\frac{\pi}{2};-\frac{\pi}{3}\right]\cup\left[\frac{\pi}{3};\frac{\pi}{2}\right)$

B) $\left(-\frac{\pi}{2};-\frac{\pi}{3}\right]\cup\left(0;\frac{\pi}{3}\right]$

C) $\left[-\frac{\pi}{3};0\right)\cup\left(0;\frac{\pi}{3}\right]$

D) $\left[-\frac{\pi}{3};0\right)\cup\left[\frac{\pi}{3};\frac{\pi}{2}\right)$

15. (a2-g13-18) Tengsizlikni yeching.

$$|\sin x|\le\frac{\sqrt{3}}{2}$$

A) $\left[-\frac{\pi}{3}+\pi k;\ \frac{\pi}{3}+\pi k\right],\ k\in Z$

B) $\left[-\frac{\pi}{6}+\pi k;\ \frac{\pi}{6}+\pi k\right],\ k\in Z$

C) $\left[-\frac{\pi}{3}+2\pi k;\ \frac{\pi}{3}+2\pi k\right],\ k\in Z$

D) $\left[-\frac{\pi}{6}+2\pi k;\ \frac{\pi}{6}+2\pi k\right],\ k\in Z$

16. (a2-g15-22) Tengsizlikning $[0;\ 2\pi]$ oraliqdagi yechimini toping.
$4\cos^2x+7\cos x-2<0$

A) $\left[0;\frac{\pi}{4}\right)\cup\left(\frac{7\pi}{4};2\pi\right]$

B) $\left(\arccos\frac{1}{4};\ \pi-\arccos\frac{1}{4}\right)$

C) $\left[0;\arccos\frac{1}{4}\right)\cup\left(2\pi-\arccos\frac{1}{4};2\pi\right]$

D) $\left(\pi-\arccos\frac{1}{4};\ \pi+\arccos\frac{1}{4}\right)$

17. (a2-g20-22) Tengsizlikni yeching.
$\left(-6x^2+5x-3\right)\cdot\left(3\operatorname{tg}^2x-1\right)\ge 0$

A) $\left(-\frac{\pi}{2}+\pi n;-\frac{\pi}{6}+\pi n\right]\cup\left[\frac{\pi}{6}+\pi n;\ \frac{\pi}{2}+\pi n\right)$

B) $\left[-\frac{\pi}{6}+\pi n;\frac{\pi}{2}+\pi n\right)$

C) $\left(-\frac{\pi}{2}+\pi n;\frac{\pi}{6}+\pi n\right]$

D) $\left[-\frac{\pi}{6}+\pi n;\frac{\pi}{6}+\pi n\right]$

18. (a2-g21-23) Tengsizlikni yeching.
$\sqrt{3}\operatorname{ctg}3x+1\ge 0$

A) $\left(\frac{\pi n}{3};\ \frac{\pi}{3}+\frac{\pi n}{3}\right],n\in Z$

B) $\left[\frac{\pi}{9}+\frac{\pi n}{3};\ \frac{2\pi}{9}+\frac{\pi n}{3}\right),n\in Z$

C) $\left(\frac{\pi n}{3};\ \frac{5\pi}{18}+\frac{\pi n}{3}\right],n\in Z$

D) $\left(\frac{\pi n}{3};\ \frac{2\pi}{9}+\frac{\pi n}{3}\right],n\in Z$

19. (a3-g1-22) Tengsizlikni yeching.
$\cos^2 8x+2\sin 8x+2>3\ \ (k\in Z)$

A) $\left(-\frac{\pi}{8}+\pi k;\ \frac{\pi}{8}+\pi k\right)$

B) $(2\pi k,\ \pi+2\pi k)$

C) $\left(-\frac{\pi}{4}+2\pi k;\frac{\pi}{4}+\pi k\right)$

D) $\left(\frac{\pi k}{4};\ \frac{\pi}{8}+\frac{\pi k}{4}\right)$

20. (a3-g4-22) Tengsizlikni yeching.

$$\operatorname{tg}x\ge\frac{1}{\operatorname{tg}x}$$

A) $\left(-\frac{\pi}{2}+\pi n;\ \frac{\pi}{4}+\pi n\right]\cup\left(\pi n;\ \frac{\pi}{4}+\pi n\right]$

B) $\left[-\frac{\pi}{4}+\pi n;\ \pi n\right)\cup\left[\frac{\pi}{4}+\pi n;\ \frac{\pi}{2}+\pi n\right)$

C) $\left(-\frac{\pi}{2}+\pi n;\ \frac{\pi}{4}+\pi n\right]\cup\left[\frac{\pi}{4}+\pi n;\ \frac{\pi}{2}+\pi n\right)$

D) $\left[-\frac{\pi}{4}+\pi n;\ \frac{\pi}{4}+\pi n\right]$

21. (a3-g8-22) $\sin 9x-4\sin 3x\le 0$ tengsizlikni yeching.

A) $\left[-\frac{\pi}{3}+\frac{2\pi}{3}k;\ \frac{2\pi}{3}k\right],\ k\in Z$

B) $\left[-\frac{\pi}{6}+\frac{2\pi}{3}k;\ \frac{\pi}{6}+\frac{2\pi}{3}k\right],\ k\in Z$

C) $\left[\frac{\pi}{6}+\frac{2\pi}{3}k;\ \frac{\pi}{2}+\frac{2\pi}{3}k\right],\ k\in Z$

D) $\left[\frac{2\pi}{3}k;\ \frac{\pi}{3}+\frac{2\pi}{3}k\right],\ k\in Z$

22. (a3-g11-21) Tengsizlikni yeching.
$(0\le\alpha\le\pi)$

$$\operatorname{ctg}\alpha+\sqrt{3}\le\frac{\sqrt{3}}{\operatorname{ctg}\alpha}+1$$

A) $\left(0;\frac{\pi}{6}\right]\cup\left[\frac{3\pi}{4};\pi\right)$

B) $\left[\frac{\pi}{4};\frac{\pi}{2}\right)\cup\left[\frac{5\pi}{6};\pi\right)$

C) $\left(0;\frac{\pi}{4}\right]\cup\left[\frac{5\pi}{6};\pi\right)$

D) $\left[\frac{\pi}{4};\frac{\pi}{2}\right)\cup\left(\frac{\pi}{2};\ \frac{5\pi}{6}\right]$

23. (a3-g12-22) Tengsizlikning $[0;\ 2\pi]$ oraliqdagi yechimini toping.
$6\sin^2x+7\sin x-3<0$

A) $\left(\arcsin\frac{1}{3};\ \pi-\arcsin\frac{1}{3}\right)$

B) $\left(0;\frac{\pi}{6}\right)\cup\left(\frac{5\pi}{6};2\pi\right)$

C) $\left[0;\arcsin\frac{1}{3}\right)\cup\left(\pi-\arcsin\frac{1}{3};2\pi\right]$

D) $\left[0;\pi-\arcsin\frac{1}{3}\right)\cup\left(\pi+\arcsin\frac{1}{3};\ 2\pi\right]$

24. (a3-g13-21) $6\cos^2x+\cos x-2>0$ tengsizlikni yeching.

A) $\left(\frac{\pi}{3}+2\pi n;\ \pi-\arccos\frac{2}{3}+2\pi n\right),\ n\in Z$

B) $\left(-\frac{\pi}{3}+2\pi n;\ \frac{\pi}{3}+2\pi n\right)\cup$

$\cup(\pi-\arccos\frac{2}{3}+2\pi n;$

$\pi+\arccos\frac{2}{3}+2\pi n),\ n\in Z$

C) $\left(\frac{\pi}{3}+2\pi n;\ \pi+\arccos\frac{2}{3}+2\pi n\right),\ n\in Z$

D) $\pi-\arccos\frac{2}{3}+2\pi n;$

$\pi+\arccos\frac{2}{3}+2\pi n,\ n\in Z$

25. (a3-g19-22) $2\text{tg}^2x - \text{tg}x \le 1$ tengsizlikni yeching.

A) $\left(-\frac{\pi}{2}+\pi n; -arctg\frac{1}{2}+\pi n\right) \cup \left(\frac{\pi}{4}+\pi n; \frac{\pi}{2}+\pi n\right); (n \in Z)$

B) $\left(-arctg\frac{1}{2}+\pi n; \frac{\pi}{4}+\pi n\right); (n \in Z)$

C) $\left(-\frac{\pi}{2}+\pi n; -\frac{\pi}{4}+\pi n\right) \cup \left(arctg\frac{1}{2}+\pi n; \frac{\pi}{2}+\pi n\right); (n \in Z)$

D) $\left(-\frac{\pi}{4}+\pi n; arctg\frac{1}{2}+\pi n\right); (n \in Z)$

26. (a3-g22-21) $2\sin 3x - 3\cos 3x \ge 5$ tengsizlikni yeching.

A) $\left\{\frac{\pi}{2}+2\pi n\right\},\ n \in Z$

B) $\left\{\frac{\pi}{2}+\pi n\right\},\ n \in Z$

C) $\{\pi+2\pi n\},\ n \in Z$

D) $\varnothing$

27. (a4-g3-22) Tengsizlikni yeching.
$(-6x^2 + 5x - 3)\cdot(3\text{tg}^2x - 1) \ge 0$

A) $(-\infty; \infty)$

B) $\left[-\frac{\pi}{6}+\pi n; \frac{\pi}{2}+\pi n\right)$

C) $\left(-\frac{\pi}{2}+\pi n; \frac{\pi}{6}+\pi n\right]$

D) $\left[-\frac{\pi}{6}+\pi n; \frac{\pi}{6}+\pi n\right]$

28. (a4-g7-21)
$\cos^2 3x - 5\cos 3x + 2{,}25 \le 0$
tengsizlikni yeching.

A) $\left[-\frac{\pi}{9}+\frac{2\pi k}{3}; \frac{\pi}{9}+\frac{2\pi k}{3}\right]; k \in Z$

B) $\left[\frac{\pi}{9}+\frac{2\pi k}{3}; \frac{5\pi}{9}+\frac{2\pi k}{3}\right]; k \in Z$

C) $\left[-\frac{\pi}{3}+2\pi k; \frac{\pi}{3}+2\pi k\right]; k \in Z$

D) $\left[\frac{\pi}{3}+2\pi k; \frac{5\pi}{3}+2\pi k\right]; k \in Z$

29. (a4-g8-22) Tengsizlikning $[0; 2\pi]$ oraliqdagi yechimini toping.
$8\sin^2x - 10\sin x - 3 < 0$

A) $\left(\arcsin\frac{1}{4}; \pi - \arcsin\frac{1}{4}\right)$

B) $\left(0; \frac{\pi}{6}\right) \cup \left(\frac{5\pi}{6}; 2\pi\right)$

C) $\left[0; \pi + \arcsin\frac{1}{4}\right) \cup \left(2\pi - \arcsin\frac{1}{4}; 2\pi\right]$

D) $\left[0; \pi - \arcsin\frac{1}{4}\right) \cup \left(\pi + \arcsin\frac{1}{4}; 2\pi\right]$

30. (a4-g11-25) Quyidagi tengsizlik x $(x \in [0; 2\pi])$ ning qanday qiymatlarida o'rinli bo'ladi?

$3\sin^2 x + \frac{5}{2}\sin x - 2 < 0$

A) $\left[0; \frac{\pi}{6}\right) \cup \left(\frac{5\pi}{6}; 2\pi\right]$

B) $\left(\frac{\pi}{6}; \frac{5\pi}{6}\right)$

C) $\left(0; \frac{\pi}{3}\right) \cup \left(\frac{2\pi}{3}; 2\pi\right]$

D) $\left[0; \frac{\pi}{3}\right) \cup \left(\frac{2\pi}{3}; 2\pi\right]$

31. (a4-g12-23) $f(x) = \frac{1}{3}x^3 + \frac{1}{2}x - \frac{1}{3}$ funksiyaning $[-1; 1]$ kesmadagi eng katta va eng kichik qiymatlari yig'indisini toping.

A) $-\frac{1}{3}$ B) $\frac{2}{3}$ C) 0 D) $\frac{2}{3}$

32. (a5-g1-21) Tengsizlikni yeching.
$\cos^2 2x \ge \sin^2 2x$

A) $\left[-\frac{\pi}{4}+2\pi n; \frac{\pi}{4}+2\pi n\right]$

B) $\left\{-\frac{\pi}{2}+\pi n\right\}$

C) $\left[-\frac{\pi}{4}+\pi n; \frac{\pi}{4}+\pi n\right]$

D) $\left[-\frac{\pi}{8}+\frac{\pi n}{2}; \frac{\pi}{8}+\frac{\pi n}{2}\right]$

33. (a5-g3-21) $|\text{tg}3x| \ge \sqrt{3}$ tengsizlikni yeching.

A) $\left[\frac{\pi}{3}+\pi n; \frac{\pi}{2}+\pi n\right),\ n \in Z$

B) $\left(-\frac{\pi}{6}+\frac{\pi n}{3}; \frac{\pi}{9}+\frac{\pi n}{3}\right] \cup \left[\frac{\pi}{9}+\frac{\pi n}{3}; \frac{\pi}{6}+\frac{\pi n}{3}\right),\ n \in Z$

C) $\left[-\frac{\pi}{9}+\frac{\pi n}{3}; \frac{\pi}{9}+\frac{\pi n}{3}\right],\ n \in Z$

D) $\left(-\frac{\pi}{2}+\pi n; -\frac{\pi}{3}+\pi n\right] \cup \left[\frac{\pi}{3}+\pi n; \frac{\pi}{2}+\pi n\right),\ n \in Z$

34. (a5-g8-21) $\text{tg}x > \sin x$ tengsizlikni yeching.

A) $\left(\pi n; \frac{\pi}{2}+\pi n\right), n \in Z$

B) $\left(-\frac{\pi}{4}+\pi n; \frac{\pi}{4}+\pi n\right), n \in Z$

C) $\left(\frac{\pi}{4}+\pi n; \frac{\pi}{2}+\pi n\right), n \in Z$

D) $R - \left\{\frac{\pi}{2}+\pi n\right\}, n \in Z$

35. (a5-g9-22) Tengsizlik sistemasini yeching.

$$\begin{cases}\sin x > \frac{\sqrt{3}}{2} \\ \cos x > \frac{\sqrt{3}}{2}\end{cases}$$

A) $\left(\frac{2\pi}{3}+2\pi n; \frac{11\pi}{6}+2\pi n\right),\ n \in Z$

B) $\left(\frac{\pi}{6}+2\pi n; \frac{\pi}{3}+2\pi n\right),\ n \in Z$

C) $\varnothing$

D) $\left(\frac{5\pi}{6}+2\pi n; \frac{5\pi}{3}+2\pi n\right),\ n \in Z$

36. (a5-g12-18) $-\frac{1}{2} \le \sin x \le \frac{\sqrt{3}}{2}$ tengszlikni $[0; 2\pi]$ oraliqda qanoatlantiruvchi butun sonlar yig'indisini toping.

A) 12 B) 14 C) 10 D) 0

37. (a5-g15-23) Tengsizlikni yeching.
$1 - \sin^2 3x \le 1 - \cos^2 3x$

A) $\left[\frac{\pi}{4}+\frac{\pi n}{2}; \frac{\pi}{2}+\frac{\pi n}{2}\right)$

B) $\left[\frac{\pi}{12}+\frac{\pi n}{3}; \frac{\pi}{4}+\frac{\pi n}{3}\right]$

C) $\left[-\frac{\pi}{8}+\frac{\pi n}{2}; \frac{\pi}{8}+\frac{\pi n}{2}\right]$

D) $\left[-\frac{\pi}{12}+\frac{\pi n}{3}; \frac{\pi}{12}+\frac{\pi n}{3}\right]$

38. (a5-g17-30) Tengsizlikni yeching.
$\sin^2 3x - 0{,}5\sin 6x > 2\sin 3x - 2\cos 3x$

A) $\left(\frac{\pi}{12}+\frac{2\pi n}{3}; \frac{5\pi}{12}+\frac{2\pi n}{3}\right),\ n \in Z$

B) $\left(-\frac{\pi}{4}+\frac{2\pi n}{3}; \frac{\pi}{12}+\frac{2\pi n}{3}\right),\ n \in Z$

C) $\left(\frac{\pi}{12}+2\pi n; \frac{\pi}{4}+2\pi n\right),\ n \in Z$

D) $\left(-\frac{\pi}{12}+\frac{\pi n}{3}; \frac{\pi}{12}+\frac{\pi n}{3}\right),\ n \in Z$

39. (a5-g25-18) Tengsizlikni yeching.
$\sin 15x - 4\sin 5x < 0$

A) $\left(\frac{\pi}{10}+\frac{2\pi n}{5}; \frac{3\pi}{10}+\frac{2\pi n}{5}\right), n \in Z$

B) $\left(-\frac{\pi}{10}+\frac{2\pi n}{5}; \frac{\pi}{10}+\frac{2\pi n}{5}\right), n \in Z$

C) $\left(\frac{2\pi n}{5}; \frac{\pi}{5}+\frac{2\pi n}{5}\right), n \in Z$

D) $\left(\frac{\pi}{10}+\frac{\pi n}{5}; \frac{\pi(n+1)}{5}\right), n \in Z$

40. (a6-g4-18) Tengsizlikni yeching: $|\sin 3x| > |\cos 3x|$.

A) $\left(-\frac{\pi}{12}+\frac{\pi n}{3}; \frac{\pi}{12}+\frac{\pi n}{3}\right), n \in Z$

B) $\left(-\frac{\pi}{12}+\frac{2\pi n}{3}; \frac{\pi}{12}+\frac{2\pi n}{3}\right), n \in Z$

C) $\left(\frac{\pi}{12}+\frac{\pi n}{3};\frac{\pi}{4}+\frac{\pi n}{3}\right),\ n\in Z$

D) $\left(\frac{\pi}{12}+\frac{2\pi n}{3};\frac{\pi}{4}+\frac{2\pi n}{3}\right),\ n\in Z$

41. (a6-g6-18) Tengsizlikni yeching:

$\left(\cos 2x-\frac{\pi}{3}\right)\left(\sin 5x+\frac{\pi}{2}\right)\cdot$

$\cdot(\sin 9x-4\sin 3x)<0$

A) $\left(\frac{2\pi k}{3};\frac{\pi}{3}+\frac{2\pi k}{3}\right)$

B) $\left[\frac{\pi k}{3};\frac{\pi}{3}+\frac{\pi k}{3}\right]$

C) $\left(-\frac{\pi}{3}+\frac{\pi k}{3};\frac{\pi k}{3}\right)$

D) $\left(-\frac{\pi}{3}+\frac{2\pi k}{3};\frac{2\pi k}{3}\right)$

42. (a6-g9-17) Ifodani soddalashtiring:

$(1+\operatorname{tg}^2 x)\cdot(2\sin^2 x+3\cos 2x+1)$.

A) 1 B) $-4\operatorname{ctg}^2 x$

C) $4\operatorname{ctg}^2 x$ D) 4

43. (a6-g16-21) Tengsizlikni yeching:

$1-\sin^2 3x\le 1-\cos^2 3x$.

A) $\left[\frac{\pi}{4}+\frac{\pi n}{2};\frac{\pi}{2}+\frac{\pi n}{2}\right)$

B) $\left[\frac{\pi}{12}+\frac{\pi n}{3};\frac{\pi}{4}+\frac{\pi n}{3}\right]$

C) $\left[-\frac{\pi}{8}+\frac{\pi n}{2};\frac{\pi}{8}+\frac{\pi n}{2}\right]$

D) $\left[-\frac{\pi}{12}+\frac{\pi n}{3};\frac{\pi}{12}+\frac{\pi n}{3}\right]$

44. (a6-g19-8) Tengsizlikni yeching:

$\sin 2x>\cos x$.

A) $\left(\frac{\pi}{6}+2\pi n;\frac{5\pi}{6}+2\pi n\right)$

B) $\left(-\frac{5\pi}{6}+2\pi n;\frac{\pi}{6}+2\pi n\right)$

C) $\left(\frac{\pi}{6}+2\pi n;\frac{\pi}{2}+2\pi n\right)\cup$
$\left(\frac{5\pi}{6}+2\pi n;\frac{3\pi}{2}+2\pi n\right)$

D) $\left(-\frac{\pi}{2}+2\pi n;\frac{\pi}{6}+2\pi n\right)\cup$
$\left(\frac{\pi}{2}+2\pi n;\frac{5\pi}{6}+2\pi n\right)$

96. Trigonometrik funksiyalar xossalari. Davri. O'sish va kamayish oraliqlari. Aniqlanish sohasi

1. (a1-g5-20) $90°<x<y<180°$ bo'lsa, quyidagilardan qaysi biri to'g'ri?

A) $\cos x<\cos y$ B) $\operatorname{tg}x<\operatorname{tg}y$

C) $\sin x<\sin y$ D) $\sin x<\cos y$

2. (a1-g6-21) $y=\sin\frac{2x}{3}+\operatorname{tg}\frac{x}{4}+\cos\frac{x}{3}$ funksiyaning eng kichik musbat davrini toping.

A) 12π B) 3π C) 2π D) 6π

3. (a1-g14-21) Funksiyaning eng kichik musbat davrini toping.

$f(x)=\sin\left(\frac{2x+\pi}{3}\right)+\cos^2\left(\frac{\pi}{2}+3\right)$

A) π B) 3π

C) 6π D) 12π

4. (a1-g16-23) Quyidagi funksiyaning qiymatlar sohasini aniqlang.

$y=2\cos 2x+6\sin x\cos x$

A) $\left(-\sqrt{10};\sqrt{10}\right)$

B) $\left[-\sqrt{10};\sqrt{10}\right]$

C) $\left[-\sqrt{13};\sqrt{13}\right]$

D) $\left[-2\sqrt{3};2\sqrt{3}\right]$

5. (a1-g16-24) Funksiyaning eng kichik musbat davrini toping.

$f(x)=\sin\left(\frac{2x+\pi}{3}\right)+\cos^2\left(\frac{\pi}{2}+\frac{2x}{5}\right)$

A) π B) $7{,}5\pi$ C) 3π D) 15π

6. (a1-g17-21) $3-\sin x\cdot\cos x\cdot\cos 2x$ ifodaning eng katta qiymatini toping.

A) 4 B) 3,25

C) 3 D) 2,75

7. (a2-g1-21) $y=-\sin x\cdot\cos x\cdot\cos 2x$ funksiyaning qiymatlar sohasini toping.

A) $[-0{,}25;\ 0]$

B) $[-0{,}25;\ 0{,}25]$

C) $[-1;\ 1]$

D) $[-4;\ 4]$

8. (a2-g5-21)

$y=\cos\frac{2x}{3}+\operatorname{ctg}\frac{x}{2}+\cos\frac{4x}{3}$

funksiyaning eng kichik musbat davrini toping.

A) 2π B) 3π C) 12π D) 6π

9. (a2-g17-21) $\sin 1977°$, $\operatorname{tg}2011°$, $\cos 2088°$ lar ishoralarining ketma-ketligini toping.

A) +, +, + B) –, +, –

C) –, –, + D) +, –, –

10. (a2-g17-22) Quyidagi funksiyaning eng kichik musbat davrini toping.

$y=4\cos\left(\frac{2x+\pi}{5}\right)-5\operatorname{ctg}\left(\frac{x+2\pi}{3}\right)+\frac{\pi}{5}$

A) 3π B) 5π C) 15π D) 30π

11. (a2-g23-20) Funksiyaning eng kichik musbat davrini toping.

$f(x)=\sin 4x+\cos 3x+\operatorname{tg}2x$

A) 2π B) 24π C) 6π D) 12π

12. (a3-g2-22) $y=5\cos x-\sqrt{4-tg2x}$ funksiyaning aniqlanish sohasini toping.

A) $\left(-\frac{\pi}{4}+\frac{\pi k}{2};\frac{1}{2}arctg4+\frac{\pi k}{2}\right];\ (k\in Z)$

B) $\left(\frac{1}{2}arctg4+\frac{\pi k}{2};\frac{\pi k}{2}\right];\ (k\in Z)$

C) $\left(-\frac{\pi}{2}+\pi k;arctg4+\pi k\right];\ (k\in Z)$

D) $\left[\frac{1}{2}arctg4+\frac{\pi k}{2};\pi+\pi k\right);\ (k\in Z)$

13. (a3-g4-21)

$y=\cos\frac{2x}{5}+\operatorname{ctg}\frac{x}{4}+\sin\frac{x}{3}$ funksiyaning eng kichik musbat davrini toping.

A) 60π B) 30π C) 15π D) 20π

14. (a3-g7-21) Quyida keltirilgan trigonometrik funksiyaning davrini hisoblang.

$f(x)=\sin\left(\frac{2x}{5}+\frac{\pi}{3}\right)+\operatorname{tg}^2\frac{\pi}{4}$

A) 5π B) $2{,}5\pi$ C) 3π D) $4\pi/3$

15. (a3-g9-22) Tengsizlikni yeching.

$2\sin^2 x+\sin x<0$

A) $(-\pi+2\pi k;\ 2\pi k),\ k\in Z$

B) $\left(-\pi+2\pi k;\ -\frac{5\pi}{6}+2\pi k\right)\cup$
$\left(-\frac{\pi}{6}+2\pi k;\ 2\pi k\right),\ k\in Z$

C) $\left(-\frac{5\pi}{6}+2\pi k;\ -\frac{\pi}{6}+2\pi k\right)\cup$
$(2\pi k;\ \pi+2\pi k),\ k\in Z$

D) $(2\pi k;\ \pi+2\pi k),\ k\in Z$

16. (a3-g11-20) Funksiyaning eng kichik musbat davrini toping.

$f(x)=\cos\left(\frac{2x+\pi}{5}\right)+\sin^2\left(\frac{\pi}{2}+3\right)$

A) 5π B) 10π C) $2{,}5\pi$ D) 20π

17. (a3-g13-22) Quyidagi mulohazalardan qaysilari noto'g'ri?

1) Argumentning qiymati ortganda funksiyaning qiymati kamaysa, bunday funksiyalar kamayuvchi funksiya hisoblanadi;

2) $y=a^x$ funksiyaning grafigi OX o'qini (1; 0) nuqtada kesib o'tadi;

3) logarifmik funksiyaning asosi barcha musbat qiymatlarni qabul qiladi;

4) $y=\arccos x$ juft funksiya;

5) Tezlanish tenglamasining boshlang'ich funksiyasi tezlik tenglamasini ifodalaydi.

A) 2; 4; 5 B) 1; 3; 4

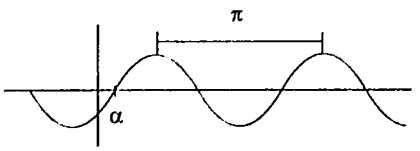
C) 2; 3; 4 D) 1; 4; 5

18. (a3-g16-20) Funksiyaning eng kichik musbat davrini toping.

$f(x)=\cos\left(\frac{2x+\pi}{5}\right)+\sin^2\left(\frac{\pi}{2}+3\right)$

A) 5π B) 10π C) $2{,}5\pi$ D) 20π

19. (a3-g18-21) Quyidagi rasmda qaysi funksiyaning grafigi keltirilgan?



A) $y = \sin(2x - \alpha)$
B) $y = \sin(2x + \alpha)$
C) $y = \sin(x - \alpha)$
D) $y = \sin(x + \alpha)$

20. (a3-g21-20) Berilgan funksiyaning eng kichik musbat davrini toping.

$$y = \sin\frac{3x}{2} + \cos\frac{5x}{3} + \operatorname{tg}2x$$

A) 6π B) 12π
C) 2π D) 4π

21. (a3-g24-20) Quyida keltirilgan funksiyaning eng kichik musbat davrini toping.

$$f(x) = 4 - 3\operatorname{ctg}\frac{x}{2} - \operatorname{tg}^2(-x) + \cos^3\left(\frac{x}{3} + \frac{\pi}{5}\right)$$

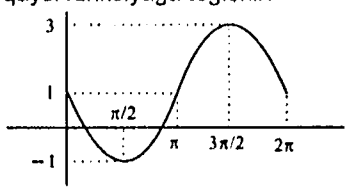
A) $\pi/2$ B) 2π
C) 4π D) 6π

22. (a4-g3-23) Funksiyaning eng kichik musbat davrini toping.

$$f(x) = \sin\left(\frac{2x+\pi}{3}\right) + \cos^2\left(\frac{\pi}{2} + 3\right)$$

A) π B) 3π
C) 6π D) 12π

23. (a4-g4-22) Quyida keltirilgan grafik qaysi funksiyaga tegishli?



A) $y = 2\sin x - 1$
B) $y = 1 - 2\sin x$
C) $y = 2\sin x + 1$
D) $y = -1 - 2\sin x$

24. (a4-g13-34) m ning qanday qiymatlarida $y = \cos x + mx$ funksiya aniqlanish sohasida kamayadi?
A) $[1; \infty]$ B) $[-1; \infty)$
C) $(-\infty; -1]$ D) $(-\infty; 1]$

25. (a4-g16-20) $y = (5\sin 2x + 3\cos 2x)^2$ funksiyaning eng katta qiymatini toping.
A) 64 B) 17
C) 34 D) 54

26. (a4-g22-22) Quyidagi funksiyaning eng kichik musbat davrini toping.

$$y = 4\cos\left(\frac{2x+\pi}{5}\right) - 5\operatorname{ctg}\left(\frac{x+2\pi}{3}\right) + \frac{\pi}{5}$$

A) 3π B) 5π
C) 15π D) 30π

27. (a4-g23-20) $y = \cos x$ va $y = \sin x$ funksiyalarning kesishish nuqtasi absissasini ko'rsating.

A) $\frac{\pi}{2} + \pi k$ B) $\frac{\pi}{2} + 2\pi k$
C) $\frac{\pi}{4} + \pi k$ D) $\frac{\pi}{4} + 2\pi k$

28. (a4-g24-19) $y = 7\sin^2 2x + 24\cos^2 2x$ funksiyaning eng kichik qiymatini toping.
A) −10 B) 24
C) 7 D) 17

29. (a5-g9-21) n ning qanday qiymatida $y = 2 + n\cdot\sin x$ funksiya grafigi $(5\pi/6; 7)$ nuqtadan o'tadi?
A) −10 B) 10
C) 5 D) 18

30. (a5-g10-19) $y = \sin|x|$ funksiya haqida fikrlardan qaysilari noto'g'ri?
1) davriy funksiya; 2) juft funksiya;
3) manfiy qiymatlarni qabul qilmaydi;
4) qiymatlar sohasi $[-1; 1]$;
5) $\left\{\frac{\pi}{2} + 2\pi k\right\}$ nuqtada eng katta qiymatga erishadi.
A) 1, 4, 5 B) 2, 3, 4
C) 1, 3, 5 D) 3, 4, 5

31. (a5-g15-6)

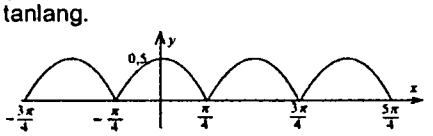
$$y = \cos\frac{2x}{3} + \operatorname{ctg}\frac{x}{2} + \cos\frac{4x}{3}$$ eng kichik musbat davrini toping.
A) 2π B) 3π
C) 12π D) 6π

32. (a5-g19-18) $y = |\sin x + \cos x|$ funksiya $[-2{,}5\pi; 3{,}5\pi]$ oraliqda necha marta o'zining eng kichik qiymatiga erishadi?
A) 6 B) 5
C) 7 D) 8

33. (a5-g22-18) $y = 7\sin^2 3x + 24\cos^2 3x$ funksiyaning eng katta qiymati uning eng kichik qiymatidan qanchaga ortiq?
A) 17 B) 50
C) 24 D) 7

34. (a6-g1-18) $6\sin^2 3x + 9\cos^2 3x$ ifoda nechta butun qiymat qabul qila oladi?
A) 20 B) 21
C) 4 D) 3

35. (a6-g3-18) Quyida keltirilgan grafikka mos keluvchi funksiyani tanlang.



A) $y = \left|\sin\left(x + \frac{\pi}{4}\right)\cdot\cos\left(x + \frac{\pi}{4}\right)\right|$
B) $y = |\cos 2x|$
C) $y = \left|\sin 2\left(x + \frac{\pi}{4}\right)\right|$
D) $y = \left|\frac{1}{2}\sin 2\left(x + \frac{\pi}{2}\right)\right|$

36. (a6-g12-16) Quyidagi funksiyalardan nechtasi davriy?

1) $y = \sqrt{\operatorname{tg}(\ln(\cos x))}$; 2) $\sqrt[7]{\lg\left(\operatorname{tg}\sqrt{x^4}\right)}$;

3) $y = \cos\left(\sqrt{\sin x}\right)$; 4) $\ln(\operatorname{tg}(\cos x))$.

A) 2 B) 1
C) 3 D) 0

37. (a6-g13-9) $f(x) = 3\sin^3(12x + 3) + \cos^2(9x + 7)$ funksiyaning eng kichik musbat davrini toping.
A) 2π B) π
C) $\frac{\pi}{3}$ D) $\frac{\pi}{2}$

38. (a6-g16-5)

$$y = \cos\frac{2x}{3} + \operatorname{ctg}\frac{x}{2} + \cos\frac{4x}{3}$$

funksiyaning eng kichik musbat davrini toping.
A) 2π B) 3π
C) 12π D) 6π

39. (a6-g26-18) $y = 1 - 2\cos 5x$ funksiyaning grafigi qaysi nuqtalarda OX o'qini kesib o'tadi?

A) $\pm\frac{\pi}{15} + \frac{2\pi n}{5}$, $n \in Z$

B) $\pm\frac{\pi}{30} + \frac{2\pi n}{3}$, $n \in Z$

C) $\pm\frac{\pi}{15} + \frac{\pi n}{5}$, $n \in Z$

D) $\pm\frac{\pi}{30} + \frac{\pi n}{5}$, $n \in Z$

15-bob. Hosila

97. Funksiya hosilasi. Differensiallash formulalari va ularni qo'llash

1. (a1-g8-9) $f(x) = x^3 + 3x + 5$ funksiyaning a nuqtadagi hosilasi $6a$ ga teng bo'lsa, a ning qiymatini toping.
A) 2 B) −2
C) 1 D) −1

2. (a1-g11-24) Hosila uchun berilgan formulalardan qaysilari noto'g'ri?
1) $(\cos(x^2 - 3x))' = \sin(x^2 - 3x)(3 - 2x)$;
2) $(\sin(x^2 - 4x))' = \cos(x^2 - 4x)(4 - 2x)$;
3) $(\ln(x^2 - 3x))' = \frac{3 - 2x}{3x - x^2}$;
4) $\left(e^{(x^2-4x)}\right)' = e^{x^2-4x}\cdot(4 - 2x)$;
5) $(\operatorname{tg}(x^2 - 3x))' = \frac{3 - 2x}{\cos^2(x^2 - 3x)}$
A) 2; 4; 5 B) 1; 3; 4
C) 1; 4; 5 D) 2; 3; 5

3. (a1-g17-23) $y = x^3 + e^{-3x} + 7$ funksiyaning hosilasini toping.
A) $3x^2 + 3e^{-3x}$ B) $3x^2 - 3e^{-3x}$
C) $4x^4 - 3e^{-3x}$ D) $4x^4 - 3e^{-3x}$

1. (a2-g1-23) $y = x^4 + 4^x$ funksiyaning hosilasini toping.
A) $4x^3 + x \cdot 4^{x-1}$
B) $4x^3 + 4^x \cdot \ln 4$
C) $4x^3 + 4^x$
D) $5x^5 + 4^x$

5. (a2-g11-24) Hosilalar uchun formulalarning qaysilari noto'g'ri?

1) $(\log_a x)' = \frac{\ln a}{x}$; 2) $(\sin x)' = \cos x$;

3) $(\cos x)' = -\sin x$;

4) $(\operatorname{tg} x)' = \frac{1}{\cos^2 x}$;

5) $(\operatorname{ctg} x)' = \frac{1}{\sin^2 x}$.

A) 3; 4; 5
B) 1; 4; 5
C) 2; 3; 5
D) 1; 2; 3

6. (a2-g13-36) Hosila uchun berilgan formulalarning qaysilari to'g'ri?

1) $x' = 1$; 2) $(\sin x)' = -\cos x$;

3) $(tgx)' = \frac{1}{\cos^2 x}$; 4) $(e^x)' = -e^x$;

5) $(a^x)' = a^x \ln a$.

A) 1; 3; 5
B) 1; 2; 3
C) 1; 2; 5
D) 2; 4; 5

7. (a2-g21-24) Hosilalar uchun berilgan formulalarning qaysilari to'g'ri?

1) $(x^n)' = n \cdot x^{n-1}$

2) $(\log_a x)' = \frac{1}{x \cdot \ln a}$

3) $(\cos x)' = \sin x$

4) $(\operatorname{ctg} x)' = -\frac{1}{\sin^2 x}$

5) $(e^{kx+b})' = \frac{1}{k} \cdot e^{kx+b}$.

A) 1; 3; 4
B) 1; 2; 5
C) 1; 2; 4
D) 2; 3; 4

8. (a3-g10-24) Hosilalar uchun formulalarning qaysilari to'g'ri?

1) $(\log_a x)' = \frac{1}{x \ln a}$ 2) $(\sin x)' = \cos x$

3) $(\cos x)' = -\sin x$

4) $(\operatorname{tg} x)' = -\frac{1}{\cos^2 x}$

5) $(\operatorname{ctg} x)' = \frac{1}{\sin^2 x}$

A) 3; 4; 5
B) 1; 4; 5
C) 2; 3; 5
D) 1; 2; 3

9. (a3-g20-23) $f(x) = |x^2 - 7x - 18|$ bo'lsa, $f'(2)$ ni hisoblang.
A) aniqlab bo'lmaydi
B) 3
C) –3
D) 0

10. (a5-g1-22) $f(x) = x \cdot |x|$ bo'lsa, $f'(0)$ ning qiymatini toping.
A) –1
B) 0
C) 1
D) bu nuqtada hosilaga ega emas

11. (a5-g3-23) $f'(x) = 3x^2 - 2x + 1$ va $f(2) = 10$ bo'lsa, $f(0) = ?$
A) 1 B) 3
C) 2 D) 4

12. (a6-g17-20) $f'(x) = 4x^3 + 6x^2 - 7x$ va $f(2) = 17$ bo'lsa, $f(-1) = ?$
A) 33 B) –8,5
C) 17 D) –5,5

13. (a6-g26-19) $f(x) = |8x^2 - 5|$ funksiya quyidagi nuqtalardan qaysi birida hosilaga ega emas?
A) $\frac{5}{\sqrt{2}}$ B) $\frac{\sqrt{5}}{4}$
C) $-\frac{5}{2}$ D) $-\frac{\sqrt{5}}{2\sqrt{2}}$

98. Yig'indi, ayirma, ko'paytma va bo'linmaning hosilasi

1. (a1-g9-24)
$f(x) = 2x^4 - \frac{x^3}{3} + 5x^2 - 2x - 3$ bo'lsa, $f'(1) = ?$
A) 12 B) 15
C) 18 D) –10

2. (a2-g8-25) $y = \ln x \cdot \sin 2x$ funksiya hosilasini toping.
A) $\frac{\sin 2x}{x} + 2\cos 2x \cdot \ln x$
B) $\frac{2\cos 2x}{x}$
C) $\frac{2\sin 2x}{x} + \cos 2x \cdot \ln x$
D) $\frac{2\cos 2x}{x} + 2\ln x \cdot \sin 2x$

3. (a2-g16-23) Berilgan funksiyaning hosilasini toping.
$y = a^{2x-3} - \cos(3x + 5)$
A) $2a^{2x-3} \ln 2 + 3\sin(3x + 5)$
B) $2a^{2x-3} \ln a + 3\sin(3x + 5)$
C) $2a^{2x-3} \ln 2 - 3\sin(3x + 5)$
D) $2a^{2x-3} \ln a - 3\sin(3x + 5)$

4. (a3-g16-23) $f(x) = 3x \cdot \ln x + 2x^2$ bo'lsa, $f'(e) = ?$
A) 5 B) 3 + 1e
C) 6 + 4e D) 5e

5. (a4-g9-22) $f(x) = x^3 + mx^2 - 4x + 3$ funksiya berilgan. $f'(2) = f'(1)$ bo'lsa, m ni toping.
A) 2 B) 1 C) –2 D) –1

6. (a4-g23-22) $f(x)$ $\sin\left(x^2 + \frac{\pi}{12}\right)$ bo'lsa, $f'\left(\frac{\sqrt{\pi}}{2}\right)$ ni toping.
A) $\frac{\sqrt{\pi}}{2}$ B) $\frac{1}{2}$
C) $\frac{1}{4}$ D) $\frac{\sqrt{\pi}}{4}$

7. (a4-g24-21) Ushbu $y = \cos(x^2 + 3)$ funksiyaning hosilasini toping.
A) $-2x \cdot \sin(x^2 + 3)$
B) $-\sin(2x + 3)$
C) $\cos(2x + 3)$
D) $2x \cdot \sin(x^2 + 3)$

8. (a4-g25-23) 23. $f(x) = \int_0^{3x} \sin^2 t\,dt$ funksiyaning hosilasini toping.
A) $f'(x) = \frac{1}{2} - \frac{1}{12}\cos 3x$
B) $f'(x) = \frac{3}{2} - \frac{1}{24}\cos 6x$
C) $f'(x) = \frac{3}{2} - \sin 6x$
D) $f'(x) = 1 - \frac{1}{2}\sin 4x$

9. (a5-g2-22) $f(x) = \frac{\ln x}{x}$ bo'lsa, $f'(x) = 0$ tenglamaning ildizini toping.
A) 0 B) e
C) 1 D) 2e

10. (a5-g7-22) Quyidagilardan qaysi biri $y = (x^2 + 7x + 1) \cdot \log_3 x$ ning hosilasiga teng.
A) $y' = \frac{2x + 7}{x \ln 3}$
B) $y' = \frac{x^2 + 7x + 1}{x \ln 3} + \frac{\log_3 x}{2x + 7}$
C) $y' = \frac{\log_3 x}{x^2 + 7x + 1} + 2x + 7$
D) $y' = (2x + 7)\log_3 x + \frac{x^2 + 7x + 1}{x \ln 3}$

11. (a5-g13-19) $f(x) = \frac{ax + b}{bx + a}$ va $f'(0) = -2$ bo'lsa, $\frac{b^2}{a^2}$ ning qiymatini toping.
A) 2,25 B) 0,(4)
C) 3 D) 4

12. (a5-g16-19) $y = x^4 \cdot 4^x$ funksiyaning hosilasini toping.
A) $4x^3 \cdot 4^x \cdot (4 + x)$
B) $4x^3 \cdot 4^{x+1} \cdot \ln 4$
C) $x^3 \cdot 4^x \cdot (4 + x\ln 4)$
D) $24x \cdot 4^x \ln 4$

13. (a5-g17-18) $y = \dfrac{x^2 + \sqrt{x} - 5}{x}$ funksiyaning hosilasini toping.
A) $y' = \dfrac{2x^2 - \sqrt{x} + 10}{2x^2}$
B) $y' = 2x - \dfrac{1}{\sqrt{x}}$
C) $y' = \dfrac{2x^2 - \sqrt{x} - 5x}{2x^2}$
D) $y' = 2 + \dfrac{1}{\sqrt{x}}$

14. (a6-g1-19) $f(x) = |x^2 - 6x + 8|$ bo'lsa, $f'(2) = ?$
A) 0 B) mavjud emas
C) –2 D) 2

15. (a6-g7-19) $f(x) = |x^2 - 5x + 4|$ funksiya uchun $f'(3) + f'(5) = ?$
A) 0
B) hosilasi yo'q
C) 6
D) 4

16. (a6-g10-19) Quyidagi funksiyaning hosilasini toping $y = x^{x^2+1}$.
A) $(x^2+1) \cdot x^{x^2+1}$
B) $x^{x^2+1} \cdot (2x + \ln x)$
C) $x^{x^2+1} \cdot \left(2x\ln x + \dfrac{x^2+1}{x}\right)$
D) $x^{x^2+1} \cdot \left(x + (x^2+1)\ln x\right)$

17. (a6-g15-1) x ning qanday qiymatlarida $y = x^3 + 2x^2 - 16x - 16$ funksiya o'zining hosilasidan kichik, bo'ladi?
A) $(-5; 0) \cup (4; \infty)$
B) $(-5; 4)$
C) $(-\infty; -4) \cup (0; 5)$
D) $(-4; 0) \cup (5; \infty)$

18. (a6-g21-15) $f(x) = (x^3 + 5x^2 - 4)^4 \cdot (x - 2)$ bo'lsa, $f'(1)$ ni hisoblang.
A) 432 B) –400
C) –216 D) –2

99. Murakkab funksiya hosilasi

1. (a1-g1-19) $f(x) = \ln\sqrt{x^2+2}$ funksiyaning hosilasini toping.
A) $\dfrac{x}{x^2+2}$ B) $\dfrac{x}{x+2}$
C) $\dfrac{2}{\sqrt{x^2+2}}$ D) $\dfrac{x}{\sqrt{x^2+2}}$

2. (a1-g3-4) Agar $f(x) = |x^2 - 5x + 6|$ bo'lsa, $f'(2) = ?$
A) Bu nuqtada hosilasi yo'q.
B) 0
C) 1
D) 3

3. (a1-g4-22) $f(x) = x^{1+x^2}$ bo'lsa, $f'(1) = ?$
A) 2 B) $\dfrac{3}{2}$
C) 1 D) $\dfrac{1}{2}$

4. (a1-g5-23) $y = \cos(\sin 5x)$ funksiyaning hosilasini toping.
A) $-5\cos 5x \cdot \sin(\sin 5x)$
B) $\cos 5x \cdot \cos(\sin 5x)$
C) $-\sin(\sin 5x)$
D) $-\sin(\cos 5x)$

5. (a1-g6-23) Ushbu $y = \ln(3x^3 + 4\sin 4x)$ funksiyaning hosilasini toping.
A) $\dfrac{1}{3x^3 + 4\sin 4x}$
B) $\dfrac{9x^2 + 16\cos 4x}{3x^3 + 4\sin 4x}$
C) $\dfrac{x^2 + \cos 4x}{3x^3 + 4\sin 4x}$
D) $\dfrac{9x^2 - 16\cos 4x}{3x^3 + 4\sin 4x}$

6. (a1-g7-21) $f(x) = \cos(\mathrm{Sin}5x)/5$ funksiyaning hosilasini toping.
A) $-\cos 5x \cdot \sin(\sin 5x)$
B) $-\sin(\sin 5x)$
C) $-(\cos 5x)$
D) $\cos 5x \cdot \cos(\sin 5x)$

7. (a1-g10-24) Ushbu $f(x) = 3^{\sin x^3}$ funksiyaning hosilasini toping.
A) $3x^2 \cdot 3^{\sin x^3} \cdot \cos x^3$
B) $3x^2 \cdot 3^{\sin x^3} \cdot \cos x^3 \cdot \ln 3$
C) $3x^2 \cdot 3^{\cos x^3} \cdot \cos 3x^2 \cdot \ln 3$
D) $3x^2 \cdot 3^{\sin 3x^2} \cdot \cos x^3 \ln 3$

8. (a1-g13-23) $y = x^{2x}$ funksiyaning hosilasini ko'rsating.
A) $2x \cdot x^{2x-1}$ B) $2x \cdot x^{2x-1}\ln x$
C) $2x \cdot x^{2x}\ln x$ D) $2 \cdot x^{2x} \cdot (\ln x + 1)$

9. (a1-g14-23) $f(x) = x \cdot \ln x + 5x^2$ bo'lsa, $f'(e) = ?$
A) 7 B) $2 + 10e$
C) $5 + 2e$ D) $7e$

10. (a2-g5-23) Hosila uchun berilgan formulalardan qaysilari noto'g'ri?
1) $\left(\sin(x^2 - 5x)\right)' = \cos(x^2 - 3x) \cdot (5 - 2x)$;
2) $\left(\cos(x^2 - 5x)\right)' = \sin(x^2 - 4x) \cdot (5 - 2x)$;
3) $\left(e^{|x^2 - 3x|}\right)' = e^{x^2 - 3x} \cdot (3 - 2x)$;
4) $\left(\ln(x^2 - 5x)\right)' = \dfrac{5 - 2x}{5x - x^2}$;
5) $\left(\mathrm{tg}(x^2 - 4x)\right)' = \dfrac{4 - 2x}{\cos^2(x^2 - 4x)}$.
A) 1; 3; 5 B) 1; 3; 4
C) 2; 4; 5 D) 1; 2; 4

11. (a2-g6-23) $f(x) = 4\sin^3 3x$ bo'lsa, $f'\left(\dfrac{\pi}{9}\right) = ?$
A) $\dfrac{\sqrt{3}}{4}$ B) 1
C) 13,5 D) $\dfrac{8}{3}$

12. (a2-g9-24) Hosila uchun berilgan formulalardan qaysilari noto'g'ri?
1) $\left(\cos(x^2 - 3x)\right)' = \sin(x^2 - 3x) \cdot (3 - 2x)$;
2) $\left(\sin(x^2 - 4x)\right)' = \cos(x^2 - 4x) \cdot (4 - 2x)$;
3) $\left(\ln(x^2 - 3x)\right)' = \dfrac{3 - 2x}{3x - x^2}$;
4) $\left(e^{(x^2 - 4x)}\right)' = e^{x^2 - 4x} \cdot (4 - 2x)$;
5) $\left(\mathrm{tg}(x^2 - 3x)\right)' = \dfrac{3 - 2x}{\cos^2(x^2 - 3x)}$.
A) 2; 4; 5 B) 1; 3; 4
C) 1; 4; 5 D) 2; 3; 5

13. (a2-g10-24) Ushbu $f(x) = 2^{\cos 5x}$ funksiyaning hosilasini toping.
A) $-5 \cdot 2^{\cos 5x} \cdot \sin 5x \cdot \ln 2$
B) $-10 \cdot 2^{\cos 5x} \cdot \sin 5x \cdot \ln 5$
C) $5 \cdot \sin 5x \cdot 2^{\sin 5x} \cdot \ln 2$
D) $-5 \cdot 2^{-\sin 5x} \cdot \cos 5x \cdot \ln 2$

14. (a2-g12-34) $f(x) = 4\cos^3 3x$ $f'\left(\dfrac{\pi}{18}\right) = ?$
A) $\dfrac{\sqrt{3}}{4}$ B) 1
C) $-\dfrac{27}{8}$ D) 13,5

15. (a2-g22-23) $y = x^{3x}$ funksiyaning hosilasini ko'rsating.
A) $y' = 3x \cdot x^{3x-1}$
B) $y' = 3x \cdot x^{3x-1}\ln x$
C) $y' = 3x \cdot x^{3x}\ln x$
D) $y' = 3 \cdot e^{3x\ln x} \cdot (\ln x + 1)$

16. (a2-g23-23) $f(x) = 2\sin^3 3x$ bo'lsa, $f'\left(\dfrac{\pi}{9}\right) = ?$
A) $\dfrac{\sqrt{3}}{4}$ B) 1 C) $\dfrac{27}{4}$ D) $\dfrac{19}{8}$

17. (a3-g1-23)
$y = \ln\left(\frac{x^{15}}{15}\right)$ bo'lsa, $y' = ?$

A) $\frac{15}{x}$ B) $\frac{1}{x^{15}}$

C) $\frac{1}{15x^2}$ D) $\frac{x^2}{15}$

18. (a3-g3-25) $y = \ln 2x \cdot \cos x$ funksiya hosilasini toping.

A) $\frac{\cos x}{x} - \sin x \cdot \ln 2x$

B) $-\frac{2\sin x}{x}$

C) $\frac{\cos x}{2x} - \sin x \cdot \ln 2x$

D) $\frac{2\sin x}{x} - 2\ln 2x \cdot \cos x$

19. (a3-g7-23) $y = e^{\ln(\sin x)}$ funksiyaning hosilasini toping.

A) $e^{\frac{\ln(\sin x)}{\cos x}}$ B) $\cos x$

C) $e^{\cos x \ln(\sin x)}$ D) $\frac{e^{\ln(\sin x)}}{\cos x}$

20. (a3-g9-23) Ushbu $y = \ln(3x^4 + 4\cos 3x)$ funksiyaning hosilasini toping.

A) $\frac{1}{3x^4 + 4\cos 3x}$

B) $\frac{12x^3 - 12\sin 3x}{3x^4 + 4\cos 3x}$

C) $\frac{x^3 - \sin 3x}{3x^4 + 4\sin 3x}$

D) $\frac{12x^3 + 12\sin 3x}{3x^4 + 3\cos 3x}$

21. (a3-g13-23) Ushbu $y = \sin(4x^4 + 3\cos 3x)$ funksiyaning hosilasini toping.

A) $\cos\left(4x^4 + 3\cos 3x\right)$

B) $-\left(16x^3 + 9\sin 3x\right)\cos\left(4x^4 + 3\cos 3x\right)$

C) $\left(16x^3 - 9\sin 3x\right)\cos\left(4x^4 + 3\cos 3x\right)$

D) $-\cos\left(4x^4 + 3\cos 3x\right)$

22. (a3-g21-22) $y = \ln(\sin(3x^2 + 5))$ funksiyaning hosilasini toping.

A) $6x \cdot \operatorname{ctg}\left(3x^2 + 5\right)$

B) $\frac{18x}{\sin\left(3x^2 + 5\right)}$

C) $3x \cdot \sin 2\left(3x^2 + 5\right)$

D) $3x \cdot \cos 2\left(3x^2 + 5\right)$

23. (a3-g23-22) $f(x) = x \cdot \ln x + 5x^2$ bo'lsa, $f'(e) = ?$

A) $2 + 10e$
B) 7
C) $5 + 2e$
D) $7e$

24. (a3-g24-22) $f(x) = \cos(\sin 2x)$ bo'lsa, $f'\left(\frac{\pi}{2}\right) = ?$

A) –2 B) –1
C) 0 D) 2

25. (a4-g1-23) $f(x) = \ln\sqrt{x^6 + 3}$
$f'(1) = ?$

A) 2 B) $\frac{3}{2}$

C) $\frac{3}{4}$ D) $\frac{7}{4}$

26. (a4-g3-24)
$f(x) = \sqrt{tgx \cdot \sqrt{ctgx}}$ bo'lsa, $f'\left(\frac{\pi}{4}\right) = ?$

A) 1 B) $\frac{1}{2}$

C) $\frac{1}{4}$ D) $\frac{1}{8}$

27. (a4-g4-23) $f(x) = \sin^7 x$ bo'lsa, $f'\left(\frac{\pi}{3}\right) = ?$

A) $\frac{189}{128}$ B) $\frac{189}{32}$

C) $\frac{27}{32}$ D) $\frac{27}{64}$

28. (a4-g14-29) Quyidagi funksiyaning hosilasini toping.
$y = x^{x^2+1}$

A) $\left(x^2 + 1\right) \cdot x^{x^2+1}$

B) $x^{x^2+1} \cdot (2x + \ln x)$

C) $x^{x^2+1} \cdot \left(2x \ln x + \frac{x^2 + 1}{x}\right)$

D) $x^{x^2+1} \cdot \left(x + \left(x^2 + 1\right)\ln x\right)$

29. (a4-g15-22) Ushbu $f(x) = 3^{\sin x^3}$ funksiyaning hosilasini toping.

A) $3x^2 \cdot 3^{\sin x^3} \cdot \cos x^3$

B) $3x^2 \cdot 3^{\sin x^3} \cdot \cos x^3 \cdot \ln 3$

C) $3x^2 \cdot 3^{\cos x^3} \cdot \cos 3x^2 \cdot \ln 3$

D) $3x^2 \cdot 3^{\sin 3x^2} \cdot \cos x^3 \ln 3$

30. (a4-g16-22)
22. $f(x) = \sqrt[4]{tgx \cdot \sqrt{ctgx}}$ bo'lsa,
$f'\left(\frac{\pi}{4}\right) = ?$

A) $\frac{1}{3}$ B) $\frac{1}{4}$

C) $\frac{1}{8}$ D) $\frac{1}{12}$

31. (a4-g20-22) $f(x) = x^{\ln x}$ funksiyaning $x = e^2$ nuqtadagi hosilasini toping.
A) 2 B) $4e^2$
C) 4 D) 4e

32. (a4-g21-22)
$f(x) = \sqrt[3]{ctgx \cdot \sqrt{tgx}}$ bo'lsa, $f'\left(\frac{\pi}{4}\right) = ?$

A) $-\frac{1}{12}$ B) $-\frac{1}{3}$

C) $-\frac{1}{8}$ D) $-\frac{1}{6}$

33. (a4-g25-22)
$y = \frac{x^7}{7} + 5x^4 + 4x$, $y''(1) = ?$

A) 26 B) 66
C) 67 D) 25

34. (a5-g3-22) $f(x) = \sin(2\sin 3x)$ bo'lsa, $f'(\pi) = ?$

A) 3 B) 6
C) 0 D) –6

35. (a5-g4-22) Ushbu $y = \ln(4x^4 + 3\sin 3x)$ funksiyaning hosilasini toping.

A) $\frac{1}{4x^4 + 3\sin 3x}$

B) $\frac{x^3 + \cos 3x}{4x^4 + 3\sin 3x}$

C) $\frac{16x^3 + 9\cos 3x}{4x^4 + 3\sin 3x}$

D) $\frac{16x^3 - 9\cos 3x}{4x^4 + 3\sin 3x}$

36. (a5-g5-22) $f(x) = 4\cos^5 4x$ bo'lsa, $f'\left(\frac{\pi}{24}\right) = ?$

A) 22,5 B) –22,5
C) $22,5\sqrt{3}$ D) $-22,5\sqrt{3}$

37. (a5-g6-22) $f(x) = \log_2\sqrt{x^3 + 3}$ bo'lsa, $f'(1) = ?$

A) $\frac{3}{4\ln 2}$ B) $\frac{1}{4\ln 2}$

C) $\frac{1}{8\ln 2}$ D) $\frac{3}{8\ln 2}$

38. (a5-g8-22) $f(x) = (2x - 5)^4$ bo'lsa, $f'(2)$ ni hisoblang.
A) –4 B) 8
C) 4 D) –8

39. (a5-g9-23) $y = \sqrt{x - \sqrt{x}}$ funksiyaning hosilasini toping.

A) $y' = \frac{2\sqrt{x} - 1}{4\sqrt{x^2 - x\sqrt{x}}}$

B) $y' = \frac{\sqrt{2\sqrt{x}}}{2\sqrt{2\sqrt{x} - 1}}$

C) $y' = \frac{2\sqrt{x} - 1}{2\sqrt{x^2 - x\sqrt{x}}}$

D) $y' = \frac{\sqrt{2\sqrt{x}}}{4\sqrt{x^2 - x\sqrt{x}}}$

40. (a5-g10-21) $y = x^{3x^2-1}$ funksiyaning hosilasini toping.

A) $y' = \left(6x\ln x + 3x - \frac{1}{x}\right)\cdot x^{3x^2-1}$

B) $y' = (3x^2-1)\cdot x^{3x^2-1}\ln x$

C) $y' = (6x-1)\cdot x^{3x^2-1}\ln x$

D) $(3x^2\ln x - 3x)\,x^{3x^2-1}$

41. (a5-g11-19) $y = 3^{x^2-2x}$ bo'lsa, $y = ?$

A) $(2x-2)\cdot 3^{x^2-2x}$

B) $(x^2-2x)\cdot 3^{x^2-2x}$

C) $(x^2-2x)\cdot 3^{x^2-2x}\cdot\ln 3$

D) $(2x-2)\cdot 3^{x^2-2x}\cdot\ln 3$

42. (a5-g12-19) $y = (\ln x + 1)\ln x$ funksiya hosilasini toping.

A) $\frac{\ln x+1}{x}$ B) $\frac{2\ln x+1}{x^2}$

C) $\frac{\ln x}{x^2}+\frac{1}{x}$ D) $\frac{2\ln x+1}{x}$

43. (a5-g15-15) Ushbu $y = \ln(4x^5 + 4\cos 3x)$ funksiyaning hosilasini toping.

A) $\frac{1}{4x^5+4\cos 3x}$

B) $\frac{5x^4-3\sin 3x}{4x^5+4\cos 3x}$

C) $\frac{0,8x^4-1,(3)\sin 3x}{4x^5+4\cos 3x}$

D) $\frac{20x^4-12\sin 3x}{4x^5+4\cos 3x}$

44. (a5-g25-19) $f(x) = \sin^3 x\cdot\cos x$ funksiya berilgan. $f'\left(\frac{\pi}{6}\right)$ ning qiymatini toping.

A) –0,5
B) –0,25
C) 0,25
D) 0,5

45. (a6-g2-19) Berilgan funksiyaning hosilasini toping: $y = \sqrt[3]{x^2+\operatorname{tg}x+15}$.

A) $\frac{2x+1}{3\cos^2 x\sqrt[3]{(x^2+\operatorname{tg}x+15)^2}}$

B) $\frac{2x-1}{3\cos^2 x\sqrt[3]{(x^2+\operatorname{tg}x+15)^2}}$

C) $\frac{2x-1}{3\cos^2 x\sqrt[3]{(x^2+\operatorname{tg}x+15)^2}}$

D) $\frac{2x\cos^2 x+1}{3\cos^2 x\sqrt[3]{(x^2+\operatorname{tg}x+15)^2}}$

46. (a6-g3-19) $y = 7^{\arcsin^2 x}$ funksiyaning hosilasini toping.

A) $\frac{2\arcsin x\cdot\ln 7}{\sqrt{1-x^2}}\cdot 7^{\arcsin^2 x}$

B) $\frac{7^{\arcsin^2 x-1}\ln 7}{\sqrt{1-x^2}}$

C) $\frac{7\arcsin x}{\ln 7\cdot\sqrt{1-x^2}}\cdot 7^{\arcsin^2 x}$

D) $2\cdot 7^{\arcsin^2 x-1}$

47. (a6-g4-19) Ushbu $f(x) = 5^{\cos 3x^2}$ funksiyaning hosilasini toping.

A) $-x^3\cdot 5^{\sin 3x^2}\cdot\cos x^3\cdot\ln 5$

B) $-6x^3\cdot 5^{\cos 3x^2}\cdot\sin x^3\cdot\ln 5$

C) $6x\cdot 5^{\cos 3x^2}\cdot\cos 3x^2\cdot\ln 5$

D) $-6x\cdot 5^{\cos 3x^2}\cdot\sin 3x^2\cdot\ln 5$

48. (a6-g5-20) $f''(x) = -\frac{1}{9}f(x)$ bo'lsa, quyidagilardan qaysi biriga teng bo'lishi mumkin.

A) $\operatorname{ctg}\frac{x}{3}$ B) tg3x

C) sin3x D) $\cos\frac{x}{3}$

49. (a6-g9-19) $y = \ln(\sin(\cos x))$ bo'lsa, $y' = ?$

A) $-\sin x\cdot\operatorname{ctg}(\cos x)$

B) $\frac{-\sin x\cdot\cos(\sin x)}{\sin(\cos x)}$

C) $\sin x\cdot\operatorname{ctg}(\cos x)$

D) $\frac{\sin x\cdot\cos(\sin x)}{\sin(\cos x)}$

50. (a6-g12-28) $y = \sin(\sin(\sin(x)))$ funksiyaning hosilasini toping.

A) $\cos(\cos(x))\cdot\cos(\cos(\cos(x)))\cdot\cos x$
B) $\cos(\cos(\cos(x)))$
C) $\cos(\sin(\sin(x)))$
D) $\cos(\sin(x))\cdot\cos(\sin(\sin(x)))\cdot\cos x$

51. (a6-g14-19) $y = \ln x^{\ln x^{\ln x}}$ funksiyaning hosilasini toping.

A) $\frac{(\ln^n x-1)}{x}$

B) $\frac{9\ln^2 x}{x^2}$

C) $\frac{(\ln x-1)\ln x^{(\ln x-1)}}{x}$

D) $\frac{3\ln^2 x}{x}$

52. (a6-g16-13) Ushbu $y = \ln(4x^5 + 4\cos 3x)$ funksiyaning hosilasini toping.

A) $\frac{1}{4x^5+4\cos 3x}$

B) $\frac{5x^4-3\sin 3x}{x^5+\cos 3x}$

C) $\frac{0,8x^4-1,(3)\sin 3x}{4x^5+4\cos 3x}$

D) $\frac{20x^4+12\cos 3x}{4x^5+4\cos 3x}$

53. (a6-g17-19) $f(x) = \operatorname{tg}\sqrt{x^4+8}$ funksiya berilgan. Ushbu funksiyaning $x = 1$ nuqtadagi hosilasini toping.

A) $\frac{6}{\cos^2 3}$ B) $12\cos^2 3$

C) $\frac{2}{3\cos^2 3}$ D) $\frac{4\cos^2 3}{3}$

54. (a6-g23-24) $y = \cos^2(5x^2-7)$ funksiyaning hosilasini toping.

A) $10x\sin(10x^2-14)$
B) $20x\cos(5x^2-7)$
C) $-10x\sin(10x^2-14)$
D) $-20x\cos(5x^2-7)$

55. (a6-g24-21) $y = \frac{x^6}{5}+3x^3+2x^2+4$ bo'lsa, $y''(1) = ?$

A) 14 B) 28 C) 30 D) 4

100. Funksiyaning o'sish va kamayish oraliqlari

1. (a1-g15-23) $y = 0,25x^4 - -1,(6)x^3 - 2x^2 + 20x$ funksiyaning kamayish oraliqlarini toping.

A) $(-\infty; -2]\cup[2; 5]$
B) $[-2; 2]\cup[5; \infty)$
C) $[2; 5]$
D) $(-\infty; -5]\cup[-2; 2]$

2. (a3-g2-23) $f(x) = e^{\frac{1}{3}x^3-2x^2-45x+4}$ funksiyaning o'sish oraliqlarini toping?

A) $(-\infty; -9]\cup[5; \infty)$
B) $[-9; 5]$
C) $(-\infty; -5]\cup[9; \infty)$
D) $[-5; 9]$

3. (a3-g4-10) $\frac{1}{5}\le x\le 5$ va $-5\le y\le -\frac{1}{5}$ bo'lsa, $\frac{y}{x}$ qaysi oraliqda bo'ladi?

A) $\left[-1; -\frac{1}{25}\right]$ B) $\left[-25; -\frac{1}{25}\right]$

C) $[-25; -1]$ D) $[-25; -5]$

4. (a3-g7-9) Agar $24 < x \le 32$; $2\le y < 4$ bo'lsa, $\frac{x}{y}$ qaysi son oralig'ida bo'ladi?

A) $8 < \frac{x}{y}\le 16$

B) $6 < \frac{x}{y}\le 12$

C) $8\le\frac{x}{y}\le 16$

D) $6 < \frac{x}{y}\le 16$

5. (a3-g14-23) $y = x^3 - 6x^2 + 9x + 7$ funksiyaning o'sish oralig'ini toping.
A) $(0; \infty]$
B) $[1; 3]$
C) $[1; \infty)$
D) $(-\infty; 1] \cup [3; \infty)$

6. (a3-g19-23) Argumentning nechta butun qiymati $f(x) = 2^{x^3 - 10x^2 - 7x - 2}$ funksiyaning kamayish oralig'iga tegishli?
A) 7 B) 8
C) 6 D) cheksiz ko'p.

7. (a4-g2-22) $y = x^3 - 6x^2 + 9x + 7$ funksiyaning kamayish oralig'ini toping.
A) $(-\infty; 0]$
B) $[1; 3]$
C) $[0; \infty)$
D) $(-\infty; 0] \cup [3; \infty)$

8. (a4-g22-23) $y = 2\sin^2 x + x$ funksiyaning o'sish oraliqlarini toping.
A) $\left[-\frac{\pi}{12} + \pi n; \frac{7\pi}{12} + \pi n\right],\ n \in Z$
B) $\left[-\frac{\pi}{6} + 2\pi n; \frac{7\pi}{6} + 2\pi n\right],\ n \in Z$
C) $\left[\frac{7\pi}{12} + \pi n; \frac{11\pi}{12} + \pi n\right],\ n \in Z$
D) $\left[\frac{5\pi}{12} + \pi n; \frac{11\pi}{12} + \pi n\right],\ n \in Z$

101. Funksiyaning eng katta va eng kichik qiymati. Funksiyaning kritik nuqtalari, maksimum va minimumlari

1. (a1-g12-27) $\sqrt{10x - 16 - x^2} + \sin y \cdot \cos y$ ning eng katta qiymatini toping.
A) 4 B) 2,5
C) 3,5 D) 3

2. (a2-g12-30) $y = \log_2 \frac{1 + \cos^2 x}{\sqrt{2}}$ funksiyaning eng kichik va eng katta qiymatlari ko'paytmasini toping.
A) 0,75
B) –0,25
C) –3
D) 0,5

3. (a4-g10-16) $y = (x + 3)\cdot(x + 4)\cdot(x + 5)\cdot(x + 6)$ funksiyaning eng kichik qiymatini toping.
A) 9 B) –9
C) –1 D) 18

4. (a4-g11-7) $f(x) = x^3 + mx^2 + 3mx + 1$ funksiya $x = m$ nuqtada minimumga ega bo'lsa, m ning olishi mumkin bo'lgan qiymatlardan birini ko'rsating?
A) –2
B) 2
C) –1
D) –0,6

5. (a4-g12-24) Hisoblang:
$\int_1^3 \frac{6x - 2}{3x^2 - 2x + 1} dx$
A) $\ln(\frac{25}{2})$ B) 21
C) ln11 D) ln21

6. (a4-g21-20) $y = (3\sin 4x + 7\cos 4x)^2$ funksiyaning eng katta qiymatini toping.
A) 100 B) 16
C) 58 D) 54

7. (a5-g21-14)
$y = \frac{13,5}{|-14x + x^2 + 20| + 9} - 4$
funksiyaning eng katta qiymatini toping.
A) $-1\frac{19}{58}$ B) $-3\frac{21}{58}$
C) $-5\frac{1}{2}$ D) $-2\frac{1}{2}$

8. (a6-g18-27) $y = 2ax^3 - 6x^2 + bx + 7$ funksiya $x = 1$ nuqtada maksimumga va $x = 4$ nuqtada minimumga ega bo'lsa, $a \cdot b$ ning qiymatini toping.
A) $\frac{48}{5}$ B) $\frac{96}{25}$
C) 24 D) $\frac{1}{24}$

102. Urinmaning burchak koeffitsiyenti

1. (a2-g4-24) $y = x^3 - 3x^2 + 5x$ funksiyaga $x_0 = 1$ nuqtada o'tkazilgan urinmaning OX o'qi bilan hosil qilgan burchagi tangensini toping.
A) 3 B) 9
C) 2 D) 6

2. (a2-g15-24) $y = x^3 - 3x^2 + 7$ funksiyaga $x_0 = 3$ nuqtada o'tkazilgan urinmaning OX o'qi bilan hosil qilgan burchagi tangensini toping.
A) 7 B) 5
C) 6 D) 9

3. (a2-g18-23) $f(x) = 3x^3 - 2x^2 + 5$ funksiya grafigiga $x_0 = 3$ nuqtadan o'tkazilgan urinmaning burchak koeffisiyentini toping.
A) 69 B) 72
C) 56 D) 49

4. (a2-g19-23) $y = 2x^3 - 6x^2 + 9$ funksiyaga $x_0 = -2$ nuqtada o'tkazilgan urinmaning OX o'qi bilan hosil qilgan burchagi tangensini toping.
A) –12 B) 0
C) 24 D) 48

5. (a3-g4-23) $y = x^3 - 2x^2 + 12$ funksiyaga $x_0 = 2$ nuqtada o'tkazilgan urinmaning OX o'qi bilan hosil qilgan burchagi tangensini toping.
A) 8 B) 6
C) 2 D) 4

6. (a3-g12-24) $y = x^3 - 2x^2 + 5$ funksiyaga $x_0 = 2$ nuqtada o'tkazilgan urinmaning OX o'qi bilan hosil qilgan burchagi tangensini toping.
A) 4 B) 5
C) 6 D) 9

7. (a3-g22-22) $y = x^x$ funksiyaga $x = 2$ nuqtada o'tkazilgan urinmaning burchak koeffitsiyentini toping.
A) 3ln2 + 2 B) ln16 + 4
C) 1 D) ln2 + 1

8. (a4-g5-22) $y = x^3 - 3x^2 + 7$ funksiyaga $x_0 = 3$ nuqtada o'tkazilgan urinmaning OX o'qi bilan hosil qilgan burchagi tangensini toping.
A) 7 B) 5
C) 6 D) 9

9. (a4-g8-24) $y = 2x^5 - 2x + 5$ funksiyaga $x_0 = 2$ nuqtada o'tkazilgan urinmaning OX o'qi bilan hosil qilgan burchagi tangensini toping.
A) 158 B) 62
C) 318 D) 60

10. (a4-g10-22) Absissalari 1 va 2 bo'lgan nuqtalarda $f(x) = x^3 - 7x^2 + 14x - 7$ funksiya grafigiga o'tkazilgan urinmalar orasidagi burchak necha gradus?
A) 45 B) 30
C) 60 D) 90

11. (a5-g14-19) $y = 2x^3 - 5x^2 + 4x$ funksiyaga $x = 2$ nuqtada o'tkazilgan urinmaning burchak koeffitsiyentini toping.
A) 7 B) 2 C) 8 D) –10

12. (a5-g20-19) Qaysi nuqtalarda $y = \cos\left(3x + \frac{\pi}{2}\right)$ funksiyaga o'tkazilgan urinmalarning burchak koeffitsiyentlari 3 ga teng bo'ladi?
A) $x = \frac{\pi}{6} + \frac{2\pi n}{3}\ \ (n \in Z)$
B) $x = -\frac{\pi}{3} + \frac{2\pi n}{3}\ \ (n \in Z)$
C) $x = -\frac{\pi}{3} + 2\pi n\ \ (n \in Z)$
D) $x = \frac{2\pi n}{3}\ \ (n \in Z)$

13. (a5-g21-19) $y = \frac{6x - 3}{x^2 + 1}$ funksiyaga $x = 1$ nuqtada o'tkazilgan urinmaning OY o'qi bilan hosil qilgan burchagini toping.
A) arctg1,5 B) arctg0,5
C) arcctg0,5 D) arcctg1,5

14. (a5-g23-19) $y = \frac{x^2 + ax - 3}{x - 2}$ to'g'ri $y = 0,5x$ to'g'ri chiziqqa perpendikulyar bo'lsa, *a ning* qiymatini toping.
A) –2 B) 5
C) –1 D) –3,(6)

103. Urinma tenglamasi

1. (a1-g1-30) Quyida keltirilgan . nuqtalardan qaysi biri $f(x) = x^3 - 3x^2 + 2$ funksiya grafigiga $x_0 = 3$ nuqtadan o'tkazilgan urinma tenglamasiga tegishli?
A) (2; –7)
B) (1; –18)
C) (4; 5)
D) (2; –11)

2. (a1-g2-24) $f(x) = x^2 - 3x + 4$ parabolaga $x_0 = 3$ nuqtada o'tkazilgan urinma, OY o'qini qaysi nuqtada kesib o'tadi?
A) (0; 4) B) (0; 7)
C) (0; –5) D) (0; 0)

3. (a2-g7-23) Quyida keltirilgan nuqtalardan qaysi biri $f(x) = x^3 - 3x^2 + 2$ funksiya grafigiga $x_0 = 3$ nuqtadan o'tkazilgan urinma tenglamasiga tegishli?
A) (3; 2)
B) (1; –18)
C) (4; 5)
D) (2; –11)

4. (a3-g6-23) Qaysi nuqtada $y = x^2 + 2x - 8$ funksiyaning grafigiga o'tkazilgan urinma $y + 2x - 8 = 0$ to'g'ri chiziqqa parallel bo'ladi?
A) (2; 8) B) (–2; 8)
C) (–2; –8) D) (2; –8)

5. (a4-g17-22) $y = e^{3x}$ funksiyaga o'tkazilgan urinma koordinata boshidan o'tadi. Urinmaning bu funksiyaga urinish nuqtasi ordinatasini toping.
A) 0,(3) B) e^3
C) 1 D) e

6. (a5-g18-34) $y = \frac{2x+5}{x+1}$ funksiyaga $x = 2$ nuqtada o'tkazilgan urinma OY o'qini qaysi nuqtada kesib o'tadi?
A) 3 B) 2,(3)
C) 3,(6) D) 2

7. (a5-g22-19) $y = mx$ to'g'ri chiziq $y = x^3 + 2$ egri chiziqqa urinsa, m ning qiymatini toping.
A) 0,5 B) 2
C) 3 D) 0

8. (a6-g6-19) $f(x) = x - 2\ln\frac{x}{2} + 4$ funksiya grafigiga o'tkazilgan gorizontal urinma tenglamasini tuzing.
A) $y = 4$
B) $y = 6$
C) $y = 8 - \ln 4$
D) $y = 5 + 2\ln 2$

9. (a6-g22-6) $y = 2x^2 - 5x + 5$ parabolaning ordinatasi 2 ga teng bo'lgan ikki nuqtasidan ikki urinma o'tkazilgan. Shu urinmalarning kesishish nuqtasi ordinatasini toping.
A) 1,75 B) –2,5
C) –0,25 D) 0,75

10. (a6-g25-8) $y = \frac{1+\sin 2x+\cos 2x}{2(\sin x+\cos x)}$ funksiya absissasi $x_0 = \frac{2\pi}{3}$ nuqtadan o'tkazilgan urunma tenglamasini tuzing.
A) $y = \frac{\sqrt{3}}{2}x + \frac{2\sqrt{3}\pi+3}{6}$
B) $y = \frac{1}{2}x + \frac{4\pi-3\sqrt{3}}{6}$
C) $y = -\frac{\sqrt{3}}{2}x + \frac{2\sqrt{3}\pi-3}{6}$
D) $y = -\frac{1}{2}x + \frac{4\pi-3\sqrt{3}}{6}$

104. Hosilaning mexanik ma'nosi

1. (a1-g4-23) Bosib o'tilgan yo'l formulasi $S(t) = t^3 + 2t^2 + 5$ (m) bo'lgan avtomobilning 5-soniyadagi tezlanishini toping.
A) 34 B) 30
C) 28 D) 15

2. (a2-g3-32) Harakat tenglamasi $x = 12 + 4t - 0{,}2t^2$ (m) bo'lgan avtomobil necha soniyada to'xtaydi.
A) 12 B) 4
C) 10 D) 2

3. (a3-g5-23) Harakat tenglamasi $x = t^3 - 6t + \ln t$ bo'lgan jismning 2-soniyadagi tezlanishini toping.
A) 4
B) 5,75
C) 11,75
D) 6,5

4. (a3-g8-23) $y = 4 - \sqrt{4x+1}$ funksiyaning grafigiga, $x_0 = 2$ nuqtadan urinma va koordinata o'qlari bilan chegaralangan uchburchakning yuzini toping.
A) $\frac{49}{6}$ B) $\frac{49}{8}$
C) $\frac{49}{12}$ D) $\frac{49}{16}$

5. (a3-g17-23) Harakat tenglamasi $x = 12 + 4t - 0{,}2t^2$ (m) bo'lgan avtomobil necha soniyada to'xtaydi?
A) 12 B) 4
C) 10 D) 2

6. (a3-g18-23) Harakat tenglamasi $S(t) = t^2 - 32\ln t$ bo'lgan jism necha soniyada to'xtaydi?
A) 8 B) 4
C) 16 D) 2

7. (a4-g6-22) Bosib o'tilgan yo'l formulasi $S(t) = t^3 + 2t^2 + 5$ (m) bo'lgan avtomobilning 5-soniyadagi tezlanishini toping.
A) 34 B) 30
C) 28 D) 15

8. (a4-g7-22) Harakat tenglamasi $x = 4\sin\frac{\pi}{6}t$ bo'lgan tebranuvchi jismning $t = 2$ soniyadagi oniy tezligi modulini toping.
A) 2 B) $\frac{4}{3}$
C) $\frac{2\pi}{3}$ D) $\frac{\pi}{3}$

9. (a5-g24-19) $x = 3^x + 3t + 2t^3$ qonuniyat bilan harakatlanayotgan jismning 3-soniyadagi tezlanishini toping.
A) 63
B) $27\ln^2 3 + 36$
C) $27\ln 3 + 36$
D) $27\ln 3 + 57$

10. (a6-g9-20) Harakat tenglamasi $S = t^3 + 3t^2 - 2S + 1$ bo'lgan jismning $t = 2$ soniyadagi tezlanishini toping.
A) 18 B) 6
C) 12 D) 4

11. (a6-g16-27) Quyidagi mulohazalardan qaysi biri noto'g'ri?
A) Geometrik progressiyaning uchta hadi o'rtasidagi had qolgan ikki had o'rta geometrigiga teng.
B) $y = a^x$ $(a > 0)$ funksiya grafigi OX o'qini kesib o'tmaydi.
C) $y = \log_a x$ $(a > 0)$ funksiya grafigi OX o'qini (1; 0) nuqtada kesib o'tadi.
D) Tezlik tenglamasidan olingan hosila harakat tenglamasini ifodalaydi.

12. (a6-g19-3) $x = t^3 - 9t^2 + 15t$ qonuniyat bilan harakatlanayotgan jism harakat boshlangandan so'ng qaysi vaqt onlarida to'xtaydi?
A) 1; 5
B) $\frac{9-\sqrt{21}}{2}$; $\frac{9+\sqrt{21}}{2}$
C) 3; 5
D) $\frac{9-\sqrt{21}}{6}$; $\frac{9+\sqrt{21}}{6}$

16-bob. Boshlang'ich funksiya va integral

105. Boshlang'ich funksiya haqida tushuncha. Boshlang'ich funksiya xossalari. Boshlang'ich funksiyani topish jadvali

1. (a1-g2-25) $y = \sin(\sin x)\cdot\cos x$ funksiyaning boshlang'ichini toping.
A) $\sin(\sin x)$
B) $\cos(\sin x)$
C) $-\sin(\sin x)$
D) $-\cos(\sin x)$

2. (a1-g5-24) $y = \frac{1}{x^2-4}$ funksiyaning boshlang'ichini toping.

A) $\frac{x-2}{4}$ B) $\ln x^2 - 4$

C) $\ln\frac{x-2}{x+2}$ D) $\ln\frac{x-2}{x-2}$

3. (a1-g17-24) $y = \frac{1}{x\ln x}$ funksiyaning boshlang'ich funksiyasini ko'rsating.

A) $\ln^2 x$ B) $\ln x$

C) $\ln(\ln x)$ D) $x\ln x$

4. (a2-g3-27) Quyidagi funksiyaning boshlang'ich funksiyasini toping.

$f(x) = \frac{x-1}{x+2}$

A) $F(x) = \ln|x-1| + x + C$

B) $F(x) = \ln|x+2| + 3x + C$

C) $F(x) = x - 3\ln|x+2| + C$

D) $F(x) = x^{\ln(x-1)} + x + C$

5. (a2-g4-25) $F(x) = \sin(\cos x) + C$ funksiya quyidagilardan qaysi birining boshlang'ich funksiyasi?

A) $f(x) = \cos x\cdot\cos(\cos x)$

B) $f(x) = \sin x\cdot\cos(\cos x)$

C) $f(x) = -\cos x\cdot\sin(\cos x)$

D) $f(x) = -\sin x\cdot\cos(\cos x)$

6. (a2-g7-24) Berilgan funksiyaning boshlang'ich funksiyasini toping.

$f(x) = (2x-3)^2 + \frac{2}{x}$

A) $1+\sqrt{3}$

B) $\sqrt{2}$

C) $F(x) = \frac{1}{6}(2x-3)^3 + 2\ln|x| + c$

D) $F(x) = \frac{1}{6}(2x-3)^3 + \frac{4}{x^2} + c$

7. (a2-g9-25) $f(x) = \cos 4x\cdot\sin^5 4x$ funksiyaga boshlang'ich funksiyani toping.

A) $F(x) = -\frac{1}{96}\sin 4x\cdot\cos^6 4x$

B) $F(x) = \frac{1}{24}\sin^6 4x$

C) $F(x) = -\frac{1}{24}\cos^6 4x$

D) $F(x) = (\cos 4x + \sin 4x)^6$

8. (a2-g11-25) Funksiyaning boshlang'ich funksiyasini toping.

$f(x) = (2x-5)\cdot\sin(x^2-5x+7)$

A) $F(x) = \cos(x^2-5x+7) + C$

B) $F(x) = \sin(x^2-5x+7) + C$

C) $F(x) = -\cos(x^2-5x+7) + C$

D) $F(x) = -\sin(x^2-5x+7) + C$

9. (a2-g12-33) Quyidagilardan qaysi biri $f(x) = \frac{1}{x}$ funksiyaning boshlang'ich funksiyasi bo'lishi mumkin?

A) $\ln x^2$ B) $\ln 3x$ C) $\frac{1}{x^2}$ D) $\ln\frac{1}{x}$

10. (a2-g15-25) $F(x) = \ln(x^2-3x) + C$ funksiya quyidagilardan qaysi birining boshlang'ich funksiyasi?

A) $f(x) = \frac{x-3}{x^2-3x+c}$

B) $f(x) = \frac{2x-3}{x^2-3x}$

C) $f(x) = \ln(x^2-3x)\cdot(2x-3)$

D) $f(x) = \frac{\ln(x^2-3x)\cdot x + 2x - 3}{x^2-3x}$

11. (a2-g23-24) Quyidagilardan qaysi biri $f(x) = \frac{1}{x}$ funksiyaning boshlang'ich funksiyasi bo'lishi mumkin?

A) $\ln x^2$ B) $\ln 3x$

C) $\frac{1}{x^2}$ D) $\ln\frac{1}{x}$

12. (a3-g8-24) $y = e^{9x} - \sin 4x$ funksiyaning boshlang'ich funksiyalaridan birini ko'rsating.

A) $\frac{1}{9}e^{9x} + \frac{1}{4}\cos 4x$

B) $9e^{9x} + 4\cos 4x$

C) $9e^{9x} - 4\cos 4x$

D) $\frac{1}{9}e^{9x} - \frac{1}{4}\cos 4x$

13. (a3-g12-25) $F(x) = \ln(x^3-3x^2) + C$ funksiya quyidagilardan qaysi birining boshlang'ich funksiyasi?

A) $f(x) = \frac{3x^2-6x}{x^3-3x^2}$

B) $f(x) = \frac{3x^2+3x}{x^3-3x^2+C}$

C) $f(x) = \ln(x^3-3x^2)\cdot(3x^2-6x)$

D) $f(x) = \frac{\ln(x^3-3x^2)\cdot(3x^2-6x)}{x^3-3x^2} + \frac{x^3-6x}{x^3-3x^2}$

14. (a3-g14-24) Boshlang'ich funksiyani topish uchun berilgan formulalardan qaysilari noto'g'ri?

1) $f(x) = \frac{1}{x}$; $x>0$ $F(x) = \ln|x| + C$;

2) $f(x) = a^x$ $F(x) = \frac{a^x}{\ln a} + C$;

3) $f(x) = \cos x$ $F(x) = -\sin x + C$;

4) $f(x) = \frac{1}{\sin^2 x}$ $F(x) = \operatorname{ctg}x + C$;

5) $f(x) = \frac{1}{\cos^2 x}$ $F(x) = -\operatorname{tg}x + C$.

A) 1; 2; 3 B) 2; 3; 5

C) 2; 3; 4 D) 3; 4; 5

15. (a3-g15-23) $F(x) = 5\operatorname{tg}x + 3x + C$ quyidagi funksiyalardan qaysi birining boshlang'ich funksiyasi?

A) $y = \frac{5}{\sin^2 x} + 3$

B) $y = \frac{5}{\sin^2 x} + 3$

C) $y = \frac{5}{\cos^2 x} + 3$

D) $y = \frac{5}{\cos^2 x} + 3$

16. (a3-g17-24) Quyidagi funksiyaning boshlang'ich funksiyasini toping.

$f(x) = \frac{2x-1}{x+2}$

A) $F(x) = 2x - 5\ln|x+2| + C$

B) $F(x) = \ln|x+2| + 3x + C$

C) $F(x) = 5x - 2\ln|x+2| + C$

D) $F(x) = x^{\ln(2x-1)} + x + C$

17. (a3-g18-24) $y = 4y'$ tenglikni qanoatlantiruvchi funksiyani ko'rsating.

A) $y = C\cdot e^{4x}$ B) $y = C\cdot e^{0,25x}$

C) $y = 4C\cdot e^x$ D) $y = 0,25C\cdot e^x$

18. (a3-g21-23) $f(x)$ funksiyaning boshlang'ichi $F(x)$ bo'lsa, $f(0,2x)$ funksiyaning boshlang'ichi quyidagilardan qaysi biriga teng?

A) $0,2F(0,2x)$ B) $5F(5x)$

C) $5F(0,2x)$ D) $0,2F(5x)$

19. (a3-g22-23) $F(x) = \cos(x^3+3)$ funksiya quyidagilardan qaysi birining boshlang'ichi?

A) $3x^2\sin(x^3+3)$

B) $-3x^2\sin(x^3+3)$

C) $(3x^2+1)\cdot\sin(x^3+3)$

D) $-(3x^2+1)\cdot\sin(x^3+3)$

20. (a4-g2-23) Boshlang'ich funksiyani topish uchun berilgan formulalardan qaysilari noto'g'ri?

1) $f(x) = \frac{1}{x}$; $x>0$, $F(x) = \ln x + C$;

2) $f(x) = a^x$, $F(x) = a^x\ln a + C$;

3) $f(x) = \sin x$, $F(x) = \cos x + C$;

4) $f(x) = \frac{1}{\sin^2 x}$, $F(x) = -\operatorname{ctg}x + C$;

5) $f(x) = \frac{1}{\cos^2 x}$, $F(x) = -\operatorname{tg}x + C$.

A) 1; 3; 5 B) 2; 3; 5

C) 2; 3; 4 D) 2; 4; 5

21. (a4-g4-24) Quyidagi funksiyaning boshlang'ichini toping.

$\sin(5x+3) - \frac{1}{x} + \ln 3$

A) $\cos(5x+3) - \frac{1}{x^2} + \frac{\ln 3}{x} + C$

B) $\frac{-\cos(5x+3)}{5} + \frac{1}{x^2} + \frac{\ln 3}{x} + C$

C) $\frac{-\cos(5x+3)}{5} - \ln x + x\cdot\ln 3 + C$

D) $\frac{\cos(5x+3)}{5} - \ln x + \frac{\ln 3}{x} + C$

22. (a4-g9-2) Hisoblang:

$$0,(3)+\frac{-1,(2)}{0,0(6)}$$

A) $\frac{-55}{3}$ B) -18

C) $-\frac{52}{3}$ D) -3

23. (a4-g22-24) $y=(2x+3)^3$ funksiyaning boshlang'ichini toping.

A) $F(x)=\frac{(2x+3)^4x^2}{4}+C$

B) $F(x)=24x^4+72x^3+54x^2+27x+C$

C) $F(x)=\frac{8}{3}x^4+18x^3+54x^2+27x+C$

D) $F(x)=2x^4+12x^3+27x^2+27x+C$

24. (a4-g23-23) $F(x)=\ln(x^2+4)$ quyidagilardan qaysi birining boshlang'ichi?

A) $\frac{\ln^2(x^2+4)}{2}$

B) $\frac{2}{x^2+4}$

C) $x^2+4+\ln(x^2+4)$

D) $\frac{2x}{x^2+4}$

25. (a5-g1-23) $f(x)=\frac{2}{x^2+x}$ funksiyaning boshlang'ichini toping.

A) $\ln\left(\frac{x}{x+1}\right)+C$

B) $\ln\left(\frac{x}{x+1}\right)^2+C$

C) $\ln(x^2+x)^2+C$

D) $\ln(x^2+x)+C$

26. (a5-g11-20) Quyidagi funksiyaning boshlang'ichini toping.

$$\sin(5x+3)-\frac{1}{x}+\ln 3$$

A) $\cos(5x+3)-\frac{1}{x^2}+\frac{\ln 3}{x}+C$

B) $\frac{-\cos(5x+3)}{5}+\frac{1}{x^2}+\frac{\ln 3}{x}+C$

C) $\frac{-\cos(5x+3)}{5}-\ln x+\ln 3\cdot x+C$

D) $\frac{\cos(5x+3)}{5}-\ln x+\frac{\ln 3}{x}+C$

27. (a5-g14-20) $F(x)=24x^5-\frac{4}{x}+3^x$ funksiya quyidagilardan qaysi birining boshlang'ichi?

A) $4x^5-4\ln x+\frac{3^x}{\ln 3}$

B) $\frac{4}{25}$

C) $120x^5-4\ln x+\frac{3^x}{\ln 3}$

D) $120x^4+\frac{4}{x^2}+3^x\ln 3$

28. (a5-g18-20) $y=\mathrm{tg}^2x$ funksiyaning boshlang'ichini toping.

A) $y=\frac{\mathrm{tg}^3x}{3}\cdot\cos^2x+C$

B) $y=\frac{\cos^2x}{2\mathrm{tg}x}+C$

C) $y=x+ctgx+C$

D) $y=\mathrm{tg}x-x+C$

29. (a5-g21-20) Quyidagi funksiyaning boshlang'ichini toping.

$$\sin(5x+3)-\frac{1}{x}+\ln 3$$

A) $\cos(5x+3)-\frac{1}{x^2}+\frac{\ln 3}{x}+c$

B) $\frac{-\cos(5x+3)}{5}+\frac{1}{x^2}+\frac{\ln 3}{x}+c$

C) $\frac{-\cos(5x+3)}{5}-\ln x+\ln 3\cdot x+c$

D) $\frac{\cos(5x+3)}{5}-\ln x+\frac{\ln 3}{x}+c$

30. (a6-g7-20) $f(x)=2\cos x-4\sin x$ funksiyaning boshlang'ich funksiyasi $F(x)$ va $F\left(\frac{\pi}{3}\right)=\sqrt{3}+5$ bo'lsa, $F(\pi)=?$

A) 5
B) 7
C) –1
D) 1

31. (a6-g15-8) Quyidagi funksiyaning boshlang'ichini toping.

$$f(x)=\sin(5x+3)-\frac{1}{x}+\ln 3.$$

A) $\cos(5x+3)-\frac{1}{x^2}+\frac{\ln 3}{x}+c$

B) $\frac{-\cos(5x+3)}{5}+\frac{1}{x^2}+\frac{\ln 3}{x}+c$

C) $\frac{-\cos(5x+3)}{5}-\ln x+\ln 3\cdot x+c$

D) $\frac{\cos(5x+3)}{5}-\ln x+\frac{\ln 3}{x}+c$

32. (a6-g21-17) $y=\frac{1}{x^2+2x}$ funksiyaning boshlang'ichini toping.

A) $2\ln\frac{x+2}{x}+C$

B) $2\ln\frac{x}{x+2}$

C) $\frac{1}{2}\ln\frac{x}{x+2}+C$

D) $\frac{1}{2}\ln\frac{x+2}{x}$

106. Boshlang'ich funksiyani topish qoidalari

1. (a1-g8-25) $f(x)=\frac{1}{x^2-4}$ funksiyaning boshlang'ichini toping.

A) $\frac{1}{4}\ln\left|\frac{x-2}{x+2}\right|$

B) $\ln|x^2-4|$

C) $\frac{1}{4}\ln\left|\frac{x+2}{x-2}\right|$

D) $\frac{1}{4}\ln|x^2-4|$

2. (a1-g9-25) $f(x)=\frac{\cos(\ln 2x)}{x}$ funksiyaning boshlang'ich funksiyasini toping.

A) $0,5\sin(\ln 2x)+c$
B) $\cos(\ln 2x)+c$
C) $\sin(\ln 2x)+c$
D) $2\sin(\ln 2x)+c$

3. (a1-g11-25) $f(x)=\cos 4x\cdot\sin^5 4x$ funksiyaga boshlang'ich funksiyani toping.

A) $F(x)=-\frac{1}{96}\sin 4x\cdot\cos^6 4x$

B) $F(x)=\frac{1}{24}\sin^6 4x$

C) $F(x)=-\frac{1}{24}\cos^6 4x$

D) $F(x)=(\cos 4x+\sin 4x)^6$

4. (a1-g13-24) $f(x)=x\cdot\cos x^2$ funksiyaning boshlang'ich funksiyasini ko'rsating.

A) $\sin x^2$ B) $\sin 2x^2$
C) $\sin^2x^2$ D) $0,5\sin x^2$

5. (a2-g1-24) $f(x)$ funsiyaning boshlang'ichi $F(x)$ bo'lsa, $f(0,5x)$ ning boshlang'ichi quyidagilardan qaysi biriga teng?

A) $F(0,5x)$
B) $0,5F(x)$
C) $2F(0,5x)$
D) $0,5F(0,5x)$

6. (a2-g5-24) $f(x)=\cos 3x\cdot\sin^6 3x$ funksiyaga boshlang'ich funksiyani toping.

A) $F(x)=(\sin 3x-\cos 3x)^7$

B) $F(x)=\frac{1}{63}\sin 3x\cdot\cos^7 4x$

C) $F(x)=-\frac{1}{21}\cos^7 3x$

D) $F(x)=\frac{1}{21}\sin^7 3x$

7. (a2-g6-24) Quyidagi funksiyaning boshlang'ich funksiyasini toping.

$$f(x)=\frac{x-3}{x+3}$$

A) $F(x) = \ln|x-3| + x + C$
B) $F(x) = \ln|x+2| + 3x + C$
C) $F(x) = x - 6\ln|x+3| + C$
D) $F(x) = x^{\ln(x-3)} + x + C$

8. (a2-g8-26) $f(x) = 8x^3 - 5$ funksiyaning grafigi A(1; 4) nuqtadan o'tuvchi boshlang'ich funksiyasini toping.
A) $2x^4 - 5x + 1$
B) $2x^4 - 5x + 7$
C) $4x^4 - 5x - 1$
D) $4x^4 - 5x - 7$

9. (a2-g17-23) $y = 2\sin^2 x + x$ funksiyaning o'sish oraliqlarini toping.
A) $\left[-\frac{\pi}{12}+\pi n; \frac{7\pi}{12}+\pi n\right],\ n \in Z$
B) $\left[-\frac{\pi}{6}+2\pi n; \frac{7\pi}{6}+2\pi n\right],\ n \in Z$
C) $\left[\frac{7\pi}{12}+\pi n; \frac{11\pi}{12}+\pi n\right],\ n \in Z$
D) $\left[\frac{5\pi}{12}+\pi n; \frac{11\pi}{12}+\pi n\right],\ n \in Z$

10. (a3-g1-24) Quyidagi funksiyaning boshlang'ichini toping.
$\sin(5x+3) - \frac{1}{x} + \ln 3$
A) $\cos(5x+3) - \frac{1}{x^2} + \frac{\ln 3}{x} + c$
B) $\frac{-\cos(5x+3)}{5} + \frac{1}{x^2} + \frac{\ln 3}{x} + c$
C) $\frac{-\cos(5x+3)}{5} - \ln x + \ln 3 \cdot x + c$
D) $\frac{\cos(5x+3)}{5} - \ln x + \frac{\ln 3}{x} + c$

11. (a3-g3-26) $f(x) = 8x^3 - 5$ funksiyaning grafigi A(2; 7) nuqtadan o'tuvchi boshlang'ich funksiyasini toping.
A) $2x^4 - 5x + 1$
B) $2x^4 - 5x - 15$
C) $4x^4 - 5x - 1$
D) $4x^4 - 5x + 15$

12. (a3-g4-24) $F(x) = \ln(x^2 - 3x) + C$ funksiya quyidagilardan qaysi birining boshlang'ich funksiyasi?
A) $f(x) = \frac{x-3}{x^2-3x+c}$
B) $f(x) = \frac{2x-3}{x^2-3x}$
C) $f(x) = \ln(x^2-3x)\cdot(2x-3)$
D) $f(x) = \frac{\ln(x^2-3x)\cdot x + 2x - 3}{x^2-3x}$

13. (a3-g5-24) $y = 3y'$ tenglikni qanoatlantiruvchi funksiyani toping.
A) $y = C \cdot e^{\frac{x}{3}}$ B) $y = C \cdot e^{3x}$
C) $y = C \cdot e^{\frac{3}{x}}$ D) $y = C \cdot e^{\frac{1}{3x}}$

14. (a3-g6-24) $y = \frac{2x^3+2}{x+1}$ funksiyaning boshlang'ich funksiyasi qaysi javobda to'g'ri ko'rsatilgan?
A) $\frac{2x^3}{3} + x^2 + 2x + c$
B) $\frac{2x^3}{3} - x^2 + 2x + c$
C) $2x^3 + 2x^2 + 2x + c$
D) $\frac{2x^3}{3} - 2x^2 + 4x + c$

15. (a3-g9-24) $y = 3y'$ tenglikni qanoatlantiruvchi funksiyani ko'rsating.
A) $y = Ce^{3x}$ B) $y = Ce^{\frac{1}{3}x}$
C) $y = \frac{C}{3}e^{3x}$ D) $y = 3Ce^{x}$

16. (a3-g10-25) Funksiyaning boshlang'ich funksiyasini toping.
$f(x) = (3x^2 - 4x)\cdot\cos(x^3 - 2x^2 + 12)$
A) $F(x) = \cos(x^3 - 2x^2 + 12) + C$
B) $F(x) = \sin(x^3 - 2x^2 + 12) + C$
C) $F(x) = -\cos(x^3 - 2x^2 + 12) + C$
D) $F(x) = -\sin(x^3 - 2x^2 + 12) + C$

17. (a3-g15-24) $f(x) = x - \frac{x^2}{2}$ funksiyaning (6; 2)nuqtadan o'tuvchi boshlang'ich funksiyasini toping.
A) $\frac{x^2}{2} - \frac{x^3}{6} + 20$
B) $\frac{x^2}{2} + \frac{x^3}{6} - 56$
C) $\frac{x^2}{2} - \frac{x^3}{6} + 18$
D) $\frac{x^2}{2} - \frac{x^3}{6} - 18$

18. (a3-g16-24) $f(x)$ funksiyaning boshlang'ichi $F(x)$ bo'lsa, $f(0,5x)$ funksiyaning boshlang'ichi qanday bo'ladi?
A) $\frac{1}{2}F\left(\frac{x}{2}\right)$
B) $2F\left(\frac{x}{2}\right)$
C) $\frac{1}{2}F(x)$
D) $2F(x)$

19. (a3-g23-23) Quyidagi funksiyaning boshlang'ich funksiyasini toping.
$f(x) = 4\sin^3 x \cdot \cos x$
A) $\sin^3 x + C$
B) $\frac{\sin^4 x}{3} + C$
C) $\frac{\sin^4 x}{4} + C$
D) $\sin^4 x + C$

20. (a4-g5-23) $F(x) = \ln(x^2 - 3x) + C$ funksiya quyidagilardan qaysi birining boshlang'ich funksiyasi?
A) $f(x) = \frac{x-3}{x^2-3x+c}$
B) $f(x) = \frac{2x-3}{x^2-3x}$
C) $f(x) = \ln(x^2-3x)\cdot(2x-3)$
D) $f(x) = \frac{\ln(x^2-3x)\cdot x + 2x - 3}{x^2-3x}$

21. (a4-g8-25) $F(x) = \ln(4x^3 - 2x^2) + C$ funksiya quyidagilardan qaysi birining boshlang'ich funksiyasi?
A) $f(x) = \frac{12x^2-4x}{4x^3-2x^2}$
B) $f(x) = \frac{12x^2+4x}{4x^3-2x^2+C}$
C) $f(x) = \ln(4x^3-2x^2)\cdot(12x^2-4x)$
D) $f(x) = \frac{\ln(4x^3-2x^2)\cdot(12x^2-4x)}{4x^3-2x^2} + \frac{4x^3-2x^2}{4x^3-2x^2}$

22. (a4-g17-23) $y = \frac{\cos 2x}{\sin^2 x}$ funksiyaning boshlang'ichini toping.
A) $Y = -2x - \operatorname{ctg}x + C$
B) $Y = 2x + \operatorname{ctg}x + C$
C) $Y = \ln(\sin^2 x) + C$
D) $Y = -2x + \operatorname{ctg}x + C$

23. (a5-g7-23) $y = \frac{2x+1}{x^2+1}$ ning boshlang'ich funksiyasini toping.
A) $\ln|x^2+1|$
B) $\ln|x^2+1| + \operatorname{arctg}x + C$
C) $\ln x + \operatorname{arctg}x + C$
D) $\operatorname{arctg}(x^2+1) + C$

24. (a5-g12-20) Quyidagilardan qaysi biri $y = \frac{\ln^8 x}{x}$ funksiyaning boshlang'ichidan biri?
A) $\frac{\ln^9 x}{9x} + 3$
B) $\frac{\ln^9 x}{9} + 7$
C) $\frac{\ln^7 x}{x^2} + 5$
D) $\frac{x^2 \cdot \ln^8 x}{8} + 3$

25. (a5-g15-29) $0,25y' = y$ tenglamani yeching.
A) $y = e^{4x}$
B) $y = e^{0,25x}$
C) $y = 0,25e^{x}$
D) $y = 4e^{x}$

26. (a5-g17-24) $y' = \frac{5y}{x}$ tenglikni qanoatlantiruvchi funksiyani toping.
A) $y = Cx^4$ B) $y = Cx^5$
C) $y = Cx^4$ D) $y = Cx^5$

27. (a5-g24-20) Ifodaning boshlang'ichidan birini toping.
$y = \frac{\ln^4 x}{x}$
A) $y = \frac{\ln^5 x}{5x^2}$
B) $y = \frac{2\ln^5 x}{5x^2}$
C) $y = \frac{\ln^6 x}{5}$
D) $y = \frac{x\ln^3 x}{3}$

28. (a6-g13-12) $y = (1+x)\sqrt{x}$ funksiyaning boshlang'ichini toping.
A) $2x\sqrt{x}\left(\frac{1}{3}+\frac{x}{5}\right)+C$
B) $2\sqrt[3]{x}\left(\frac{1}{3}+\frac{x}{5}\right)+C$
C) $\frac{1}{2\sqrt{x}}+\frac{2}{3}\sqrt{x}+C$
D) $\frac{1}{3\sqrt[3]{x}}+\frac{3}{4}\sqrt[3]{x}+C$

29. (a6-g16-26) $0{,}25y' = y$ tenglamani yeching.
A) $y = Ce^{4x}$
B) $y = Ce^{0{,}25x}$
C) $y = 0{,}25Ce^x$
D) $y = 4Ce^x$

30. (a6-g25-23) $y = \frac{4x-12}{x^2-6x}$ funksiyaning boshlang'ichini toping.
A) $y = \ln\frac{2x-6}{x^2}+C$
B) $y = \ln\sqrt{x^2-6x}+C$
C) $y = \ln(x^2-6x)^2+C$
D) $y = \ln\frac{2x-6}{4x^2-24}$

107. Aniq integral

1. (a1-g1-17) Hisoblang:
$\int_1^5 \frac{x^2+5x+7}{x+3}dx$
A) 10 + ln2
B) 20 + ln2
C) 15
D) ln25

2. (a1-g3-5) Integralni hisoblang.
$\int_0^2 (1-2x)^2\,dx$
A) $4\frac{1}{2}$ B) $-3\frac{1}{3}$
C) $-4\frac{1}{2}$ D) $4\frac{2}{3}$

3. (a1-g4-24) $\int_0^3 \frac{2x+3}{2x+1}dx = a+\ln 7$ bo'lsa, a nechaga teng?
A) 9 B) 4
C) 0 D) 3

4. (a1-g7-22) Tenglamani yeching.
$\int_t^t (4x+10)\,dt = 100$
A) 5 B) 8
C) 10 D) 4

5. (a1-g10-25) Hisoblang:
$\int_1^3 \frac{4x+1}{2x^2+x-2}dx$
A) ln2,6
B) ln19
C) ln13 – 5
D) 18

6. (a1-g12-18) Integralni hisoblang.
$\int_0^{\frac{\pi}{4}} \sin x\cdot\cos^7 x\,dx$
A) $-\frac{15}{128}$ B) $-\frac{15}{16}$
C) $\frac{1}{16}$ D) $\frac{15}{16}$

7. (a1-g14-24) Integralni hisoblang.
$\int_0^{\pi/6} \sin 5x\cdot\sin 2x\,dx$
A) $-\frac{17}{42}$ B) $-\frac{17}{84}$
C) $\frac{11}{84}$ D) $\frac{17}{84}$

8. (a1-g15-24) Hisoblang:
$\int_1^2 \frac{10x-4}{5x^2-4x}dx$
A) ln6
B) ln12 – 2
C) ln12
D) 6

9. (a2-g2-25) Hisoblang:
$\int_2^4 \frac{2x}{(x+1)^2}dx$
A) ln2 B) $\ln\frac{5}{3}$
C) $2\ln\frac{5}{3}$ D) 2ln2

10. (a2-g10-25) Hisoblang:
$\int_1^2 \frac{6x-2}{3x^2-2x}dx$
A) ln2,5 B) ln5 – 2
C) 3ln2 D) 7

11. (a2-g13-28) $\frac{5}{4}$ tenglamada a ni qanoatlantiruvchi qiymatlari yig'indisini toping.
A) 0,5 B) 2
C) 3 D) 2,5

12. (a2-g14-29) Hisoblang:
$\int_1^e \frac{\ln^2 x}{x}dx$
A) 3^{-1} B) $\frac{1}{3}+e$
C) $3e$ D) $\frac{2}{3}$

13. (a2-g16-24) Aniq integralni hisoblang.
$\int_2^5 \frac{dx}{2x-2}$
A) ln2 B) ln16
C) ln4 D) $\ln\sqrt{2}$

14. (a2-g18-24) Hisoblang:
$\int_1^2 \frac{6x-2}{3x^2-2x}dx$
A) ln2,5 B) ln5 – 2
C) 3ln2 D) 7

15. (a2-g19-24) $\int_3^5 \frac{1}{x^2-4}dx = ?$
A) $\frac{\ln 7}{4}$ B) $\frac{4}{\ln\frac{15}{7}}$
C) $\frac{\ln\frac{15}{7}}{4}$ D) $\frac{\ln\frac{7}{15}}{4}$

16. (a2-g20-24) Tenglamani yeching.
$\int_{-t}^{t} (4x+10)dx = 100,\quad t = ?$
A) 5 B) 8
C) 6 D) 10

17. (a2-g21-25) Hisoblang:
$\int_{\pi/4}^{\pi/2} \cos 3x\cdot\cos 5x\,dx$
A) $-\frac{1}{4}$ B) $-\frac{3}{4}$
C) $-\frac{1}{8}$ D) $-\frac{5}{16}$

18. (a2-g22-24) $\int_{-1}^{t} (6x+12)dx = 120$ bo'lsa, t ning qiymatini toping.
A) 5 B) 8
C) 6 D) 10

19. (a3-g2-24) Hisoblang:
$\int_0^2 (2+x)^3 dx$
A) 50 B) 40
C) 45 D) 60

20. (a3-g7-24)

$\int_0^a (x^2-1)dx = 6$ va $a > 0$ bo'lsa, a = ?

A) 1 B) 2
C) 3 D) 6

21. (a3-g11-24) Hisoblang:

$\int_{-2}^{3} |x+1|dx$

A) $\frac{3}{5}$ B) $\frac{9}{4}$
C) $\frac{16}{5}$ D) $\frac{17}{2}$

22. (a3-g19-24) Aniq integralni hisoblang.

$\int_1^2 (3+2x^2)^2 dx$

A) 12,8 B) 72,4
C) 59,6 D) 61,8

23. (a3-g20-24) Aniq integralni hisoblang.

$\int_e^{e^2} \ln x^2 dx$

A) $2e$ B) $2e^2$
C) e^2-1 D) $4e$

24. (a3-g24-23) Hisoblang:

$\int_1^2 \frac{x^3+1}{x^2}dx$

A) 2 B) 3
C) 4 D) 6

25. (a4-g6-23) Aniq integralni hisoblang.

$\int_0^2 \sqrt{x^3+2x+4}\cdot(6x^2+4)dx$

A) 14 B) $\frac{105}{4}$
C) $\frac{200}{3}$ D) $\frac{224}{3}$

26. (a4-g9-23) Aniq integralni hisoblang.

$\int_0^1 \frac{x^2+x+1}{x+1}dx$

A) 1 + ln2 B) ln2
C) $\ln 2\sqrt{e}$ D) 2 + ln2

27. (a4-g10-23) $\int_{-1}^{2} (|x|+|x-2|)dx$ = ?

A) 10 B) 8
C) 7 D) 5

28. (a4-g11-8) Hisoblang $\int_{-1}^{3} |3-x|dx$

A) 16 B) 4
C) 8 D) 9

29. (a4-g11-31) 31. $\int_a^b (2x-1)dx = 50$ va $a + b = 11$ bo'lsa, a = ?

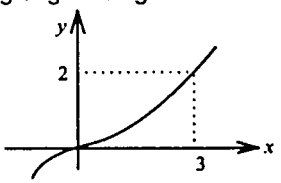
A) 1 B) 2 C) 3 D) 4

30. (a4-g13-28)

$\int_{\frac{4\pi}{3}}^{\frac{5\pi}{3}} |\sin x|dx$ ni hisoblang.

A) 1,5 B) 2
C) 1 D) –1,5

31. (a4-g14-33) Quyida $f(x)$ funksiya grafigi keltirilgan.



$\int_0^3 f^2(x)\cdot f'(x)dx$ = ?

A) $\frac{8}{3}$ B) $\frac{4}{3}$
C) 9 D) $\frac{2}{3}$

32. (a4-g18-23) $\int_m^n xdx = \int_{-n}^{-m} dx$ bo'lsa, $m + n$ ning qiymatini toping ($n > m$).

A) 4 B) 2
C) 1 D) –4

33. (a4-g19-22) $y = \cos(\sin 5x)$ funksiyaning hosilasini toping.

A) $\cos 5x\cdot\cos(\sin 5x)$
B) $-\sin(\sin 5x)$
C) $-\sin(\cos 5x)$
D) $-5\cos 5x\cdot\sin(\sin 5x)$

34. (a4-g19-23) Aniq integralni hisoblang.

$\int_0^{\frac{\pi}{6}} \sin 5x\cdot\sin 2x dx$

A) $\frac{17}{84}$ B) $\frac{11}{84}$
C) $\frac{3}{14}$ D) $\frac{11}{42}$

35. (a4-g20-23) Aniq integralni hisoblang.

$\int_{-\frac{5\pi}{3}}^{-\frac{4\pi}{3}} |\sin x|dx$

A) –1 B) $-\sqrt{3}$
C) 1 D) $\sqrt{3}$

36. (a4-g24-22) Integralni hisoblang.

$\int_0^2 (3x-1)^2 dx$

A) 38 B) 12
C) 8 D) 14

37. (a5-g2-23) Aniq integralni hisoblang.

$\int_e^{e^3} \frac{dx}{x\cdot\ln x}$

A) 0 B) 1 C) ln3 D) ln2

38. (a5-g5-23) Hisoblang:

$\int_{-1}^{3} |3-x|dx$ = ?

A) 16 B) 8
C) 4 D) 12,5

39. (a5-g6-23) Integralni hisoblang.

$\int_{-2}^{2} \frac{x^2-3x+4}{3-x}dx$ = ?

A) 1 B) 2ln5
C) 6ln5 D) 4ln0,2

40. (a5-g9-24) Hisoblang:

$\int_{-1}^{1} \frac{x^2+2}{x^2}dx$

A) –6 B) –2 C) 0 D) 1

41. (a5-g10-22) Aniq integralni hisoblang.

$\int_0^{\frac{\pi}{6}} \sin 5x\cdot\sin 2x dx$

A) $-\frac{17}{42}$ B) $\frac{17}{84}$
C) $\frac{17}{42}$ D) $\frac{11}{84}$

42. (a5-g13-20) Aniq integralni hisoblang.

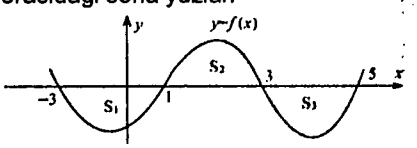
$\int_{-1}^{2} x^2\cdot|x|dx$

A) 4,25 B) 3,75
C) 5,75 D) 7,25

43. (a5-g20-20) $\int_2^x (t-1)dt \le 4$, $(x > 2)$ tengsizlikni yeching.

A) $[4;\infty)$ B) $(2;8]$
C) $[-2;4]$ D) $(2;4]$

44. (a5-g25-20) Rasmda S_1, S_2 va S_3 $f(x)$ funksiya va koordinata o'qlari orasidagi soha yuzlari



$S_1 = 6$, $S_2 = 8$ va $S_3 = 5$ bo'lsa, $\int_{-3}^{5} f(x)dx$ ning qiymatini toping.

A) –3 B) 3 C) 19 D) –19

45. (a6-g1-20) Integralni hisoblang: $\int_3^4 \frac{xdx}{x^2-3x+2}$.

A) $\ln\frac{4}{3}$ B) $\frac{3}{2}\ln\frac{2}{3}$
C) $\ln\frac{3}{4}$ D) $\ln\frac{8}{3}$

46. (a6-g2-20) Aniq integralni hisoblang: $\int_0^{\pi/3} \sin 3x\cdot\sin 7x dx$.

A) $-\frac{3\sqrt{3}}{80}$ B) $-\frac{7\sqrt{3}}{80}$

C) $\frac{3\sqrt{3}}{80}$ D) $\frac{7\sqrt{3}}{80}$

47. (a6-g4-20) Hisoblang:

$\int_1^2 \frac{x^3+1}{x^2}dx$.

A) 2 B) 3
C) 4 D) 1

48. (a6-g8-20) Aniq integralni hisoblang:

$\int_0^1 \frac{(t-1)dt}{\sqrt[3]{t}-1}$.

A) $-\frac{17}{20}$ B) $-\frac{37}{20}$

C) $\frac{17}{20}$ D) $\frac{37}{20}$

49. (a6-g10-20) Quyida $f(x)$ funksiya grafigi keltirilgan $\int_0^3 f^2(x)\cdot f'(x)dx = ?$

A) $\frac{9}{2}$ B) $\frac{4}{3}$

C) $\frac{11}{3}$ D) $\frac{8}{3}$

50. (a6-g12-25) Aniq integralni hisoblang: $\int_0^3 \frac{24x-\log_2 256}{3x^2-2x+4}dx$.

A) $4\ln\frac{27}{4}$ B) $4\ln\frac{25}{4}$

C) $\ln\frac{625}{8}$ D) $\ln 6{,}25$

51. (a6-g18-17) $f(x)$ toq funksiya bo'lsa, $\int_{-3}^{3} f(x)dx$ quyidagilardan qaysi biriga teng?

A) $2\left|\int_0^3 f(x)dx\right|$

B) $\frac{1}{2}\left|\int_0^3 f(x)dx\right|$

C) 0

D) $6\left|\int_0^1 f(x)dx\right|$

52. (a6-g19-27) Aniq integralni hisoblang: $\int_1^2 \frac{x^3+1}{x^2}dx$.

A) 1 B) 4
C) 2 D) 0,5

53. (a6-g23-15) Aniq integralni hisoblang:

$\int_0^1 (x^2+7x+3)(14x+49)dx$.

A) 32 B) 56
C) 392 D) 693

54. (a6-g24-26) Aniq integralni hisoblang:

$\int_1^3 \frac{1}{\sqrt{2x+3}}dx$.

A) 2 B) 4
C) 1/3 D) 2/3

55. (a6-g26-20) Aniq integralni hisoblang: $\int_1^2 \frac{x^4+1}{x^3}dx$.

A) 1,5 B) 1,875
C) 1,125 D) 0,875

108. Egri chiziqli trapetsiya yuzi

1. (a1-g6-24) $y = x^3 + 5$, $y = 69$ va $x = 0$ chiziqlar bilan chegaralangan sohaning yuzini toping.
A) 192 B) 276
C) 84 D) 156

2. (a3-g13-24) $y = 4x^3 + 4$, $y = 36$ va $x = 0$ chiziqlar bilan chegaralangan sohaning yuzini toping.
A) 24 B) 72
C) 54 D) 48

3. (a3-g22-36) $y = |x - 1|$, $x = -1$, $x = 2$ va $y = 0$ chiziqlar bilan chegaralangan figurani absissalar o'qi atrofida aylantirish natijasida hosil bo'lgan jismning hajmini toping.
A) 3π B) 4π
C) 5π D) π

4. (a4-g3-26) $y = 6/x$ chiziq, $x = 6$, $y = 3$ to'g'ri chiziqlar bilan chegaralangan soha yuzasini toping.
A) $12 - 6\ln 3$
B) $6 + 6\ln 3$
C) $2 + 3\ln 3$
D) $6\ln 3$

5. (a4-g7-23) $y = \frac{3}{x}$; $y = 3$ va $x = 6$ chiziqlar bilan chegaralangan soha yuzini toping.
A) $\ln 216$
B) $18 - \ln 216$
C) $15 - 3\ln 6$
D) $6\ln 6$

6. (a4-g10-36) $y = |x + 2|$, $x = 3$, $x = 0$ va $y = 0$ to'g'ri chiziq bilan chegaralangan figurani absissalar o'qi atrofida aylantirish natijasida hosil bo'lgan jismning hajmini toping.
A) 39π B) 42π
C) 48π D) 36π

7. (a4-g13-22) 22. $y = \frac{1}{x}$ egri chiziq, $y = 1$ va $y = 4$ to'g'ri chiziqlari va y o'qi bilan chegaralangan soha yuzasini toping.
A) $\ln 4 - 0{,}25$
B) $\ln 3$
C) $\ln 3 - 0{,}5$
D) $\ln 4$

8. (a5-g2-24) $Q(x)\cdot P(x+1) = x^2 + x + 2$ tenglik berilgan. $Q(x)$ ko'phadni $x - 2$ ga bo'lgandagi qoldiq 4 ga teng bo'lsa, $P(3)$ ni toping.
A) 8 B) 4
C) 2 D) 1

9. (a5-g4-23) $y = 2x^3 + 5$, $y = 59$ va $x = 0$ chiziqlar bilan chegaralangan sohaning yuzini toping.
A) 177 B) 55,5
C) 84 D) 121,5

10. (a5-g16-20) $xy = 8$ egri chiziq, $x = 8$ va $y = 8$ to'g'ri chiziqlar bilan chegaralangan soha yuzini toping.
A) $56 - 24\ln 2$
B) $2 + 6\ln 2$
C) $64 - 8\ln 8$
D) $24\ln 2$

11. (a5-g19-20) $y = \operatorname{tg}x$, $x = \pi$, $y = \sqrt{3}$ va $y = \frac{1}{\sqrt{3}}$ chiziqlar hosil qilgan sohaning yuzini toping.

A) $\ln\sqrt{3} + \frac{4\pi}{3\sqrt{3}} - \frac{\pi}{3}$

B) $\frac{\ln 3}{2} + \frac{7\pi}{6\sqrt{3}}$

C) $\ln\frac{1}{\sqrt{3}} + \frac{4\pi}{3\sqrt{3}} - \frac{\pi}{12}$

D) $\ln\frac{1}{\sqrt{3}} + \frac{4\pi}{3\sqrt{3}} - \frac{\pi}{3}$

12. (a5-g22-20) $y = x^3$ egri chiziq hamda $y = 1$ va $x = 3$ to'g'ri chiziqlar bilan chegarlangan soha yuzini toping.
A) 20 B) 27
C) 26 D) 18

13. (a6-g3-20) $y = \sin x$, $y = \cos x$, $x = \frac{3\pi}{4}$ va $x = \frac{7\pi}{4}$ chiziqlar bilan chegaralangan soha yuzini toping.
A) $\sqrt{2}$ B) 2
C) $4\sqrt{2}$ D) $2\sqrt{2}$

14. (a6-g6-20) $y = x^2 + x + 6$ va $y = 6x$ chiziqlar kesishishidan hosil bo'lgan soha yuzini toping.

A) $\frac{1}{6}$ B) $\frac{2}{3}$

C) $8\frac{5}{6}$ D) $9\frac{1}{6}$

15. (a6-g14-8) $y = x + \frac{|x|}{x}$, $y = 0$, $x = 0$, $x = -2$ va $x = 4$ chiziqlar bilan chegaralangan soha yuzini toping.
A) 8 B) 24
C) 16 D) 12

16. (a6-g20-23) $y = x^3 - 8$, $y = 56$ va $x = 0$ chiziqlar bilan chegaralangan sohaning yuzini toping.
A) 224 B) 160
C) 32 D) 192

17-bob. Hostandart masalalar

109. Hostandart masalalar

1. (a1-g1-15) $y = x^2 - 5x - 14$ funksiyaning koordinata o'qlari bilan kesishish nuqtalari yordamida uchburchak yasaldi. Shu uchburchakning yuzini toping.
A) 63 B) 49
C) 35 D) 98

2. (a1-g1-18) Tenglamaning ildizlari ko'paytmasini toping.
$x^{\log_3 x} = 9x$
A) 9 B) 3
C) 1 D) 0,(3)

3. (a1-g3-32) Tengsizlikni yeching.
$(-6x^2 + 5x - 3)\cdot(3tg^2x - 1) \geq 0$
A) yechimi yo'q
B) $\left[-\frac{\pi}{6}+\pi n;\frac{\pi}{2}+\pi n\right)$
C) $\left(-\frac{\pi}{2}+\pi n;\frac{\pi}{6}+\pi n\right]$
D) $\left[-\frac{\pi}{6}+\pi n;\frac{\pi}{6}+\pi n\right]$

4. (a1-g3-34) $2 < x \leq 9$, $6 \leq y < 13$ bo'lsa, $\frac{3y+6x}{6y}$ kasrning eng katta qiymatini toping
A) 2 B) 3
C) 5 D) 1

5. (a1-g3-35) $x^2 - 5x + 1 = \left(\frac{1}{2}\right)^{-2x}$ tenglamaning nechta yechimi bor?
A) 0 B) 1
C) 2 D) 3

6. (a1-g4-5) x va y haqiqiy sonlar bo'lsa, $2x^2 - 2xy + y^2 - 2x + 2$ ifodaning eng kichik qiymati nechaga teng?
A) –2 B) –1
C) 1 D) 2

7. (a1-g5-10) $5 \leq x \leq 9$, $4 \leq y \leq 11$ bo'lsa, $\frac{5x+7y}{2y}$ ning eng katta qiymatini toping.
A) 9,125
B) 7,25
C) 6
D) 3,375

8. (a1-g9-8) $\frac{4}{x}+\frac{2}{y}-\frac{1}{z}=4$; $\frac{1}{x}-\frac{1}{y}-\frac{2}{z}=5$; $\frac{1}{x}-\frac{3}{y}-\frac{6}{z}=-3$, bo'lsa $\frac{1}{x}+\frac{1}{y}+\frac{1}{z}$ yig'indining qiymatini toping.
A) 3 B) 4
C) 5 D) 6

9. (a1-g14-19) $|\log_2 x| = -x + 4$ tenglama nechta yechimga ega?
A) 2
B) yechimi
C) cheksiz
D) 1

10. ≤ 128 bo'lsa, $\frac{x}{y}+\frac{z}{t}$ eng kichik qiymatini toping.
A) 0,75 B) 1
C) 0,25 D) 0,5

11. (a1-g16-8) Nechta natural x va y sonlar jufti $x^2 - y^2 = 13$ tenglikni qanoatlantiradi?
A) 4 B) 3
C) 1 D) 2

12. (a1-g17-13) $7 + 9 + 11 + 13 + \ldots + (2n + 1) = an^2 + bn + c$ tenglik ayniyat bo'lsa, $a + b + c$ ni toping.
A) 0 B) 4
C) –5 D) –11

13. (a2-g1-1) a, b va c raqamlar. abc sonidan bac soni ayrilganda 270 hosil bo'ladi. $a + b$ yig'indi quyidagilardan qaysi biriga teng bo'la olmaydi?
A) 8 B) 15
C) 7 D) 5

14. (a2-g3-1) a, b, c musbat haqiqiy sonlar $a\cdot b = 30$, $b\cdot c = 24$ bo'lsa, $a + b + c$ yig'indining eng kichik qiymati nechaga teng?
A) 15 B) 10
C) 29 D) 8

15. (a2-g3-6) $\frac{a+3b+c}{2a+b+c}=3$ $3c = 4b$, $a < -1$ bo'lsa quyidagilardan qaysi biri to'g'ri?
A) $a < c < b$
B) $a < b < c$
C) $b < a < c$
D) $c < a < b$

16. (a2-g4-10) $x^2 - y^2 = 21$ tenglik x va y ning nechta butun qiymatlarida o'rinli bo'ladi?
A) 2 B) 4
C) 8 D) 16

17. (a2-g11-11) Agar $-3 \leq a \leq 2$ va $-5 \leq b \leq 4$ bo'lsa, $3a^2 - 4b$ ifodaning eng katta va eng kichik qiymatlari yig'indisini toping.
A) 43 B) 28
C) 31 D) 36

18. (a2-g13-5) a, b va c butun sonlar bo'lib, $1 < a < b < c < 6$ tengsizlikni qanoatlantirsa, $\frac{a}{b}+\frac{b}{c}+\frac{a}{c}$ ifodaning eng kichik qiymatini toping.
A) $\frac{115}{65}$ B) $\frac{125}{75}$
C) $\frac{170}{100}$ D) $\frac{92}{48}$

19. (a2-g16-2) Quyidagi mulohazalardan qaysi biri noto'g'ri?
A) Natural sonlar to'plamining barcha elementlari butun sonlar to'plamining ham elementlari hisoblanadi.
B) Har qanday sonning 0-darajasi 1 ga teng.
C) Kvadrat tenglamaning ozod hadi musbat son bo'lsa, uning ildizlari manfiy son bo'lishi mumkin.
D) $a < 0$ va $b < 0$ bo'lsa, $|a + b| = -a - b$

20. (a2-g17-18) $3^{x+6} + 2^{y-3} = 5$ tenglamani qanoatlantiruvchi x va y larning barcha butun qiymatlari yig'indisini toping.
A) –1
B) –2
C) –3
D) –4

21. (a3-g1-10) $a\cdot b\cdot c > 0$, $ab^2 > 0$ va $ba^2 < 0$ bo'lsa, a,b va c sonlarining ishoralari qaysi javobda ko'rsatilgan?
A) +; –; –
B) –; –; –
C) –; +; –
D) –; –; +

22. (a3-g5-18) Quyidagi mulohazalardan qaysilari noto'g'ri?
1) Arifmetik progressiyaning qaysidir hadidan bir xil uzoqlikda joylashgan hadlarning yig'indisi o'zgarmas bo'ladi;
2) Funksiyaning grafigi OY o'qini qarama-qarshi sonlarda kesib o'tsa, bu juft funksiya;
3) $y = \log_a x$ ($a > 1$) funksiya o'suvchi funksiya hisoblanadi;
4) Birlik aylananing to'rtinchi choragida burchaklarning kosinusi manfiy;
5) Harakat tenglamasidan hosila olinsa, jismning tezlanish tenglamasi hosil bo'ladi.
A) 1; 3; 5
B) 2; 4; 5
C) 1; 3; 4
D) 2; 3; 4

23. (a3-g11-7) $ax = by = cz = 3$ va $x + y + z = 18$ bo'lsa, $\frac{1}{a}+\frac{1}{b}+\frac{1}{c}=?$
A) 6 B) 54
C) 9 D) 4,5

24. (a3-g16-6) $ax = by = cz = 3$ va $x + y + z = 18$ bolsa, $\frac{1}{a}+\frac{1}{b}+\frac{1}{c}=?$
A) 6
B) 54
C) 9
D) 4,5

25. (a3-g17-1) a, b, c turli natural sonlar, $a\cdot b = 42$, $b\cdot c = 28$ bo'lsa, $a + b + c$ yig'indining eng kichik qiymatini toping.
A) 20
B) 19
C) 17
D) aniqlab bo'lmaydi

26. (a4-g1-9)
$|y-3x+5|+\sqrt[4]{5x-y-9}=0$ bo'lsa, $x^2+y^2=?$
A) 17 B) 10
C) 2 D) 5

27. (a4-g3-6)
$2x^2+4y^2+z^2+4xy+2x-4$ ifodaning eng kichik qiymatini toping.
A) –5 B) 2
C) –3 D) –4

28. (a4-g7-24) $|x-2y|+10z^2+x^2-6xz-12z+36=0$ tenglik o'rinli bo'lsa, $x+y+z=?$
A) 9
B) 33
C) 24
D) 18

29. (a4-g9-3) $a+4b-c=0$ bo'lsa, $\frac{a^2-b^2-c^2-2bc}{a^2+b^2-c^2+2ab}$ quyidagilardan qaysi biriga teng?
A) 0
B) –4
C) 1,(6)
D) 2

30. (a4-g10-21) $e^{-x}=|\sin 4x|$ tenglama $[0;\pi]$ oraliqda nechta yechimga ega?
A) Ø B) 16
C) 4 D) 8

31. (a4-g11-9) Quyidagi tenglama nechta yechimga ega?
$y^2+2y+5=x^2+12x+40$
A) cheksiz ko'p
B) 1
C) 2
D) 4

32. (a4-g11-29) $a-b+c=3$ va $ab+bc-ac=4$ bo'lsa, $a^2+b^2+c^2$ ning qiymatini toping.
A) 12 B) 15
C) 16 D) 17

33. (a4-g12-3) n ning qanday qiymatida $1\frac{1}{8}-n$ ifodaning qiymati eng kichik uch xonali songa teng bo'ladi?
A) 99,975
B) –99,125
C) –98,875
D) –101,125

34. (a4-g14-25)
$(3y+2x)^2+(4x+5y+2)^2=0$ bo'lsa, $x+y=?$
A) 1 B) 2
C) –1 D) 5

35. (a4-g16-17) $5^x=-x^2+3x-5$ tenglama nechta ildizga ega?
A) 2
B) 1
C) 4
D) 0

36. (a5-g1-7) $x^3+kx^2-6x+8=0$ tenglamaning uch ildizi geometrik progressiyaning ketma-ket hadlari bo'lsa, k ning qiymatini toping.
A) 1 B) 2
C) –3 D) –2

37. (a5-g2-8) x va y musbat butun sonlar va $4x^2-9y^2=19$ bo'lsa, $x+y$ ning qiymatini toping.
A) 8
B) 20
C) 6
D) 12

38. (a5-g4-17) $|x^2-3|=0{,}5^x+2$ tenglama nechta ildizga ega?
A) 2
B) 0
C) 3
D) 4

39. (a5-g4-24) $4{,}5x^2+8y^2-3x+4y+1=0$ tenglik o'rinli bo'lsa, $x-y$ ni hisoblang.
A) $\frac{1}{12}$
B) $-\frac{1}{12}$
C) $\frac{7}{12}$
D) aniqlab bo'lmaydi

40. (a5-g8-24) a, b, c va d noldan farqli turli raqamlar. $b-a+c=7$ va $(a-b)^2=d$ bo'lsa, c ning qabul qilishi mumkin bo'lgan qiymatlar yig'indisini toping.
A) 15
B) 42
C) 17
D) 32

41. (a5-g18-1) x va y natural sonlar bo'lib, $x^2+2x=y^2+2y+17$ tenglikni qanoatlantiradi. $x+y$ ning qiymatini toping.
A) 15
B) 17
C) –19 va 15
D) 15; –1; –3 va – 19

42. (a5-g19-19) $2x+3y=5$ tenglik berilgan. x^2+y^2 ning eng kichik qiymatini toping.
A) $\frac{10}{13}$
B) $\frac{100}{13}$
C) $\frac{225}{13}$
D) $\frac{25}{13}$

43. (a5-g20-7) $\frac{x+1}{y}-\frac{3y}{x+1}=2$ tenglik o'rinli bo'lsa, y ni x orqali ifodalang.
A) $y_1=\frac{x+1}{3}$ va $y_2=-x-1$
B) $y_1=\frac{x-1}{3}$ va $y_2=x+1$
C) $y_1=\frac{-x+1}{3}$ va $y_2=x+1$
D) $y_1=\frac{x+1}{3}$ va $y_2=1-x$

44. (a5-g21-6) $\frac{3x-2y}{3x+4y}=\frac{2}{5}$ bo'lsa, $\frac{x^2+y^2}{xy}=?$
A) $\frac{1}{2}$
B) $\frac{2}{3}$
C) $\frac{5}{2}$
D) $\frac{9}{2}$

45. (a6-g10-6) $x, y \in N$ bo'lsa, $x^2-y^2=-24$ tenglamaning ildizlari nechta?
A) 0 B) 2
C) 4 D) 5

46. (a6-g20-19) $2x=3y=4z$ va $\frac{1}{x}+\frac{1}{y}+\frac{1}{z}=2$, $y=?$
A) 3
B) 1,5
C) 2
D) 4,5

47. (a6-g21-30) $3^x=|x+3|+|x+5|$ tenglama nechta ildizga ega?
A) 1
B) 2
C) 3
D) 0

48. (a6-g26-6) $5x=3y=4z$ bo'lsa, $\frac{x+y}{y+z}$ ni hisoblang.
A) $\frac{24}{25}$
B) $\frac{8}{7}$
C) $\frac{32}{35}$
D) $\frac{8}{7}$

49. (a6-g26-7)
$x^3-2ax^2+(a+2)x-2=0$ tenglamaning ikki ildizi o'zaro teskari sonlardan iborat bo'lsa, a ning qiymatini toping.
A) –1,4
B) 1,4
C) 0,6
D) 1,(6)

GEOMETRIYA

1-bob. Burchak. Masofa. To'g'ri chiziqlar

110. Qo'shni va vertical burchaklar. Parallel va kesishuvchi to'g'ri chiziqlar orasidagi burchaklar

1. (a1-g1-20) Parallel to'g'ri chiziqlarni uchinchi to'g'ri chiziq kesib o'tdi. Hosil bo'lgan ichki almashinuvchi burchaklardan birining to'rtdan bir qismiga 5° ni qo'shsak ikkinchisining uchdan bir qismiga teng bo'ladi. Bu burchaklardan kattasini toping.
A) 100°/7 B) 600°/7
C) 60° D) 120°

2. (a1-g2-27) Parallel ikki to'g'ri chiziqni uchinchi to'g'ri chiziq kesib o'tishidan hosil bo'lgan ichki almashinuvchi burchaklardan birining uchdan bir qismi ikkinchisining to'rtdan bir qismidan 5° katta. Shu burchaklardan kichigini toping.
A) $\frac{600}{7}$ B) $\frac{660}{7}$
C) 60 D) 120

3. (a1-g4-25) Ayirmasi 40° bo'lgan qo'shni burchaklarning nisbati qaysi javobda to'g'ri ko'rsatilgan?
A) $\frac{11}{7}$ B) x^2y^2 C) $\frac{2}{3}$ D) $\frac{7}{8}$

4. (a1-g5-25) Qo'shni burchaklardan biri ikkinchisidan 4 marta katta. Bu burchaklar ayirmasini toping.
A) 30° B) 150° C) 108° D) 144°

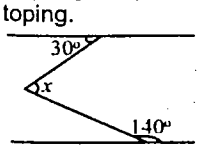
5. (a1-g7-24) Qo'shni burchaklardan biri bu burchaklar ayirmasidan 4 marta kichik. Shu burchaklar ayirmasini toping.
A) 120 B) 150 C) 90 D) 135

6. (a1-g10-26) Qo'shni burchaklardan biri bu burchaklar ayirmasidan 3 marta kichik. Shu burchaklar ayirmasini toping.
A) 120 B) 150 C) 108 D) 144

7. (a1-g12-10) Ichki almashinuvchi burchaklardan birining uchdan biri, ikkinchisining yarmidan 12° kichik. Shu burchaklardan kattasini toping.
A) 134,4° B) 108°
C) 72° D) 56°

8. (a2-g2-26) α va β burchaklarning yig'indisi 190° ga teng. α va β ga qo'shni bo'lgan burchaklar yig'indisini toping.
A) 170° B) 250° C) 190° D) 210°

9. (a2-g7-25) Rasmdan x burchakni toping.



A) 80° B) 70° C) 170° D) 110°

10. (a2-g10-26) Qo'shni burchaklardan biri bu burchaklar ayirmasidan 4 marta kichik. Shu burchaklar ayirmasini toping.
A) 120 B) 150 C) 90 D) 135

11. (a2-g11-26) α va β burchaklarning yig'indisi 70° ga teng. α va β ga qo'shni bo'lgan burchaklar yig'indisini toping.
A) 110° B) 250° C) 290° D) 310°

12. (a2-g17-24) $y = (2x + 3)^3$ funksiyaning boshlang'ichini toping.

A) $F(x) = \frac{(2x+3)^4 x^2}{4} + C$

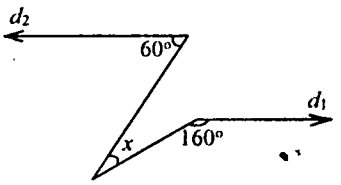
B) $F(x) = 24x^4 + 72x^3 + 54x^2 + 27x + C$

C) $F(x) = \frac{8}{3}x^4 + 18x^3 + 54x^2 + 27x + C$

D) $F(x) = 2x^4 + 12x^3 + 27x^2 + 27x + C$

13. (a2-g19-25) Parallel to'g'ri chiziqlarni uchinchi to'g'ri chiziq kesib o'tganda, hosil bo'lgan ichki qo'shni burchaklardan biri ikkinchisidan 5 marta katta. Bu burchaklardan kattasini toping.
A) 144° B) 150°
C) 135° D) 120°

14. (a2-g22-25) Yondagi rasmdan foydalanib x ning qiymatini toping.

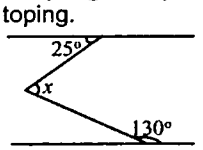


A) 40 B) 50 C) 60 D) 20

15. (a3-g1-25) Quyidagi mulohazalardan qaysi biri noto'g'ri?
A) Ikki qo'shni burchakning yig'indisi 180°ga teng.
B) Qavariq beshburchak ichki burchaklarining yig'indisi 540° ga teng.
C) Agar ikkita teng yonli uchburchakning asoslari va asosga yopishgan burchaklari teng bo'lsa, bu uchburchaklar tengdir.
D) Teng yonli uchburchakning balandliklari uchidan boshlab hisoblanganda kesishish nuqtasida 2:1 nisbatda bo'linadi.

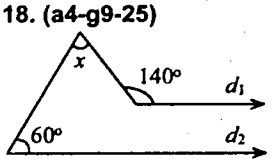
16. (a3-g10-26) α va β burchaklarning yig'indisi 160° ga teng. α va β ga qo'shni bo'lgan burchaklar yig'indisini toping.
A) 20° B) 200° C) 110° D) 290°

17. (a3-g11-25) Rasmdan x burchakni toping.



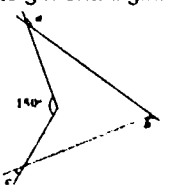
A) 75° B) 95° C) 155° D) 85°

18. (a4-g9-25)



Rasmdagi d_1 va d_2 nurlar parallel bo'lsa, x burchakni toping.
A) 120° B) 100°
C) 80° D) 70°

19. (a4-g10-25) Yondagi rasmdan foydalanib quyidagilardan qaysi biri to'g'ri ekanligini toping.

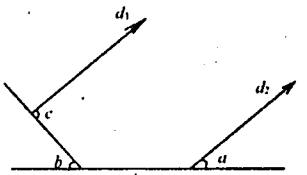


A) $a + b + c = 150°$
B) $a + c = b$
C) $a + b - c = 210°$
D) $a + b - c = 150°$

20. (a4-g22-25) Bir to'g'ri chiziq o'zaro perpendikulyar bo'lgan ikki to'g'ri chiziqning birini 36° da kesib o'tsa, ikkinchisi bilan hosil qilgan o'tmas burchakni toping.
A) 114° B) 66°
C) 156° D) 126°

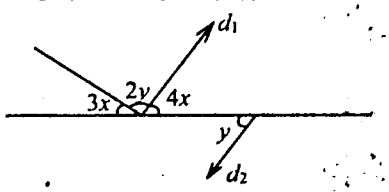
21. (a5-g9-25) Ikki to'g'ri chiziqning kesishishidan hosil bo'lgan burchaklardan uchtasining yig'indisi 223° ga teng. Shu burchaklardan kattasi kichigidan qancha katta?
A) 137° B) 94°
C) 43° D) 75°

22. (a5-g16-21) Rasmda $d_1 // d_2$. Quyidagi javoblardan qaysi birida a, b va c orasidagi bog'lanish keltirilgan?



A) $a + b + c = 360°$
B) $c + b + a = 180°$
C) $c = 2a + b$
D) $c = a + b$

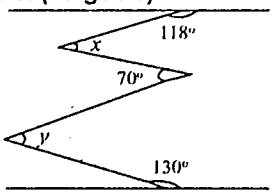
23. (a5-g22-21) Rasmda d_1 nur d_2 nurga parallel. y ning qiymatini toping.



A) 12° B) 48°
C) 36° D) 24°

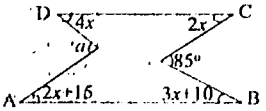
24. (a5-g23-21) Ikki perpendikulyar chiziqdan birini uchinchi chiziq 27° burchak ostida kesib o'tadi. Shu chiziqning perpendikulyar chiziqlardan ikkinchisi bilan hosil qilgan o'tmas burchagini toping.
A) 117° B) 126°
C) 153° D) 63°

25. (a6-g6-21)



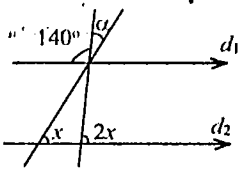
Rasmdan foydalanib $x + y$ ning qiymatini toping.
A) 82 B) 178 C) 182 D) 58

26. (a6-g11-4)



Rasmda AB||CD bo'lsa, a burchakni toping.
A) 75° B) 129°
C) 105° D) 51°

27. (a6-g17-21) Rasmdan foydalanib, α burchakni toping.



A) 20° B) 30° C) 40° D) 10°

111. Kemaga doir masalalar

1. (a1-g6-25) Uzunligi 7,2 sm bo'lgan kesma 4:5 nisbatda ikki bo'lakka bo'lindi. Bu bo'laklar uzunliklari ayirmasini toping.
A) 0,8 sm B) 1,8 sm
C) 0,9 sm D) 1,6 sm

2-bob. Uchburchaklar

112. Uchburchakning perimetri, medianasi, bissektrisasi, balandligi, o'rta chizig'i

1. (a3-g7-25) Bir uchburchakning perimetri 51 sm. Agar uchburchakning a tomoni 4 sm qisqa, b tomoni 2 sm qisqa bo'lganda bu uchburchakning a, b, c tomonlari 2, 3 va 4 sonlariga mutanosib bo'lardi. Uchburchakning eng uzun tomoni necha sm?
A) 17 B) 30 C) 19 D) 20

2. (a3-g8-25) Uchburchakning birinchi tomoni $x(x > 14)$ sm, ikkinchi tomoni undan 9 sm qisqa, uchinchi tomoni esa birinchisidan 5 sm uzun. Shu uchburchakning perimetrini (sm) toping.
A) $3x + 14$ B) $3x - 4$
C) $3x - 14$ D) $3x + 4$

3. (a5-g2-25) Ikki tomonining uzunligi 13 sm dan bo'lgan uchburchakning perimetri eng katta butun qiymatini toping.
A) 39 B) 42 C) 51 D) 52

4. (a6-g13-10) Uchburchakning tomonlari $P(x) = x^3 + 3x^2 + 2x$ ko'phadning bo'luvchilari va x butun son bo'lsa, uchburchak perimetrining eng kichik qiymatini toping.
A) 6 B) 9 C) 12 D) 20

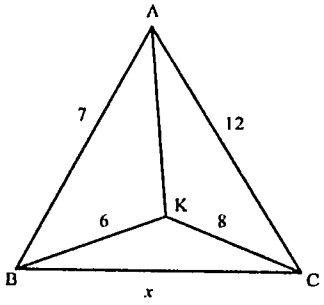
5. (a6-g21-28) ABC uchburchakning AC tomonidan D nuqta olindi. AB = BC = 15, AD = 5 va DC = 13 bo'lsa, BD ni toping.
A) $4\sqrt{5}$ B) $6\sqrt{10}$
C) $4\sqrt{10}$ D) $5\sqrt{5}$

113. Uchburchak tengsizligi

1. (a1-g17-25) Uchburchakning tomonlari $2x - 1$, $x + 3$ va 8 ga teng. Bu uchburchakning hamma tomonlari butun sondan iborat deb hisoblab, nechta uchburchak yasash mumkin?
A) 9 B) 10
C) cheksiz ko'p D) 8

2. (a4-g4-25) O'tmas burchakli uchburchakning eng katta tomoni 16 ga, qolgan ikki tomoni 8 va $3x + 1$ ga teng. x ning qabul qilishi mumkin bo'lgan eng katta butun qiymatini toping.
A) 3 B) 4 C) 5 D) 6

3. (a4-g11-32) Shaklga ko'ra x nechta butun qiymat qabul qila oladi?



A) 3 B) 13 C) 8 D) 16

4. (a4-g15-25) O'tkir burchakli uchburchakning ikki tomoni 5 va 9 ga teng. Uchburchakning uchinchi tomoni nechta butun qiymatlarni qabul qila oladi?
A) 9 B) 6 C) 3 D) 5

5. (a4-g20-26) ABC uchburchakning A burchagi o'tmas. |AC| = 9 va |AB| = 12 bo'lsa, BC tomon qabul qilishi mumkin bo'lgan qiymatlardan eng kichik butunini toping.
A) 4 B) 16 C) 15 D) 22

6. (a5-g10-25) Kichik tomonlari 13 va 9 ga teng bo'lgan o'tmas burchakli uchburchakning uchinchi tomoni nechta butun qiymatga ega bo'lishi mumkin?
A) 17 B) 16 C) 6 D) 5

7. (a5-g25-21) O'tkir burchakli uchburchakning ikki tomoni 9 va 12 ga teng. Uchinchi tomoni nechta butun qiymatlarni qabul qila oladi?
A) 17 B) 11 C) 7 D) 5

8. (a6-g2-21) ABC uchburchakda AB = 10; BC = 17. O uchburchak ichidagi nuqta va OA = 5; OC = 11 bo'lsa AC tomon nechta butun qiymat qabul qila oladi?
A) 10 B) 19 C) 8 D) 21

114. Uchburchakning burchaklari yig'indisi. Uchburchakning tashqi burchaklari

1. (a1-g8-22) ABC uchburchakda $\sin A = \frac{4}{5}$, $\sin B = \frac{5}{13}$ bo'lsa, sinC ning qiymati nechaga teng?
A) $\frac{33}{65}$ B) $\frac{16}{65}$ C) $\frac{63}{65}$ D) $\frac{56}{65}$

2. (a1-g9-26) ABC uchburchakda AD bissektrisa. ACB burchak 80°, ADB burchak 120° bo'lsa, ABC burchakning qiymatini toping.
A) 10° B) 20° C) 30° D) 40°

3. (a1-g11-21) O'tkir burchakli uchburchakning ikki tashqi burchagi yig'indisining sinusi –0,6 ga teng. Shu uchburchakning uchinchi tashqi burchagining tangensini toping.
A) –0,75 B) 1,(3)
C) –1,(3) D) 0,75

4. (a1-g16-28) Uchburchak burchaklari arifmetik progressiyani tashkil etsa, uning o'rtacha burchagi kattaligini aniqlang.
A) 30^0 B) 60^0 C) 90^0 D) 120^0

5. (a2-g4-26) ABC uchburchakda A burchak 60° ga, B burchak esa 46° ga teng. Bu uchburchakning C uchidan CD bissektrisa chiqarilgan. BDC burchakni toping.
A) 97° B) 53° C) 127° D) 83°

6. (a2-g5-25) Asosidagi burchagi 10° bo'lgan teng yonli uchburchakning yon tomoniga tushirilgan bissektrisasi va shu tomonga tushirilgan balandligi orasidagi burchakni toping.
A) 60° B) 75° C) 80° D) 85°

7. (a2-g8-27) Burchaklari 2:3:4 nisbatda bo'lgan uchburchakning katta tomoniga tushirilgan balandligi bilan kichik tomoni orasidagi burchakni toping.
A) 18° B) 30° C) 42° D) 54°

8. (a2-g9-21) O'tkir burchakli uchburchakning ikki tashqi burchagi yig'indisining sinusi – 0,6 ga teng. Shu uchburchakning uchinchi tashqi burchagining tangensini toping.
A) –0,75 B) 1,(3)
C) –1,(3) D) 0,75

9. (a2-g9-26) Asosidagi burchagi 20° bo'lgan teng yonli uchburchakning yon tomoniga tushirilgan bissektrisasi va shu tomonga tushirilgan balandligi orasidagi burchakni toping.
A) 70° B) 60° C) 50° D) 40°

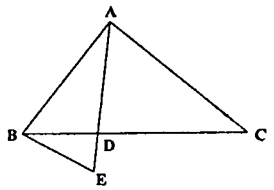
10. (a2-g16-25) ABC uchburchakning B burchagi 70°, C burchagi 40°. A burchakdan AD bissektrisa chiqarilgan. ADB burchakni toping.
A) 105° B) 35°
C) 145° D) 75°

11. (a3-g3-27) Burchaklari 5:6:7 nisbatda bo'lgan uchburchakning katta tomoniga tushirilgan balandligi bilan kichik tomoni orasidagi burchakni toping.
A) 18° B) 30° C) 42° D) 54°

12. (a3-g13-25) ABC uchburchakning A uchidan AD bissektrisa chiqarildi. Agar ADC burchak 105°bo'lsa, B va C burchaklar ayirmasini toping.
A) 15° B) 45° C) 30° D) 45°

13. (a3-g15-25) Teng yonli uchburchakning asosidagi burchagi 12° ga teng. Shu uchburchakning yon tomoni va ikkinchi yon tomoniga tushirilgan balandligi orasidagi burchakni toping.
A) 54° B) 64° C) 66° D) 78°

14. (a3-g20-25) Rasmda tasvirlangan uchburchakda AB = AC = a + b, AD = a va DE = b. Agar DAC burchak 70° bo'lsa, CBE burchak kattaligini toping.

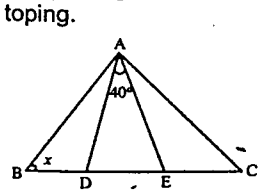


A) 25
B) 42
C) 35
D) aniqlab bo'lmaydi.

15. (a4-g1-25) Uchburchakning burchaklari arifmetik progressiyani tashkil etadi. Uning kichik burchagi quyidagilardan qaysi biriga teng?
A) 54°
B) 60°
C) 45°
D) berilganlar yetarli emas.

16. (a4-g4-12) Uchburchakning ichki burchaklari arifmetik progressiyaning ketma-ket hadlari va eng kichik burchagi 36° bo'lsa, eng katta burchagini toping.
A) 72 B) 69 C) 84 D) 86

17. (a4-g14-26) Quyida ABC uchburchak keltirilgan. Bu uchburchakda |BD| = |DA| = |AE| = |EC|. DAE burchak 40° ga teng bo'lsa, ABD burchakni toping.



A) 35 B) 25 C) 30 D) 20

18. (a4-g18-25) ABC uchburchakning ichidan O nuqta olingan. BAO burchak x, ABO burchak α, OCB burchak y va OBC burchak β. AOC burchak 105° ga teng. $\alpha - x = 10°$, $\beta - y = 15°$ bo'lsa, ABC burchak kattaligini toping.
A) 65° B) 60° C) 55° D) 50°

19. (a4-g23-25) ABE muntazam uchburchak. BCDE esa kvadrat va uchburchak bilan umumiy tomonga ega, uchburchakdan tashqarida yotadi. CAD burchak kattaligini toping.
A) 15° B) 30° C) 45° D) 60°

20. (a5-g1-19) ABC uchburchakda A burchak to'g'ri. B uchidan AC tomonga BD chiziq o'tkazilgan. AD = 1, DC = 5 va AB = 2. ABD va ACB burchaklar yig'indisini toping.
A) 30° B) 45° C) 60° D) 75°

21. (a5-g3-25) Uchburchakning ikki burchagi ayirmasi moduli 54° ga teng. Uchinchi burchakdan tushirilgan bissektrisa va qarama-qarshi tomon orasidagi o'tkir burchakni toping.
A) 58° B) 66° C) 72° D) 63°

22. (a5-g8-25) ABC uchburchakning BC tomoniga AD kesma o'tkazildi. AB = AD = DC va BAD burchak 72° bo'lsa, ADC burchakni toping.
A) 108° B) 126°
C) 117° D) 122°

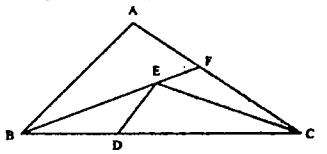
23. (a5-g14-21) Uchburchakning ikki ichki burchagi yig'indisi uning uchinchi burchagidan 5 marta katta. Shu uchburchakning uchinchi burchagini toping.
A) 60° B) 45° C) 36° D) 30°

24. (a5-g17-21) ABC uchburchakning BC tomonidan D va F nuqtalar shunday tanlab olindiki, natijada BD = DA va AF = FC tenglik hosil bo'ldi. Agar BAC burchak 124°bo'lsa, DAF burchak kattaligini toping.
A) 62° B) 64° C) 72° D) 68°

25. (a5-g21-21) Uchburchakning o'tmas burchagi qarshisidagi tomonning uzunligi 16 ga teng. Qolgan ikki tomoni esa $3x + 1$ va 8 ga teng. x ning qabul qilishi mumkin bo'lgan eng katta butun qiymatini toping.
A) 2 B) 13 C) 7 D) 4

26. (a6-g1-21) ABC uchburchakning AC tomoniga BD chiziq o'tkazildi. BDC uchburchakda esa BD tomonga CE chiziq o'tkazildi. $\angle DBC = x$, $\angle BCE = y$ va $\angle ECD = z$ bo'lsa, BDA burchak quyidagilardan qaysi biriga teng?
A) $2x + y + z$ B) $x + y + z$
C) $2x + 2y - z$ D) $2z - x - y$

27. (a6-g3-22)



Rasmda BD = DE = EC = FC va AC = BC. Agar FCE burchak 24° bo'lsa, FBA burchakni toping.
A) 78° B) 54° C) 26° D) 32°

28. (a6-g5-21) ABC uchburchakda $\angle A - \angle C = 72°$. B uchidan chiqqan bissektrisa va AC tomon orasidagi burchakni toping.
A) 54° B) 36° C) 18° D) 66°

29. (a6-g7-21) ABC ucburchakning A burchagi BC tomonga o'tkazilgan AE va AD kesmalar yordamida uch bo'lakka bo'lindi. CAD, DAE va EAB burchaklar arifmetik progressiyaning ketma-ket hadlari. DAE burchakning qiymati 30° ga teng. ABC burchakning ACB burchakka nisbati 11:7 bo'lsa, ABC buchakni toping.
A) 35° B) 90° C) 60° D) 55°

30. (a6-g14-12) ABC uchburchakning AB tomonidan E va AC tomonidan D nuqtalar olingan. BD = BC va DBC burchak EDB burchakdan ikki marta katta bo'lsa, EDA burchakni toping.
A) aniqlab bo'lmaydi
B) 60°
C) 120°
D) 90°

31. (a6-g20-15) ABC uchburchakning BC tomoniga AD bissektrisa o'tkazilgan. Agar |AC| = |BC| va <ADC = 112,5° bo'lsa, ACB burchakning kattaligini toping.
A) 35° B) 30° C) 40° D) 50°

32. (a6-g22-8) Uchburchakning ichki burchaklari nisbati 4:5:6 bo'lsa, uning tashqi burchaklari nisbatini toping.
A) 2:3:4
B) 9:10:11
C) 8:9:10
D) 4:5:6

33. (a6-g24-19) ABC uchburchakning A burchagi 75°. BE va CD – balandliklar. EBC burchak 45° bo'lsa, DCB burchakni toping.
A) 15° B) 45° C) 30° D) 60°

115. Teng yonli uchburchak

1. (a1-g11-26) Asosidagi burchagi 20° bo'lgan teng yonli uchburchakning yon tomoniga tushirilgan bissektrisasi va shu tomonga tushirilgan balandligi orasidagi burchakni toping.
A) 70° B) 60° C) 50° D) 40°

2. (a1-g13-26) ABC teng yonli uchburchakning A burchagi to'g'ri. Uchburchakning AC tomonidan F, AB tomonidan E va BC tomonidan D nuqtalar shunday tanlab olindiki, natijada AFDE to'g'ri to'rtburchak hosil bo'ldi. Agar FD = 3 va DE = 4 bo'lsa, AC tomon uzunligini toping.
A) 3 B) 7 C) 4 D) 6

3. (a2-g15-26) Teng yonli uchburchakning yon tomoniga tushirilgan balandligi shu tomonni asos uchidan boshlab 4 sm va 12 sm ga teng kesmalarga ajratadi. Uchburchakning asosi uzunligini toping.
A) 20 B) 16 C) $4\sqrt{7}$ D) $8\sqrt{2}$

4. (a3-g2-31) Teng yonli uchburchakning asosi 20 sm, yon tomoni 26 sm. Asosga tushirilgan mediana bu uchburchakni ikki qismga ajratadi. Hosil bo'lgan uchburchaklarga ichki chizilgan aylanalar markazlari orasidagi masofani toping.
A) 4 B) 6 C) 8 D) 12

5. (a3-g4-25) Teng yonli uchburchakning yon tomoniga tushirilgan balandligi shu tomonni asosidan boshlab 8 sm va 12 sm ga teng kesmalarga ajratadi. Uchburchakning asosi uzunligini toping.
A) 20 B) 16
C) $8\sqrt{5}$ D) $8\sqrt{2}$

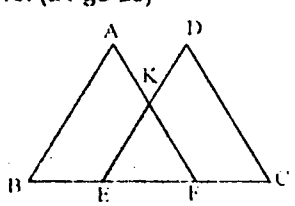
6. (a3-g6-25) Teng yonli uchburchakning uchidagi burchagi 136°. Bir yon tomoniga tushirilgan balandlik va bissektrisa orasidagi burchakning qiymatini toping.
A) 46° B) 57° C) 59° D) 68°

7. (a3-g12-26) Teng yonli uchburchakning yon tomoniga tushirilgan balandligi shu tomonni asos uchidan boshlab 6 sm va 8 sm ga teng kesmalarga ajratadi. Uchburchakning asosi uzunligini toping.
A) 10 B) $2\sqrt{33}$
C) $2\sqrt{42}$ D) $8\sqrt{3}$

8. (a3-g14-31) Asosi 6 va yon tomonlari 5 bo'lgan teng yonli uchburchakka tashqi chizilgan aylana markazidan uchburchakning yon tomonigacha bo'lgan masofani toping.
A) $\frac{7}{8}$ B) $\frac{3}{2}$ C) $\frac{15}{8}$ D) $\frac{13}{4}$

9. (a3-g18-25) Teng yonli uchburchakning yon tomoniga tushirilgan bissektrisa, yon tomonni asosi uchidan boshlab 4 va 8 ga teng bo'lgan bo'laklarga ajratadi. Uchburchakning perimetrini toping.
A) 30 B) 48 C) 36 D) 42

10. (a4-g3-29)



Yuqoridagi chizmada ABF va DEC ikkita teng muntazam uchburchaklar. Agar KEF uchburchakning yuzasi $9\sqrt{3}$ ga teng va ABCDK shaklning perimetri 30 ga teng bo'lsa, butun jismning yuzasini toping.
A) $18\sqrt{3}$ B) $23\sqrt{3}$
C) $27\sqrt{3}$ D) $32\sqrt{3}$

11. (a4-g8-26) Teng yonli uchburchakning yon tomoniga tushirilgan balandligi shu tomonni asosidan boshlab 3 sm va 12 sm ga teng kesmalarga ajratadi. Uchburchakning asosi uzunligini toping.
A) 9 B) $\sqrt{153}$
C) $\sqrt{90}$ D) $9\sqrt{3}$

12. (a4-g12-25) Teng yonli uchburchakning uchidagi burchagi 112°. Asosidagi burchaklarning bissektrisalari kesishishidan hosil bo'lgan o'tkir burchakni toping.
A) 36° B) 34° C) 44° D) 31°

13. (a4-g12-31) Uchidagi burchagi 30° bo'lgan teng yonli uchburchakka tashqi chizilgan aylana radiusi R ga teng. Uchburchakning yon tomonini toping.
A) $\frac{\sqrt{6}-\sqrt{2}}{4}R$ B) $\frac{2\sqrt{3}+\sqrt{2}}{2}R$
C) $\frac{\sqrt{3}-\sqrt{2}}{2}R$ D) $\frac{\sqrt{6}+\sqrt{2}}{2}R$

14. (a5-g21-18) Teng yonli uchburchakda: α – uchidagi va β – asosdagi burchaklar. $\frac{tg\alpha}{tg\beta}=4$ bo'lsa, tgα + tgβ ning qiymatini toping.
A) $5\sqrt{6}$ B) $2.5\sqrt{6}$
C) $1,5\sqrt{6}$ D) $\sqrt{6}$

15. (a5-g24-21) ABC uchburchakning BC tomonidan D nuqta shunday olindiki, natijada DC = AC bo'lib qoldi. Agar ABC burchak 36° va BAD burchak esa 15° bo'lsa, C tashqi burchak necha gradusligini toping.
A) 102° B) 66°
C) 87° D) 108°

16. (a6-g1-28) Teng yonli ABC uchburchak tekisligida yotmaydigan O nuqtadan BC asosgacha bo'lgan masofa 50 ga teng. OA chiziq uchburchak tekisligiga perpendikulyar. Agar uchburchak asosidagi burchak 30° va yon tomoniga tushirilgan balandligi $14\sqrt{3}$ ga teng bo'lsa, AO = ?
A) 48 B) $24\sqrt{3}$
C) 24 D) $48\sqrt{3}$

17. (a6-g5-19) Perimetri 30 ga teng bo'lgan teng yonli uchburchakning asosi qanday bo'lganda u eng katta yuzaga teng bo'ladi?
A) 10
B) $30\left(2-\sqrt{3}\right)$
C) 7,5
D) $15\left(2-\sqrt{2}\right)$

18. (a6-g5-28) Teng yonli ABC uchburchakning AB yon tomoni 12 ga, B uchidagi burchagi 120° ga teng. B uchidan uchburchak tekisligiga perpendikulyar, uzunligi $6\sqrt{2}$ ga teng BD kesma o'tkazildi. ADC uchburchak yuzini toping.
A) 72 B) 108
C) $36\sqrt{6}$ D) $36\sqrt{3}$

19. (a6-g8-22) Agar teng yonli uchburchak yuzining tomoni uning asosiga teng kvadrat yuziga nisbati 1:3 bo'lsa, bu uchburchakning uchidagi burchak kosinusini toping.
A) $\frac{7}{25}$ B) $\frac{14}{25}$ C) $\frac{5}{6}$ D) $\frac{24}{25}$

20. (a6-g18-25) Teng yonli uchburchakning uchidagi va asosidagi bir burchagi bissektrisalari 111° burchak ostida kesishadi. Uchburchakning uchidagi tashqi burchagini toping.
A) 138° B) 159°
C) 69° D) 84°

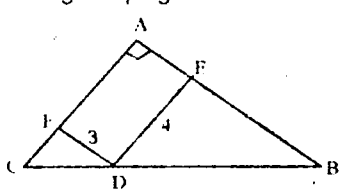
116. To'g'ri burchakli uchburchak. Pifagor teoremasi

1. (a1-g15-26) To'g'ri burchakli uchburchakning o'tkir burchagi 45° va medianasi 4 ga teng. Shu uchburchakning kichik katetini toping.
A) 4 B) $4\sqrt{2}$
C) 8 D) $2\sqrt{2}$

2. (a2-g3-31) To'g'ri burchakli uchburchakning perimetri 132, tomonlari kvadratlarining yig'indisi 6050 ga teng. Uning gipotenuzasini toping.
A) 64 B) 65 C) 55 D) 60

3. (a2-g12-29) MKN to'g'ri burchakli uchburchakning MN gipotenuzasida T nuqta olingan. NMK burchak 30°, |KT| = 3x + 2, |KN| = 5x va |TM| = |TN| bo'lsa, |MN| nechaga teng.
A) 4 B) 6 C) 10 D) 12

4. (a2-g20-26) ABC teng yonli, to'g'ri burchakli uchburchak. AEDF esa to'g'ri to'rtburchak bo'lsa, AC tomonning uzunligini toping.



A) 3 B) 7 C) 4 D) 6

5. (a2-g21-26) ABC to'g'ri burchakli uchburchakning C o'tkir burchagidan AB katetga tushirilgan mediananing uzunligi $3\sqrt{2}$ ga teng. Agar AB katetning uzunligi 6 ga teng bo'lsa, bu uchburchakning gipotenuzasi uzunligini toping.
A) $3\sqrt{5}$ B) 3 C) 5 D) $3\sqrt{3}$

6. (a3-g15-26) To'g'ri burchakli uchburchakning bir kateti 16 ga va unga tushirilgan medianasi $4\sqrt{13}$ ga teng. Gipotenuza uzunligini toping.
A) 18 B) 20 C) 25 D) 32

7. (a3-g20-21) x va y to'g'ri burchakli uchburchakning o'tkir burchaklari. $\operatorname{tg}x \cdot \operatorname{ctg}y = \frac{1}{4}$ bo'lsa, $\cos y$ ni toping.

A) $\frac{2}{\sqrt{5}}$ B) $\frac{1}{\sqrt{5}}$
C) $\frac{\sqrt{3}}{2}$ D) $\frac{2}{\sqrt{3}}$

8. (a4-g2-25) To'g'ri burchakli uchburchakning gipotenuzasiga tushirilgan balandligi 6 ga teng. Agar shu uchburchakning katetlaridan biri 10 ga teng bo'lsa, ikkinchisini toping.
A) 15 B) 12,5 C) 8 D) 7,5

9. (a4-g6-25) ABC to'g'ri burchakli uchburchakning AC gipotenuzasidan D nuqta olingan. AD = 1, DC = 3 va $BD = \sqrt{3}$ bo'lsa, BC tomon uzunligini toping.
A) $2\sqrt{2}$ B) $2\sqrt{3}$
C) $\frac{3\sqrt{3}}{2}$ D) 2

10. (a4-g13-35) To'g'ri burchakli uchburchakda o'tkir burchaklarining medianalari uzunliklari 9 va 12 ga teng. Gipotenuzaning uzunligini toping.
A) $6\sqrt{5}$ B) $3\sqrt{5}$ C) 9 D) 15

11. (a4-g17-26) To'g'ri burchakli uchburchakning to'g'ri burchagidan tushirilgan balandlik 4 ga teng. Gipotenuza qiymatining katetlar qiymatlari ko'paytmasiga nisbatini toping.
A) 0,25 B) 0,5 C) 2 D) 4

12. (a6-g4-21) Ikkita katetdan teng uzoqlikda joylashgan hamda gipotenuzada yotgan nuqta gipotenuzani $\frac{480}{7}$ sm va $\frac{360}{7}$ sm uzunlikdagi kesmalarga ajratadi. Uchburchakning katetlari yig'indisini toping.
A) 142 B) 168 C) 216 D) 192

117. To'g'ri burchakdan tushirilgan balandik, katetlarning gipotenuzadagi proyeksiyalari

1. (a1-g7-25) To'g'ri burchakli uchburchakning gipotenuzasiga tushirilgan balandlik 9 ga teng. Shu balandlik bilan kichik katet orasidagi burchak 30° ga teng. Uchburchakning katta katetini toping.
A) $\frac{9\sqrt{3}}{2}$ B) $3\sqrt{3}$
C) 18 D) $9\sqrt{3}$

2. (a1-g13-25) ABC to'g'ri burchakli uchburchakda AH gipotenuzaga tushirilgan balandlik. AB katet uzunligi $4\sqrt{3}$ ga AH balandlik esa $4\sqrt{2}$ ga teng. Ushbu uchburchakda AD mediananing uzunligi necha sm?
A) 4 B) 5 C) 6 D) 8

3. (a2-g2-27) To'g'ri burchakli uchburchakning gipotenuzasiga tushirilgan balandlik uni 16:25 nisbatda bo'ladi. Bu uchburchakning katetlari nisbatini toping.
A) 16:25 B) 4:5
C) 2:5 D) 3:4

4. (a3-g14-25) To'g'ri burchakli uchburchakning gipotenuzasiga tushirilgan balandligi 6 ga teng. Agar shu uchburchakning katetlaridan biri 10 ga teng bo'lsa, ikkinchisini toping.
A) 8 B) 4 C) 7,5 D) 12,5

5. (a3-g16-25) To'g'ri burchakli uchburchakning o'tkir burchaklaridan biri ikkinchisidan 2 marta kichik. Agar gipotenuzaga tushirilgan balandlik 4 ga teng bo'lsa, gipotenuzani toping.
A) $\frac{16\sqrt{3}}{3}$ B) $4\sqrt{3}$
C) $\frac{8\sqrt{3}}{3}$ D) 8

6. (a3-g17-25) To'g'ri burchakli uchburchakning gipotenuzasiga tushirilgan balandlik gipotenuzani 4:1 nisbatda bo'ladi. Bu uchburchak katta katetining kichik katetiga nisbatini toping.
A) 16 B) 4 C) 2 D) 8

7. (a4-g12-26) To'g'ri burchakli uchburchakning gipotenuzasiga tushirilgan balandligi 12 ga, medianasi esa 13 ga teng. Uchburchakning kichik katetini toping.
A) $8\sqrt{7}$ B) $2\sqrt{26}$
C) $9\sqrt{3}$ D) $4\sqrt{13}$

8. (a4-g15-26) To'g'ri burchakli uchburchakning A to'g'ri burchagi uchidan BC tomonga AD mediana va AH balandlik tushirildi. Agar AB = 8 va AC = 6 bo'lsa, HD kesma uzunligini toping.
A) 3,6 B) 1,8 C) 1,4 D) 2,5

9. (a4-g23-26) To'g'ri burchakli uchburchakning A to'g'ri burchagi uchidan BC tomonga AD mediana va AH balandlik tushirildi. Agar AB = 8 va AC = 6 bo'lsa, HD kesma uzunligini toping.
A) 3,6 B) 1,8 C) 1,4 D) 2,5

10. (a5-g11-21) To'g'ri burchakli uchburchakning katetlari 8 va 10 ga teng. Gipotenuzaga tushirilgan AH balandlik va AD mediana tushirilgan. HD masofani toping.
A) $\frac{9}{\sqrt{41}}$ B) $\frac{3}{\sqrt{41}}$
C) $\frac{7\sqrt{41}}{8}$ D) $\frac{\sqrt{41}}{6}$

11. (a6-g13-34) Gipotenuzaga tushirilgan balandlik gipotenuzada o'zi ajratgan kesmalarning biridan 6 sm uzun, ikkinchisidan 9 sm qisqa. Uchburchakning kichik kateti uzunligini toping.
A) $6\sqrt{13}$ B) 18
C) $9\sqrt{13}$ D) 39

118. Sinuslar teoremasi

1. (a1-g6-26) ABC teng tomonli uchburchakning B uchidan AC tomonda joylashgan D nuqtaga kesma o'tkazildi. Hosil bo'lgan BDC uchburchakning DC tomoni 4 ga teng va DBC burchak 15° bo'lsa, |AB| = ?
A) $4\sqrt{3}$ B) $6\sqrt{3}+3$
C) $8\sqrt{3}-4$ D) $4\sqrt{3}+8$

2. (a3-g21-25) ABC uchburchakning A burchagi 120°, C burchagi 45° ga teng. A uchidan chiqarilgan bissektrisa BC tomonni D nuqtada kesadi. AD kesma uzunligining CD kesma uzunligiga nisbatini toping.
A) $\frac{\sqrt{6}}{3}$ B) $\frac{\sqrt{6}}{2}$ C) $\frac{\sqrt{3}}{2}$ D) $\frac{\sqrt{2}}{2}$

3. (a5-g7-25) ABC uchburchakda A burchak 75° va B burchak 60°. Agar AB tomon uzunligi 6 ga teng bo'lsa, AC tomon uzunligini toping.
A) $2\sqrt{6}$ B) $2\sqrt{3}$
C) $3\sqrt{6}$ D) $4\sqrt{3}$

4. (a5-g13-22) ABC uchburchakda C burchak to'g'ri. AD BC tomonga tushirilgan kesma. BD = 6, ADC burchak 50° va AC = 6sin50° bo'lsa, ABC burchakni toping.
A) 50° B) 65° C) 25° D) 30°

5. (a6-g9-21) ABC uchburchakning BC tomoni l. A burchak 2α ga va C burchak α ga teng. AB tomonni toping.
A) $\frac{l\sin\alpha}{2\cos 2\alpha}$ B) $\frac{l\sqrt{3}}{3}$
C) $\frac{l}{2\cos\alpha}$ D) $2l\cos\alpha$

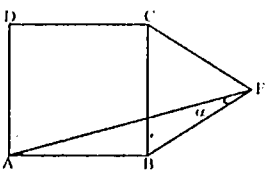
119. Kosinuslar teoremasi

1. (a1-g1-21) ABD uchburchakning BD tomonidan C nuqta tanlab olingach tomoni 2 ga teng ABC muntazam uchburchak hosil bo'ldi. Agar CD 1 ga teng bo'lsa, AD tomon uzunligini toping.
A) $\sqrt{3}$ B) $\sqrt{5}$ C) 3 D) $\sqrt{7}$

2. (a1-g16-29) Uchburchakning a, b va c tomonlari orasida $a^2 = b^2 + c^2 + bc$ munosabat o'rinli bo'lsa, uzunligi a ga teng bo'lgan tomon qarshisida yotgan burchakni aniqlang.
A) 60° B) 120°
C) 30° D) 150°

3. (a3-g11-26) ABC teng tomonli uchburchakning B uchidan AC tomonda joylashgan D nuqtaga kesma o'tkazildi. Hosil bo'lgan BDC uchburchakning DC tomoni 4 ga teng va DBC burchak 15° bo'lsa, $|AB| = ?$
A) $4\sqrt{3} + 8$ B) $6\sqrt{3} + 3$
C) $8\sqrt{3} - 4$ D) $4\sqrt{3}$

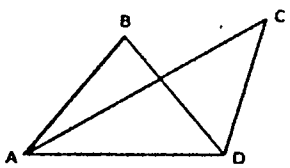
4. (a4-g20-20)



Yuqoridagi rasmda ABCD kvadrat va BCE teng tomonli uchburchak bo'lsa, sinα ning qiymatini toping.
A) $\frac{\sqrt{2+\sqrt{3}}}{4}$ B) $\frac{\sqrt{2+\sqrt{3}}}{2}$
C) $\frac{\sqrt{2-\sqrt{3}}}{2}$ D) $\frac{\sqrt{2-\sqrt{3}}}{4}$

5. (a4-g24-25) ABC uchburchakda BC = AB = 15. AC tomondan D nuqta olingan. CD = 13 va AD = 5 bo'lsa, BD kesma uzunligini toping.
A) $5\sqrt{10}$ B) $4\sqrt{5}$
C) $5\sqrt{5}$ D) $4\sqrt{10}$

6. (a6-g10-22) Rasmga ko'ra AB = 8, AD = DC = 12 va BD = 10. AC kesma A burchakni teng bo'lakka bo'ladi. Shu kesma uzunligini toping.



A) $9\sqrt{2}$ B) $6\sqrt{2}$
C) $9\sqrt{3}$ D) $15\sqrt{2}$

7. (a6-g15-9) ABC uchburchakda A burchak 15° va B burchak 55° bo'lsa, uchburchak tomonlari orasida qanday munosabat mavjud bo'ladi?
A) $c^2 = 2b^2 + ab$
B) $c^2 = b^2 + 4ab$
C) $2c^2 = b^2 + 3ab$
D) $c^2 = ab + b^2$

8. (a6-g22-28) ABC uchburchakda $|AB| = 4$ sm, $|AC| = 9$ sm. Uchburchakning AC tomoniga BD kesma tushirilganda ABD teng tomonli uchburchak hosil bo'ldi. D nuqtadan BC tomongacha bo'lgan masofani toping.
A) $\frac{10\sqrt{3}}{\sqrt{61}}$ B) $\frac{10\sqrt{3}}{\sqrt{21}}$
C) $\frac{5}{2}$ D) 2

120. Uchburchak bissektrisalarining xossasi

1. (a1-g2-28) To'g'ri burchakli uchburchakning gipotenuzasiga tushirilgan bissektrisasi gipotenuzani 5 va 12 ga teng kesmalarga ajratadi. Bu uchburchakning kichik katetini toping.
A) 10 B) $\frac{85}{13}$ C) $\frac{66}{13}$ D) $\frac{17}{13}$

2. (a1-g3-6) To'g'ri burchakli uchburchakning katetiga tushirilgan bissektrisa katetni 10 va 26 ga teng kesmalarga ajratadi. Shu uchburchakning perimetrini toping.
A) 72 B) 108
C) 84 D) 90

3. (a2-g10-27) Uchburchakning tomonlari 4, 6 va 9 ga teng. Shu uchburchakning katta tomoniga tushirilgan bissektrisaning shu tomondan ajratgan kesmalari uzunliklarining ayirmasi modulini toping.
A) 3,3 B) 2,7 C) 2 D) 1,8

4. (a2-g13-30) ABC uchburchakda AD bissektrisa. BD = 9, DC = 12, AC – AB = 4 bo'lsa, ABC uchburchakning perimetrini toping.
A) 45 B) 49
C) 57 D) 50

5. (a3-g5-26) Uchburchakning ikki tomoni 20 va 24 ga teng. Bu tomonlar orasidagi burchak 60° ga teng bo'lsa, uchinchi tomonga tushirilgan bissektrisa uzunligini toping.
A) $\frac{120}{11}$ B) $\frac{240}{11}$
C) $\frac{60\sqrt{3}}{11}$ D) $\frac{120}{11}\sqrt{3}$

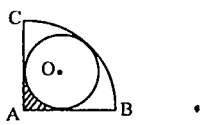
6. (a3-g7-34) Quyidagi mulohazalardan qaysi biri doimo to'g'ri?
A) To'g'ri burchakli uchburchakning gipotenuzaga tushirilgan bissektrisasi gipotenuzaning yarmiga teng.
B) Aylananing vatari uning radiusidan katta bo'la olmaydi.
C) Ikki vektor yig'indisining uzunligi ularning modullari ayirmasidan kichik bo'la olmaydi.
D) Fazodagi ikki nuqtadan faqat bitta tekislik o'tkazish mumkin.

7. (a3-g14-26) ABC uchburchakning A uchidan AD mediana chiqarildi. Keyin CAD uchburchakda AD tomonga C uchdan CN bissektrisa chiqarilgan. AB, BC va AC tomonlar mos ravishda 10, 12 va 8 ga teng bo'lsa, DN kesma uzunligini toping.
A) $\frac{6\sqrt{46}}{7}$ B) $\frac{5\sqrt{46}}{7}$
C) $\frac{3\sqrt{46}}{7}$ D) $\frac{10\sqrt{46}}{7}$

8. (a3-g19-26) Katetlari 8 va 6 ga teng bo'lgan to'g'ri burchakli uchburchakning kichik katetiga tushirilgan bissektrisa gipotenuzaga tushirilgan medianani qanday uzunlikdagi kesmalarga ajratadi?
A) $\frac{25}{11}$ va $\frac{40}{11}$ B) 3 va 2
C) $\frac{35}{13}$ va $\frac{30}{13}$ D) $\frac{25}{13}$ va $\frac{40}{13}$

9. (a3-g22-25) Uchburchakning tomonlari 6, 4 va 5 ga teng. 5 ga teng tomonga tushirilgan bissektrisa uzunligini toping.
A) $\sqrt{14}$ B) $\sqrt{17}$
C) $3\sqrt{2}$ D) 4

10. (a4-g17-25) B uchi to'g'ri bo'lgan ABC uchburchakning C o'tkir burchagidan CD bissektrisa chiqarilgan. CDB uchburchakning D uchidan BC tomonga DE bissektrisa chiqarilgan. BE = 2 va EC = 4 bo'lsa, AD kesma uzunligini toping.



A) 6 B) $4\sqrt{3}$ C) 8 D) $6\sqrt{3}$

11. (a4-g18-26) ABC uchburchakning B burchagi to'g'ri. C uchidan chiqqan bissektrisasi AB tomonni D nuqtada kesib o'tadi. BDC uchburchakning D uchidan chiqqan bissektrisa BC tomonni E nuqtada kesib o'tadi. BE = 2, EC = 4 bo'lsa, AD kesma uzunligini toping.
A) $2\sqrt{3}$ B) $4\sqrt{3}$ C) 4 D) 6

12. (a4-g19-31) ABC uchburchakning C uchidan CD bissektrisa chiqarilgan. AD = 6, AC = 12. ABC uchburchakka ichki chizilgan aylana AB tomonga E nuqtada urinadi. Agar ABC uchburchakning perimetri 42 ga teng bo'lsa, DE kesma uzunligini toping.
A) 0,5 B) 2 C) 1,5 D) 1

13. (a4-g25-25) ABC uchburchakning BC tomoniga AD bissektrisa o'tkazilgan. Agar $|AC| = |BC|$ va $< ADC = 105°$ bo'lsa, ACB burchakning kattaligini toping.
A) 30° B) 35° C) 40° D) 50°

14. (a5-g6-25) ABC uchburchakda AN bissektrisa. AN = NC. ANC burchak 80° bo'lsa, ABC burchakni toping.
A) 50° B) 60° C) 40° D) 30°

15. (a5-g23-22) ABC uchburchakda AN A burchak bissektrisasi. HN chiziq esa AB tomonga perpendikulyar. AH = 6, AN = 10 va NC = 17 bo'lsa, AC tomon uzunligini toping.
A) 21 B) 9 C) 18 D) 24

16. (a6-g8-21) Katetlari 24 sm va 18 sm bo'lgan to'g'ri burchakli uchburchakning kichik burchagi bessiktirisasi uzunligini toping.
A) 15 B) $8\sqrt{10}$
C) $32\sqrt{\pi}$ D) 30

17. (a6-g12-22) Uchburchakning ikki tomoni 3 va 1 ga, uchinchi tomonga chiqarilgan bissektrisa $0{,}75\sqrt{3}$ ga teng. Bu ikki tomon orasidagi burchak kotangensini toping.
A) $\frac{1}{\sqrt{3}}$ B) $-\frac{1}{\sqrt{3}}$
C) $\sqrt{3}$ D) $-\sqrt{3}$

18. (a6-g14-16) ABC uchburchakning A uchidan a tomonga AK va B uchidan b tomonga BL bissektrisalar o'tkazilgan va ular O nuqtada kesishadi.
AO:OK = 3:2 bo'lsa, $\frac{BO}{OL} = ?$
A) $\frac{5b+2a}{2}$ B) $\frac{5a+2b}{2b}$
C) $\frac{5a-2b}{2b}$ D) $\frac{3a+2ab}{ab}$

19. (a6-g19-25) ABC uchburchakning B uchidan BD bissektrisa chiqarilgan. BC = 20, AD = 6. DC + AB = 22 (AB > DC) bo'lsa, BD bissektrisa uzunligini toping.
A) $4\sqrt{5}$ B) $2\sqrt{13}$
C) $3\sqrt{10}$ D) $6\sqrt{5}$

20. (a6-g26-21) ABC uchburchakning B uchidan BD bissektrisa chiqarilgan. BC = 24, AD = 7. DC + AB = 26 (AB > DC) bo'lsa, BD bissektrisa uzunligini toping.
A) $3\sqrt{21}$ B) $2\sqrt{56}$
C) $6\sqrt{7}$ D) $2\sqrt{28}$

121. Uchburchak medianasining xossalari

1. (a1-g8-26) ABC uchburchakning medianalari kesishish nuqtasi G nuqtada joylashgan. BGC burchak 90° ga teng. Agar AG kesma uzunligi 12 sm bo'lsa, BC tomon uzunligini toping.
A) 12 B) 9 C) 18 D) 24

2. (a1-g10-27) Tomonlarining uzunliklari 6, 8 va 10 ga teng bo'lgan uchburchakning kichik tomoniga tushirilgan medianasi uzunligini toping.
A) 5 B) $2\sqrt{13}$
C) $\sqrt{73}$ D) 3

3. (a1-g14-26) ABC uchburchakda G medianalar kesishish nuqtasidan o'tuvchi EF to'g'ri chiziq BC asosiga parallel. Agar BC = 9 bo'lsa, EG kesmaning uzunligi necha sm?
A) 3 B) 4 C) 2,5 D) 6

4. (a2-g7-26) ABC uchburchakning AB, AC va BC tomonlari mos ravishda 5, 6 va 7 ga teng. AC tomonga BN bissektrisa va BM medianalar o'tkazilgan. MN kesma uzunligini toping.
A) $\frac{1}{2}$ B) $\frac{7}{11}$
C) $\frac{5}{12}$ D) $\frac{7}{12}$

5. (a2-g22-26) ABC to'g'ri burchakli uchburchakda AH gipotenuzaga tushirilgan balandlik. AB katet uzunligi $4\sqrt{7}$ ga, AH balandlik esa $4\sqrt{3}$ ga teng. Ushbu uchburchakda AD mediana uzunligini necha sm?
A) 4 B) 8 C) 6 D) 7

6. (a3-g5-25) Uchburchakning burchaklari 1, 3 va 4 sonlariga proporsional. Agar uchburchakning katta tomoni 16 ga teng bo'lsa, shu tomonga tushirilgan mediana uzunligini toping.
A) 4
B) 8
C) 12
D) aniqlab bo'lmaydi.

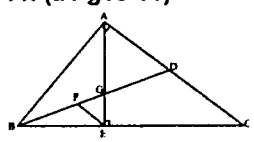
7. (a3-g17-26) ABC uchburchakning A uchidan tushirilgan balandlik va mediana bir chiziqda yotadi. Uchburchakning AB tomoni 5 ga, BC tomoni 8 ga teng bo'lsa, ushbu uchburchakning bissektrisalari va medianalari kesishish nuqtalari orasidagi masofani toping.
A) 0,(3) B) 0,5 C) 0,25 D) 0,2

8. (a3-g23-25) ABC to'g'ri burchakli uchburchakda AH gipotenuzaga tushirilgan balandlik. AB katet uzunligi $4\sqrt{3}$ ga AH balandlik $4\sqrt{2}$ ga teng. Ushbu uchburchakda AD mediananing uzunligi necha sm?
A) 4 B) 5 C) 6 D) 12

9. (a4-g2-26) Uchburchakning ikki medianasining uzunligi 18 va 13,5 ga teng va ular o'zaro perpendikulyar. Uchinchi mediana uzunligini toping.
A) 18 B) 15 C) 17,5 D) 22,5

10. (a4-g10-26) Uchburchakning uchlaridan tushgan medianalar $m_a = 6$, $m_b = 9$ va $m_c = 12$ bo'lsa, AB tomon uzunligini toping.
A) $2\sqrt{10}$ B) $2\sqrt{5}$
C) 5 D) $4\sqrt{3}$

11. (a4-g13-11)



Yuqoridagi chizmada $\angle A = 90°$, AB = AC. G uchburchakning medianalari kesishish nuqtasi. GF = FB va EF = 4 bo'lsa, AE = ?
A) $\frac{6\sqrt{10}}{5}$ B) $\frac{\sqrt{5}}{5}$
C) $\frac{4\sqrt{5}}{5}$ D) $\frac{12\sqrt{10}}{5}$

12. (a4-g16-25) Tomonlari uzunliklari 70, 240 va 250 bo'lgan uchburchakning eng kichik medianasi uzunligini toping.
A) 125 B) $\sqrt{58825}$
C) $\sqrt{19300}$ D) 120

13. (a4-g21-25) Tomonlari uzunliklari 35, 120 va 125 bo'lgan uchburchakning eng kichik medianasi uzunligini toping.
A) 62,5 B) $\frac{\sqrt{58825}}{2}$
C) $\sqrt{3815}$ D) 60

14. (a4-g25-31) ABC uchburchakning A uchidan chiqqan medianasi uchburchakka tashqi chizilgan aylanani D nuqtada kesadi. |AC| = |DC| = 6 bo'lsa, BC tomon uzunligini toping.
A) $3\sqrt{2}$ B) $6\sqrt{2}$ C) 6 D) 12

15. (a5-g5-25) To'g'ri burchakli uchburchakda to'g'ri burchak uchidan chiqarilgan mediana 6 ga teng va gipotenuza bilan 60° burchak hosil qiladi. Kichik katet uzunligini toping.
A) 6 B) $6\sqrt{3}$
C) 3 D) $4\sqrt{3}$

16. (a5-g5-26) ABC uchburchakda AB = 12, AC = 8. AN bissektrisa va BM mediana P nuqtada kesishadi. $\frac{AP}{PN}$ nisbatni toping.
A) 1,5 B) 1,(6)
C) 2,25 D) 3

17. (a5-g14-22) ABC uchburchakning A uchidan AD mediana chiqarilgan. B uchidan chiqarilgan bissektrisa AC tomonni A uchidan boshlab 9:32 nisbatda bo'lsa, AD medianani A uchdan boshlab qanday nisbatda bo'ladi?
A) 9:16 B) 9:64 C) 9:8 D) 9:2

18. (a5-g18-29) Tomonlari 10, 14 va 16 bo'lgan uchburchakning kichik medianasi uzunligini toping.
A) $\sqrt{201}$ B) $\sqrt{295}$
C) $\sqrt{129}$ D) $\sqrt{84}$

19. (a6-g7-22) ABC uchburchakning AD medianasiga parallel KM kesma uchburchakning yuzini 1:7 nisbatda bo'ladi. Agar KM = 4 bo'lsa, AD mediana uzunligini toping.
A) 8 B) $4\sqrt{3}$
C) $4\sqrt{7}$ D) $8\sqrt{2}$

20. (a6-g7-27) ABC uchburchak. $\vec{m}$ BC tomonga tushirilgan mediana. Agar AC tomon $\vec{b}$ ga teng bo'lsa, $\overrightarrow{AB}$ quyidagilardan qaysi biriga teng?

A) $\frac{\vec{b}+\vec{m}}{2}$ B) $\frac{\vec{b}-\vec{m}}{2}$

C) $2\vec{m}-\vec{b}$ D) $2\vec{m}+\vec{b}$

21. (a6-g11-21) ABC uchburchakda m_a median A uchidan chiqarilgan medianani ifodalaydi. $m_a = 11$, $m_b = 10$ va $m_c = 7$ bo'lsa, BC tomon uzunligini toping.

A) $\frac{2\sqrt{177}}{3}$ B) $\frac{4\sqrt{60}}{3}$

C) $\frac{2\sqrt{393}}{3}$ D) $\frac{20\sqrt{5}}{3}$

22. (a6-g12-4) To'g'ri burchakli uchburchakning o'tkir burchaklaridan chiqqan medianalar orasidagi burchakni toping.

A) 45°
B) 120°
C) 90°
D) aniqlab bo'lmaydi

23. (a6-g12-36) Quyidagi mulohazalardan qaysi biri to'g'ri?

A) Ixtiyoriy uchburchakning medianasi uning balandligidan katta yoki teng, bissektrisasidan kichik yoki teng bo'ladi.
B) Yig'indisi birga teng vektorlar birlik vektorlari deyiladi.
C) $a + b = 1$ bo'lsa, $a^3 + b^3 + ab$ ning eng kichik qiymati 0,5 ga teng.
D) x va y butun sonlar, agar $3x + 17y$ 19 ga bo'linsa, $43x + 75y$ ham 19 ga bo'linadi.

24. (a6-g17-22) ABC uchburchakda B to'g'ri burchak. AB = 15 va AC = 17 bo'lsa, AD mediana uzunligini toping.

A) 8,5 B) $\sqrt{241}$

C) $\sqrt{229}$ D) $\sqrt{74}$

25. (a6-g19-7) ABC to'g'ri burchakli uchburchakning gipotenuzasiga AH balandlik tushirilgan. AB = 30, AC = 40 bo'lsa, AHC uchburchakning A uchidan chiqarilgan medianasi uzunligini toping.

A) 24 B) $6\sqrt{13}$

C) 16 D) $8\sqrt{13}$

26. (a6-g25-6) To'g'ri burchakli uchburchakning katetlariga tushirilgan medianalari $\sqrt{52}$ va $\sqrt{73}$ ga teng. Gipotenuzani toping.

A) 5 B) 10

C) $5\sqrt{5}$ D) 15

122. Uchburchak balandligi

1. (a1-g12-31) Uchburcakning o'tmas burchagini tashkil qiluvchi tomonlari 7 va 10 sm ga teng. Shu uchburchakning katta tomoni nechta butun qiymat qabul qila oladi?

A) 13 B) 4 C) 6 D) 9

2. (a1-g14-25) ABC uchburchak. AH BC tomonga tushirilgan balandlik. $|AC| = 13$, $|BH| = 4$ va $|HC| = 12$ bo'lsa, $|AB| = ?$

A) 5 B) 3

C) $\sqrt{41}$ D) 17

3. (a2-g6-25) ABC uchburchakning C uchidan CD balandlik tushirilgan va ACD burchak α ga teng. Agar $\frac{|AD|}{|DB|} = \frac{\sqrt{3}}{4}$, $|BC| = 4$ va $\cos\alpha = \frac{4}{5}$ bo'lsa, uchburchakning CD balandligining uzunlgini toping.

A) $2\sqrt{2}$ B) 1 C) 2 D) $\frac{1}{\sqrt{2}}$

4. (a2-g6-26) Tomonlari 5, 6, 7 sm ga teng bo'lgan uchburchakning 7 sm li tomoniga tushirilgan balandligi nechaga teng?

A) $\frac{6\sqrt{6}}{7}$ B) $\frac{12\sqrt{6}}{7}$

C) $2\sqrt{6}$ D) $6\sqrt{6}$

5. (a2-g8-28) Yuzasi 30 sm^2 bo'lgan uchburchakning barcha tomonlari ko'paytmasi 600 ga teng bo'lsa, uning barcha balandliklari ko'paytmasini toping.

A) 240 B) 450 C) 180 D) 360

6. (a2-g23-25) Uchburchakning ichki burchaklari 1, 2 va 3 sonlariga proporsional. Katta tomonga tushirilgan balandlik 6 ga teng bo'lsa, kichik tomon uzunligini toping.

A) 12 B) $2\sqrt{3}$

C) $4\sqrt{3}$ D) $6\sqrt{3}$

7. (a3-g3-28) Yuzasi 30 sm^2 bo'lgan uchburchakning barcha tomonlari ko'paytmasi 375 ga teng bo'lsa, uning barcha balandliklari ko'paytmasini toping.

A) 144 B) 288 C) 432 D) 576

8. (a3-g8-26) Uchburchakning 12 ga teng balandligi uning asosi uzunligini 7:18 nisbatda bo'ladi. Shu balandlikka parallel va uchburchakning yuzini teng ikkiga bo'ladigan to'g'ri chiziq kesmasining uzunligini toping.

A) 9 B) 10 C) 6,5 D) 11

9. (a3-g16-26) ABC uchburchakning A uchidan BC tomonga uzunligi AB tomoga teng AD kesma o'tkazilgan. DC kesma uzunligi 2 ga, AD kesma 10 ga va BC tomonga tushirilgan balandlik 6 ga teng. Uchburchakning AC tomon uzunligini toping.

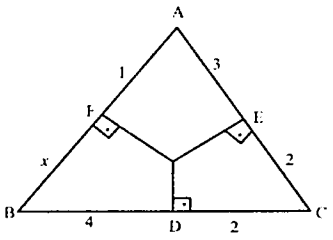
A) 10 B) 6

C) $2\sqrt{34}$ D) $\sqrt{68}$

10. (a3-g21-26) ABC uchburchakning AB, BC va AC tomonlari mos ravishda 6, 7 va 8 ga teng. A uchdan chiqarilgan bissektrisa, B uchidan chiqarilgan balandlikni B uchidan boshlab qanday nisbatda bo'ladi?

A) $\frac{13}{8}$ B) $\frac{32}{17}$ C) $\frac{21}{13}$ D) $\frac{3}{2}$

11. (a4-g11-10)



Rasmda berilgan uchburchakda $x = ?$

A) $\sqrt{2}$
B) $2\sqrt{2}$
C) $\sqrt{3}$
D) $2\sqrt{3}$

12. (a4-g19-26) ABC uchburchakning AB, BC va AC tomonlari mos ravishda 8, 14 va 10 ga teng. AB tomonga CH balandlik tushirilgan bo'lsa, AH kesma uzunligini toping.

A) $4\sqrt{6}$ B) 6

C) 10 D) 2

13. (a5-g4-25) ABC uchburchakning BC tomoniga AD mediana va AH balandlik tushirilgan. AD = 7, BH = 2·HD = 2 bo'lsa, AC tomon uzunligini toping.

A) $2\sqrt{13}$ B) $4\sqrt{6}$

C) 8 D) $7\sqrt{2}$

14. (a5-g16-22) ABC uchburchakda AD A to'g'ri burchakdan tushirilgan mediana. BE esa ADB uchburchakda AD tomonga tushirilgan balandlik. Agar AB = 24 va AC = 32 bo'lsa, BE kesma uzunligini toping.

A) 14,4 B) 24

C) 19,2 D) 16

15. (a5-g20-21) Teng yonli uchburchakning yon tomoniga tushirilgan bissektrisa shu tomonni asosdan boshlab 3:5 nisbatda ajratsa, shu tomonga tushgan balandlik uni qanday nisbatdagi kesmalarga ajratadi?

A) 9:25 B) 3:4

C) 9:41 D) 5:16

16. (a5-g22-22) ABC uchburchakning A uchidan tushirilgan balandlik 12 ga teng. B va C burchaklar mos ravishda 76° va 37° ga teng. ($\sin 37° = 0{,}6$ va $\operatorname{tg} 76° = 4$) bo'lsa, BC tomon uzunligini toping.

A) $3 + \frac{48}{\sqrt{17}}$

B) 23,2

C) $3 + \frac{12}{\sqrt{17}}$

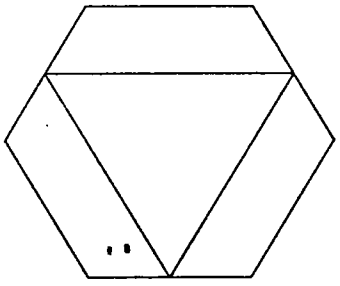
D) 19

17. (a6-g10-21) ABC uchburchakning AD balandligi hamda BC tomoni 12 ga va $\operatorname{tg}B = 3\operatorname{tg}C$ bo'lsa, AC tomon uzunligini toping.

A) 13 B) 25 C) 17 D) 15

123. Uchburchak turi

1. (a1-g9-28)



Yondagi shaklda muntazam oltiburchak keltirilgan. Oltiburchakning ichiga muntazam uchburchak chizilgan. Rasmga qarab, bo'yalgan soha yuzasining uchburchak yuzasiga nisbatini toping.

A) $\frac{6}{5}$ B) $\frac{4}{3}$ C) $\frac{7}{4}$ D) $\frac{5}{3}$.

124. Uchburchak yuzasi

1. (a1-g3-36) ABC uchburchakning BC asosiga parallel EF to'g'ri chiziq uchburchakning medianalar kesishish nuqtasidan o'tadi. Agar BEFC to'rtburchakning yuzi 30 sm^2 bo'lsa, ABC uchburchakning yuzini toping.
A) 54 B) 66 C) 48 D) 60

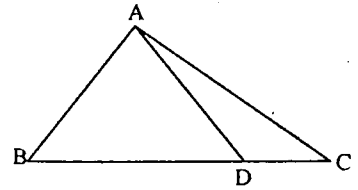
2. (a1-g4-27) ABD uchburchakning A uchidan BD tomonga AC chiziq o'tkazilgan. $\angle CAB = 90°$, $|AB| = c$, $|AC| = b$, $|BC| = a$ va $|CD| = d$. Berilganlardan foydalanib ACD uchburchakning yuzini toping.

A) $\frac{5^2}{7^3}$ B) $\frac{bcd}{2a}$

C) $\frac{(a+b)d}{2a}$ D) $\frac{abd}{2bc}$

3. (a1-g6-27) ABC uchburchakning AB tomonida D nuqta va BC tomonida E nuqta olindi. 3AD = 5BD va 6EC = 5BE bo'lsa, ABC uchburchak yuzining BDE uchburchak yuziga nisbatini toping.
A) 88:25 B) 44:9
C) 30:18 D) 25:18

4. (a1-g7-26)



ABC uchburchakning yuzi 15 sm^2 $|AB| = |AD|$, $|BD| = 2\cdot|DC| = 4$ sm bo'lsa, $|AD|$ necha sm?

A) $\sqrt{29}$ B) $\sqrt{21}$
C) $\sqrt{26}$ D) $\sqrt{19}$

5. (a1-g8-27) ABC teng yonli uchburchakning A burchagi 90°. Uning AB tomonida E nuqta, BC tomonidan F nuqta olingan. $|EA| = 2|EB|$ va EF kesma BC tomonga perpendikulyar. EFC uchburchak yuzining ABC uchburchak yuziga nisbatini toping.

A) $\frac{3}{8}$ B) $\frac{5}{6}$ C) $\frac{5}{18}$ D) $\frac{7}{6}$

6. (a1-g9-27) ABC to'g'ri burchakli uchburchakning katetlaridan biri 11 ga teng bo'lib, tomonlarining uzunligi butun sonlardan iborat bo'lsa, bu uchburchakning yuzasi nechaga teng?
A) 330 B) 440
C) 550 D) 660

7. (a1-g11-27) Uchburchakning ikkita medianasi o'zaro perpendikulyar va har birining uzunligi 6 sm dan. Uchburchakning yuzini toping.
A) 24 B) 18 C) 16 D) 12

8. (a1-g17-26) Teng yonli uchburchakning yon tomonlari 6 ga teng. Medianalar kesishish nuqtasidan asosigacha bo'lgan masofa 1 ga teng. ABC uchburchakning yuzini toping.
A) $6\sqrt{3}$ B) $9\sqrt{3}$
C) 6 D) 9

9. (a1-g17-29) ABCD to'g'ri to'rtburchakning ichidan G nuqta olib, o'sha nuqtadan to'rtburchakning uchlariga chiziqlar tortildi. Hosil bo'lgan DGC, AGD va AGB uchburchaklarning yuzlari mos ravishda 9, 15 va 10 ga teng. BGC uchburchakning yuzini toping.
A) 4 B) 6 C) 10 D) 12

10. (a2-g1-26) ABC uchburchakning B uchidan chiqqan mediana AC tomonni E nuqtada kesib o'tadi. A uchidan chiqarilgan AD kesma BE medianani F nuqtada kesib o'tadi va BF = 2FE tenglikni qanoatlantiradi. ABC uchburchakning yuzi BFD uchburchakning yuzidan necha marta katta?
A) 4 B) 6 C) 8 D) 12

11. (a2-g4-27) ABC uchburchakning ichidan olingan bir nuqtadan tomonlarga parallel chiziqlar o'tkazildi. Hosil bo'lgan uchta kichik uchburchaklarning yuzalari mos ravishda 8, 18 va 32 ga teng. ABC uchburchakning yuzini toping.
A) 116 B) 232 C) 162 D) 324

12. (a2-g5-26) Uchburchakning ikkita medianasi o'zaro perpendikulyar va har birining uzunligi 9 sm dan. Uchburchakning yuzini toping.
A) 54 B) 40,5 C) 27 D) 63

13. (a2-g6-29) To'g'ri to'rtburchakning kichik tomoni 7 ga teng. Diagonallari 60° burchak ostida kesishadi. To'g'ri to'rtburchakning yuzini toping.
A) $49\sqrt{3}$ B) $56\sqrt{3}$
C) 63 D) 56

14. (a2-g7-27) Gipotenuzasi 7 ga teng bo'lgan to'g'ri burchakli uchburchakning ichiga tomoni 4 ga teng bo'lgan muntazam uchburchak shunday chizilganki, muntazam uchburchakning ikki uchi gipotenuzada, uchinchi uchi esa to'g'ri burchakda yotadi. To'g'ri burchakli uchburchakning yuzini toping.
A) $3\sqrt{3}$ B) $7\sqrt{3}$
C) $\frac{14}{\sqrt{3}}$ D) $\frac{21\sqrt{3}}{4}$

15. (a2-g7-34) Muntazam ABC uchburchakning AB tomoni orqali o'tkazilgan tekislikdagi proyeksiyasi teng yonli ABD teng yonli uchburchakdan iborat. Agar uchburchak tekislik bilan 30° burchak hosil qilgan va tomoni 8 ga teng bo'lsa, ABD uchburchak yuzini toping.

A) $\frac{63^{31}}{63\ 27}$ B) 24

C) $16\sqrt{3}$ D) 12

16. (a2-g9-27) Uchburchakning ikkita medianasi o'zaro perpendikulyar va har birining uzunligi 6 sm dan. Uchburchakning yuzini toping.
A) 24 B) 18 C) 16 D) 12

17. (a2-g11-27) ABC uchburchakning A uchidan AN bissektrisa tushirilgan. AB va AC tomonlari mos ravishda 8 va 13 ga teng. ABN uchburchakning yuzi 12 ga teng bo'lsa, ANC uchburchakning yuzi nechaga teng?
A) 26 B) 31,5 C) 34 D) 19,5

18. (a2-g13-21) Uchburchak burchaklaridan biri 60°, unga tashqi chizilgan aylana radiusi $\frac{7}{\sqrt{3}}$ ga, ichki chizilgan aylana radiusi $\sqrt{3}$ ga teng. Uchburchakning yuzini toping
A) $8\sqrt{3}$ B) $20\sqrt{3}$
C) $5\sqrt{3}$ D) $10\sqrt{3}$

19. (a2-g14-23) Katetlari a, b va gipotenuzasi c bo'lgan to'g'ri burchakli uchburchakda $(a + c + b)(b + a - c) = 42$ bo'lsa, uchburchakning yuzasini toping.
A) 21 B) 12 C) 10,5 D) 12,5

20. (a2-g15-27) Burchaklari nisbati 1:5:6 kabi bo'lgan uchburchakning katta tomoni 6 sm. Shu uchburchakning katta tomoni unga tushgan balandligi va medianasi bilan chegaralangan qismi yuzini toping.

A) $\frac{3\sqrt{3}}{4}$ B) $\frac{4\sqrt{3}}{3}$

C) $\frac{2\sqrt{3}}{9}$ D) $\frac{9\sqrt{3}}{8}$

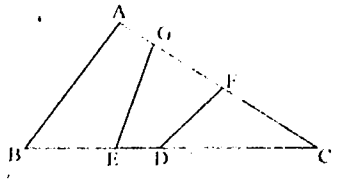
21. (a2-g16-26) ABC uchburchakning AB tomonidan D, AC tomonidan E nuqta shunday olindiki, natijada ADE burchak ACB burchakka teng bo'ldi. $\frac{AD}{AC} = \frac{3}{5}$.

Agar BDEC to'rtburchakning yuzi 80 ga teng bo'lsa, ABC uchburchakning yuzini toping.
A) 45 B) 105 C) 125 D) 110

22. (a2-g17-25) Bir to'g'ri chiziq o'zaro perpendikulyar bo'lgan ikki to'g'ri chiziqning birini 36° da kesib o'tsa, ikkinchisi bilan hosil qilgan o'tmas burchakni toping.
A) 114° B) 66° C) 156° D) 126°

23. (a2-g18-26) Yuqoridagi rasmda $BE = DC = 2ED$, $AG = \frac{1}{2}FC = \frac{1}{3}GF$.

ABC uchburchakning yuzasi S bo'lsa, bo'yalgan sohaning yuzini toping.



A) $\frac{1}{2}S$ B) $\frac{7}{30}S$
C) $\frac{2}{3}S$ D) $\frac{11}{30}S$

24. (a2-g19-26) ABC uchburchak tomonlarining o'rtalaridan uch nuqta olinib hosil qilingan uchburchakning yuzi 24 ga teng. ABC uchburchakning yuzini toping.
A) 96 B) 72 C) 120 D) 144

25. (a2-g21-27) ABC uchburchakning AB asosiga parallel, AC va BC tomonlarni M va N nuqtalarda kesuvchi chiziq o'tkazildi. ABC uchburchakning yuzi 36 ga teng. Agar AB kesma MN kesmadan 3 marta uzun bo'lsa, ABNM to'rtburchakning yuzini toping.
A) 32 B) 24 C) 27 D) 9

26. (a2-g23-26) ABC uchburchakning A uchidan BC tomonga uzunligi AB tomonga teng AD kesma o'tkazilgan. DC kesma uzunligi 3 ga, BD kesma 12 ga teng. Agar uchburchakning yuzi 60 ga teng bo'lsa, AC tomon uzunligini toping.
A) 10 B) 5
C) $5\sqrt{5}$ D) $\sqrt{145}$

27. (a3-g1-26) To'g'ri burchakli uchburchakning uzunligi 14 va 18 ga teng katetlariga tushirilgan medianalari uni uchta uchburchakka va to'rtburchakka ajratadi. To'rtburchakning yuzini toping.
A) 42 B) 63 C) 64 D) 48

28. (a3-g2-26) To'g'ri burchakli uchburchakning katetlari 15 va 20 ga teng. Gipotenuzaga tushirilgan mediana va balandlik orasidagi kesimning yuzasini toping.
A) 21 B) 16 C) 20 D) 30

29. (a3-g4-26) ABC uchburchakning B uchidan AC tomoniga shunday chiziq o'tkazildiki, natijada ACB burchak, ABD burchakka teng bo'lib qoldi. AB = 7, AD = 4 va ABC uchburchakning yuzi 98 ga teng bo'lsa, BDC uchburchakning yuzini toping.
A) 32 B) 49 C) 56 D) 66

30. (a3-g6-26) ABC to'g'ri burchakli uchburchakning gipotenuzasi AB. BC katetga AL bissektrisa tushirilgan. CL = 4 va AB + AC = 14 bo'lsa, ABC uchburchak yuzini toping.
A) 14 B) 21 C) 28 D) 24

31. (a3-g7-26) ABC uchburchakda F AC tomondan, D AB tomondan, E esa BC tomondan olingan nuqtalar. Bu uchburchakda: $|DB| = 3|DA|$, $|EC| = |EB|$ va $|FC| = 4|FA|$ bog'lanishlar mavjud. Agar ABC uchburchakning yuzi 60 sm^2 bo'lsa, DEF uchburchakning yuzasi necha sm^2?
A) 10,5 B) 7,5 C) 9 D) 15

32. (a3-g7-28) ABCD to'g'ri to'rtburchakning ichidan P nuqta olindi. PAB, PBC va PCD uchburchaklarning yuzi mos ravishda 12; 16 va 18 ga teng bo'lsa, PAD uchburchakning yuzini toping.
A) 10 B) 14 C) 22 D) 32

33. (a3-g8-31) To'g'ri burchakli uchburchakka aylana ichki chizilgan. Shu aylana urinish nuqtasidan uning katetlaridan birini to'g'ri burchak uchidan boshlab hisoblaganda uzunliklari 6 va 14 bo'lgan kesmalarga ajratadi. Uchburchakning yuzini hisoblang.
A) 150 B) 300 C) 420 D) 210

34. (a3-g9-25) To'g'ri burchakli uchburchakning gipotenuzaga tushirilgan balandligi gipotenuzani nisbati 2 ga teng bo'lgan bo'laklarga bo'ladi. Agar balandlik $4\sqrt{2}$ ga teng bo'lsa, shu uchburchakning yuzini toping.
A) 48 B) $48\sqrt{2}$
C) $24\sqrt{2}$ D) 24

35. (a3-g10-27) ABC uchburchakning A uchidan AN bissektrisa tushirilgan. AB va AC tomonlari mos ravishda 6 va 9 ga teng. ABN uchburchakning yuzi 15 ga teng bo'lsa, ABC uchburchakning yuzi nechaga teng?
A) 30 B) 22,5 C) 45 D) 37,5

36. (a3-g12-27) Burchaklari nisbati 1:5:6 kabi bo'lgan uchburchakning katta tomoni 4 sm. Shu uchburchakning katta tomoni unga tushgan balandligi va medianasi bilan chegaralangan qismi yuzini toping.
A) $\sqrt{3}$ B) $\frac{\sqrt{3}}{2}$ C) $\frac{1}{2}$ D) 1

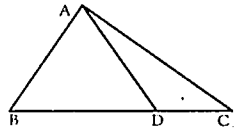
37. (a3-g17-28) To'g'ri to'rtburchakning katta tomoni 9 ga teng. Diagonallari 120° burchak ostida kesishadi. To'g'ri to'rtburchakning yuzini toping.
A) $81\sqrt{3}$ B) $18\sqrt{3}$
C) $36\sqrt{3}$ D) $27\sqrt{3}$

38. (a3-g22-26) ABC uchburchakning A burchagi 90°. AC tomondan D nuqta olingan. AD = 6 va DC = 8 va BDC burchak 135° bo'lsa. BDC uchburchakning yuzini toping.
A) 24 B) 18 C) 42 D) 36

39. (a3-g22-31) To'g'ri burchakli uchburchakning perimetri 48 ga teng va bu uchburchak aylanaga tashqi chizilgan. To'g'ri burchak uchidan aylanaga urinish nuqtasigacha bo'lgan masofa 4 ga teng bo'lsa ABC uchburchakning yuzasini toping.
A) 72 B) 96 C) 84 D) 48

40. (a3-g23-26) Uchburchak ABC da D bissektrisalarning kesishish nuqtasi, AB = 5, AC = 6, BC = 7 bo'lsa, ABDC to'rtburchakning yuzini toping.
A) $2\sqrt{6}$ B) $\frac{7\sqrt{6}}{3}$
C) $\frac{11\sqrt{6}}{3}$ D) $4\sqrt{6}$

41. (a4-g1-26) ABC uchburchakning yuzi 48 sm^2 $|AB| = |AD|$ $|BD| = 3$. $|DC| = 12$ sm bo'lsa, $|AD|$ necha *sm*?



A) $3\sqrt{6}$ B) $6\sqrt{2}$ C) 6 D) $3\sqrt{5}$

42. (a4-g4-26) ABC uchburchakning AB va AC tomonlari mos ravishda 4 va 8 ga teng. A burchagi 135°. K va L nuqtalar AC va BC tomonlarning o'rta nuqtalari bo'lsa, BKL uchburchakning yuzini toping.
A) $8\sqrt{2}$ B) $4\sqrt{2}$ C) $2\sqrt{2}$ D) $\sqrt{2}$

43. (a4-g4-31) ABC uchburchakning A burchagi to'g'ri. AB = 6 va AC = 8. Bu uchburchakka ichki chizilgan aylana tomonlarga K, L va m nuqtalarda urinadi. KLM uchburchakning yuzini toping.
A) 3,2 B) 3,6 C) 4,2 D) 4,8

44. (a4-g5-26) Burchaklari nisbati 1:5:6 kabi bo'lgan uchburchakning katta tomoni 6 sm. Shu uchburchakning katta tomoni unga tushgan balandligi va medianasi bilan chegaralangan qismi yuzini toping.
A) $\frac{3\sqrt{3}}{4}$ B) $\frac{4\sqrt{3}}{3}$
C) $\frac{2\sqrt{3}}{9}$ D) $\frac{9\sqrt{3}}{8}$

45. (a4-g7-26) ABC uchburchak AB asosiga parallel chizilgan, yon tomonini C uchidan boshlab 2:4:5 nisbatda bo'luvchi to'g'ri chiziqlar yordamida 3 bo'lakka bo'lingan. O'rtadagi bo'lakning yuzasi 80 ga teng bo'lsa, uchburchakning yuzini toping.
A) 220 B) 320
C) 287,5 D) 302,5

46. (a4-g8-27) Burchaklari nisbati 1:5:6 kabi bo'lgan uchburchakning katta tomoni 6 sm. Shu uchburchakning katta tomoni unga tushgan balandligi va medianasi bilan chegaralangan qismi yuzini toping.

A) $\frac{5\sqrt{3}}{6}$ B) $\frac{9\sqrt{3}}{8}$ C) $\frac{9}{2}$ D) 3

47. (a4-g9-26) ABC uchburchakning AC tomoni 12 ga teng. Shu uchburchakning BH balandligidan D nuqta olindi va ABCD to'rtburchakning yuzi 48 ga teng bo'lib qoldi. BD kesma uzunligini toping.

A) 12 B) 8 C) 6 D) 4

48. (a4-g10-28) ABCD trapetsiyada AD va BC asoslar. F diagonallar kesishish nuqtasi. $3|BF| = 5|FD|$. $S_{(BFC)} - S_{(AFD)} = 64$ bo'lsa, ABC uchburchakning yuzini toping.

A) 100 B) 256 C) 232 D) 160

49. (a4-g14-30) Tomoni 1 ga teng bo'lgan ABCD kvadratning AD tomoni o'rtasidan F va DC tomon o'rtasidan E nuqtalar olingan. BEF uchburchakning yuzasini toping.

A) $\frac{5}{8}$ B) $\frac{1}{3}$ C) $\frac{2}{3}$ D) $\frac{3}{8}$

50. (a4-g16-26) ABC ucbhurchakning BC asosiga parallel EF to'g'ri chiziq uchburchakning medianalar kesishish nuqtasidan o'tadi. Agar BEFC to'rtburchakning yuzi 25 sm^2 bo'lsa, AEF uchburchakning yuzini toping.

A) 3,125 B) 20
C) 8 D) 45

51. (a4-g17-35) Kubning pastki asosidagi uchlari ABCD ustki uchlari A'B'C'D'. Agar kubning tomoni a ga teng bo'lsa, A'BD uchburchakning yuzini toping.

A) $a^2\sqrt{3}$ B) $\frac{3a^2}{4}$

C) $\frac{3a^2}{2}$ D) $\frac{a^2\sqrt{3}}{2}$

52. (a4-g19-25) Perimetri 21 ga teng bo'lgan uchburchakning ichidagi O nuqta barcha tomonlardan 4 sm masofada joylashgan. Uchburchakning yuzini toping.

A) 84 B) 42 C) 28 D) 56

53. (a4-g20-25) Balandliklari 9, 12, 7,2 bo'lgan uchburchak yuzasini toping.

A) 36 B) 54 C) 72 D) 27,8

54. (a4-g21-26) ABC uchburchakning BC asosiga parallel EF to'g'ri chiziq uchburchakning medianalar kesishish nuqtasidan o'tadi. Agar BEFC to'rtburchakning yuzi 55 sm^2 bo'lsa, AEF uchburchakning yuzini toping.

A) 11 B) 44 C) 32 D) 99

55. (a4-g22-26) ABC uchburchakda AB:BC = 3:5. BC tomon o'rtasidagi D nuqtadan B burchak bissektrisasiga parallel qilib AC tomonga DE kesma tushirildi. CDE uchburchak yuzining ABC uchburchak yuziga nisbatini toping.

A) 5:32 B) 9:25
C) 5:16 D) 4:25

56. (a4-g25-26) ABC uchburchakda DE o'rta chiziq (DE//BC). C uchidan CD kesma tushirildi. Agar CDE uchburchakning yuzasi 9 ga teng bo'lsa, ABC uchburchak yuzasini toping.

A) 45 B) 27 C) 36 D) 18

57. (a5-g1-25) Tomonlarining uzunliklari a, $a-7$ va $a+1$ bo'lgan to'g'ri burchakli uchburchakning yuzini toping.

A) 24 B) 30 C) 60 D) 12

58. (a5-g1-26) ABC uchburchakning BC tomonidan D va E nuqtalar, AC tomonidan F nuqta olindi. BD = DE = EC va AF = CF. ABD, ADF va FEC uchburchaklarning yuzlari yig'indisi 30 ga teng bo'lsa, ADF uchburchak yuzini toping.

A) 12 B) 18 C) 9 D) 6

59. (a5-g2-26) ABC uchburchakning medianalari kesishish nuqtasi g dan AC tomonga parallel GD va BC tomonga parallel GE chiziqlar o'tkazildi. D va E AB tomonda yotadi. Agar ABC uchburchakning yuzasi 18 ga teng bo'lsa, GDE uchburchakning yuzasini toping.

A) 2 B) 8 C) 4,5 D) 1

60. (a5-g2-35) ABCD – kubning ostki qismi, A'B'C'D esa – ustki qismi. Kubning tomoni 6 ga teng bo'lsa, ACD' uchburchakning yuzini toping.

A) $27\sqrt{3}$ B) $13,5\sqrt{3}$

C) $18\sqrt{3}$ D) $36\sqrt{3}$

61. (a5-g3-29) ABCD tomoni 16 ga teng kvadrat. E AD tomonning, F CD tomonning o'rta nuqtalari. CE va AF chiziqlar g nuqtada kesishadi. AEG uchburchakning yuzini toping.

A) $\frac{64}{3}$ B) 32

C) $\frac{32}{3}$ D) 16

62. (a5-g4-26) ABC uchburchakning BC asosiga parallel EF to'g'ri chiziq uchburchakning medianalar kesishish nuqtasidan o'tadi. Agar BEFC to'rtburchakning yuzi 48 sm^2 bo'lsa, AEF uchburchakning yuzini toping.

A) 22,6 B) 32
C) 38,4 D) 86,4

63. (a5-g6-26) ABC uchburchakda BC tomonga AN kesma tushirilgan. N nuqtadan AB va AC tomonlarga tushirilgan perpendikulyarlarning har biri 6 ga teng. AB + AC = 21 bo'lsa, ABC uchburchakning yuzini toping.

A) 126 B) 84 C) 63 D) 91

64. (a5-g6-35) ABCD to'g'ri burchakli parallelepipedning pastki asosi, A'B'C'D esa mos ravishda ustki asosi. E nuqta esa, DD' tomondan olingan nuqta. Parallellipeped asosining tomonlari k, $2k$, balandligi $3k$ ga teng bo'lsa, BB'E uchburchak yuzasini toping.

A) $\frac{\sqrt{13k^2}}{2}$ B) $\frac{3\sqrt{5k^2}}{2}$

C) $\sqrt{10k^2}$ D) aniqlab bo'lmaydi

65. (a5-g7-26) ABC to'g'ri burchakli uchburchakda BD bissektrisa. D nuqtadan AB tomonga parallel o'tkazilgan chiziq BC gipotenuzani E nuqtada kesib o'tadi. Agar AB = 12 va BC = 20 bo'lsa, BDE uchburchak yuzini toping.

A) 18,5 B) 24 C) 16 D) 22,5

66. (a5-g8-26) ABC uchburchakning AB, BC va AC tomonlaridan mos ravishda F, D va E nuqtalar olingan. 2BF = FA, DC = 3BD va AE = EC bo'lsa, AFDE to'rtburchak yuzining ABC uchburchak yuziga nisbatini toping

A) $\frac{13}{24}$ B) $\frac{7}{12}$ C) $\frac{8}{15}$ D) $\frac{5}{12}$

67. (a5-g9-26) Uchburchakning 9 va 6 ga teng medianalari orasidagi burchak 120° ga teng. Uchburchakning yuzini toping.

A) 36 B) $12\sqrt{3}$
C) 24 D) $18\sqrt{3}$

68. (a5-g11-22) ABC uchburchakning AB tomonidan E nuqta olingan. ED AH balandlikka parallel va EC chiziq AH balandlikni F nuqtada kesib o'tadi. FC = 2EF. ED = 9, AF = 8 va BC = 12 bo'lsa, ABC uchburchakning yuzini toping.

A) 84 B) 168 C) 81 D) 162

69. (a5-g13-21) ABC uchburchakning medianalari g nuqtada kesishadi. BC tomondan L nuqta shunday tanlab olindiki, GL AC tomonga parallel bo'lib qoldi. Agar GLC uchburchakning yuzi 3 ga teng bo'lsa, ABC uchburchak yuzini toping.

A) 54 B) 27 C) 36 D) 18

70. (a5-g13-24) ABCD parallelogramning AB tomonidan E nuqta olindi. CE kesmadan esa F nuqta tanlab olindi. AE = EB, 3CF = 2CE tengliklar berilgan va paralellogrammning yuzi 96 ga teng bo'lsa, CFB uchburchak yuzini toping.

A) 9,6 B) 12,8 C) 16 D) 8

71. (a5-g15-7) ABC uchburchakda AB = 7 va AC = 9 ABC uchburchakning A uchidan AD bissektrisa chiqarilgan. BAD uchburchakning B uchidan BE mediana chiqarildi. (E nuqta AD kesmada) BED uchburchak yuzini ABC uchburchak yuziga nisbatini toping.

A) $\frac{7}{18}$ B) $\frac{3}{14}$ C) $\frac{7}{32}$ D) $\frac{9}{32}$

72. (a5-g15-20) Katetlari a, b va gipotenuzasi c bo'lgan to'g'ri burchakli uchburchakda $(a + c + b)(b + a - c) = 72$ bo'lsa, uchburchakning yuzasini toping.
A) 18 B) 72 C) 36 D) 27

73. (a5-g18-9) Uchburchakning balandliklari 6, 6 va 15 ga teng bo'lsa, ushbu uchburchakning yuzini toping.
A) $\frac{90}{\sqrt{6}}$ B) $\frac{36}{\sqrt{15}}$
C) $\frac{225}{2\sqrt{6}}$ D) $\frac{270}{3\sqrt{5}}$

74. (a5-g19-21) Uchburchakning burchaklaridan 37°. Bu burchak qarshisidagi tomon uzunligi a ga teng. Uchburchakning yuzi quyidagilardan qaysi biriga teng?
A) berilganlar yetarli emas
B) $\frac{a^2 \sin^2 37^\circ}{2}$
C) $\frac{a^2 \sin 37^\circ \cdot \operatorname{tg} 37^\circ}{2}$
D) $\frac{a^2 \cos^2 37^\circ}{2}$

75. (a5-g20-22) Tomonlari 5, 7 va 8 sm bo'lgan uchburchakning medianalar kesishgan nuqtasidan tomonlarga parallel kesmalar o'tkazildi. Uchburchak ichida hosil bo'lgan uchburchakchalardan birining yuzasini toping.
A) $\frac{10\sqrt{3}}{9}$ B) $\frac{5\sqrt{3}}{6}$
C) $\frac{9\sqrt{2}}{10}$ D) $\frac{20\sqrt{3}}{27}$

76. (a5-g24-22) ABC uchburchakning AB, BC va AC tomonlari mos ravishda 12, 10 va 18 ga teng. AH balandlik va AD mediana bo'lsa, AHD uchburchakning yuzini toping.
A) $4\sqrt{2}$ B) $10\sqrt{2}$
C) $8\sqrt{2}$ D) $36\sqrt{2}$

77. (a6-g2-22) ABC uchburchakda AB = BC = 6 va B burchak 120° ga teng. H balandliklarning kesishish nuqtasi bo'lsa, HAC uchburchak yuzini toping.
A) $12\sqrt{3}$ B) $18\sqrt{3}$
C) 36 D) $27\sqrt{3}$

78. (a6-g3-26) ABC to'g'ri burchakli uchburchakka ichki chizilgan aylana AB tomonga D nuqtada, AC tomonga F nuqtada urinadi. A – to'g'ri burchak. BD = 3 va FC = 4 bo'lsa, ABC uchburchakning yuzini toping.
A) 6 B) 12 C) 24 D) 18

79. (a6-g4-22) ABC uchburchakning BC tomonidan D, AB tomondan E nuqta olingan. AD va CE chiziqlar K nuqtada kesishadi. Agar BD = 4DC, AE = 2BE va ABC uchburchakning yuzi 330 ga teng bo'lsa, KDC uchburchak yuzini toping.
A) 10 B) 6 C) 24 D) 32

80. (a6-g5-22) ABC uchburchakda G og'irlik markazi DAC tomonda yotadi va GD AB ga parallel. Agar ABGD to'rtburchakning yuzi 36 ga teng bo'lsa, ABC uchburchakning yuzini toping.
A) 72 B) 108 C) 81 D) 96

81. (a6-g6-22) ABC uchburchakning medianalari G nuqtada kesishadi. ABG uchburchakning medianalari T nuqtada kesishadi. Bu nuqtadan AB ga parallel BC tomonni D, AC tomonni E nuqtada kesuvchi chiziq o'tkazilgan. Agar ABDE to'rtburchakning yuzi 34 ga teng bo'lsa, ABC uchburchak yuzini toping.
A) 162 B) 272
C) 204 D) 170

82. (a6-g10-25) Radiuslari 3 va 12 ga teng aylanalar M nuqtada tashqi uringan. Ularning umumiy urunmasi aylanalarga K va L nuqtalarda uringan bo'lsa, KML uchburchak yuzini toping.
A) 36 B) 28,8 C) 24,4 D) 32

83. (a6-g12-14) ABCDEF muntazam oltiburchak. CD tomondan K, DE tomondan L nuqta olindi. 2CK = KD va 2DN = 3NE. Agar oltiburchakning yuzi 90° ga teng bo'lsa, AKN uchburchak yuzini toping.
A) 36 B) 32 C) 40 D) 35

84. (a6-g12-17) Tomonlari 3, 4 va 5 sonlariga proporsional ABC uchburchakka ichki chizilgan aylana tomonlariga D, E va F nuqtalarda urinadi. ABC uchburchak yuzining DEF uchburchak yuziga nisbatini toping.
A) 1,25 B) 2,5 C) 1,(3) D) 5

85. (a6-g15-11) Muntazam ABC uchburchakning AB tomoni orqali o'tkazilgan tekislikdagi proyeksiyasi teng yonli ABD uchburchakdan iborat. Agar uchburchak tekislik bilan 60° burchak hosil qilgan va tomoni 6 ga teng bo'lsa, ABD uchburchak yuzini toping.
A) $3\sqrt{3}$ B) $4,5\sqrt{3}$
C) $9\sqrt{3}$ D) 12

86. (a6-g15-29) ABC uchburchakda DE o'rta chiziq (DE||BC). C uchidan CD kesma tushirildi. Agar CDE uchburchakning yuzasi 7 ga teng bo'lsa, ABC uchburchak yuzasini toping.
A) 35 B) 28 C) 21 D) 14

87. (a6-g16-6) ABC uchburchakda AB = 7 va AC = 9 ABC uchburchakning A uchidan AD bissektrisa chiqarilgan. BAD uchburchakning B uchidan BE mediana chiqarildi. (E nuqta AD kesmada) BED uchburchak yuzining ABC uchburchak yuziga nisbatini toping.
A) $\frac{7}{18}$ B) $\frac{3}{14}$ C) $\frac{7}{32}$ D) $\frac{9}{32}$

88. (a6-g16-18) Katetlari a, b va gipotenuzasi c bo'lgan to'g'ri burchakli uchburchakda $(a + c + b)(b + a - c) = 72$ bo'lsa, uchburchakning yuzasini toping.
A) 18 B) 72 C) 36 D) 27

89. (a6-g18-13) ABC uchburchakning B burchagi to'g'ri. AD BC tomonga o'tkazilgan mediana va DE kesma AC tomonga perpendikulyar. Agar DE = 6 va AB = 18 bo'lsa, DEC uchburchak yuzini toping.
A) 27 B) $7,2\sqrt{5}$
C) 36 D) $10,8\sqrt{5}$

90. (a6-g22-19) ABCD kvadratning tomoni 24 ga teng. DC tomonida E va F nuqtalar olindi, |DE| = |EF| = |FC|. AF va BE kesmalar tushirilganda ular G nuqtada kesishdi. EFG uchburchak yuzini toping.
A) 36 B) 24 C) 12 D) 18

91. (a6-g23-10) ABC uchburchakda $\cos(2A - B) + \sin(A + B) = 2$ va AB = 24 bo'lsa, ABC uchburchakning yuzini toping.
A) $36\sqrt{3}$
B) aniqlab bo'lmaydi
C) 144
D) $72\sqrt{3}$

92. (a6-g26-22) ABC uchburchakning BC tomoniga tushirilgan AD kesma BD ga teng. AC = 15, CD = 7 va AD = 10 bo'lsa, ABC uchburchak yuzini toping.
A) $\frac{84\sqrt{6}}{17}$ B) $\frac{204\sqrt{6}}{7}$
C) $52\sqrt{6}$ D) $\frac{75\sqrt{6}}{4}$

93. (a6-g26-24) ABCD to'g'ri to'rtburchakning ichidan P nuqta olindi. $S_{ABP} = 36$, $S_{BPC} = 24$ va $S_{APD} = 30$ ga teng bo'lsa, DPC uchburchakning yuzini toping.
A) 20 B) 28 C) 30 D) 18

125. O'xshash uchburchaklar

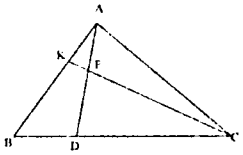
1. (a1-g15-27) ABC uchburchakning BC tomoniga shunday AD kesma tushirildiki, natijada ABC burchak DAC burchakka teng bo'ldi. Agar BD = 5 va DC = 4 bo'lsa, AC kesma uzunligini toping.
A) $\sqrt{20}$
B) 9
C) 6
D) aniqlab bo'lmaydi

2. (a4-g5-25) ABC uchburchakning AB tomonidan D AC tomonidan E nuqtalar olingan. DE chiziq BC asosga paralallel. AD = 4, DB = AE, EC = 1 va BC = 8 bo'lsa, DE kesma uzunligini toping.
A) $\frac{15}{2}$ B) $\frac{9}{2}$ C) $\frac{16}{3}$ D) $\frac{18}{5}$

3. (a4-g6-26) ABC uchburchakning AB tomonidan D va E, AC tomonidan F va K nuqtalar olingan (D va F nuqtalar A uchiga yaqin). AD = DE = EB va AF = FK = 2KC bo'lsa, EKFD to'rtburchak yuzining ABC uchburchak yuziga nisbatini toping.

A) $\frac{4}{15}$ B) $\frac{1}{3}$
C) $\frac{2}{5}$ D) $\frac{6}{23}$

4. (a5-g17-32) Ushbu rasmda 4BD = BC va 2AF = FD bo'lsa, BK ning KA ga nisbatini toping.



A) $\sqrt{241}$ B) $\frac{5}{3}$ C) $\frac{4}{3}$ D) $\frac{8}{3}$

5. (a6-g1-22) ABC uchburchakning AB va AC tomonlari mos ravishda 13 va 7 sonlariga proporsional. AD bissektrisasi 8 ga teng. AD bissektrisaga parallel va uchburchak yuzini teng ikkiga bo'luvchi kesma uzunligini toping.

A) $\frac{8\sqrt{130}}{13}$ B) $\frac{8\sqrt{130}}{10}$
C) $\frac{80}{13}$ D) 10,4

6. (a6-g22-11) 1,7 m li odamning soyasi 51 sm bo'lgan paytda, soyasi 20 m bo'lgan binoning balandligini toping.
A) 60 m B) 120 m
C) 80 m D) 66(6) m

126. O'xshash uchburchaklarning yuzalari. Yuzalar nisbati

1. (a3-g9-26) ABC uchburchakning BC tomonidan D nuqta olingan va AD kesma o'tkazilgan. B uchining bissektrisasi AD kesmani E nuqtada kesib o'tadi. Agar BC = 15; AB = 7 va 2BD = 3DC shartlar berilgan. BEA uchburchak yuzining ABC uchburchak yuziga nisbatini toping.

A) $\frac{2}{5}$ B) $\frac{21}{80}$ C) $\frac{7}{40}$ D) $\frac{12}{35}$

2. (a3-g13-26) Uchburchakning asosiga parallel to'g'ri chiziq uchburchakni yuzalari 7:42 nisbatda bo'luvchi bo'laklarga bo'ladi. Shu chiziq yon tomonni uchburchak uchidan boshlab qanday nisbatda bo'ladi?

A) $\frac{1}{\sqrt{6}}$ B) $\frac{1}{\sqrt{7}}$
C) $\frac{1}{7}$ D) $\frac{1}{6}$

3. (a3-g18-26) ABC uchburchakning AB, BC va AC tomonlaridan mos ravishda E, F va G nuqtalar olingan. AE = EB, BF = 2FC va CG = 3GA bo'lsa, EGF uchburchak yuzining ABC uchburchak yuziga nisbatini toping.

A) $\frac{11}{24}$ B) $\frac{5}{12}$ C) $\frac{7}{24}$ D) $\frac{1}{4}$

4. (a3-g20-26) ABC uchburchakning AB, BC va AC tomonlaridan mos ravishda D, E va F nuqtalar olingan. AD = 3DB, BC = 5BE, CA = 3CF bo'lsa, DEF uchburchak yuzining ABC uchburchak yuziga nisbatini toping.

A) $\frac{23}{60}$ B) $\frac{7}{25}$ C) $\frac{11}{60}$ D) $\frac{5}{12}$

5. (a3-g24-25) ABC uchburchakning A uchidan BC tomonga tushirilgan AD chiziq BC tomonni teng ikkiga bo'ladi va BC tomonning yarmiga teng. Agar AB va AC tomonlar mos ravishda 8 va 5 ga teng bo'lsa, BC tomon nechta butun qiymat qabul qila oladi?
A) 0 B) 1 C) 9 D) 10

6. (a3-g24-26) ABC uchburchakning AB, BC va AC tomonlaridan mos ravishda D, E va F nuqtalar olindi. 2AD = 3DB, EC = 3BE va AF = FC bo'lsa, DEF uchburchak yuzining ABC yuziga nisbatini toping.

A) $\frac{2}{5}$ B) $\frac{11}{40}$ C) $\frac{9}{20}$ D) $\frac{13}{20}$

7. (a4-g3-28) ABC uchburchakda BC tomonga AD to'g'ri chiziq tushirilgan, $< BAD = x$, $< ABD = y$ va $< ACB = x + y$, $|AB| = 9$, $|BD| = 5$ va $|DC| = 4$ bo'lsa, AC tomon uzunligini toping.
A) 8 B) 6 C) 6,4 D) 7,2

8. (a4-g24-26) ABC uchburchakning AB tomonidan F, BC tomonidan D nuqta, AC tomonidan E nuqta olindi. $\frac{BF}{FA} = \frac{1}{2}$, $\frac{BD}{DC} = \frac{5}{2}$ va $\frac{AE}{EC} = \frac{1}{3}$ bo'lsa, DEF uchburchak yuzining ABC uchburchak yuziga nisbatini toping.

A) $\frac{4}{9}$ B) $\frac{8}{21}$ C) $\frac{11}{23}$ D) $\frac{7}{16}$

9. (a5-g3-26) ABC uchburchakning AB asosiga parallel, AC va BC tomonlarni M va N nuqtalarda kesuvchi chiziq o'tkazildi. ABC uchburchakning yuzi 64 ga teng. Agar AB kesma MN kesmadan 4 marta uzun bo'lsa, ABMN to'rtburchakning yuzini toping.
A) 56 B) 54 C) 60 D) 48

10. (a5-g10-26) ABC uchburchakning A uchidan AD mediana chiqarildi. AD mediana o'rtasi E nuqta. D nuqtadan AC tomonga BE ga parallel DF chiziq o'tkazildi. BED uchburchak yuzining DFC uchburchak yuziga nisbatini toping.
A) 0,5 B) 1,5
C) 0,(6) D) 1,(6)

11. (a5-g25-22) ADC va AFC uchburchaklarning AF va DC tomonlari E nuqtada kesishadi. AC tomondan B nuqta olingan va AD, BE va CF kesmalar o'zaro parallel. Agar AD = 12 va FC = 4 bo'lsa, BE kesma uzunligini toping.
A) 2 B) 3 C) 2,5 D) 1,5

12. (a6-g20-21) ABC uchburchakning AB tomonida D nuqta va BC tomonida E nuqta olindi. 3AD = 5BD va 6EC = 5BE bo'lsa, ABC uchburchak yuzining BDE uchburchak yuziga nisbatini toping.
A) 88:25 B) 44:9
C) 30:18 D) 25:18

13. (a6-g21-4) ABC uchburchakda AB = 6 va BC = 9. B uchidan AC tomonidan BE bissektrisa o'tkazildi. E nuqtadan BC tomonga parallel ED chiziq o'tkazildi. BED uchburchak yuzining ABC uchburchak yuziga nisbatini toping.

A) $\frac{4}{25}$ B) $\frac{6}{25}$ C) $\frac{8}{27}$ D) $\frac{15}{64}$

14. (a6-g23-7) ABC uchburchakning AB tomonidan N, BC tomonidan D va E nuqtalar olindi. Natijada 2AB = 5AN, 3DE = 2BC tenglik o'rinli bo'ldi. N nuqtani D va E nuqtalar bilan tutashtirishdan hosil bo'lgan uchburchak yuzining ABC uchburchak yuziga nisbatini toping.

A) $\frac{3}{4}$ B) $\frac{3}{5}$
C) $\frac{2}{5}$ D) aniqlab bo'lmaydi

15. (a6-g24-8) Uchburchakning 10 ga teng balandligi uning asosi uzunligini 7:25 nisbatda bo'ladi. Shu balandlikka parallel va uchburchakning yuzini teng ikkiga bo'ladigan to'g'ri chiziq kesmasining uzunligini toping.
A) 7 B) 8 C) 5,5 D) 9

16. (a6-g25-13) ABC uchburchakning A uchidan BC tomonga AD kesma o'tkazildi. BD:BC = 7:10 bo'lsa, AD kesma uchburchakdan ajratgan yuzalari nisbatini toping.
A) 49:100 B) 7:10
C) 49:9 D) 7:3

3-bob. To'rtburchaklar

127. To'rtburchak xossalari

1. (a2-g1-25) ABCD to'rtburchakning AB, BC, CD va DA tomonlari mos ravishda 4, 11, 9 va 3 ga teng. Quyidagilardan qaysi biri AC kesmaning uzunligiga teng bo'la olmaydi?
A) 7 B) 11 C) 9 D) 8

2. (a2-g1-29) ABCD kvadratning DC tomonidan E nuqta olindi. DE = 2 va BE = 10 bo'lsa, ABED to'rtburchakning yuzini toping.
A) 40 B) 64 C) 36 D) 48

3. (a2-g5-28) Tomoni 5 sm va bir diagonali 6 sm ga teng bo'lgan rombning o'tmas burchagidan tushirilgan balandlik uni uchburchak va to'rtburchakka ajratadi. Hosil bo'lgan to'rtburchakning perimetrini toping
A) 18,4 sm B) 16,2 sm
C) 17,6 sm D) 19,2 sm

4. (a3-g18-29) ABCD to'g'ri to'rtburchakning katta tomoni 20 ga teng. To'rtburchakning B uchidan AC diagonalgacha bo'lgan eng qisqa masofa 12 ga teng bo'lsa, shu to'rtburchakning yuzini toping.
A) 300 B) 240 C) 150 D) 120

5. (a3-g20-28) To'g'ri to'rtburchakning bir uchidan chiqqan bissektrisa diagonalni 8 va 10 ga teng kesmalarga ajratadi. To'g'ri to'rtburchakning yuzini toping.
A) $\frac{1680}{9}$ B) $\frac{3240}{41}$
C) $\frac{6480}{41}$ D) $\frac{840}{9}$

6. (a4-g1-27) Qavariq to'rtburchakning tomonlari o'rtalarini tutashtirganda qanday geometrik jism hosil bo'ladi?
A) kvadrat
B) to'g'ri to'rtburchak
C) romb
D) parallelogram

7. (a4-g3-30) Ixtiyoriy to'rtburchakning diagonallari bir-biriga perpendikulyar. Shu to'rtburchak tomonlarining o'rtalarini tutashtirganda qanday geometrik jism hosil bo'ladi?
A) kvadrat
B) to'g'ri to'rtburchak
C) trapetsiya
D) parallelogramm

8. (a4-g7-25) ABCD to'rtburchak. BAD burchak 58°, BCD burchak 63°, DBA burchak 62° va ADC burchak 120° bo'lsa, quyidagi kesmalardan eng uzunini ko'rsating.
A) BD B) AD C) AB D) BC

9. (a4-g10-29) ABCD qavariq to'rtburchakning B burchagi to'g'ri. AB = 5, BC = 12, CD = 15 va AD = 14 bo'lsa, shu to'rtburchakning yuzini toping.
A) 120 B) 96
C) 114 D) 84

10. (a4-g15-29) ABCD qavariq to'rtburchakning D burchagi 60°, C burchagi 150° va B burchak to'g'ri. Agar DC = 6 va AD = 20 bo'lsa, AB tomon uzunligini toping.
A) 9 B) 12 C) 15 D) 13

11. (a4-g16-29) ABCD kvadratning DC tomonidan E nuqta olindi. |DE| = 3 sm va |BE| = 15 sm bo'lsa, ABED to'rtburchakning yuzasini toping.
A) 36 B) 72 C) 90 D) 144

12. (a4-g19-29) ABCD qavariq to'rtburchakda AB = AD = 10, BC = CD = 5. AC diagonal 9 ga teng. BD diagonal uzunligini toping.
A) $\frac{4\sqrt{14}}{3}$ B) $\frac{8\sqrt{14}}{3}$
C) $2\sqrt{14}$ D) $4\sqrt{14}$

13. (a4-g21-29) ABCD kvadratning DC tomonidan E nuqta olindi. |DE| = 3 sm va |BE| = 15 sm bo'lsa, ABED to'rtburchakning yuzasini toping.
A) 36 B) 72 C) 90 D) 144

14. (a5-g4-29) AECD trapetsiya, BEC muntazam uchburchak va ABCD parallelogram. DE kesma BC tomonni F nuqtada teng ikkiga bo'ladi. Agar BE = 4 bo'lsa, ABFD to'rtburchakning yuzini toping.
A) $5\sqrt{3}$ B) $6\sqrt{3}$
C) $8\sqrt{3}$ D) $7\sqrt{3}$

15. (a6-g3-21) O'xshash uchburchaklarning perimetrlari mos ravishda 12 va 27 ga teng. Agar katta uchburchakning yuzi 243 ga teng bo'lsa, kichigining yuzini toping.
A) 108 B) 48 C) 72 D) 144

16. (a6-g21-6) ABCD qavariq to'rtburchak. AD = 2, AB = 3 va BC = 5. To'rtburchakning diagonallari perpendikulyar bo'lsa, DC tomon uzunligini toping.
A) $2\sqrt{5}$ B) $3\sqrt{2}$
C) $2\sqrt{6}$ D) $5\sqrt{2}$

17. (a6-g25-21) ABCD to'g'ri to'rtburchakning AB va BC tomonlari mos ravishda 12 va 8 ga teng. AB va BC tomonlaridan M va K nuqtalar shunday olindiki, natijada, DM va DK chiziqlar D burchakni teng uchga bo'ldi. DMBK to'rtburchak yuzini toping.
A) $96-35\sqrt{3}$ B) $96-\frac{104\sqrt{3}}{3}$
C) $96-32\sqrt{3}$ D) $96-\frac{124\sqrt{3}}{3}$

128. Kvadrat, kvadrat xossasi

1. (a2-g7-28) ABCD kvadratning AB tomonidan E nuqta shunday tanlab olindiki, u AB tomonni A uchidan boshlab 5:7 nisbatda bo'ldi. Agar DE kesma uzunligi 26 ga teng bo'lsa, kvadratning tomonini toping.
A) 20 B) 23 C) 14 D) 24

2. (a2-g15-29) ABCD kvadratning B uchidan AD tomonga BE chiziq o'tkazilgan. AE = 2ED BCED to'rtburchakning yuzi 96 ga teng bo'lsa, kvadratning tomoni nechaga teng?
A) 12 B) 15 C) 18 D) 8

3. (a2-g18-29) Kvadrat tomonlarining o'rtalarini tutashtirishdan hosil bo'lgan to'rtburchakning yuzi 40 ga teng. Shu kvadratning bir uchidan qarama-qarshi tomon o'rtasigacha bo'lgan masofani toping.
A) $2\sqrt{5}$ B) $4\sqrt{5}$
C) 20 D) 10

4. (a2-g20-29) Kvadrat shaklidagi tunukadan eni 4 ga teng bo'lgan qismi qirqib olindi. Agar qolgan qismining yuzi 45 ga teng bo'lsa, kvadratning tomonini aniqlang.
A) 8 B) 5 C) 9 D) 6

5. (a2-g22-29) Tomoni 12 sm bo'lgan kvadrat tomonlarining o'rta nuqtalarini birlashtirib yangi kvadrat yasaldi. Ichma-ich kvadratlar yasash cheksiz davom ettirilsa, kvadratlarning perimetrlari yig'indisini toping.
A) $12\left(2+\sqrt{2}\right)$ B) $36\left(2+\sqrt{2}\right)$
C) $48\left(2+\sqrt{2}\right)$ D) $54\left(2+\sqrt{2}\right)$

6. (a3-g4-29) ABCD kvadratning A uchidan BC tomonga AE chiziq o'tkazilgan. BE = 3EC AECD to'rtburchakning yuzi 90 ga teng bo'lsa, kvadratning tomoni nechaga teng?
A) 12 B) 15 C) 18 D) 8

7. (a3-g6-28) Kvadratning ikki qarama-qarshi tomoni 3 sm ga uzaytirilib, qolgan ikki tomoni esa 2 sm ga qisqartirilganda perimetri dastlabki kvadratning perimetridan 20% ortiq bo'lgan to'g'ri to'rtburchak hosil bo'ldi. Dastlabki kvadrat perimetrini toping.
A) 10 B) 14 C) 5 D) 15

8. (a3-g12-29) ABCD kvadratning A uchidan BC tomonga AE chiziq o'tkazilgan. BE = 3EC AECD to'rtburchakning yuzi 90 ga teng bo'lsa, kvadratning tomoni nechaga teng?
A) 12 B) 15 C) 18 D) 8

9. (a3-g23-29) Katetlari 10 va 6 bo'lgan to'g'ri burchakli uchburchakka bu uchburchak bilan umumiy to'g'ri burchakka ega bo'lgan kvadrat ichki chizilgan. Kvadratning perimetrini toping.
A) 8 B) 16 C) 15 D) 7,5

10. (a4-g8-29) ABCD kvadratning A uchidan BC tomonga AE chiziq o'tkazilgan. BE = 2,5EC AECD to'rtburchakning yuzi 126 ga teng bo'lsa, kvadratning tomoni nechaga teng?
A) 14 B) 9 C) 18 D) 7

11. (a4-g9-28) ABCD kvadratning AD tomoni o'rtasidan E, DC tomoni o'rtasidan F nuqta olingan. AF va EC chiziqlar G nuqtada kesishadi. Agar kvadratning tomoni 16 ga teng bo'lsa, EGA uchburchak yuzini toping.
A) 21,(3) B) 10,(6)
C) 32 D) 16

12. (a5-g5-29) Kvadrat yuzasining son qiymati uning perimetrining son qiymatiga teng. Shu kvadrat diagonali uzunligini toping.

A) $8\sqrt{2}$ B) $2\sqrt{2}$

C) $4\sqrt{2}$ D) 8

13. (a5-g7-29) Tomoni 10 ga teng bo'lgan ABCD kvadratning BC tomondan E, CD tomondan F nuqta olindi. Agar DF = FC va BE = EF bo'lsa, CE kesma uzunligini toping.

A) 6,25 B) 3,75 C) 8 D) 6

14. (a5-g16-23) ABCD kvadratning AB tomonidan F, AD tomonidan E va DC tomonidan K nuqta olindi. DE = DK va AE = AF. DEK uchburchakning yuzi 49 ga, AEF uchburchakning yuzi esa 64 ga teng. Kvadratning tomoni necha sm?

A) $15\sqrt{2}$ B) 30

C) 15 D) $30\sqrt{2}$

15. (a6-g2-24) ABCD kvadratning BC va CD tomonlarida T va K nuqtalar olingan. BAT burchak ham CKT burchak ham 30° ga teng bo'lsa, AKD burchakning qiymatini toping.

A) 15° B) 60° C) 75° D) 45°

16. (a6-g3-24) ABCD kvadratning AD tomonidan K nuqta olindi. KD = 0,75AD. Agar kvadratning tomoni 5 ga teng bo'lsa, B nuqtadan CK chiziqqacha bo'lgan masofani toping.

A) 2 B) 2,4 C) 1,2 D) 4

17. (a6-g13-11) Ikki kvadratning yuzalari yig'indisi 1285 sm^2. Diagonallarining ko'paytmasi esa 1116 sm^2. Kvadratlar perimetrlari ayirmasini toping.

A) 52 B) 13 C) 60 D) 15

129. Kvadrat yuzasi

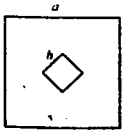
1. (a1-g16-30) Kvadrat yuzini 1,44 marta oshirish uchun uning tomoni necha marta oshirilishi kerak?

A) 1,44 B) 1,24 C) 1,2 D) 1,4

2. (a4-g3-25) ABCD kvadratning C uchidan BD diagonaliga 5 sm uzunlikdagi CE chiziq tushirilgan. Agar $EB = 3\sqrt{2}$ bo'lsa, bu kvadratning yuzasi necha sm^2?

A) 49 B) 64 C) 36 D) 25

3. (a4-g13-27) Rasmdagi tomonlari *a* va *b* bo'lgan kvadratlarning perimetrlari yig'indisi 48 ga teng. Bo'yalgan sohaning yuzasi 96 ga teng bo'lsa, $a - b = ?$



A) 8 B) 10 C) 12 D) 6

4. (a4-g24-29) Muntazam uchburchakning perimetri kvadratning perimetriga teng bo'lsa, kvadrat yuzining uchburchak yuziga nisbatini toping.

A) $\frac{3\sqrt{3}}{4}$ B) $\sqrt{3}$

C) $\frac{\sqrt{3}}{4}$ D) $\frac{2\sqrt{3}}{3}$

5. (a5-g4-28) ABCD kvadrat, DC tomondan E, AB tomondan F nuqta olindi. EF//AD. Kvadratning tomoni *x* ga teng va DE = *a* bo'lsa, $\frac{S_{EFBC}}{S_{EFAD}} = ?$

A) $\frac{x^2 - ax}{a}$ B) $\frac{x^2 + a}{ax}$

C) $\frac{x}{a} - 1$ D) $\frac{x}{a} + 1$

6. (a5-g4-30) Radiusi 16 ga teng bo'lgan doira kvadratga tengdosh. Kvadratning perimetrini toping.

A) 32π B) 64π

C) $32\sqrt{\pi}$ D) $64\sqrt{\pi}$

7. (a5-g11-24) ABCD kvadratning diagonallari O nuqtada kesishadi. Kvadrat yuzini ABOCD beshburchak yuziga nisbatini toping.

A) $\frac{5}{2}$ B) $\frac{4}{3}$ C) 2 D) $\frac{3}{2}$

8. (a6-g11-22) ABCD kvadratning AD tomonidan olingan E nuqta tomonni teng ikkiga bo'ladi. AB tomondan F nuqta olingan va BF = 2AF tenglik o'rinli. BE va FC chiziqlar G nuqtada kesishadi va GBF uchburchakning yuzi 6 birlik bo'lsa, kvadratning yuzi necha birlik?

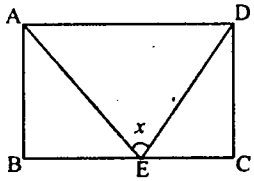
A) 48 B) 72 C) 144 D) 96

9. (a6-g24-22) ABCD kvadratning BC tomonidan K, CD tomonidan M nuqta olindi. BK = 2KC va CM = 2MD. ABK va CKM uchburchaklar yuzlari yig'indisining kvadrat yuziga nisbatini toping.

A) $\frac{5}{12}$ B) $\frac{7}{18}$ C) $\frac{1}{3}$ D) $\frac{4}{9}$

130. To'g'ri to'rtburchak, perimetri, xossalari

1. (a2-g14-16) Quyidagi rasmda ABCD to'g'ri to'rtburchak va $|AB| = |BE| = 2|EC|$ bo'lsa, $tgx = ?$



A) $\frac{1}{3}$ B) $\frac{2}{3}$ C) 3 D) $\frac{3}{2}$

2. (a2-g17-27) ABCD paralellogramning A o'tkir burchagi bissektrisasi DC tomonni D uchidan boshlab 6 va 3 ga teng kesmalarga ajratadi. Bissektrisa uzunligi 10 ga teng bo'lsa, parallelogram o'tkir burchagi sinusini toping.

A) $\frac{\sqrt{11}}{6}$ B) $\frac{5\sqrt{11}}{18}$

C) $\frac{7}{18}$ D) $\frac{5}{6}$

3. (a3-g3-29) Sinf devoriga eni bo'yidan 1,5 m uzun bo'lgan yozuv taxtasi osilgan. Devorning eni bo'yining 0,75 qismiga teng va taxta bo'yidan 2,5 m katta. Devorning taxta bilan qoplanmagan qismining yuzasi 11 m^2 bo'lsa, yozuv taxtasi bo'yining qiymatini toping.

A) 0,5 m B) 1 m

C) 1,5 m D) 2 m

4. (a3-g9-29) Tomoni 6 ga teng bo'lgan kvadratga tengdosh to'g'ri to'rtburchakning diagonali $2\sqrt{82}$ ga teng. Shu to'g'ri to'rtburchakning perimetrini toping.

A) 40 B) 26 C) 24 D) 36

5. (a4-g6-28) ABCD to'g'ri to'rtburchakning ichidan AB tomonga parallel EF kesma o'tkazildi. EA va FB A va B burchaklar bissektrisalari. Agar AB = 13 va $EA = 4\sqrt{2}$ bo'lsa, EF kesma uzunligini toping.

A) 4 B) 9 C) 5 D) 8

6. (a4-g17-29) ABCD to'g'ri to'rtburchakning B uchidan DC tomonga BE chiziq o'tkazilgan. A uchidan BE kesmaga perpendikulyar AF kesma o'tkazilgan (F BE kesmada yotadi). DE = 2, EC = 8 va AD = 6 bo'lsa, AF kesma uzunligini toping.

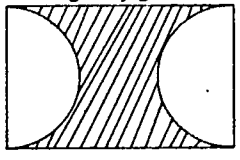
A) 5 B) 4 C) 3 D) 6

7. (a4-g22-28) Tomonlari 3:4 nisbatda bo'lgan to'g'ri to'rtburchak shaklidagi yer maydoni 48 sotix. Katta tomonga parallel qilib 0,5 m oraliqlar bilan ariqlar qazib chiqildi. Yer maydoni chekkalariga ariq qazilmagan bo'lsa, ariqlarning umumiy uzunligini toping.

A) 9600 m B) 9520 m

C) 9440 m D) 9680 m

8. (a5-g2-30) Rasmdagi shtrixlangan sohaning yuzasi yarim doiralar yuzalari yig'indisiga teng bo'lsa, to'rtburchak enining bo'yiga nisbatini toping.



A) π B) $\frac{\pi}{2}$ C) $\frac{\pi}{4}$ D) $\frac{3\pi}{4}$

9. (a5-g7-34) ABCD to'g'ri to'rtburchakning AB va BC tomonlari mos ravishda 9 va 15 ga teng.

Bu to'rtburchakning AB tomonidan o'tuvchi tekislikdagi proyeksiyasi kvadratdan iborat bo'lsa, to'rtburchak va tekislik orasidagi burchak sinusini toping.

A) 0,5 B) 0,6 C) 0,8 D) $\frac{\sqrt{3}}{2}$

10. (a5-g14-24) ABCD to'g'ri to'rtburchakning AB va BC tomonlari mos ravishda 14 va 8 ga teng. To'rtburchakning CD tomonidan E va AB tomonidan F nuqtalar olindi. Agar EC = 4 va FBCE to'rtburchakning yuzi 44 ga teng bo'lsa, FE kesma uzunligini toping.

A) $\sqrt{113}$ B) $8\sqrt{2}$
C) $\sqrt{73}$ D) 8

11. (a5-g21-24) To'g'ri to'rtburchakning tomonlari a va b ga teng. a tomon 1 birlik qisqartirilganda yuza o'zgarmasligi uchun b tomon qancha birlik orttirilishi lozim.

A) $\frac{ab}{a-1}$ B) $\frac{b}{a-1}$
C) $\frac{b-1}{a}$ D) $\frac{a}{b-1}$

12. (a6-g17-24) ABCD to'g'ri to'rtburchakning B uchidan DC tomonga BE chiziq o'tkazilgan. A uchidan BE kesmaga perpendikulyar AF kesma o'tkazilgan (FBE kesmada yotadi). DE = 10, EC = 15 va AD = 20 bo'lsa, AF kesma uzunligini toping.
A) 25 B) 20 C) 50 D) 10

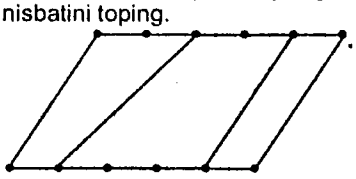
131. To'g'ri to'rtburchak yuzi

1. (a2-g3-30) To'g'ri to'rtburchakning kichik tomoni 7 ga teng. Diagonallari 60° burchak ostida kesishadi. To'g'ri to'rtburchakning yuzini toping.

A) $49\sqrt{3}$ B) $56\sqrt{3}$
C) $42\sqrt{3}$ D) $48\sqrt{3}$

2. (a2-g8-29) Sinf devoriga eni bo'yidan 1,5 m uzun bo'lgan yozuv taxtasi osilgan. Devorning eni bo'yidan 2 m va taxta bo'yidan 4 m katta. Devorning taxta bilan qoplanmagan qismi yuzasi 12,5 m^2 bo'lsa yozuv taxtasi bo'yining uzunligini toping.
A) 0,5 m B) 1 m
C) 1,5 m D) 2 m

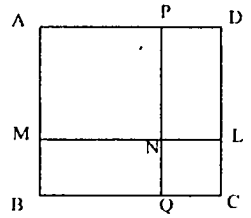
3. (a2-g10-28) Rasmdagi paralellogramning asoslari teng bo'laklarga bo'lingan. Bo'yalgan soha yuzining parallelogramm yuziga nisbatini toping.



A) $\frac{1}{2}$ B) $\frac{1}{5}$ C) $\frac{1}{10}$ D) $\frac{2}{5}$

4. (a2-g13-23) Agar to'g'ri to'rtburchakning bo'yi enidan 49 metr uzun bo'lsa va diagonali 61 m bo'lsa, uning yuzini toping.
A) 1200 B) 600
C) 660 D) 1320

5. (a2-g14-20) ABCD va NQCL kvadratlar berilgan. QM va BD diagonallar mos ravishda $\sqrt{106}$ va $14\sqrt{2}$ ga teng bo'lsa, PNLD to'rtburchakning yuzasi uning perimetridan nechaga ortiq?



A) 45 B) 31 C) 17 D) 28

6. (a2-g19-28) ABCD to'g'ri to'rtburchakning DC tomonidan E nuqta olindi. Agar |EC| = 3 va ABED to'rtburchakning yuzasi BCE uchburchakning yuzasidan to'qqiz marta katta bo'lsa, |ED| = ?
A) 9 B) 12 C) 10 D) 15

7. (a3-g1-28) Agar to'g'ri to'rtburchakning bo'yi enidan 31 metr uzun bo'lsa va diagonali 41 m bo'lsa, uning yuzini toping.
A) 540 B) 90 C) 360 D) 180

8. (a3-g1-29) O'lchamlari 24 m × 18 m bo'lgan zalni tomoni 30 sm bo'lgan kvadrat shaklidagi plitkalardan nechtasi bilan qoplash mumkin?
A) 4800 B) 14400
C) 7200 D) 9000

9. (a3-g13-29) To'g'ri to'rtburchaknning perimetri 32 ga teng. Bu to'rtburchak yuzasining eng katta qiymati nechaga teng?
A) 256 B) 60 C) 64 D) 240

10. (a3-g21-29) ABCD to'g'ri to'rtburchakning perimetri 24 sm. AB tomondan E nuqtada shunday tanlab olinganki, DEA burchak 75° va DCE burchak 30° ga teng. DCE uchburchak yuzini toping.
A) 144 B) 72 C) 32 D) 16

11. (a3-g22-28) ABCD to'g'ri to'rtburchakning CD tomonidan E nuqta olingan. CE kesmaning uzunligi 2 sm. Agar ABED to'rtburchakning yuzi BEC uchburchakning yuzidan 4 marta katta bo'lsa, DE kesma uzunligini toping.
A) 2 B) 5 C) 4 D) 3

12. (a4-g18-29) To'g'ri to'rtburchakning bir tomoni ikkinchi tomonidan 31 sm ga uzun. Diagonali esa 41 sm ga teng. To'g'ri to'rtburchakning yuzasini toping (sm^2).
A) 420,25 B) 210
C) 360 D) 200

13. (a4-g24-28) ABCD to'g'ri to'rtburchakning AB tomonidan E nuqta olindi. AE = 2EB va EBCD to'rtburchakning yuzi 36 ga teng bo'lsa, ABCD to'g'ri to'rtburchakning yuzini toping.
A) 72 B) 64 C) 96 D) 54

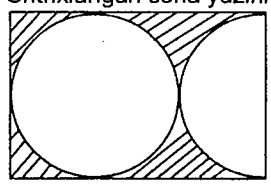
14. (a5-g1-28) Perimetri 156 ga teng bo'lgan to'g'ri to'rtburchakning bo'yi 13 sm qisqartirilib, eni 13 sm uzaytirilsa, kvadrat hosil bo'ladi. To'g'ri to'rtburchakning yuzini toping.
A) 1044 B) 840
C) 754 D) 1352

15. (a5-g3-28) ABCD to'g'ri to'rtburchakning AC diagonaliga BE perpendikulyar o'tkazilgan. AE = 8, $BC = 2\sqrt{5}$ bo'lsa, to'rtburchakning yuzini toping.
A) $20\sqrt{5}$ B) 40
C) $16\sqrt{5}$ D) 80

16. (a5-g6-29) ABCD to'g'ri to'rtburchakda E nuqta DC tomonda joylashgan va AE bisssektrisa. CE = 6 va ADE uchburchakning yuzi 32 ga teng bo'lsa, to'g'ri to'rtburchak yuzasini toping.
A) 48 B) 96 C) 56 D) 112

17. (a5-g9-28) Samsung kompaniyasi diagonallari teng bo'lgan ikki turdagi suyuq kristalli televizorlarni ommaga taqdim etdi. Birinchisining eni bo'yidan ikki marta katta, ikkinchisining eni va bo'yi nisbati 5:3 bo'lsa, ularning yuzalari nisbatini toping.
A) 1:1 B) 18:5
C) 68:75 D) 72:81

18. (a5-g10-31) Rasmdagi to'g'ri to'rtburchakning perimetri 60 ga teng. Shtrixlangan soha yuzini toping.



A) $54 - 13{,}5\pi$ B) $54 - 9\pi$
C) $216 - 54\pi$ D) $216 - 36\pi$

19. (a5-g22-24) Parallelogramm tomonlari 45 va 17 ga teng. Uning katta tomoniga yopishgan burchaklarining bessektrissalari qarama-qarshi tomonni uch qismga ajratadi. Shu qismlarning kichigini toping.
A) 14 B) 28
C) 12,5 D) 11

20. (a5-g25-24) ABCD to'g'ri to'rtburchakning AB tomonidan olingan E va F(E A ga yaqin) nuqtalar shu tomonni teng uchga bo'ladi. DF va CE kesmalar K nuqtada kesishadi. AEKD to'rtburchak yuzining DKC uchburchak yuziga nisbatini toping.

A) $\frac{7}{9}$ B) $\frac{9}{16}$ C) $\frac{13}{27}$ D) $\frac{19}{21}$

21. (a6-g6-23) To'g'ri to'rtburchak tomonlarining o'rtalari tutashtirilib boshqa to'rtburchak yasaldi. Bu to'rtburchakning o'rtalari tutashtirilib, uchinchi to'rtburchak yasaldi. Birinchi to'g'ri to'rtburchakning yuzi uchinchi to'rtburchakning yuzidan necha marta katta?
A) 2 B) 4 C) 8 D) 16

22. (a6-g18-8) ABCD to'g'ri to'rtburchakning AC diagonalidan M va N nuqtalar shunday tanlab olindiki, natijada 3,5MN = AC tenglik o'rinli bo'ldi. Agar DMN uchburchakning yuzi 16 ga teng bo'lsa, to'g'ri to'rtburchak yuzini toping.
A) 56 B) 112 C) 40 D) 80

132. Parallelogramm va uning xossasi

1. (a1-g13-28) ABCD parallelogramm. A va B burchaklarning bissektrisalari CD tomonda kesishadi. Agar |AB| = 14 sm bo'lsa, BC ning uzunligi necha sm?
A) 3,5 B) 7 C) 14 D) 28

2. (a1-g14-28) ABCD parallelogramning DC tomoniga A uchidan AE, B uchidan BF bissektrisalar chiqarilgan. Agar |AB| = 12 va |EC| = 3 sm bo'lsa, FE masofa qancha?
A) 9 B) 5 C) 6 D) 3

3. (a2-g6-28) Paralellogramm o'tmas burchagining bissektrisasi qarshisidagi tomonni o'tkir burchakdan boshlab 6 va 7 sm ga teng kesmalarga ajratadi. Bissektrisa ajratgan to'rtburchakning yuzi 20 sm^2 ga teng bo'lsa, paralellogramning o'tmas burchagi tangensini toping.

A) $\frac{1}{2\sqrt{2}}$ B) $-\frac{2\sqrt{2}}{3}$

C) $\frac{1}{3}$ D) $-\frac{\sqrt{2}}{4}$

4. (a2-g12-25) Paralellogramm o'tmas burchagining bissektrisasi qarshisidagi tomonni o'tkir burchakdan boshlab 4 va 3 sm ga teng kesmalarga ajratadi. Bissektrisa ajratgan to'rtburchakning yuzi 15 sm^2 ga teng bo'lsa, paralellogramning o'tmas burchagi tangensini toping.

A) $\frac{3}{7}\sqrt{7}$ B) $-\frac{4}{7}\sqrt{7}$

C) $\frac{4}{3}$ D) $-\frac{3}{7}\sqrt{7}$

5. (a2-g14-31) ABCD parallelogramning A uchi bissektrisasi BC tomonni B uchidan boshlab 3:2 nisbatda bo'ladi. Parallelogramm perimetrini AB tomonga nisbatini toping.

A) $\frac{18}{3}$

B) 5,(3)

C) $\sqrt[3]{x^2-4x+3} > x-3$

D) 16,(3)

6. (a2-g16-28) ABCD paralellogramning DC katta tomoni 8 ga teng. C o'tmas burchakdan AB tomonga CE balandlik tushirilgan. AE = 5 va AECD to'rtburchakning yuzi 26 sm^2 bo'lsa, paralellogramning perimetri necha sm?
A) 24 B) 26 C) 32 D) 36

7. (a2-g17-26) ABC uchburchakda AB:BC = 3:5. BC tomon o'rtasidagi D nuqtadan B burchak bissektrisasiga parallel qilib AC tomonga DE kesma tushirildi. CDE uchburchak yuzining ABC uchburchak yuziga nisbatini toping.
A) 5:32 B) 9:25
C) 5:16 D) 4:25

8. (a2-g18-28) Parallelogramning tomonlari 8 va 6 ga teng. Agar parallelogramning yuzi $24\sqrt{3}$ ga teng bo'lsa, parallelogramning tomonlariga tushirilgan balandliklari orasidagi burchakni toping.
A) 75° B) 60° C) 30° D) 45°

9. (a3-g5-29) ABCD parallelogramning AB tomonidan E nuqta olindi. 2AE = 3EB bo'lsa, ABCD parallelogram yuzining AECD to'rtburchak yuziga nisbatini toping.

A) $\frac{10}{7}$ B) $\frac{5}{4}$ C) $\frac{5}{3}$ D) $\frac{5}{2}$

10. (a3-g13-27) Quyidagi mulohazalardan qaysilari to'g'ri?
1) Parallelogramning ixtiyoriy ikki qo'shni burchaklari bissektrisalari 90° burchak ostida kesishadi; 2) Ixtiyoriy to'rtbuchakka ichki aylana chizish mumkin; 3) Bir tomonga yo'nalmagan vektorlarning yig'indisi bu vektorlar modullari yig'indisidan kichik bo'ladi; 4) Tekislikka perpendikulyar to'g'ri chiziqlar o'zaro parallel; 5) Sharning ixtiyoriy tekislik bilan kesganda ellips hosil bo'ladi.
A) 1; 3; 4 B) 2; 4; 5
C) 1; 2; 5 D) 2; 3; 4

11. (a4-g5-29) ABCD parallelogramning AB va BC tomonlari mos ravishda 13 va 7 ga teng. D burchak bissektrisasi AB tomonni E nuqtada kesadi. EB kesma uzunligini toping.
A) 10 B) 7 C) 6 D) 3

12. (a4-g6-29) ABCD parallelogramning D uchidan chiqarilgan bissektrisa AB tomonni K nuqtada kesib o'tadi. A burchak 60°, DC = 8 va BC = 3 bo'lsa, DKBC to'rtburchak yuzini toping.

A) $\frac{25\sqrt{3}}{4}$ B) $\frac{39\sqrt{3}}{4}$

C) $\frac{35\sqrt{3}}{4}$ D) $8\sqrt{3}$

13. (a4-g7-28) Parallelogramning tomonlari 7 va 18 ga teng. Katta tomonga yopishgan ikki qo'shni burchak bissektrisalarining qarama-qarshi tomondan ajratgan kesmalardan eng kichigini toping.
A) 7 B) 11 C) 4 D) 2

14. (a4-g13-30) ABCD parallelogramm. A va B burchaklarning bissektrisalari CD kesmada kesishadi. Agar |AB| = 14 sm bo'lsa, BC ning uzunligi necha sm?
A) 3,5 B) 7 C) 14 D) 28

15. (a4-g14-27) Parallelogramning diagonallari 14 va 18 ga, tomonlari nisbati 4:7 kabi. Shu parallelogramning perimetrini toping.
A) 40 B) 44 C) 42 D) 48

16. (a4-g22-27) ABCD parallelogramning A o'tkir burchagi bissektrisasi DC tomonni D uchidan boshlab 6 va 3 ga teng kesmalarga ajratadi. Bissektrisa uzunligi 10 ga teng bo'lsa, parallelogramm o'tkir burchagi sinusini toping.

A) $\frac{\sqrt{11}}{6}$ B) $\frac{5\sqrt{11}}{18}$

C) $\frac{7}{18}$ D) $\frac{5}{6}$

17. (a5-g5-31) Parallelogramga ichki va tashqi aylana chizish mumkin. Shu aylanalardan kattasining uzunligi kichigining uzunligidan necha marta katta?
A) aniqlab bo'lmaydi
B) 2
C) $\sqrt{2}$
D) $\sqrt{3}$

18. (a6-g9-24) Parallelogramning tomonlari 3:1 nisbatda bo'lib, uning katta tomoni uchlaridan chiqarilgan bissektrisalar parallelogramdan tashqarida kesishadi. Agar parallelogramning yuzi S bo'lsa, uning tashqarisidagi uchburchak yuzini toping.

A) $\frac{S}{12}$ B) $\frac{S}{2}$ C) $\frac{S}{3}$ D) $\frac{S}{6}$

19. (a6-g10-23) Parallelogramm diagonallari yig'indisi 12 ga teng bo'lsa, uning turli ikki tomoni kvadratlari yig'indisining eng kichik qiymatini toping.
A) 72 B) 24 C) 36 D) 48

20. (a6-g15-15) Parallelogramning dioganallari 14 va 18 ga teng, tomonlari nisbati esa 4:7 kabi. Shu parallelogramning perimetrini toping.
A) 40 B) 44 C) 42 D) 48

21. (a6-g18-2) AKCM to'g'ri to'rtburchak yuzining ABCD parallelogramm yuziga nisbati 0,8 ga teng. Parallelogramning o'tkir burchagi kosinusini toping.
A) aniqlab bo'lmaydi
B) 0,2
C) 0,4
D) 0,6

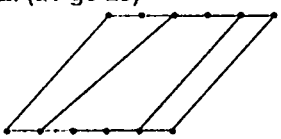
22. (a6-g20-7) Parallelogramning A, B va C uchlari tekislikdan 5, 6 va 11 ga teng masofalarda joylashgan. D uchi tekislikdan qanday masofada joylashgan?
A) 10 B) 0 C) 12 D) 8

23. (a6-g24-2) ABCD parallelogramning AB va AD tomonlari mos ravishda 12 va 5 ga teng. B uchidan chiqarilgan bissektrisa, CD tomonni E nuqtada kesib o'tsa, EC kesma uzunligini toping.
A) 5 B) 7 C) 8,5 D) 3,5

133. Parallelogramm yuzi

1. (a1-g2-30) Parallelogramning tomonlari mos ravishda 20% va 10% ga oshirildi. Bu parallelogramning yuzi necha foiz ortgan?
A) 32 B) 15 C) 25 D) 40

2. (a1-g5-29)



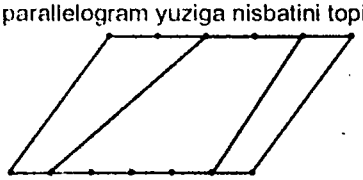
Rasmdagi parallelogramning asoslari teng bo'laklarga bo'lingan. Bo'yalgan soha yuzining parallelogramm yuziga nisbatini toping.
A) $\frac{1}{2}$ B) $\frac{1}{5}$ C) $\frac{1}{10}$ D) $\frac{2}{5}$

3. (a1-g7-28) Tomonlari 6 va 7 ga teng bo'lgan parallelogramning yuzi 21 ga teng. Parallelogramning o'tkir burchagini toping.
A) 75° B) 60° C) 30° D) 45°

4. (a1-g11-29) ABCD parallelogramning BC tomonidan E nuqta olindi. 2BE = 3EC. Agar ABE uchburchakning yuzi 15 ga teng bo'lsa, parallelogramning yuzi nechaga teng?
A) 10 B) 75 C) 30 D) 50

5. (a1-g12-21) ABCD parallelogramning AB tomonidan E nuqta olindi. Parallelogramm yuzining CDE uchburchak yuziga nisbatini toping.
A) aniqlab bo'lmaydi
B) 2
C) 3
D) 4

6. (a1-g15-29) Rasmdagi paralellogramning yuqori asosi teng 5 bo'lakka, ostki asosi teng 6 bo'lakka bo'lingan. Bo'yalgan soha yuzining parallelogram yuziga nisbatini toping.



A) $\frac{3}{5}$ B) $\frac{5}{12}$ C) $\frac{8}{15}$ D) $\frac{5}{6}$

7. (a1-g17-33) Paralellogramning tomonlari $\vec{a}$ (3; 1) va $\vec{b}$ (2; 4) vektorlardan iborat. Bu paralellogramning yuzini toping.
A) 16 B) 20 C) 18 D) 10

8. (a2-g2-29) Perimetrlari teng bo'lgan romb va kvadratning yuzalari nisbati $\sqrt{3}:2$ ga teng. Romb katta diagonalining tomoniga nisbatini toping.
A) $\sqrt{2}$ B) $\frac{\sqrt{3}+1}{2}$
C) $\frac{2\sqrt{3}}{3}$ D) $\sqrt{3}$

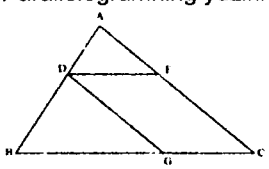
9. (a2-g3-22) ABCD parallelogramm berilgan. AB tomondan E nuqta olingan. |AE| = |EB|, |EB| = |BC| = 5 va |EC| = 6 bo'lsa, shu paralellogramning yuzini toping.
A) 36 B) 42 C) 24 D) 48

10. (a2-g4-29) ABCD paralellogramning AB tomonidan E nuqta, AD tomonidan F nuqta olindi. AE AB tomonning uchdan biriga, AF kesma esa AD tomonning uchdan biriga teng. Agar AEF uchburchakning yuzi 6 ga teng bo'lsa, paralellogramning yuzi nechaga teng?
A) 48 B) 54 C) 24 D) 108

11. (a2-g9-29) ABCD paralellogramning BC tomonidan E nuqta olindi. 2BE = 3EC. Agar ABE uchburchakning yuzi 15 ga teng bo'lsa, paralellogramning yuzi nechaga teng?
A) 10 B) 75 C) 30 D) 50

12. (a2-g23-29) ABCD parallelogramning CD tomonidan F nuqta shunday tanlab olindi. CF = 2FD. Agar AFB uchburchakning yuzi 18 bo'lsa, ABCD parallelogramning yuzini toping.
A) 54 B) 36 C) 108 D) 72

13. (a3-g7-29) Rasmda DFGC parallelogramm. Uchburchakning BC asosi 12 ga teng. Parallelogramning DF tomoni A uchidan tushgan balandlikni A uchidan boshlab 3 va 5 ga teng bo'lgan kesmalarga ajratadi. Parallelogramning yuzini toping.



A) 18 B) 27 C) 22,5 D) 13,5

14. (a3-g11-28) ABCD parallelogramning AB tomonidan E, AD tomonidan F nuqta olindi. 3AE = 2EB, AD = 4AF. Agar parallelogramning yuzi 200 ga teng bo'lsa, AEF uchburchakning yuzini toping.
A) 10 B) 40 C) 25 D) 20

15. (a3-g15-27) Tomonlari m va n ga teng ($n < m$) bo'lgan parallelogramm o'tmas burchagining bissektrisasi undan yuzasi S ga teng bo'lgan uchburchak ajratadi. Parallelogramm yuzasini toping.
A) $\frac{2(m-n)S}{n}$ B) $\frac{2(m-n)S}{m}$
C) $\frac{2mS}{n}$ D) $\frac{2nS}{m}$

16. (a3-g16-29) ABCD parallelogramning AB va BC tomonlaridan E va F nuqtalar tanlab olindi. Agar 3AE = AB va BF = FC, BFE uchburchakning yuzi 24 ga teng bo'lsa, ABCD parallelogramning yuzini toping.
A) 72 B) 96 C) 1.9 D) 144

17. (a3-g17-29) ABCD parallelogram berilgan. AB tomondan E nuqta olingan. |AE| = |EB|, |EB| = |BC| = 5 va |EC| = 6 bo'lsa, shu parallelogramning yuzini toping.
A) 36 B) 42 C) 24 D) 48

18. (a3-g24-29) ABCD parallelogramning AB tomonidan E va F nuqtalar (E A nuqtaga yaqin), CD tomondan G va H nuqtalar (G C nuqtaga yaqin) olingan. GC = DH = 2HG va AE = EF = 3FB tengliklar berilgan. EFGH to'rtburchakning parallelogramm yuziga nisbatini toping.
A) $\frac{9}{20}$ B) $\frac{7}{20}$ C) $\frac{17}{35}$ D) $\frac{11}{35}$

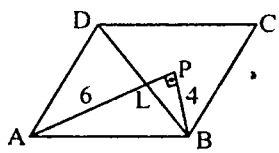
19. (a4-g1-29) ABCD parallelogramm AB tomonidan E nuqta olingan. |AE| = |EB|, |EB| = |BC| = 10 va |EC| = 16 bo'lsa, ABCD parallelogramm yuzini toping.
A) 192 B) 96 C) 384 D) 144

20. (a4-g17-28) ABCD parallelogramning DE bissektrisasi AB tomonni teng ikkiga bo'ladi. DE = 5, DC = 13 bo'lsa, parallelogramm yuzini toping.
A) 30 B) 48 C) 60 D) 72

21. (a5-g2-28) ABCD parallelogramning AB tomonidan P va Q nuqtalar, DC tomonidan S va R nuqtalar olingan. 5PQ = 2AB va 3SR = 2CD. PQRS to'rtburchakning yuzi 20 ga teng bo'lsa, parallelogramning yuzini toping.
A) 30 B) 32,5 C) 48 D) 37,5

22. (a5-g7-28) ABCD parallelogramning D burchagi 105°. BE esa AD tomonga tushirilgan balandlik va AE = 2DE. Agar DC = 16 bo'lsa, parallelogramm yuzini toping.
A) 192 B) 108 C) 90 D) 96

23. (a5-g10-29) Rasmda PB AP ga perpendikulyar. DL = 2·LB. AL = 6, va PB = 4. Parallelogramning yuzini toping.



A) 48 B) 36 C) 72 D) 60

24. (a5-g12-24) ABCD parallelogram ng AB tomonidan F va g nuqtalar, BC tomonidan E nuqta olingan. $\frac{FG}{AB}=\frac{3}{5}$ va BE = 3CE. Agar EFG uchburchakning yuzi 18 bo'lsa, parallelogramning yuzini toping.
A) 64 B) 72 C) 96 D) 80

25. (a5-g24-23) ABCD parallelogramning BC tomonidan T nuqta olindi. ATD uchburchakning yuzi 64 ga teng bo'lsa, parallelogramning yuzini toping.
A) 96 B) 128 C) 192 D) 256

26. (a6-g3-23) ABCD parallelogramning DC tomonidan F va E nuqta olindi (FD ga yaqin), AB tomondan esa K nuqta olindi. 2FE = 3DF = 6EC. KFE uchburchak yuzining parallelogram yuziga nisbatini toping.
A) 0,5 B) 0,25 C) 0,(3) D) 0,(6)

27. (a6-g8-12) Doniyor o'lchamlari 8, 12 va 15 sm bo'lgan g'istlardan kub yasamoqchi. Eng kichik hajmdagi kub yasash uchun necha dona g'isht kerak bo'ladi?
A) 120 B) 1200
C) 600 D) 6000

28. (a6-g20-5) ABCD parallelogramning AB tomonidan N, CD tomonidan K nuqtalar olindi. AB = 1,25AN = 2,5KC. AK va DN chiziqlar O nuqtada kesishadi. AON uchburchak yuzining parallelogram yuziga nisbatini toping.
A) $\frac{9}{56}$ B) $\frac{1}{7}$ C) $\frac{8}{35}$ D) $\frac{9}{28}$

29. (a6-g21-23) Parallelogramning tomonlari a va b ga teng ($a < b$). Parallelogramm o'tkir burchagining bissektrisasi undan yuzasi S ga teng uchburchak ajratadi. Parallelogramm yuzasini toping.
A) $\frac{2bS}{a}$ B) $\frac{2aS}{b}$
C) $\frac{2(b-a)S}{a}$ D) $\frac{2(b-a)S}{b}$

30. (a6-g23-21) ABCD parallelogramning AC diagonalidan K nuqta olindi. 3CK = AC bo'lsa, parallelogramm yuzi BKD uchburchak yuzidan necha marta katta?
A) 12 B) 6 C) 5 D) 10

134. Romb. Romb xossasi

1. (a1-g5-31) Rombning bir uchi aylana markazida, qolgan uchlari aylanada yotadi. Agar aylananing radiusi 12 sm bo'lsa, rombning balandligini toping.
A) 9 B) 12
C) $6\sqrt{3}$ D) $4\sqrt{3}$

2. (a1-g6-29) Rombning o'tmas burchagidan tushirilgan balandligi uni yuzalari mos ravishda 3,36 sm^2 va 20,64 sm^2 bo'lgan uchburchak va to'rtburchakka ajratadi. Balandlik 4,8 sm ga teng bo'lsa, rombning perimetrini toping.
A) 10 sm B) 20 dm
C) 0,4 m D) 0,2 m

3. (a1-g12-11) Tomoni 6 ga teng bo'lgan muntazam uchburchak tomoni $3\sqrt{2}$ ga teng bo'lgan rombga tengdosh. Rombning tomonlari orasidagi burchakni toping.
A) 45° B) 60° C) 90° D) 30°

4. (a1-g14-29) Tomoni 6 sm bo'lgan ABCD rombning A o'tkir burchagi 60°. Bu rombning CD tomonidan E nuqta, AB tomonidan F nuqtalar shunday tanlab olindiki, natijada |DE| = |FB| = 2sm bo'lib qoldi. EF kesma uzunligini toping.
A) $\sqrt{7}$ B) $2\sqrt{7}$
C) $3\sqrt{7}$ D) $4\sqrt{2}$

5. (a1-g17-28) Diagonallari uzunliklari yig'indisi 34 ga, perimetri 52 ga teng bo'lgan rombning balandligini toping.
A) $\frac{17}{2}$ B) $\frac{120}{13}$
C) 12 D) 5

6. (a3-g2-27) Tomoni 20 ga teng bo'lgan rombning yuzasi 240 ga teng. Uning kichik diagonalini toping.
A) $6\sqrt{5}$ B) $4\sqrt{10}$
C) $12\sqrt{10}$ D) 12

7. (a3-g6-27) Rombning balandligi 5 ga, diagonallari ko'paytmasi 90 ga teng. Uning perimetrini toping.
A) 16 B) 32 C) 28 D) 36

8. (a3-g9-28) Rombning diagonallari 24 va 10 ga teng. Uning balandligini toping.
A) $\frac{120}{13}$ B) $\frac{60}{13}$
C) $\frac{240}{13}$ D) $\frac{120}{17}$

9. (a3-g10-29) Perimetrlari teng bo'lgan romb va kvadratning yuzalari nisbati 1:2 ga teng. Romb katta diagonalining kvadrat diagonaliga nisbatini toping.
A) $\frac{\sqrt{3}-1}{2}$ B) $\frac{\sqrt{3}+1}{2}$
C) $\frac{2\sqrt{3}}{3}$ D) $\sqrt{3}$

10. (a3-g11-27) Rombning o'tmas burchagidan tushirilgan balandligi uni yuzalari mos ravishda 3,36 sm^2 va 20,64 sm^2 bo'lgan uchburchak va to'rtburchakka ajratadi. Balandlik 4,8 sm ga teng bo'lsa, rombning perimetrini toping.
A) 10 sm B) 20 dm
C) 0,4 m D) 0,2 m

11. (a3-g14-29) Rombning kichik diagonaliga parallel to'g'ri chiziq uning yuzini 3:4 nisbatda bo'ladi. Shu chiziq uning tomonini o'tkir burchak uchidan boshlab qanday nisbatda bo'ladi?
A) 36:1 B) $\sqrt{6}:(\sqrt{7}-\sqrt{6})$
C) $(\sqrt{3}-2):2$ D) $\sqrt{6}:\sqrt{7}$

12. (a3-g19-27) Tomoni 25 ga teng bo'lgan rombning bir diagonali 30 ga teng. Uning diagonallari kesishgan nuqtadan tomonigacha bo'lgan masofani toping
A) 12 B) 15 C) 10 D) 8

13. (a3-g20-30) Quyidagi mulohazalardan qaysilari noto'g'ri?
1) Rombning diagonallari 90° burchak ostida kesishadi.
2) Aylananing vatari uning radiusidan kichik bo'la olmaydi.
3) Ikki vektorning ayirmasi ular qarama-qarshi yo'nalganda eng kichik qiymatga erishadi.
4) Tekislikdagi kesishuvchi chiziqlarga perpendikulyar bo'lgan chiziq tekislikka ham perpendikulyar
5) Teng yonli trapetsiyaning katta asosi atrofida aylantirishdan kesik konus hosil bo'ladi.
A) 1; 3; 5 B) 2; 3, 4
C) 3, 4; 5 D) 2, 3; 5

14. (a4-g2-29) Rombning kichik diagonaliga parallel o'tkazilgan to'g'ri chiziq uning yuzini 5:2 nisbatda bo'ladi. Shu chiziq uning tomonini o'tmas burchak uchidan boshlab qanday nisbatda bo'ladi?
A) 25:4 B) $\sqrt{3}:(\sqrt{2}-1)$
C) $2:\sqrt{7}$ D) $(\sqrt{7}-2):2$

15. (a4-g4-28) Rombning tomoni $a + 1$ ga, diagonallaridan biri $2a$ ga teng bo'lsa, uning ikkinchi diagonalini toping.
A) $2\sqrt{2a+1}$ B) $2a+1$
C) $2\sqrt{a+1}$ D) $\sqrt{2a+1}$

16. (a4-g7-29) ABC uchburchakning AB tomonidan D, BC tomonidan E, AC tomonidan F nuqtalar shunday tanlab olindiki, natijada ADEF tomoni 5 ga teng romb hosil bo'ldi. Agar BD = 3 bo'lsa, FC kesma uzunligini toping.
A) 8,(3) B) 12,5
C) 8 D) 10

17. (a4-g7-36) Asosi rombdan iborat parallelepipedning katta diagonali kichik diagonalidan 2 marta katta. Agar rombning kichik diagonali parallelepiped balandligiga teng bo'lsa, rombning katta diagonalining kichik diagonaliga nisbatini toping.
A) $\sqrt{3}$ B) 2 C) $\sqrt{5}$ D) $\sqrt{7}$

18. (a4-g12-27) Tomoni 10 ga teng bo'lgan rombning ichidan olingan nuqtadan barcha tomonlarigacha bo'lgan masofalar yig'indisi 16 ga teng. Rombning kichik diagonalini toping.
A) $4\sqrt{5}$ B) $5\sqrt{2}$ C) $2\sqrt{10}$ D) 6

19. (a4-g25-27) Rombning balandligi 6 ga, diagonallari ko'paytmasi 84 ga teng. Uning perimetrini toping.
A) 14 B) 32 C) 28 D) 21

20. (a5-g8-29) Rombning ixtiyoriy nuqtasidan tomonlarigacha bo'lgan masofalar yig'indisi 18 ga teng. Rombning balandligini toping.
A) 18
B) 4,5
C) 9
D) aniqlab bo'lmaydi

21. (a5-g17-33) Tomoni 9 sm va yuzasi 72 sm^2 bo'lgan rombning ichidagi ixtiyoriy nuqtadan tomonlarigacha bo'lgan masofalar yig'indisi necha sm ga teng?
A) 8 B) 16 C) 12 D) 24

22. (a6-g1-24) ABCD rombning A burchagi 66°. AD tomondan E nuqta shunday tanlab olindiki, natijada BE kesma AD tomonga teng bo'lib qolibdi. ECD burchakning qiymatini toping.
A) 18° B) 11° C) 9° D) 12°

23. (a6-g20-28) Rombning o'tmas burchagidan tushirilgan balandligi uni yuzalari mos ravishda 3,36 sm^2 va 20,64 sm^2 bo'lgan uchburchak va to'rtburchakka ajratadi. Balandlik 4,8 sm ga teng bo'lsa, rombning perimetrini toping.
A) 10 sm B) 20 dm
C) 0,2 m D) 0,4 m

135. Romb yuzi

1. (a2-g11-29) Perimetrlari teng bo'lgan romb va kvadratning yuzalari nisbati 1:2 ga teng. Romb kichik diagonalining kvadrat diagonaliga nisbatini toping.

A) $\frac{\sqrt{3}-1}{2}$ B) $\frac{\sqrt{3}+1}{2}$

C) $\frac{\sqrt{3}}{2}$ D) $\frac{\sqrt{3}}{3}$

2. (a2-g13-24) Rombning o'tkir burchagi 45°, balandligi $\sqrt{8}$ ga teng bo'lsa, rombning yuzini toping.
A) 4 B) 5
C) $4\sqrt{8}$ D) $10\sqrt{2}$

3. (a2-g19-29) Rombning perimetri 104 ga, diagonallarining yig'indisi 68 ga teng. Rombning yuzini toping.
A) 480 B) 360 C) 120 D) 540

4. (a3-g8-28) Rombning uchidan tushirilgan balandligi uning tomonini o'tkir burchagi uchidan boshlab hisoblaganda 6 va 4 ga teng kesmalarga bo'ladi. Rombning yuzini toping.
A) 20 B) 40 C) 48 D) 80

5. (a5-g19-24) Diagonallaridan biri ikkinchisidan uch marta katta bo'lgan rombning tomoni 20 ga teng. Shu rombning yuzini toping
A) 120 B) 240 C) 400 D) 320

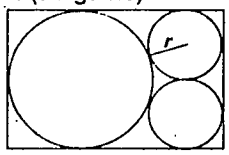
6. (a6-g5-23) ABCD – tomoni 14 ga teng bo'lgan romb. Shu rombning A o'tmas burchagidan AH balandlik tushirilgan va CH = 6 bo'lsa, AH balandlik va AC diagonal orasidagi burchak tangensini toping.

A) $\frac{2\sqrt{33}}{11}$ B) $\frac{\sqrt{33}}{11}$

C) $\frac{3}{7}$ D) $\frac{4}{\sqrt{33}}$

7. (a6-g7-23) ABCD rombning diagonallari O nuqtada kesishadi. O nuqtadan BC tomonga AB ga parallel OK kesma o'tkazildi. Agar COK uchburchakning yuzi S bo'lsa, rombning yuzini toping.
A) 4S B) 8S C) 12S D) 16S

8. (a6-g7-26)

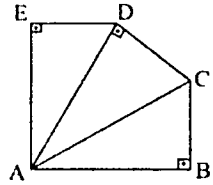


Rasmdagi eng kichik aylananing radiusi *r* ga bo'lsa, to'g'ri to'rtburchak yuzini toping.
A) $24r^2$
B) B) $4\left(4\sqrt{2}+2\right)r^2$
C) C) $4\left(2\sqrt{2}+3\right)r^2$
D) $12r^2$

136. Qavariq ko'pburchak

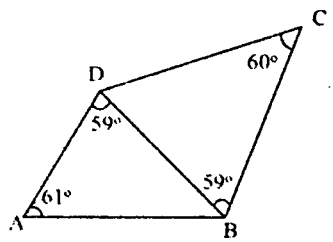
1. (a1-g1-14) Bir uchidan 9 ta diagonal chiqadigan qavariq ko'pburchakning ichki burchaklari yig'indisi nechaga teng?
A) 1980° B) 1620°
C) 1800° D) 2160°

2. (a1-g4-26) Quyidagi shaklda AE ⊥ ED, AD ⊥ DC va AB ⊥ BC. |BC| = |CD| = |DE| = 2 va |AB| = 3 bo'lsa, AE tomon uzunligini toping.



A) $\sqrt{5}$ B) $\sqrt{7}$
C) 3 D) $2\sqrt{3}$

3. (a1-g5-26)



Rasmda berilganlardan foydalanib eng uzun kesmani toping.
A) BD B) BC C) DC D) AB

4. (a1-g8-28) Ketma-ket uchlari ABCDE bo'lgan muntazam ko'pburchakning AB va DE tomonlarini davom ettirganda 108° burchak ostida kesishadi. Ko'pburchakning nechta tomoni mavjud?
A) 18 B) 15 C) 12 D) 10

5. (a1-g11-28) Muntazam o'n ikki burchakning bir uchidan chiqqan eng katta va eng kichik diagonallari orasidagi burchakni toping.
A) 70° B) 45° C) 30° D) 60°

6. (a1-g13-29) *n* tomonli va *a* tomonli ko'pburchaklar diagonallari sonining nisbatini toping.

A) $\frac{n-3}{a-3}$ B) $\frac{n}{a}$

C) $\frac{n^2-3n}{a(a-4a)+a}$ D) $\frac{3n-n^2}{a(a-3)}$

7. (a1-g14-27) Ko'pburchakning ichki burchaklarining yig'indisi tashqi burchaklari yig'indisidan 3 marta katta bo'lsa, bu ko'pburchakning nechta tomoni bor?
A) 6 B) 7 C) 8 D) 9

8. (a1-g17-27) Tashqi burchagi 40°ga teng bo'lgan muntazam ko'pburchakning ichki burchaklari yig'indisini toping.
A) 1260° B) 900°
C) 1080° D) 720°

9. (a2-g1-27) Tomonlari soni diagonallari sonidan 3 marta ko'p bo'lgan ko'pburchakning nechta tomoni mavjud?
A) 9 B) 11 C) 8 D) 7

10. (a2-g2-28) Oltiburchakning eng katta diagonalining eng kichik diagonaliga nisbatini toping.

A) $\frac{4\sqrt{3}}{3}$ B) $\sqrt{3}$

C) $\frac{2\sqrt{3}}{3}$ D) $\sqrt{2}$

11. (a2-g3-36) Quyidagi mulohazalardan qaysi biri noto'g'ri?
A) Uchburchakning ixtiyoriy 2 ta tomoni yig'indisi uning uchinchi tomonidan katta
B) Qavariq to'rtburchakning har bir uchidan bittadan olingan tashqi burchaklari yug'indisi 360° ga teng.
C) Paralellogramning tomonlari kvadratlarining yig'indisi uning diagonallari kvadratlari yig'indisidan 2 marta katta
D) Kubga ichki chizilgan sharning diametri uning tomoniga teng.

12. (a2-g4-28) Ichki burchaklari yig'indisi 2160° ga teng bo'lgan ko'pburchakning bir uchidan nechta diagonal chiqarish mumkin?
A) 14 B) 12 C) 11 D) 10

13. (a2-g5-27) Muntazam o'nburchakning bir uchidan chiqqan eng katta va eng kichik diagonallari orasidagi burchakni toping.
A) 63° B) 54° C) 36° D) 48°

14. (a2-g8-30) Muntazam 30 burchakning diagonallari sonining bir uchidan chiqqan diagonallar soniga nisbatini toping?
A) 27 B) 30 C) 15 D) 24

15. (a2-g9-28) Muntazam o'n ikki burchakning bir uchidan chiqqan eng katta va eng kichik diagonallari orasidagi burchakni toping.
A) 70° B) 45° C) 30° D) 60°

16. (a2-g11-28) Muntazam ko'pburchakning ichki burchagi tashqi burchagidan 5 marta katta. Bu ko'pburchak eng ko'p nechta diagonalga ega bo'lishi mumkin?
A) 54 B) 20 C) 35 D) 90

17. (a2-g15-28) Ichki burchagi tashqi burchagidan 8 marta katta bo'lgan muntazam ko'pburchakning nechta diagonali bor?
A) 90 B) 135 C) 170 D) 189

18. (a2-g16-27) Muntazam 18 burchakning bir uchidan chiqqan eng kichik diagonallar orasidagi burchak necha gradus?
A) 160° B) 75° C) 140° D) 150°

19. (a2-g16-29) Quyidagi mulohazalardan qaysilari noto'g'ri?
1) Uchburchakning ikki tashqi burchagi yig'indisi uchinchi ichki burchakka teng;
2) Paralellogramning bissektrisalari har doim to'g'ri burchak ostida kesishadi;
3) Aylananing vatari uzunligi uning radiusidan doimo kichik bo'ladi;
4) Rombning tomoni diagonallaridan doimo kichik bo'ladi; 5) Silindrning yoyilmasi to'g'ri to'rtburchak bo'ladi.
A) 2; 3; 4 B) 1; 3; 4
C) 1; 2; 4 D) 2; 3; 5

20. (a2-g17-28) Tomonlari 3:4 nisbatda bo'lgan to'g'ri to'rtburchak shaklidagi yer maydoni 48 sotix. Katta tomonga parallel qilib 0,5 m oraliqlar bilan ariqlar qazib chiqildi. Yer maydoni chekkalariga ariq qazilmagan bo'lsa, ariqlarning umumiy uzunligini toping.
A) 9600 m B) 9520 m
C) 9440 D) 9680 m

21. (a2-g19-27) Muntazam ko'pburchakning diagonallari soni 54 ta bo'lsa, bu ko'pburchakning bir ichki burchagi necha gradus?
A) 140° B) 150°
C) 144° D) 135°

22. (a2-g20-27) Ichki burchagi 160° bo'lgan muntazam ko'pburchakning bir uchidan nechta diagonal o'tkazish mumkin?
A) 15 B) 19 C) 18 D) 16

23. (a2-g22-27) Muntazam oltiburchakning ichidagi ixtiyoriy nuqtadan tomonlarigacha bo'lgan masofalar yig'inidisi $9\sqrt{3}$ ga teng. Shu oltiburchakning eng katta diagonali uzunligini toping.
A) $6\sqrt{3}$ B) 6
C) 3 D) $3\sqrt{3}$

24. (a2-g23-27) Ichki burchaklari yig'indisi 1800° bo'lgan muntazam ko'pburchakning har bir tashqi burchagi necha gradus?
A) 36° B) 45° C) 24° D) 30°

25. (a2-g23-30) Qavariq ko'pburchakning yuzi 96 ga teng. Agar bu ko'pburchakka ichki chizilgan aylana radiusi 6 ga teng bo'lsa, ko'pburchakning perimetrini toping.
A) 32 B) 16 C) 24 D) 18

26. (a3-g1-27) ABCDEF muntazam oltiburchakning FB diagonali 6 ga teng. Shu oltiburchakning yuzasini toping.
A) 24 B) $18\sqrt{3}$
C) 36 D) $24\sqrt{3}$

27. (a3-g2-29) Muntazam o'nburchakning ichki burchaklari yig'indisining tashqi burchaklar yig'indisiga nisbatini toping.
A) 4 B) 5 C) 6 D) 10

28. (a3-g3-30) Muntazam 30 burchakning nechta diagonali bor?
A) 810 B) 135 C) 405 D) 202

29. (a3-g4-27) Ichki burchagi tashqi burchagidan 6,5 marta katta bo'lgan muntazam ko'pburchakning nechta diagonali bor?
A) 54 B) 135 C) 90 D) 170

30. (a3-g4-35) Muntazam beshburchakli piramidaning yon sirti asos yuzasidan 2 marta katta. Piramida apofemasi 18 ga teng bo'lsa, balandligini toping.
A) $9\sqrt{3}$ B) 9
C) $6\sqrt{3}$ D) 12

31. (a3-g6-29) Muntazam o'ttizburchakning bir ichki burchagining bir tashqi burchagiga nisbatini toping.
A) 14:1 B) 15:1 C) 16:1 D) 12:1

32. (a3-g7-27) Muntazam ko'pburchakning bir ichki burchagi tashqi burchagidan 3,5 marta katta. Ko'pburchakning nechta tomoni bor?
A) 7 B) 8 C) 12 D) 9

33. (a3-g8-29) Ichki burchagi 144° va tomonining uzunligi 8 ga teng muntazam ko'pburchakning perimetri nechaga teng?
A) 72 B) 80 C) 48 D) 64

34. (a3-g9-27) Ko'pburchakning bir uchidan chiqqan diagonallar uni 16 ta uchburchakka ajratadi.
Bu ko'pburchakning nechta tomoni bor?
A) 19 B) 20 C) 17 D) 18

35. (a3-g10-28) Muntazam ko'pburchakning ichki burchagi tashqi burchagidan 4 marta katta. Bu ko'pburchak eng ko'p nechta diagonalga ega bo'lishi mumkin?
A) 54 B) 20 C) 35 D) 90

36. (a3-g11-29) Quyidagi keltirilgan mulohazalardan qaysi biri noto'g'ri?
A) Muntazam oltiburchakning tashqi burchagi ichki burchagining yarmiga teng.
B) Muntazam beshburchak ichki burchagining tashqi burchagiga nisbati 3:2.
C) Muntazam sakkizburchakning tashqi burchagi ichki burchagining uchdan biriga teng.
D) Muntazam o'nburchakning ichki burchagi tashqi burchagidan 5 marta katta.

37. (a3-g12-28) Ichki burchagi tashqi burchagidan 6,5 marta katta bo'lgan muntazam ko'pburchakning nechta diagonali bor?
A) 54 B) 135 C) 90 D) 170

38. (a3-g13-28) Muntazam ko'pburchakning bir tashqi burchagi 22,5° ga teng. Bu ko'pburchakda eng ko'pi bilan nechta diagonal o'tkazish mumkin?
A) 104 B) 20 C) 91 D) 65

39. (a3-g14-27) Muntazam 40 burchakning ichki burchagi necha gradus?
A) 162 B) 140 C) 175 D) 171

40. (a3-g15-29) Qavariq o'n oltiburchakning nechta diagonali bor?
A) 104 B) 96 C) 112 D) 120

41. (a3-g16-27) Har bir tashqi burchagi 36° bo'lgan muntazam ko'pburchakning ichki burchaklari yig'indisini toping.
A) 1800° B) 1440°
C) 2160° D) 1620°

42. (a3-g17-27) Tashqi burchagi 36° bo'lgan muntazam ko'pburchakning diagonallar soni tomonlari sonidan necha marta katta?
A) 7 B) 10 C) 3,5 D) 5

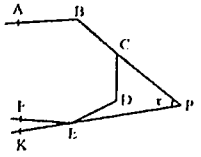
43. (a3-g18-27) 12 burchakning ichki burchaklari yig'indisining tashqi burchaklari yig'indisiga nisbatini toping.
A) 6 B) 5 C) 4 D) 8

44. (a3-g23-27) Ko'pburchakning diagonallari 54 ta bo'lsa, tomonlari sonini toping.
A) 9 B) 12 C) 10 D) 6

45. (a3-g24-27) Muntazam oltiburchakning eng katta diagonali 12 ga teng. Oltiburchakning ichidagi ixtiyoriy nuqtadan tomonlarigacha bo'lgan masofalar yig'indisini toping.
A) 12 B) $6\sqrt{3}$
C) $18\sqrt{3}$ D) 6

46. (a4-g2-27) Muntazam 45 burchakning ichki burchagi necha gradus?
A) 172 B) 164 C) 135 D) 176

47. (a4-g3-27)



Yondagi chizmada muntazam yigirma burchak tasvirlangan. Bu yerda FEK burchak 8°. CPE burchakni toping.
A) 126 B) 134 C) 162 D) 140

48. (a4-g5-27) Ichki burchagi 135° va tomonining uzunligi 6 ga teng muntazam ko'pburchakning perimetri nechaga teng?
A) 36 B) 60 C) 48 D) 32

49. (a4-g6-27) Ichki burchagi tashqi burchagidan 7 marta katta bo'lgan muntazam ko'pburchakning diagonallari soni tomonlari sonidan necha marta ko'p?
A) 6,5 B) 3,5 C) 4 D) 16

50. (a4-g9-27) Muntazam ABCDE beshburchakning BE va AC diagonallari orasidagi o'tkir burchak necha gradus?
A) 36 B) 48 C) 56 D) 72

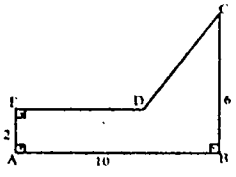
51. (a4-g10-27) Muntazam ko'pburchak tashqi burchaklarining har biri 30% kichraytirilsa, boshqa bir muntazam ko'pburchak hosil bo'ladi. Dastlabki ko'pburchak tomonlari sonining eng kichik qiymatini toping.
A) 10 B) 7 C) 12 D) 15

52. (a4-g15-27) Ko'pburchakning bir uchidan chiqqan diagonallar yordamida ko'pburchak 10 ta uchburchakka bo'lindi. Bu ko'pburchakning ichki burchaklari yig'indisini toping.
A) 1620° B) 2160°
C) 1980° D) 1800°

53. (a4-g16-27) ABCDE ... muntazam ko'pburchakda BDE burchak 135° bo'lsa, bu ko'pburchakning nechta tomoni mavjud?
A) 12 B) 8 C) 18 D) 10

54. (a4-g20-27) Ichki burchagi 160° bo'lgan muntazam ko'pburchakning bir uchidan nechta diagonal o'tkazish mumkin?
A) 22 B) 16 C) 18 D) 15

55. (a4-g20-28)



Ushbu ABCDE beshburchakda A, B, E burchaklar to'g'ri burchak. $\angle C = 45°$, $|AE| = 2$ sm, $|AB| = 10$ sm va $|BC| = 6$ sm bo'lsa, beshburchakning perimetrini toping.
A) $24+4\sqrt{2}$ B) $28+4\sqrt{2}$
C) $30+2\sqrt{2}$ D) $4\sqrt{2}+32$

56. (a4-g22-29) Ichki burchaklari yig'indisi tashqi burchaklari yig'indisidan 5 marta ko'p bo'lgan ko'pburchakning nechta diagonali bor?
A) 54 B) 35 C) 20 D) 77

57. (a4-g23-27) Ichki burchagi tashqi burchagidan 140° ga katta bo'lgan ko'pburchakning nechta diagonali bor?
A) 27 B) 54 C) 90 D) 135

58. (a4-g25-29) Ichki burchagi 144° bo'lgan muntazam ko'pburchakning bir uchidan nechta diagonal chiqarish mumkin?
A) 27 B) 7 C) 10 D) 35

59. (a5-g3-27) 18 burchak va 24 burchaklarning diagonallari soni nisbatini toping.
A) $\frac{3}{4}$ B) $\frac{5}{7}$
C) $\frac{16}{21}$ D) $\frac{15}{28}$

60. (a5-g4-27) Muntazam 18 burchakning ichki va tashqi burchaklari ayirmasini toping.
A) 140° B) 160°
C) 180° D) 150°

61. (a5-g6-33) ABCD qavariq to'rtburchak bo'lsa, quyidagilardan qaysi biri noto'g'ri?
A) $\overrightarrow{AB}+\overrightarrow{BC}=\overrightarrow{AD}+\overrightarrow{DC}$
B) $\overrightarrow{DA}+\overrightarrow{AB}=\overrightarrow{DC}+\overrightarrow{BC}$
C) $\overrightarrow{AB}+\overrightarrow{BC}+\overrightarrow{CA}=0$
D) $\overrightarrow{DB}+\overrightarrow{BC}=\overrightarrow{DC}$

62. (a5-g9-29) Muntazam o'nikkiburchakning bir uchidan chiqqan eng katta va eng kichik ikki diagonali orasidagi burchakni toping.
A) 60° B) 45°
C) 67,5° D) 50°

63. (a5-g12-21) ABC muntazam uchburchak. AB tomondan D, BC tomondan E nuqta va AC tomondan F nuqta shunday tanlab olindiki, natijada DE, EF ga perpendikulyar bo'ladi. BDE va EFC burchaklar yig'indisini toping.
A) 150° B) 120°
C) 90° D) 135°

64. (a5-g13-23) ABCDE... muntazam ko'pburchakda BDE burchak 135° bo'lsa, bu ko'pburchakning nechta tomoni mavjud?
A) 12 B) 8 C) 18 D) 10

65. (a5-g19-23) Bir ichki burchagi tashqi burchagidan 5 marta katta bo'lgan muntazam ko'pburchakning diagonallari sonini toping.
A) 35 B) 44 C) 54 D) 77

66. (a5-g25-23) ABCD... muntazam 24 burchakning AB va DC kesmalarini davom ettirganda A_1 nuqtada kesishadi. CA_1B burchak kattaligini toping.
A) 90° B) 30°
C) 120° D) 150°

67. (a6-g1-23) Muntazam 15 burchakning bir uchidan chiqqan ikki eng kichik diagonallar orasidagi burchakni toping.
A) 156° B) 144° C) 132° D) 168°

68. (a6-g10-24) Muntazam ko'pburchakning bir uchidan barcha qirralariga o'tkazilgan diagonallarning orasidagi har bir burchak 6° dan. Shu ko'pburchakning bir uchidagi tashqi burchagini toping.
A) 15° B) 9° C) 20° D) 12°

69. (a6-g23-30) ABCDE... muntazam ko'pburchakda ACD burchak 144° bo'lsa, bu ko'pburchakning nechta tomoni mavjud?
A) 10 B) 16 C) 18 D) 15

137. Qavariq ko'pburchak xossalari

1. (a1-g2-31) Muntazam ko'pburchakning bir ichki burchagi bir tashqi burchagidan 5 marta katta. Bu ko'pburchakning diagonallari soni tomonlari sonidan necha marta ko'p?
A) 6 B) 4,5 C) 5 D) 2,5

2. (a1-g4-29) ABCD qavariq to'rtburchakda $|AB| = |AD| = 3\sqrt{2}$, $|BC| = |CD| = 5$, $AB \perp AD$ bo'lsa, ABCD to'rtburchakning yuzasini toping.
A) 27 B) 30 C) 21 D) 24

3. (a1-g6-28) Quyida keltirilgan mulohazalardan qaysi biri noto'g'ri?
A) Muntazam oltiburchakning tashqi burchagi ichki burchagining yarmiga teng.
B) Muntazam beshburchak ichki burchagining tashqi burchagiga nisbati 3:2.
C) Muntazam sakkizburchakning tashqi burchagi ichki burchagining uchdan biriga teng.
D) Muntazam o'nburchakning ichki burchagi tashqi burchagidan 5 marta katta.

4. (a1-g7-27) Har bir tashqi burchagi 60° ga teng bo'lgan qavariq ko'pburchakning ichki burchaklari yig'indisini toping.
A) 360° B) 720° C) 648° D) 540°

5. (a1-g10-30) Diagonallari soni 90 ta bo'lgan muntazam ko'pburchakning bitta tashqi burchagini toping.
A) 24° B) 20° C) 28° D) 48°

6. (a2-g6-27) Muntazam oltiburchakning tomoni $6\sqrt{6}$ ga teng.

Yuzasi shu oltiburchak yuzasining uchdan biriga teng bo'lgan teng tomonli uchburchakning tomoni nechaga teng?
A) $18\sqrt{2}$ B) $12\sqrt{3}$
C) 36 D) $24\sqrt{2}$

7. (a2-g10-30) Ichki burchaklari yig'indisi 1440° bo'lgan qavariq ko'pburchakning diagonallari sonini toping.
A) 35 B) 54 C) 20 D) 44

8. (a3-g5-27) Muntazam sakkizburchakning eng katta diagonali 8 ga teng. Shu sakkizburchakning yuzini toping.
A) $48\sqrt{2}$ B) $64\sqrt{2}$
C) $128\sqrt{2}$ D) $32\sqrt{2}$

9. (a3-g19-29) Muntazam o'nikkiburchakning ichki burchaklari yig'indisining bitta tashqi burchagiga nisbatini toping.
A) 80:1 B) 100:1
C) 60:1 D) 75:2

10. (a3-g20-27) Ko'pburchakning bir uchidan chiqqan diagonallar ko'pburchakni 12 ta uchburchakka ajratadi. Bu ko'pburchakning ichki burchaklari yig'indisini toping.
A) 2340° B) 1980°
C) 2160° D) 2520°

11. (a3-g21-27) Muntazam 18 burchakning bir uchidan chiqqan eng katta va eng kichik diagonallari orasidagi burchakni toping.
A) 80° B) 20° C) 70° D) 65°

12. (a3-g21-28) Qavariq to'rtburchakning ikki tashqi burchagi yig'indisi 255° ga teng. Shu to'rtburchakning boshqa ikki ichki burchaklari yig'indisini toping.
A) 105° B) 255° C) 75° D) 135°

13. (a3-g22-27) Ichki burchagi 160° bo'lgan ko'pburchakning bir uchidan eng ko'pi bilan nechta diagonal chiqarish mumkin?
A) 15 B) 18 C) 21 D) 24

14. (a4-g4-27) Qavariq beshburchakning bir tomoniga yopishgan ikki burchagi bissektrisalari orasidagi burchak 40° ga teng. Beshburchakning qolgan uchta burchagi yig'indisini toping.
A) 280° B) 260° C) 460° D) 500°

15. (a4-g7-27) Qavariq yettiburchakning burchaklari arifmetik progressiyaning ketma-ket hadlarini tashkil etadi. Shu yettiburchakning o'rtancha burchagi kattaligini toping.
A) $\frac{900^\circ}{7}$ B) $\frac{1080^\circ}{7}$
C) 130° D) 150°

16. (a4-g8-28) Ichki burchagi tashqi burchagidan 7 marta katta bo'lgan muntazam ko'pburchakning nechta diagonali bor?
A) 90 B) 135 C) 104 D) 20

17. (a4-g12-29) Ichki burchagi tashqi burchagidan 9 marta katta bo'lgan muntazam ko'pburchakning nechta tomoni bor?
A) 18 B) 20 C) 10 D) 15

18. (a4-g17-27) Muntazam ko'pburchakning bir ichki burchagi 4 ta tashqi burchaklari yig'indisiga teng. Bu ko'pburchakning diagonallari soni nechta?
A) 35 B) 20 C) 9 D) 54

19. (a4-g17-31) ABCD qavariq to'rtburchakning A burchagi to'g'ri, AB = 6, BC = 24, AD = 8 bo'lsa, bu to'rtburchakka ichki chizilgan aylana radiusini toping.
A) 4 B) 5 C) 4,5 D) 3

20. (a4-g19-27) Muntazam oltiburchakning ichki burchagi muntazam sakkizburchakning tashqi burchagidan qanchaga ortiq?
A) 60° B) 15° C) 75° D) 30°

21. (a4-g21-27) ABCDE... muntazam ko'pburchakda BDE burchak 126° bo'lsa, bu ko'pburchakning nechta tomoni mavjud?
A) 10 B) 8 C) 18 D) 12

22. (a4-g23-31) Sakkizburchakka ichki chizilgan aylana radiusining unga tashqi chizilgan aylana radiusiga nisbatini toping.
A) cos22,5° B) sin22,5°
C) tg22,5° D) ctg22,5°

23. (a4-g24-27) Diagonallari soni tomonlari sonidan 3 marta ortiq bo'lgan qavariq ko'pburchakning ichki burchaklari yig'indisini toping.
A) 1260° B) 1080°
C) 1440° D) 900°

24. (a5-g1-27) Ichki burchagi tashqi burchagidan 11 marta katta bo'lgan muntazam ko'pburchakning bir uchidan eng ko'p nechta diagonal chiqarish mumkin?
A) 9 B) 10 C) 12 D) 8

25. (a5-g2-27) Ko'pburchakning bir uchidan chiqarilgan diagonallar uni 12 ta uchburchakka ajratadi. Ko'pburchakning ichki burchaklari yig'indisini toping.
A) 1980° B) 1800°
C) 2340° D) 2160°

26. (a5-g5-27) Muntazam o'n ikki burchakning tomoni 8 ga teng bo'lsa, eng katta diagonali quyidagilardan qaysi biriga teng?
A) $\frac{8}{\cos 15^\circ}$ B) $\frac{16}{\cos 15^\circ}$
C) $\frac{8}{\sin 15^\circ}$ D) $\frac{16}{\sin 15^\circ}$

27. (a5-g6-27) Ko'pburchakning bir uchidan 12 ta diagonal chiqarish mumkin bo'lsa, bu ko'pburchak ichki burchaklari yig'indisini toping.
A) 2160° B) 2340°
C) 2700° D) 2520°

28. (a5-g7-27) Diagonallari soni tomonlari sonidan 42 taga ortiq ko'pburchakning ichki burchaklari yig'indisi nechaga teng?
A) 2160° B) 1980°
C) 1800° D) 1620°

29. (a5-g8-27) Muntazam o'nsakkizburchakning bir uchidan chiqqan eng katta va eng kichik diagonallari orasidagi burchakni toping.
A) 20° B) 55° C) 60° D) 70°

30. (a5-g8-31) Muntazam o'nikkiburchakka tashqi chizilgan doira yuzining unga ichki chizilgan doira yuziga nisbatini toping.
A) tg15° B) $\frac{1}{\sin^2 15^\circ}$
C) $\sin^2 15^\circ$ D) $\frac{1}{\cos^2 15^\circ}$

31. (a5-g12-22) ABC muntazam uchburchakning AD va CE balandliklari K nuqtada kesishadi. Agar $AK = 4\sqrt{3}$ ga teng bo'lsa, BDKE to'rtburchak yuzini toping.
A) $7,5\sqrt{3}$ B) $7,2\sqrt{3}$
C) $12\sqrt{3}$ D) $15\sqrt{3}$

32. (a5-g12-23) Muntazam to'qqizburchakning bir uchidan chiqqan ikki eng kichik diagonallar orasidagi burchakni toping.
A) 140° B) 100°
C) 28° D) 44°

33. (a5-g14-23) Muntazam ko'pburchakning bir uchidan chiqqan eng katta va eng kichik diagonallari orasidagi burchak 70° ga teng. Shu ko'pburchakning nechta tomoni bor?
A) 10 B) 18 C) 12 D) 8

34. (a6-g4-23) Muntazam sakkizburchakning eng katta diagonali 24 ga teng. Shu sakkizburchakning yuzini toping.
A) $144\sqrt{2}$ B) $576\sqrt{2}$
C) $288\sqrt{2}$ D) $\frac{4\cos^2 3}{3}$

35. (a6-g16-1) ABCDEF muntazam oltiburchakning FB diagonali 12 ga teng. Shu oltiburchakning yuzasini toping.
A) $72\sqrt{3}$ B) 144
C) 108 D) $216\sqrt{3}$

138. Trapetsiya va uning xossalari

1. (a1-g3-29) ABCD trapetsiyaning AB va CD asoslari mos ravishda 15 va [illegible] bissektrisasi BC yon tomoniga perpendikulyar bo'lsa, AD yon tomon uzunligini toping.
A) 10 B) 13 C) 11 D) 8

2. (a1-g4-30) ABCD trapesiyaning A va B o'tkir burchaklari yig'indisi 160° ga teng. C va D burchaklarining bissektrisalari E nuqtada kesishsa, CED burchakning kattaligini toping.
A) 70° B) 80° C) 100° D) 50°

3. (a1-g13-27) Teng yonli trapetsiyaning yon tomoni 5 ga, balandligi 4 ga va katta asosi 9 ga teng. Uning o'rta chizig'ini toping.
A) 6 B) 8 C) 5 D) 4

4. (a1-g16-31) Teng yonli trapetsiyaning yon tomoni $4\sqrt{2}$ ga, kichik asosi 4 ga teng. Uning diagonali yon tomoni va katta asosi bilan mos ravishda 30^0 va α burchak tashkil qiladi. α burchakni aniqlang.
A) 60^0 B) 30^0 C) 90^0 D) 45^0

5. (a2-g13-22) Teng yonli trapetsiyaning diagonali uning o'tkir burchagini teng ikkiga bo'ladi. Agar trapetsiyaning perimetri 48 ga, katta asosi 18 ga teng bo'lsa, uning o'rta chizig'ini toping.
A) 16 B) 14 C) 10 D) 12

6. (a2-g14-33) Kichik asosi k ga teng bo'lgan teng yonli trapetsiyaga radiusi q ga teng bo'lgan aylana ichki chizilgan. Trapetsiyaning yuzini toping.
A) $\frac{4q^2+k^2}{k}$ B) $\frac{4q^3+k}{k^2}\cdot q$
C) $\frac{4q^3}{k}+kq$ D) $\frac{4q^2}{k^2}+q^2$

7. (a2-g20-28) ABCD to'g'ri burchakli trapetsiyaning A va B burchaklari to'g'ri. B uchidan DC tomonga BH perpendikulyar chiqarilgan. Trapetsiyaning DC va BC tomonlari uzunliklari teng. Agar AD = 1 va AB = 5 sm bo'lsa, BH kesma uzunligini toping.
A) 5 B) 7 C) 12 D) 1

8. (a2-g21-28) Balandligi 6 ga va yuzi 39 ga teng bo'lgan trapetsiyaning asoslari ayirmasi 5 ga teng. Trapetsiya kichik asosi uzunligini toping.
A) 4 B) 7 C) 9 D) 13

9. (a3-g4-28) Trapetsiyaning o'rta chizig'idan diagonallar ajratgan kesmaning uzunligi 4 ga teng. O'rta chiziqning uzunligi esa 10 ga teng. Trapetsiyaning katta asosi uzunligini toping.
A) 14 B) 7 C) 12 D) 6

10. (a3-g8-27) Trapetsiya o'rta chizig'i uzunligi 12 ga, katta asosidagi burchaklari 30° va 60° ga teng. Trapetsiya asoslari o'rtalarini tutashtiruvchi kesmaning uzunligi 4 ga teng. Trapetsiyaning katta asosi uzunligini toping.
A) 14 B) 13 C) 12 D) 16

11. (a3-g9-34) Quyidagi mulohazalardan qaysilari doimo to'g'ri?
1) Trapetsiyaning diagonallari 90° burchak ostida kesishadi; 2) Aylanaga ichki chizilgan trapetsiya teng yonli bo'lishi shart; 3) Ikki vektor ayirmasining moduli shu vektorlar modullari ayirmasidan kichik bo'ladi; 4) Tekislikda yotuvchi chiziq og'maga perpendikulyar bo'lsa, shu chiziq og'maning proyeksiyasiga ham perpendikulyar; 5) To'g'ri burchakli trapetsiyani to'g'ri burchakli tomoni atrofida aylantirishdan kesik konus hosil bo'ladi.
A) 1, 2, 4 B) 3, 4, 5
C) 2, 4, 5 D) 1, 2, 5

12. (a3-g15-28) Teng yonli trapetsiyaning asoslari 30 va 50 ga, balandligi esa 30 ga teng. Trapetsiyaning diagonalini toping.
A) 56 B) 70 C) 60 D) 50

13. (a3-g18-28) Asoslari 4 va 18 ga, yon tomonlari 13 va 15 ga teng bo'lgan trapetsiyaning balandligi nechaga teng?
A) 5 B) 9 C) 12 D) 8

14. (a3-g19-28) Teng yonli trapetsiyaning yon tomoni diagonaliga perpendikulyar. Trapetsiya uchidan katta asosga tushirilgan balandligi asosni 16 va 4 ga teng kesmalarga ajratsa, trapetsiya balandligini toping.
A) 12 B) 8 C) 10 D) 9

15. (a3-g23-28) Balandligi 6 sm, yuzasi 96 sm^2 bo'lgan trapetsiyaning asoslari orasidagi farq 4 sm bo'lsa, trapetsiyaning katta asosi necha sm?
A) 20 B) 18 C) 12 D) 10

16. (a4-g1-28) ABCD teng yonli trapetsiyada DC kichik asos, AB katta asos. Katta asos kichik asosdan 6 ga ko'p. |AD| = 6 bo'lsa, ADC burchak kattaligini toping.
A) 60° B) 160° C) 150° D) 120°

17. (a4-g2-28) Asoslari 9 va 15 bo'lgan trapetsiyaning yuzi 72 ga teng. Shu trapetsiyaning 150° li burchagiga yopishgan yon tomoni uzunligini toping.
A) A) $4\sqrt{3}$ B) 6
C) C) $2\sqrt{3}$ D) 12

18. (a4-g3-31) ABCD to'g'ri burchakli trapetsiya. A va D to'g'ri burchak. AB = 12, AD = 4 va $|BC| = 4\sqrt{2}$ ga teng. BCD burchakning qiymati necha gradus?
A) 135 B) 90 C) 120 D) 45

19. (a4-g4-29) AECD trapetsiyaning AE katta asosidan B nuqta olib, ABCD parallelogramm va BEC muntazam uchburchak hosil qilindi. DE diagonal BC tomonni F nuqtada teng ikkiga bo'ladi. Agar BE = 4 bo'lsa, ABFD to'rtburchakning yuzini toping.
A) $8\sqrt{3}$ B) $6\sqrt{3}$ C) $4\sqrt{3}$ D) $2\sqrt{3}$

20. (a4-g5-28) Balandligi 6 ga va yuzi 39 ga teng bo'lgan trapetsiyaning asoslari ayirmasi 5 ga teng. Trapetsiya kichik asosi uzunligini toping.
A) 4 B) 7 C) 9 D) 13

21. (a4-g11-34) Balandligi 6 sm, yuzasi 96 sm^2 bo'lgan trapesiyaning asoslari orasidagi farq 4 sm bo'lsa, trapesiyaning katta asosi necha sm?
A) 20 B) 18 C) 16 D) 14

22. (a4-g16-28) Teng yonli trapetsiyaning diagonallari o'zaro perpendikulyar va har biri 12 ga teng bo'lsa, trapetsiyaning balandligi necha sm?
A) $12\sqrt{2}$ B) $6\sqrt{3}$
C) 12 D) $6\sqrt{2}$

23. (a4-g20-29) ABCE trapetsiyaning AE katta asosdan D nuqta olindi, natijada ABCD romb va DEC muntazam uchburchak hosil bo'ldi. Agar AC kesma uzunligi $7\sqrt{3}$ ga teng bo'lsa, ABCE trapetsiyaning perimetrini toping.
A) $21+14\sqrt{3}$ B) $35\sqrt{3}$
C) 42 D) 35

24. (a4-g21-28) Teng yonli trapetsiyaning diagonallari o'zaro perpendikulyar va har biri 16 ga teng bo'lsa, trapetsiyaning balandligi necha sm?
A) $16\sqrt{2}$ B) $8\sqrt{3}$
C) 16 D) $8\sqrt{2}$

25. (a4-g23-28) ABCD to'g'ri burchakli trapetsiya va BCDE to'g'ri to'rtburchak. AD = 5 va BC = 4. Agar ADE uchburchak va BCDE to'rtburchak perimetrlari teng bo'lsa, DC tomon uzunligini toping.
A) 2 B) 2,5 C) 3 D) 1,5

26. (a4-g23-29) Diagonallari bir-biriga perpendikulyar bo'lgan teng yonli trapetsiyaning yuzasi 100 ga teng. Shu tarpetsiyaning balandligini toping.
A) 12 B) 10 C) 8 D) 15

27. (a5-g1-29) ABCD trapetsiyaning AB katta asosi 45 ga teng. Asoslariga parallel EF kesma 36 ga teng va $\frac{DE}{DA}=\frac{2}{3}$ bo'lsa, CD kichik asos uzunligini toping.
A) 18 B) 22,5 C) 12 D) 30

28. (a5-g9-27) Teng yonli trapetsiyaning diagonali $12\sqrt{3}$ ga teng va u asosi bilan 30°li burchak tashkil etadi. Trapetsiyaning o'rta chizig'i nechaga teng ?
A) 18 B) 24 C) 6 D) 12

29. (a5-g10-27) Qavariq beshburchakning bir tomoniga yopishgan ikki burchaklari bissektrisalari orasidagi burchak 48° ga teng. Qolgan uchta ichki burchaklar yig'indisini toping.
A) 276° B) 26[illegible]
C) 396° D) 288°

30. (a5-g16-24) Teng yonli ABCD trapetsiyaning katta asosi AB dan E nuqta shunday tanlab olindiki, DEC burchak trapetsiya asosidagi burchakka teng bo'lib qoldi. DE = 6, EC = 4 bo'lsa, BE kesma uzunligini AE kesma uzunligiga nisbatini toping.

A) $\frac{8}{27}$ B) $\frac{2}{3}$ C) $\frac{4}{9}$ D) $\frac{1}{3}$

31. (a5-g18-24) Teng yonli trapetsiyaning yon tomoni 9 ga teng. 15 ga teng diagonali esa katta asosdagi burchakning bissektrisasi bo'lsa, shu burchakning kosinusini toping.

A) $\frac{7}{18}$ B) $\frac{5}{6}$

C) $\frac{10\sqrt{11}}{36}$ D) $\frac{\sqrt{11}}{6}$

32. (a5-g19-26) ABCD trapetsiyaga aylana ichki chizilgan. ABCE esa (E nuqta CD tomon davomida) parallelogramm. Agar AB katta asos 13 ga va DE = 4 bo'lsa, trapetsiyaning perimetrini toping.

A) 34 B) 36 C) 44 D) 66

33. (a5-g20-24) ABCD teng yonli trapetsiyaning katta asosi AB = 11 sm, kichik asosi va yon tomonlari 5 sm dan. D uchidan DH balandlik tushirilgan va BC yon tomon o'rtasidan E nuqta olingan. DHE uchburchak yuzasi necha sm^2?

A) 19,5 B) 7,5 C) 13 D) 15

34. (a5-g22-23) ABCD trapetsiyaning A katta asosidagi burchak bissektrisasi BC yon tomonga perpendikulyar va BC tomonni C uchidan boshlab 2:5 nisbatda bo'ladi. Trapetsiya kichik asosi uzunligining katta asosi uzunligiga nisbatini toping.

A) aniqlab bo'lmaydi
B) 3:7
C) 3:10
D) 4:25

35. (a5-g23-23) Trapetsiyaning diagonallari o'zaro perpendikulyar, ularning har biri 24 ga teng. Trapetsiya balandligini toping.

A) $8\sqrt{3}$ B) 24

C) $12\sqrt{2}$ D) $16\sqrt{2}$

36. (a5-g24-24) ABCD trapetsiyaning AC diagonali A burchakni teng ikkiga bo'ladi va BC tomonga perpendikulyar. Trapetsiyaning AB katta asosining CD kichik asosiga nisbatini toping.

A) 2 B) 1,5
C) 3 D) aniqlab bo'lmaydi

37. (a6-g4-24) ABCD to'g'ri burchakli trapetsiyaning AC diagonali BC yon tomonga perpendikulyar. Agar trapetsiyaning asoslari 12 va 4 ga teng bo'lsa, BC yon tomon uzunligini toping.

A) $4\sqrt{2}$ B) 8

C) $4\sqrt{3}$ D) $4\sqrt{6}$

38. (a6-g8-24) Teng yonli trapetsiyaning kichik asosining uzunligi b ga va yon tomoniga teng. Diagonali yon tomoniga perpendikulyar. Trapetsiya o'rta chizig'ining uzunligini toping.

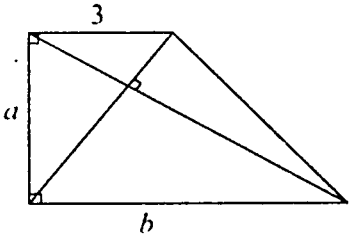
A) 2b

B) $\frac{\sqrt{3}+1}{2}b$

C) $\sqrt{3}b$

D) $\frac{3b}{2}$

39. (a6-g9-22)



Rasmda berilgan ma'lumotlardan foydalanib quyidagilardan qaysi biri to'g'ri ekanligini toping.

A) $a^2 = b$ B) $2a - b = 0$
C) $b + 3 = 2a$ D) $a^2 = 3b$

40. (a6-g14-20) ABCD teng yonli trapetsiyaning diagonallari o'zaro perpendikulyar va har biri 8 ga teng. Trapetsiyaning diagonallari o'rta chiziqdan ajratgan kesma uzunligini toping.

A) $2\sqrt{2}$
B) 1
C) aniqlab bo'lmaydi
D) $2\sqrt{2}-1$

41. (a6-g25-27) Teng yonli trapetsiyaning yon tomoni diagonaliga perpendikulyar. Trapetsiya uchidan katta asosga tushirilgan balandligi asosni 32 va 18 ga teng kesmalarga ajratsa, trapetsiya balandligini toping.

A) 24 B) 16 C) 12 D) 25

139. Trapetsiya yuzi

1. (a1-g7-30) Teng yonli trapetsiyaning perimetri 40 ga, unga ichki chizilgan aylananing radiusi 3 ga teng. Shu trapetsiyaning yuzini toping.

A) 40 B) 60 C) 80 D) 120

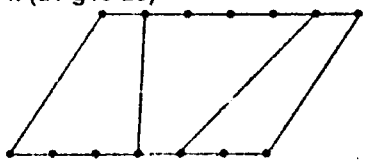
2. (a1-g8-29) ABCD trapetsiyaning AB katta asosi 15 ga, AD yon tomoni 10 ga teng. AC diagonal A burchakning bissektrisasi 16 ga teng. Trapetsiyaning yuzasini toping.

A) 96 B) 150 C) 120 D) 144

3. (a1-g9-29) Teng yonli trapesiyaning yon tomoni 13 ga teng. Diagonali esa o'rta chizig'ini 12 va 7 ga teng kesmalarga ajratdi. Trapesiyaning yuzini toping.

A) 224 B) 228 C) 256 D) 288

4. (a1-g10-28)



Rasmdagi parallelogramning asoslari teng bo'laklarga bo'lingan. Bo'yalgan soha yuzining parallelogramm yuziga nisbatini toping.

A) $\frac{7}{12}$ B) $\frac{1}{3}$ C) $\frac{5}{12}$ D) $\frac{2}{3}$

5. (a1-g12-20) Teng yonli trapetsiyaning katta burchagi 120°. Shu trapetsiyaga ichki chizilgan aylana radiusi 3 ga teng. Shu trapetsiya yuzini toping.

A) 48 B) $24\sqrt{3}$
C) 72 D) $16\sqrt{3}$

6. (a2-g1-28) Trapetsiyaning tomonlari orasida $(a+c)^2-(b+d)^2=36$ bog'lanish mavjud. Trapetsiyaning balandligi 3 ga, perimetri 18 ga teng. Agar *a* va *c* tomonlar trapetsiyaning asoslari bo'lsa, trapetsiyaning yuzini toping.

A) 12 B) 15 C) 24 D) 21

7. (a2-g5-29) ABCD trapetsiyaning A va D burchaklari to'g'ri. Bu trapetsiyada AB//DC, AB = BC = 13 sm, DC = 8 sm bo'lsa, trapetsiyaning yuzini toping.

A) 76 B) 92 C) 116 D) 126

8. (a2-g7-29) Trapetsiyaning yon tomonlari 13 va 15 ga, asoslari esa 6 va 20 ga teng. Shu trapetsiyaning yuzini toping.

A) 117 B) 208 C) 195 D) 156

9. (a2-g12-24) ABCD trapetsiyada AB katta asos DAB burchak 30°, CBA burchak esa 45°, $|CB| = 6\sqrt{2}$ va $|DC| = 4$ bo'lsa, trapetsiyaning yuzini toping

A) $6\cdot(5+3\sqrt{3})$ B) $6\cdot(7+3\sqrt{3})$

C) $20+7\sqrt{3}$ D) $4\cdot(3+\sqrt{3})$

10. (a2-g22-28) ABCD to'g'ri burchakli trapetsiyada AB tomon AD va BC tomonlarga perpendikulyar. AB tomon 15 ga teng. AD va BC tomonlar mos ravishda 6 va 14 sm ga teng. Shu trapetsiyaning AB tomonidan E nuqta shunday tanlab olindiki, natijada $3|AE| = 2|EB|$ tenglik hosil bo'ldi. CDE uchburchakning yuzini toping.

A) 69 B) 75 C) 84 D) 98

11. (a2-g23-28) Teng yonli trapetsiyaning diagonali yon tomoniga perpendikulyar. Agar trapetsiyaning katta asosi 13 ga, o'rta chizig'i 9 ga teng bo'lsa, trapetsiyaning yuzini toping.

A) aniqlab bo'lmaydi
B) 36
C) 54
D) 99

12. (a3-g2-28) Teng yonli trapetsiyaning yon tomoni diagonaliga perpendikulyar. Trapetsiya uchidan katta asosga tushirilgan balandligi asosni 12 va 3 ga teng kesmalarga ajratsa, trapetsiya yuzini toping.
A) 58 B) 96 C) 72 D) 48

13. (a3-g5-28) Teng yonli trapetsiyaning diagonali yon tomoniga perpendikulyar. Trapetsiyaning yon tomoni 15 ga, balandligi 12 ga teng. Shu trapetsiyaning yuzini toping.
A) 192 B) 96 C) 144 D) 180

14. (a3-g9-31) Trapetsiyaga ichki va tashqi aylana chizish mumkin. Agar trapetsiyaning diagonallari bir-biriga perpendikulyar va yon tomoni 7 ga teng bo'lsa, trapetsiyaning yuzini toping.
A) aniqlab bo'lmaydi
B) 12,25
C) 24,5
D) 49

15. (a3-g13-30) Trapetsiyaning diagonallari 150° burchak ostida kesishadi. Agar bu diagonallar ko'paytmasi 76 ga teng bo'lsa, trapetsiyanng yuzini toping.
A) 76 B) 19 C) 38 D) 152

16. (a3-g14-28) Asoslari 11 va 5 bo'lgan trapetsiyaning yuzi 16 ga teng. Shu trapetsiyaning 150° li burchagiga yopishgan yon tomoni uzunligini toping.
A) 2 B) $2\sqrt{3}$ C) 4 D) $4\sqrt{3}$

17. (a3-g16-28) Teng yonli trapetsiyaning diagonallari bir-biriga perpendikulyar va uning o'rta chizig'i 8 ga teng. Shu trapetsiyaning yuzini toping.
A) 64
B) 36
C) aniqlab bo'lmaydi
D) 32

18. (a3-g20-29) Trapetsiyaning diagonallari 12 va 15 ga teng va ular orasidagi burchak 60° ni tashkil etadi. Trapetsiyaning yuzini toping.
A) $45\sqrt{3}$ B) 45
C) $\frac{45}{2}$ D) $\frac{45\sqrt{3}}{2}$

19. (a3-g22-29) Diagonallari bir-biriga perpendikulyar va uzunliklari 12 va 9 ga teng bo'lgan trapetsiyaning yuzasini toping.
A) 108 B) 105 C) 54 D) 72

20. (a3-g24-28) Trapetsiyaning diagonallari 12 va 14 ga va ular orasidagi burchak 45° ga teng. Trapetsiyaning yuzini toping.
A) $84\sqrt{2}$ B) 42
C) 84 D) $42\sqrt{2}$

21. (a4-g12-28) ABCD trapetsiyaning AB va CD asoslari 7 va 3 ga teng. BC yon tomonidagi E nuqtadan katta asosga EF kesma tushirildi. Agar CE = EB va EF//AD bo'lsa, trapetsiya yuzining BEF uchburchak yuziga nisbatini toping.
A) 4:1 B) 8:1 C) 10:1 D) 14:1

22. (a4-g14-28) ABCD trapetsiyada AB kichik asos. Diagonallari O nuqtada kesishadi. AOB uchburchakning yuzasi 6 ga, AOD uchburchakning yuzasi 12 ga teng bo'lsa, $\frac{|DO|}{|OB|} = ?$
A) 4 B) 2 C) 0,5 D) $\sqrt{2}$

23. (a4-g18-28) Teng yonli trapetsiyaning asoslari 15 va 9 ga teng. Diagonali yon tomoniga perpendikulyar. Trapetsiyaning yuzini toping.
A) aniqlab bo'lmaydi
B) 144
C) 72
D) 108

24. (a4-g19-28) Trapetsiyaning yon tomoni teng uch bo'lakka bo'lindi. Bu nuqtalardan asoslarga parallel kesmalar o'tkazildi. Bu kesmalarning uzunliklari 7 va 11 ga teng. Bu kesmalar orasidagi masofa 4 ga teng. Trapetsiyaning yuzini toping.
A) 108 B) 54 C) 36 D) 72

25. (a5-g2-29) ABCD trapetsiyaning CD asosi 3 ga, AB asosi esa 8 ga teng. Trapetsiyaning diagonallari P nuqtada kesishadi. Agar DPC uchburchakning yuzi 6 ga teng bo'lsa, trapetsiyaning yuzini toping.
A) $\frac{242}{3}$ B) $\frac{314}{9}$
C) $\frac{194}{3}$ D) $\frac{124}{9}$

26. (a5-g5-28) ABCD trapetsiyada AB ga parallel CE kesma o'tkazilganda tomoni 7 ga teng ABCE romb hosil bo'ldi. Rombning o'tkir burchagi 45° va DE = 4 bo'lsa, trapetsiyaning yuzini toping.
A) $\frac{63}{\sqrt{2}}$ B) $\frac{\sqrt{77}}{2}$
C) $57\sqrt{2}$ D) $29\sqrt{2}$

27. (a5-g6-28) ABCD trapetsiyaning AB va CD asoslari 14 va 8 ga teng. CD asosdan E nuqta tanlab olindi. ABE uchburchak yuzining trapetsiya yuziga nisbatini toping.
A) $\frac{4}{7}$ B) $\frac{11}{14}$ C) $\frac{7}{11}$ D) $\frac{7}{22}$

28. (a5-g10-28) EF ABCD trapetsiyaning o'rta chizig'i. AB katta asos. DCF uchburchakning yuzi 4 ga, AEB uchburchakning yuzi 22 ga teng. DEBF to'rtburchakning yuzini toping.
A) 13 B) 26 C) 18 D) 30

29. (a5-g11-23) ABCD trapetsiyada BC AB va CD ga perpendikulyar. AC A o'tmas burchak bissektrisasi. BC = 7 va AD = 25 bo'lsa, trapetsiyaning yuzini toping.
A) 600 B) 175 C) 91 D) 135

30. (a6-g2-23) ABCD trapetsiyaning CD kichik asosidan E nuqta olindi. Agar AB asos CD asosdan 3 marta katta bo'lsa, ADE va EBC uchburchaklar yuzalari yig'indisining AEB uchburchak yuziga nisbatini toping.
A) aniqlab bo'lmaydi
B) $\frac{1}{9}$
C) $\frac{4}{9}$
D) $\frac{1}{3}$

31. (a6-g5-24) ABCD trapetsiyaning A uchidan BC va CD tomonlari o'rtasiga AE va AF chiziqlar o'tkazildi. AECF to'rtburchak yuzining trapetsiya yuziga nisbatini toping.
A) aniqlab bo'lmaydi
B) $\frac{1}{2}$
C) $\frac{1}{3}$
D) $\frac{2}{3}$

32. (a6-g5-26) ABCD trapetsiyaga ham ichki, ham tashqi aylana chizish mumkin. Agar AD bir yon tomoni 12 ga, kichik asosi 8 ga teng bo'lsa, shu trapetsiyaning yuzini toping.
A) 96 B) $48\sqrt{2}$
C) $96\sqrt{2}$ D) 100

33. (a6-g11-30) Teng yonli trapetsiyaning katta asosidagi burchagining bissektrisasi yon tomoniga perpendikulyar. Trapetsiyaning perimetri 44 ga, kichik asosi 4 ga teng bo'lsa, yuzasini toping.
A) $60\sqrt{3}$ B) $40\sqrt{3}$
C) $48\sqrt{3}$ D) $54\sqrt{3}$

34. (a6-g17-23) Teng yonli trapetsiyaning diagonali yon tomoniga perpendikulyar. Trapetsiyaning kichik asosi 10 ga va o'rta chizig'i 18 ga teng. Trapetsiyaning yuzini toping.
A) 144 B) 288
C) 216 D) 108

35. (a6-g19-20) Trapetsiyaning asosiga parallel chiziqlar yon tomonini 2:3:5 nisbatda bo'ladi. Bu chiziqlar trapetsiya yuzini qanday nisbatda bo'ladi?
A) aniqlab bo'lmaydi
B) 1:3:8
C) 4:9:25
D) 4:5:16

36. (a6-g26-23) Asoslari 27 va 6 ga, yon tomonlari 13 va 20 ga teng bo'lgan trapetsiya yuzini toping.
A) 198 B) 164
C) 396 D) 297

140. Ko'pburchak yuzasi. O'xshash ko'pburchaklarning yuzalari

1. (a1-g2-29) Uchburchakning asosiga parallel chiziqlar o'tkazildi. Bu chiziqlar uchburchakning yon tomonini asosidan boshlab, 2:4:5 sonlariga proporsional ravishda bo'ldi. Bu chiziqlar yordamida hosil qilingan sohalar yuzalarining nisbati qaysi javobda keltirilgan?
A) 4:16:25 B) 25:16:4
C) 4:32:85 D) 25:56:40

2. (a1-g4-28) ABCDEF muntazam oltiburchakning FB diagonali $4\sqrt{3}$. Shu oltiburchakning yuzasini toping.
A) 24 B) $\frac{1}{\sin 2\alpha}$
C) 36 D) $24\sqrt{3}$

3. (a1-g5-28) Muntazam oltiburchakning yuzi $24\sqrt{3}$ ga teng. Shu oltiburchakning ichidagi ixtiyoriy nuqtadan tomonlarigacha bo'lgan masofalar yig'indisini toping.
A) $9\sqrt{3}$ B) $12\sqrt{3}$
C) 12 D) 9

4. (a1-g15-28) Muntazam oltiburchakning ichidagi ixtiyoriy nuqtadan tomonlarigacha bo'lgan masofalar yi'g'indisi 18 ga teng. Shu oltiburchakning yuzini toping.
A) 27 B) 36
C) $36\sqrt{3}$ D) $18\sqrt{3}$

5. (a2-g18-27) Muntazam oltiburchakning ichidagi ixtiyoriy nuqtadan uning tomonlarigacha bo'lgan masofalar yig'indisi 9 ga teng. Shu oltiburchakning yuzini toping.
A) $\frac{9\sqrt{3}}{2}$ B) $3\sqrt{3}$
C) $\frac{15\sqrt{3}}{2}$ D) $9\sqrt{3}$

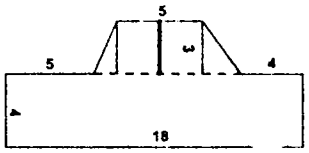
6. (a4-g9-29) ABCD to'g'ri to'rtburchakning AB tomonidan E nuqta olindi. AE = 2EB. Agar EBCD to'rtburchakning yuzi 36 ga teng bo'lsa, ABCD to'rtburchakning yuzini toping.
A) 48 B) 54 C) 50 D) 44

7. (a4-g15-28) ABCD to'g'ri to'rtburchakning AC diagonali 4 ga teng. Bu diagonal AB tomon bilan 22,5° burchak hosil qiladi. Shu to'rtburchakning yuzini toping.
A) $4\sqrt{2}$ B) 8
C) 4 D) $8\sqrt{2}$

8. (a4-g16-31) Ko'pburchakka ichki chizilgan aylana radiusi 3 ga teng. Agar shu ko'pburchakning perimetri 24 ga teng bo'lsa, ko'pburchakning yuzini toping.
A) 72 B) 48 C) 36 D) 54

9. (a4-g18-27) Muntazam sakkizburchak va oltiburchaklarning eng katta diagonallari teng. Ularning yuzlari nisbatini toping.
A) $\frac{\sqrt{6}}{2}$ B) $\frac{4\sqrt{6}}{9}$
C) $\frac{\sqrt{6}}{3}$ D) $\frac{2\sqrt{6}}{3}$

10. (a4-g25-28)



Rasmda kichkinagina Muhmudjon chizgan mashina va uning o'lchamlari tasvirlangan. Shu mashinaning yuzasini toping
A) 86 B) 93 C) 90 D) 114

11. (a5-g3-31) O'nikkiburchakka tashqi chizilgan aylana radiusi 12 ga teng. O'nikkiburchak yuzini toping
A) $432\sqrt{3}$ B) $144\sqrt{3}$
C) 432 D) 144

12. (a5-g7-30) Aylanadan tashqaridagi P nuqtadan ikki kesuvchi o'tkazilgan. Birinchi kesuvchi A va B nuqtalarda, ikkinchi kesuvchi esa C va D nuqtalardan o'tadi. PA = 2x, AB = x, PC = x + 6 va CD = 2x + 6 bo'lsa, x ni toping.
A) 18 B) 12 C) 16 D) 9

13. (a5-g8-28) ABCD to'g'ri to'rtburchak. DC tomondan P va N nuqtalar, AB tomondan K va L nuqtalar olingan. AP va DK Q nuqtada, BN va CL M nuqtada kesishadi va KLMNPQ muntazam oltiburchak. Agar $AD = 2\sqrt{3}$ bo'lsa, oltiburchak yuzini toping.
A) $8\sqrt{3}$ B) $12\sqrt{3}$
C) $6\sqrt{3}$ D) $18\sqrt{3}$

14. (a5-g14-26) Qavariq to'rtburchakning qarama-qarshi tomonlari mos ravishda 8 va 7 ga teng. Agar shu to'rtburchakka ichki chizilgan aylana radiusi 4 ga teng bo'lsa, bu to'rtburchakning yuzi nechaga teng?
A) 60
B) 30
C) 120
D) aniqlab bo'lmaydi

15. (a5-g15-1) ABCDEF muntazam oltiburchakning FB diagonali 12 ga teng. Shu oltiburchakning yuzasini toping.
A) $72\sqrt{3}$ B) 144
C) 108 D) $216\sqrt{3}$

16. (a5-g15-3) ABCD to'g'ri to'rtburchakning AD tomonidan T nuqta olindi. TBC burchak 30°, CTD burchak 75° va to'rtburchakning perimetri 18 bo'lsa, bu to'rtburchakning yuzini toping.
A) 20,25 B) 20
C) 14 D) 18

17. (a5-g16-26) Qavariq ko'pburchakka ichki chizilgan aylananing radiusi 3 ga teng. Agar ko'pburchakning perimetri 24 ga teng bo'lsa, ko'pburchakning yuzini toping.
A) 72 B) 36 C) 18 D) 144

18. (a5-g17-3) Muntazam beshburchakning tomoni 6 ga teng. Quyidagilardan qaysi biri beshburchakning yuziga teng?
A) $45 \cdot \operatorname{tg}54°$ B) $90 \cdot \sin 72°$
C) $45 \cdot \sin 72°$ D) $90 \cdot \operatorname{tg}54°$

19. (a5-g18-19) To'g'ri to'rtburchakning tomonlarining o'rtalari tutashtirilib, qavariq to'rtburchak yasaldi. Qavariq to'rtburchakning yuzi to'g'ri to'rtburchakning yuzining necha foizini tashkil etadi?
A) 50 B) 25 C) 75 D) 37,5

20. (a5-g19-22) ABC uchburchakning A uchidan tushirilgan AD medianadan T nuqta tanlab olindi. 5AT = 2AD. AC to'g'ri chiziqdan M nuqta olindi. TM BC tomonga parallel bo'lsa, BTMA to'rtburchak yuzining BTMC to'rtburchak yuziga nisbatini toping.
A) $\frac{39}{106}$ B) $\frac{1}{5}$
C) $\frac{7}{18}$ D) $\frac{5}{13}$

21. (a5-g20-23) ABCDEFG muntazam yettiburchak ichidan shunday H nuqta olindiki, natijada ABCH romb hosil bo'ldi. HCD burchak kattaligini toping.
A) $\frac{2\pi}{7}$ B) $\frac{5\pi}{7}$ C) $\frac{4\pi}{7}$ D) $\frac{3\pi}{7}$

22. (a5-g21-22) ABC uchburchakning AB tomonidan F, BC tomonidan D va AC tomonidan E nuqta olindi. 2BF = AF, 3BD = DC va AE = EC. AFDE to'rtburchak yuzining ABC uchburchak yuziga nisbatini toping.
A) $\frac{13}{24}$ B) $\frac{7}{12}$ C) $\frac{5}{12}$ D) $\frac{5}{24}$

23. (a5-g21-23) ABCDE beshburchak. ED = BC = 6. AE = AB va DC = 14. Beshburchakning A burchagi to'g'ri, B va E burchaklari 105° dan. Berilganlardan foydalanib beshburchakning yuzini toping.
A) $100 + 51\sqrt{3}$ B) $51\sqrt{3} + 200$
C) $17\sqrt{3} + 200$ D) $34\sqrt{3} + 100$

24. (a5-g23-24) ABCD parallelogramning DC tomoni E va F nuqtalar (E, D ga yaqin) yordamida teng uchga bo'lingan. AF kesma esa K va L nuqtalar (K A ga yaqin) yordamida teng uchga bo'lingan. Agar parallelogramning yuzi 192 ga teng bo'lsa, BLFC to'rtburchak yuzini toping.
A) 48 B) 32 C) 64 D) 92

25. (a5-g25-25) Markazi O nuqtada bo'lgan aylanada AB va AC uzunligi 4 ga teng bo'lgan vatarlar. COB burchak 120° bo'lsa, ACOB botiq to'rtburchak yuzini toping.

A) $8\sqrt{3}$ B) $4\sqrt{3}$

C) $\frac{8\sqrt{3}}{3}$ D) $\frac{4\sqrt{3}}{3}$

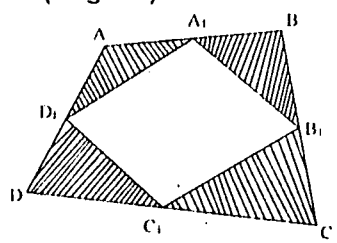
26. (a6-g6-24) ABCD kvadratning BC tomonidan E nuqta olindi. BC = 1,5BE. BD diagonal AE kesmani K nuqtada kesib o'tadi. DKEC to'rtburchak yuzining ABK uchburchak yuziga nisbatini toping.

A) $\frac{9}{4}$ B) $\frac{10}{3}$ C) $\frac{8}{3}$ D) $\frac{11}{6}$

27. (a6-g7-24) ABCD parallelogramning AD tomonidan K, BC tomonidan N nuqtalar olindi. CK||AN ga parallel. Agar BC = 4BN bo'lsa, ANCK to'rtburchak yuzining ABCD to'rtburchak yuziga nisbatini toping.

A) $\frac{3}{8}$ B) $\frac{2}{5}$ C) $\frac{4}{5}$ D) $\frac{3}{4}$

28. (a6-g9-23)



ABCD qavariq to'rtburchak, $A_1B_1C_1D_1$ shu to'rtburchak tomonlarining o'rtalari. $A_1C_1 = 2$, $A_1D_1 = 3$ va $B_1C_1A_1$ 15° bo'lsa, shtrixlangan soha yuzini toping.

A) $2\sqrt{2+\sqrt{3}}$ B) $3\sqrt{2+\sqrt{3}}$

C) $6\sqrt{2+\sqrt{3}}$ D) $3\sqrt{2-\sqrt{3}}$

29. (a6-g9-29) ABCDEF va $A_1B_1C_1D_1E_1F_1$ muntazam oltiburchakli prizmaning uchlari bo'lib, asosining tomoni 4 sm va balandligi 10 sm ga teng. ADE_1F_1 sohaning yuzini toping.

A) $48\sqrt{7}$ B) 60

C) $12\sqrt{7}$ D) $24\sqrt{7}$

30. (a6-g12-31) ABCD to'g'ri to'rtburchakning BC tomonidan F nuqta olindi. AF kesmadan K nuqta shunday tanlab olindiki, AK = 3KF tenglik o'rinli bo'ldi. AKD uchburchak yuzining ABCD to'rtburchak yuziga nisbatini toping.

A) $\frac{3}{4}$ B) $\frac{1}{4}$ C) $\frac{1}{8}$ D) $\frac{3}{8}$

31. (a6-g13-14) Qavariq to'rtburchakning qarama-qarshi tomonlari mos ravishda 7 va 9 ga teng. Agar shu to'rtburchakka ichki chizilgan aylana radiusi 4 ga teng bo'lsa, bu to'rtburchakning yuzi nechaga teng?

A) 64 B) 32

C) 128 D) aniqlab bo'lmaydi

32. (a6-g13-24) ABCD parallelogramm DC tomonidan F va AF kesmadan L nuqta olingan. CD = 3FC, AL = 2LF va parallelogramning yuzi 144 sm^2 bo'lsa, BLFC to'rtburchak yuzini toping.

A) 36 B) 54 C) 24 D) 48

33. (a6-g14-9) ABCD to'g'ri to'rtburchakning B uchidan AD tomon o'rtasiga BM chiziq o'tkazildi. BC tomondan olingan N nuqta shu tomonni BN:NC = 3:1 nisbatda bo'ladi. AN va BM chiziqlar O nuqtada kesishadi va AOM uchburchakning yuzi 16 ga teng. NOMDC shakl yuzini toping.

A) 96 B) 44 C) 84 D) 72

34. (a6-g16-9) Muntazam uchburchakka aylana ichki chizilgan. Shu aylanaga esa muntazam oltiburchak ichki chizilgan. Uchburchak va oltiburchak yuzlarining nisbatini toping.

A) $\frac{1}{\sqrt{3}}$ B) 4 C) $\frac{2}{3}$ D) 2

35. (a6-g19-4) ABCDE beshburchakda AB = AE = 4, BC = 6, CD = 3 va $DE = 5\sqrt{3}$. BAE va BCD burchaklar mos ravishda 120° va 60° ga teng bo'lsa, beshburchak yuzini toping.

A) $8,5\sqrt{3}+18$ B) 26,5

C) $26,5\sqrt{3}$ D) $18\sqrt{3}+8,5$

36. (a6-g22-14) Tomoni 8 ga teng muntazam ABCDEFGH sakkizburchakning kichik diagonallari hosil qilgan ACEG to'rtburchak yuzasini toping.

A) $64+128\sqrt{2}$

B) $64\sqrt{2}-64$

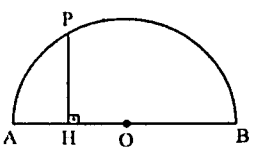
C) $128+64\sqrt{2}$

D) $64+64\sqrt{2}$

4-bob. Aylana va doira

141. Aylana, doira, radius, diametr, vatar

1. (a1-g3-30)



Rasmda PH kesma AB kesmaga perpendikulyar.
|PH| = 6 sm, |AH| = 4 sm bo'lsa, |AB| = ?

A) 13 B) 14 C) 15 D) 16

2. (a1-g4-31) Aylananing AB va CD vatarlari E nuqtada 90° burchak ostida kesishadi. |AE| = 2, |CE| = 4 va |ED| = 6 bo'lsa, aylananing radiusini toping.

A) 5 B) 6

C) $5\sqrt{2}$ D) $6\sqrt{2}$

3. (a1-g13-30) Vatar aylananing markaziy burchakka mos yoyining oltidan bir qismini tortib turadi. Shu vatar aylananing kichik yoyi ixtiyoriy nuqtasidan qaraganda qanday burchak ostida ko'rinadi?

A) 60 B) 120 C) 150 D) 30

4. (a2-g1-30) Aylananing vatari 120° li yoyni tortib turadi. Bu vatar aylaning kichik yoyining ixtiyoriy nuqtasidan qanday burchak ostida ko'rinadi?

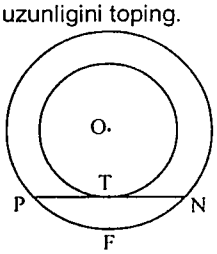
A) 60° B) 90°

C) 120° D) 30°

5. (a2-g8-31) Aylananing vatari radiusning to'rtdan biriga teng. Shu vatar tortib turgan markaziy burchak kosinusini toping.

A) $\frac{1}{32}$ B) $\frac{31}{32}$ C) $\frac{1}{16}$ D) $\frac{15}{16}$

6. (a2-g12-27) Shaklda markazlari O nuqtada bo'lgan aylanalar berilgan. Ularning radiuslari 6 va 10 ga teng. PN vatar kichik aylanaga urinadi va OF ga perpendikulyar. PF kesma uzunligini toping.



A) $\frac{20}{\sqrt{5}}$ B) $4\sqrt{3}$

C) $6\sqrt{5}$ D) $\frac{16}{\sqrt{3}}$

7. (a2-g15-30) Aylanadan tashqaridagi P nuqtadan aylanaga PT urinma va aylanani A va B nuqtalarda kesib o'tuvchi chiziq o'tkazildi (|PB| > |PA|). PT = 6 va PA = 4 bo'lsa, AB vatar uzunligini toping.

A) 9 B) 10 C) 5 D) 6

8. (a2-g22-30) Vatar aylananing markaziy burchakka mos yoyining beshdan bir qismini tortib turadi. Shu vatar aylananing katta yoyining ixtiyoriy nuqtasidan qaraganda qanday burchak ostida ko'rinadi?

A) 72° B) 96° C) 48° D) 36°

9. (a3-g2-30) Radiuslari 20 sm li doiralarning markazlari orasidagi masofa 32 sm. Ularning umumiy vatari uzunligini toping.

A) 12 B) 18 C) 30 D) 24

10. (a3-g3-31) Aylananing vatari radiusning to'rtdan biriga teng. Shu vatar tortib turgan markaziy burchak kosinusini toping.

A) $\frac{1}{32}$ B) $\frac{31}{32}$ C) $\frac{1}{16}$ D) $\frac{15}{16}$

11. (a3-g5-34) Quyidagi mulohazalardan qaysi biri noto'g'ri?
A) Aylananing vatari diametridan katta bo'la olmaydi.
B) Tekislikdagi ixtiyoriy chiziqqa perpendikulyar bo'lgan chiziq tekislikning o'ziga perpendikulyar bo'lmasligi mumkin.
C) Teng yonli uchburchakning bissektrisalari kesishish nuqtasidan 2:1 nisbatda bo'linadi.
D) Piramidaning uchi asosining tomonlardan bir xil uzoqlikda joylashgan bo'lsa, bu piramidaning balandligi asosidagi figuraga ichki chizilgan aylana markaziga tushadi.

12. (a3-g12-30) Aylanadan tashqaridagi P nuqtadan aylanaga PT urinma va aylanani A va B nuqtalarda kesib o'tuvchi chiziq o'tkazildi. (|PB| > |PA|). PT = 8 va PA = 4 bo'lsa, AB vatar uzunligini toping.
A) 10 B) 12 C) 16 D) 6

13. (a3-g13-31) Aylana markazidan vatardagi A nuqtagacha bo'lgan masofa $\sqrt{41}$ ga teng. Agar A nuqta vatarni 8 va 16 ga teng bo'lgan kesmalarga ajratsa, aylana radiusini toping.
A) 10 B) 25 C) 13 D) 20

14. (a3-g18-30) Aylananing markazidan uzunligi radiusga teng bo'lgan vatarigacha bo'lgan masofa 3 ga teng. Shu aylananing eng katta vatari uzunligini toping.
A) $2\sqrt{3}$ B) 6 C) $4\sqrt{3}$ D) 3

15. (a3-g22-30) Aylananing markazidan 6 sm uzoqlikda joylashgan ikki vatarning uzunliklar $2n + 4$ va $3n - 2$ ga teng. Aylananing radiusini toping.
A) 5 B) 10 C) 8 D) 15

16. (a4-g6-30) Markazlari bir nuqtada bo'lgan ikki aylana orasida qolgan soha yuzasi 56,25 ga teng. Kichik aylanaga urinadigan katta aylana vatarining uzunligini toping.
A) 7,5 B) 15 C) 30 D) 3,75

17. (a4-g8-30) Aylanadan tashqaridagi P nuqtadan aylanaga PT urinma va aylanani A va B nuqtalarda kesib o'tuvchi chiziq o'tkazildi (|PB| > |PA|). PT = 12 va PA = 8 bo'lsa, AB vatar uzunligini toping.
A) 18 B) 10 C) 16 D) 9

18. (a4-g12-30) Radiusi 10 ga teng aylananing markazidan 8 ga teng masofada joylashgan nuqta orqali diametr va unga perpendikulyar vatar o'tkazilgan. Shu vatarning uzunligini toping.
A) 6 B) 10 C) 12 D) 16

19. (a4-g16-30) Diametri 22 sm bo'lgan aylanada AB vatar o'tkazilgan. C nuqta AB vatarni 10 va 6 ga teng bo'lgan kesmalarga ajratadi. Aylana markazidan C nuqtagacha bo'lgan masofani toping.
A) $\sqrt{61}$ B) $\sqrt{73}$ C) $\sqrt{96}$ D) $6\sqrt{3}$

20. (a4-g21-30) Diametri 22 sm bo'lgan aylanada AB vatar o'tkazilgan. C nuqta AB vatarni 10 va 6 ga teng bo'lgan kesmalarga ajratadi. Aylana markazidan C nuqtagacha bo'lgan masofani toping.
A) $\sqrt{61}$ B) $\sqrt{73}$
C) $\sqrt{96}$ D) $6\sqrt{3}$

21. (a5-g6-30) Aylana markazidan radiusning uchdan bir qismi uzoqlikdan AB vatar o'tkazildi. OD radius AB vatarga perpendikulyar bo'lsa, AD kesma uzunligining AB vatar uzunligiga nisbatini toping.
A) $\frac{\sqrt{6}}{4}$ B) $\frac{\sqrt{6}}{2}$ C) $\frac{\sqrt{2}}{3}$ D) $\frac{\sqrt{2}}{\sqrt{3}}$

22. (a5-g8-30) Aylananing AB va CD vatarlari O nuqtada kesishadi. AO = x, OB = $x + 2$, OD = $0{,}75x$ va OC = $1{,}5x$ bo'lsa, CD vatar uzunligini toping.
A) 36 B) 34 C) 16 D) 12

23. (a5-g9-30) Aylananing AB va CD vatarlari P nuqtada kesishadi va u AB vatarni |AP| = 48 va |BP| = 25 ga, CD vatarni uzunliklari nisbati 3:4 ga teng kesmalarga ajratadi. Shu kesmalardan kichigining uzunligini toping.
A) 20 B) 30 C) 40 D) 24

24. (a5-g12-25) Markazi O nuqtada bo'lgan aylanada CD vatar AB diametrga parallel. Agar CD vatar katta yoyning ixtiyoriy nuqtasidan 70° burchak ostida ko'rinsa, BCD burchak kattaligini toping.
A) 27,5° B) 20°
C) 12,5° D) 10°

25. (a5-g20-25) Radiusi R ga teng aylanadagi nuqtadan o'zaro teng ikki vatar o'tkazildi. Bu vatarlar orasidagi burchak 150° bo'lsa, ularning uzunligini toping.
A) $R\sqrt{2+\sqrt{3}}$ B) $R\sqrt{2-\sqrt{3}}$
C) $\frac{R\sqrt{2-\sqrt{3}}}{2}$ D) $\frac{R\sqrt{2+\sqrt{3}}}{2}$

26. (a5-g24-25) Aylananing AB va CD vatarlari kesishmaydi va mos ravishda 9 va 16 ga teng. BD va AC vatarlar O nuqtada kesishadi. BO ning CO ga nisbatini toping.
A) $\frac{9}{16}$ B) $\frac{16}{9}$ C) $\frac{8}{9}$ D) $\frac{9}{8}$

27. (a6-g1-25) Ikki kesishuvchi aylanalarning umumiy vatari aylanalar markazlaridan mos ravishda 60° va 90° burchak ostida ko'rinadi. Agar aylanalar markazlari orasidagi masofa $1+\sqrt{3}$ ga teng bo'lsa, aylanalar radiuslarini toping.
A) 3; $\sqrt{2}$ B) 2; $\sqrt{2}$
C) 3; $\sqrt{3}$ D) $2\sqrt{2}$; 4

28. (a6-g2-25) A nuqta – aylanadan tashqaridagi nuqta. Bu nuqtadan AD urinma va aylanani B va C nuqtalarda kesib o'tadigan kesuvchi o'tkazildi. Agar AB = BC = 12 bo'lsa, DB vatarning DC vatarga nisbatini toping.
A) 1 B) $\frac{\sqrt{2}}{2}$ C) $\frac{\sqrt{3}}{2}$ D) $\frac{1}{2}$

29. (a6-g3-25) Aylananing vatari o'zi tortib turgan kichik yoyning ixtiyoriy nuqtasidan 124° burchak ostida ko'rinadi. Bu vatar uchidan o'tkazilgan urinma va ushbu vatar orasidagi burchakni toping.
A) 56° B) 62° C) 28° D) 31°

30. (a6-g9-25) Aylananing ikki vatari o'zaro 90° burchak ostida kesishadi. Ulardan birining uzunligi 11 ga teng, ikkinchisi esa kesishish nuqtasidan 10 va 3 ga teng kesmalarga bo'lindi. Aylananing radiusini toping.
A) $\frac{7}{\sqrt{2}}$ B) $4\sqrt{10}$
C) $\frac{\sqrt{170}}{2}$ D) $13\sqrt{2}$

31. (a6-g17-25) Diametri 32 sm bo'lgan aylanada AB vatar o'tkazilgan. C nuqta AB vatarni 14 va 6 ga teng bo'lgan kesmalarga ajratadi. Aylana markazidan C nuqtagacha bo'lgan masofani toping.
A) $2\sqrt{37}$ B) $2\sqrt{43}$
C) $8\sqrt{3}$ D) $4\sqrt{10}$

32. (a6-g20-11) B, C, D va E nuqtalar aylanadagi, A esa aylanadan tashqaridagi nuqtalar. D nuqta AE kesmada, B esa AC kesmada yotadi. Agar AE = 12 va AC = 16 bo'lsa, BE vatar uzunligining CD vatar uzunligiga nisbatini toping.
A) $\frac{4}{3}$ B) $\frac{3}{4}$
C) $\frac{9}{16}$ D) aniqlab bo'lmaydi

33. (a6-g25-22) Aylana markazidan bir tarafda joylashgan ikki parallel vatarlar orasidagi masofa 8 ga teng. Bu vatarlar nisbati 4:3. Agar aylana radiusi 40 ga teng bo'lsa, katta vatar uzunligini toping.
A) 64 B) 32 C) 48 D) 80

34. (a6-g26-25) CDAB diametrga parallel vatar va 110° li yoyni tortib turadi. BCD burchakning qiymatini toping.
A) 35° B) 55° C) 17,5° D) 27,5°

142. Aylanaga o'tkazilgan urinma

1. (a2-g4-30) Aylanaga P nuqtadan PA va PB urinmalar o'tkazilgan. APB burchak 70° ga teng bo'lsa, aylananing AB vatari katta yoyning ixtiyoriy nuqtasidan qanday burchak ostida ko'rinadi?
A) 110° B) 35° C) 70° D) 55°

2. (a3-g5-30) P nuqtadan aylanaga o'tkazilgan urinmalar A va B nuqtada urinadi. Agar bu urinmalar orasidagi burchak 70° bo'lsa, AB vatar kichik yoyning ixtiyoriy nuqtasidan qanday burchak ostida ko'rinadi?
A) 55° B) 125°
C) 35° D) 145°

3. (a3-g16-32) Aylanadan tashqaridagi nuqtadan aylanaga o'tkazilgan eng qisqa va eng uzun masofalar mos ravishda 3 va 27 ga teng. Bu nuqtadan aylanaga o'tkazilgan urinmaning urinish nuqtasigacha bo'lgan masofani toping.
A) $6\sqrt{2}$ B) 9 C) $3\sqrt{2}$ D) 15

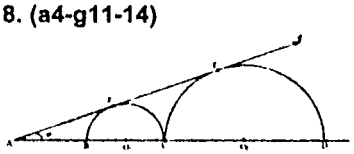
4. (a3-g20-31) Aylananing ikki vatari bir-biriga perpendikulyar va ularning biri kesishish nuqtasidan 8 va 12 ga teng bo'laklarga, ikkinchisi esa 6 va 16 ga teng bo'laklarga bo'linadi. Shu aylananing radiusini toping.
A) $5\sqrt{5}$ B) $\frac{65}{8}$
C) $4\sqrt{2}$ D) 6

5. (a3-g21-30) Radiuslari nisbati 3 ga teng bo'lgan aylanalar bir-biriga urinadi. P nuqtadan bu ikki aylanaga umumiy urinmalar o'tkazilgan. Shu urinmalar orasidagi burchakni toping.
A) 30° B) arctg4
C) arctg2 D) 60°

6. (a4-g3-32) Radiusi 6 ga teng bo'lgan aylananing 60° li sektoriga boshqa bir doira ichki chizilgan. Shu doiraning yuzasi nechaga teng?
A) 4π B) 16π
C) $6{,}25\pi$ D) $2{,}25\pi$

7. (a4-g7-30) A nuqtadan, radiusi 7 ga teng bo'lgan aylanagacha bo'lgan eng qisqa masofa 3 ga teng. A nuqtadan aylanaga o'tkazilgan urinmaning urinish nuqtasigacha bo'lgan masofani toping.
A) $\sqrt{39}$ B) $\sqrt{42}$ C) $\sqrt{21}$ D) $\sqrt{51}$

8. (a4-g11-14)



5 va 12 sm radiusga ega bo'lgan ikkita aylana yonma-yon qo'yilgan. Bu ikkita aylanaga urinma shaklida d nur o'tgan. EAB burchak θ ga teng bo'lsa, $\sin\theta$ ning qiymatini toping.
A) $\frac{5}{7}$ B) $\frac{7}{17}$ C) $\frac{12}{13}$ D) $\frac{5}{13}$

9. (a4-g15-30) P nuqtadan aylanaga o'tkazilgan ikki urinma orasidagi burchak 54° ga teng. Bu urinmalar urinish nuqtalari orqali o'tkazilgan vatar va urinma orasidagi burchakni toping.
A) 27° B) 63° C) 36° D) 54°

10. (a4-g23-30) P nuqtadan aylanaga o'tkazilgan ikki urinma orasidagi burchak 54° ga teng. Bu urinmalar urinish nuqtalari orqali o'tkazilgan vatar va urinma orasidagi burchakni toping.
A) 27° B) 63° C) 36° D) 54°

11. (a5-g3-30) Radiusi 20 ga teng bo'lgan aylanaga urinma va shu urinmaga parallel vatar o'tkazildi. Agar urinma va vatar orasidagi masofa 32 ga teng bo'lsa, vatarning uzunligini toping.
A) 32 B) 16 C) 48 D) 24

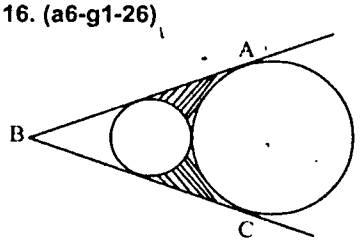
12. (a5-g11-25) Aylana tashqarisidagi nuqtadan aylanagacha bo'lgan eng yaqin masofa va aylananing radiusi 5 ga teng. Shu nuqtadan aylanaga o'tkazilgan urinmaning uzunligini toping
A) $5\sqrt{3}$ B) $5\sqrt{5}$
C) 10 D) $5\sqrt{2}$

13. (a5-g14-25) Aylanadan tashqaridagi nuqtadan aylanagacha bo'lgan eng qisqa va eng uzun masofalar mos ravishda 7 va 17 ga teng bo'lsa, shu nuqtadan aylanaga o'tkazilgan urinmaning urinish nuqtasigacha bo'lgan masofasini toping.
A) $\sqrt{119}$ B) 13
C) $5\sqrt{5}$ D) 12

14. (a5-g17-6) P nuqtadan aylanaga o'tkazilgan urinma T nuqtada urinadi. Shu nuqtadan o'tkazilgan kesuvchi esa aylanani A va B nuqtalarda kesib o'tadi. Agar PA = 8, PB = 18 vaTA = 6 bo'lsa, TB kesma uzunligini toping.
A) 9 B) $\frac{18}{\sqrt{5}}$
C) $3\sqrt{5}$ D) 12

15. (a5-g23-26) Aylananing AB vatari 48 sm va T nuqtadan o'tkazilgan urinmaga parallel. Agar vatar va urinma orasidagi masofa 7 ga teng bo'lsa, aylana radiusini toping.
A) $\frac{625}{14}$ B) $\frac{125}{7}$
C) $\frac{96}{7}$ D) $\frac{288}{7}$

16. (a6-g1-26)



Chizmada ABC burchak 60° va B nuqtadan katta aylana markazigacha masofa 6 ga teng bo'lsa, bo'yalgan sohaning yuzini toping.
A) $4\sqrt{3}-\frac{11\pi}{6}$ B) $8-\frac{11\pi}{3}$
C) $4-\frac{11\pi}{6}$ D) $8\sqrt{3}-\frac{11\pi}{3}$

17. (a6-g4-25) Radiusi 12 ga teng bo'lgan aylananing AB vatari 120° li yoyni tortib turadi. Ushbu vatarga va aylananing kichik yoyiga urinadigan aylana radiusini toping.
A) 6 B) 3
C) $3\sqrt{3}$ D) $1{,}5\sqrt{3}$

18. (a6-g6-25) Markazi O_1 nuqtada radiusi 8 ga teng bo'lgan aylanaga markazidan o'tib ichki tarafdan urinuvchi, markazi O_2 nuqtada bo'lgan aylana ichki chizildi. Aylanadan tashqarida P nuqta olindi. $PO_1 = 17$ ga teng va O_1 nuqtada O_2 markazli aylanaga urinadi. Shu nuqtadan O_2 nuqtagacha bo'lgan masofani toping.
A) $\sqrt{97}$ B) $\sqrt{273}$
C) 15 D) $\sqrt{305}$

19. (a6-g17-26) Aylananing AB vatari 24 sm va T nuqtadan o'tkazilgan urinmaga parallel. Agar vatar va urinma orasidagi masofa 9 ga teng bo'lsa, aylana radiusini toping.
A) 16,5 B) 12,5 C) 6,25 D) 8,25

20. (a6-g19-10) Radiusi 7 ga teng aylanaga P nuqtadan aylanani A va B nuqtalarda kesib o'tuvchi kesuvchi o'tkazildi (PB > PA). PA = 8 va AB = 10. P nuqtadan o'tkazilgan ikki urinma orasidagi burchak tangensini toping.
A) $\frac{172}{195}$ B) $\frac{133}{75}$
C) $\frac{7}{6}$ D) $\frac{168}{95}$

21. (a6-g21-14) Aylana tashqarisidagi nuqtadan aylanaga ikki urinma o'tkazilgan. Agar urinmalar orasidagi burchak 72° bo'lsa, urinish nuqtalarining aylanadan ajratgan kichik va katta yoylar uzunliklarining nisbatini toping.
A) $\frac{3}{7}$ B) $\frac{1}{4}$ C) $\frac{2}{3}$ D) $\frac{7}{11}$

22. (a6-g22-3) Radiusi 8 sm ga teng bo'lgan aylana tashqarisidagi nuqtadan aylanaga ikkita urinma o'tkazildi. Shu nuqtadan urinish nuqtalarigacha masofa 15 sm. Bir urinmaning urinish nuqtasidan ikkinchi urinmagacha bo'lgan masofani toping.
A) $\frac{2980}{289}$ B) $\frac{1920}{289}$
C) 16 D) $\frac{3600}{289}$

23. (a6-g24-5) Aylanadan tashqaridagi A nuqtadan aylanagacha bo'lgan eng qisqa masofa 6 ga teng. Agar aylana radiusi 4 ga teng bo'lsa, A nuqtadan aylanaga o'tkazilgan urinmaning urinish nuqtasigacha bo'lgan masofani toping.
A) $4\sqrt{3}$ B) 10
C) $2\sqrt{21}$ D) $2\sqrt{6}$

143. Aylana va kusuvchi

1. (a2-g19-30) Aylanadan tashqaridagi P nuqtadan aylanaga PT urinma va aylanani A va B nuqtalarda kesib o'tuvchi chiziq o'tkazildi ($|PB| > |PA|$). $PT = 9$ va $PA = 3$ bo'lsa, AB vatar uzunligini toping.
A) 15 B) 27 C) 24 D) 6

2. (a4-g4-30) Markazi O nuqtada bo'lgan aylanadan tashqaridagi A nuqtadan aylanani C va D nuqtalarda kesuvchi chiziq o'tkazilgan. $AC = 6$ va A nuqtadan aylanagacha bo'lgan eng qisqa masofa 4 ga teng. CD kesma aylana radiusiga teng bo'lsa, aylana radiusini toping.
A) 10
B) 8
C) 6
D) aniqlab bo'lmaydi

3. (a4-g9-30) Markazi O nuqtada bo'lgan aylanadan tashqaridagi A nuqtadan aylanani C va D nuqtalarda kesuvchi chiziq o'tkazilgan. AO kesma esa aylanani B nuqtada kesadi. Agar $AC = 6$, $AB = 4$ va $CD = BO$ bo'lsa, aylananing radiusini toping.
A) 8 B) 6 C) 12 D) 10

144. Aylana uzunligi

1. (a1-g7-32) Markazi $\left(-2; \frac{1}{3}\right)$ nuqtada joylashgan va radiusi 4 ga teng bo'lgan aylana tenglamasini ko'rsating.
A) $4x^2 + 4y^2 + 4x - 24y - 27 = 0$
B) $9x^2 + 9y^2 + 36x - 6y - 107 = 0$
C) $x^2 + y^2 + 4x - 6y - 3 = 0$
D) $9x^2 + 9y^2 - 36x + 6y - 107 = 0$

2. (a1-g8-31) Odam g'ildirakni aylantirib ketmoqda. U g'ildirakni 8 marta to'liq aylantirganda manzilga yana 12 metr qoladi, 15 marta to'liq aylantirganda esa manzildan 9 metr o'tib ketadi. G'ildirakning diametri necha metr? ($\pi = 3$)
A) 1,6 B) 1 C) 0,8 D) 0,5

3. (a1-g9-32) y o'qini (0;3), x o'qini (4;0) nuqtada va koordinatalar boshini kesib o'tuvchi aylananing radiusi nechaga teng?
A) 2,4 B) 2,5
C) 0,75 D) 0,4

4. (a1-g10-33) Markazi (3; –0,5) nuqtada joylashgan va radiusi 3 ga teng bo'lgan aylana tenglamasini ko'rsating.
A) $9x^2 + 9y^2 - 6x + 36y - 45 = 0$
B) $4x^2 + 4y^2 + 24x - 4y + 1 = 0$
C) $x^2 + y^2 - 6x + 4y + 4 = 0$
D) $4x^2 + 4y^2 - 24x + 4y + 1 = 0$

5. (a1-g17-30) Aylananing uzunligi 10 ga teng bo'lgan vatari markazdan 12 sm uzoqlikda joylashgan. Shu aylana uzunligini toping.
A) 24π B) 20π C) 26π D) 30π

6. (a4-g13-16) $x^2 + y^2 - 6x + 8y = 0$ aylanaga konsentrik bo'lgan va radiusi uning radiusidan 1 birlik ko'p bo'lgan aylana tenglamasini ko'rsating.
A) $(x-3)^2 + (y+4)^2 = 36$
B) $(x+3)^2 + (y-4)^2 = 36$
C) $(x+3)^2 + (y-3)^2 = 16$
D) $(x-3)^2 + (y-4)^2 = 16$

7. (a4-g13-29) a ning nechta qiymatida $x^2 + y^2 = 1$ va $x^2 + (y-a)^2 = 4$ aylanalar urinadi?
A) 4 B) 2 C) 1 D) 0

8. (a4-g14-32) Tenglamasi $4 + x^2 + y^2 + 25 - 10x - 4y = 29$ bo'lgan aylananing y o'qini kesib o'tgan nuqtalari o'rta geometrigini toping.
A) 2 B) 4 C) 0 D) 1

9. (a4-g16-32) $x^2 + y^2 + 6x + 9y + 5 = 0$ tenglama bilan berilgan aylana x o'qini A va B nuqtalarda kesadi. A va B nuqta o'rtasidan o'tuvchi vertikal to'g'ri chiziq tenglamasini ko'rsating.
A) $y = x - 3$ B) $x = 5$
C) $y = 4,5$ D) $x = -3$

10. (a4-g20-32) M(3; –1) nuqtadan $x^2 + y^2 + 4x - 8y = 16$ aylanagacha bo'lgan eng uzoq va eng qisqa masofalar yig'indisini toping.
A) 12 B) $10\sqrt{2}$
C) $6\sqrt{3}$ D) 10

11. (a4-g21-32) $x^2 + y^2 + 6x + 9y + 5 = 0$ tenglama bilan berilgan aylana OX o'qini A va B nuqtalarda kesadi. A va B nuqta o'rtasidan o'tuvchi vertikal to'g'ri chiziq tenglamasini ko'rsating.
A) $y = x - 3$ B) $x = 5$
C) $y = 4,5$ D) $x = -3$

12. (a4-g22-32) Koordinata boshidan $x^2 + y^2 + 10x - 10y + 41 = 0$ aylanagacha bo'lgan eng qisqa masofani toping.
A) $5 - 3\sqrt{2}$ B) $5\sqrt{2} - 3$
C) $9 - 5\sqrt{2}$ D) $3\sqrt{2} + 2$

13. (a4-g23-12) Yettiga bo'lganda 4 qoldiq qoladigan dastlabki o'ttiz ikkita son yig'indisini toping.
A) 3600 B) 3824
C) 3985 D) 3271

14. (a5-g1-32) $x^2 + y^2 + 7x - 10y + 9 = 0$ tenglama bilan berilgan aylana y o'qini A va B nuqtalarda kesadi. A va B nuqta o'rtasidan o'tuvchi, gorizontal to'g'ri chiziq tenglamasini ko'rsating.
A) $y = x - 5$ B) $y = 5$
C) $y = 3,5$ D) $y = x + 3,5$

15. (a5-g3-32) $x^2 + y^2 - 6x + 4y - 12 = 0$ aylanani $y = 1$ to'g'ri chiziq kesib o'tishidan hosil bo'lgan vatar uzunligini toping.
A) 6 B) 4 C) 12 D) 8

16. (a5-g7-32) $x^2 + y^2 - 2x + 8y = 47$ tenglama bilan berilgan aylananing eng katta vatari uzunligini toping.
A) 16 B) 8 C) 12 D) 14

17. (a5-g20-27) $x^2 + y^2 - 6x + 10y + 9 = 0$ aylanani $\vec{a}$ vektor bo'ylab siljitish natijasida $x^2 + y^2 + 8x - 2y = 8$ aylana hosil bo'ldi. $\vec{a}$ ning koordinatalarini toping.
A) $\vec{a}(7; 6)$ B) $\vec{a}(6; -7)$
C) $\vec{a}(-7; 6)$ D) $\vec{a}(-6; 7)$

18. (a6-g9-27) Tenglamasi $(x-4)^2 + (y-a)^2 = R^2$ bo'lgan aylana OY o'qiga va $y = 2$ chiziqqa urinadi. Shu aylaning koordinata o'qining 4 choragida yotuvchi qismida hosil qilgan sohasi yuzini toping. (Aylana OX o'qini kesib o'tadi.)
A) $\frac{16\pi}{3} - 4\sqrt{3}$ B) $\frac{32\pi - 4\sqrt{3}}{3}$
C) $\frac{4\sqrt{3} + 16\pi}{3}$ D) $\frac{4(8\pi + 3\sqrt{3})}{3}$

19. (a6-g22-5) $y = x$ to'g'ri chiziqning $(x-5)^2 + (y-3)^2 = 34$ aylana ichida qolgan qismi uzunligini toping.
A) $7\sqrt{2}$ B) $6\sqrt{2}$
C) $4\sqrt{2}$ D) $8\sqrt{2}$

20. (a6-g25-26) Markazi koordinata tekisligining to'rtinchi choragida yotgan aylananing radiusi 4 ga teng va u koordinata o'qlariga urinadi. Aylana tenglamasini ko'rsating.
A) $x^2 + y^2 - 8x + 8y + 32 = 0$
B) $x^2 + y^2 + 8x - 8y + 16 = 0$
C) $x^2 + y^2 - 8x + 8y = 0$
D) $x^2 + y^2 - 8x + 8y + 16 = 0$

145. Aylana yoyi uzunligi

1. (a1-g14-30) To'rtta nuqta aylanani yoylarga ajratadi. Yoylarning uzunliklari 2:5:7:10 nisbatda bo'lingan. Shu to'rtta nuqtani ketma-ket tutashtirish natijasida hosil bo'lgan to'rtburchakning diagonallari orasidagi burchakni toping.
A) 67,5° B) 72,5°
C) 75° D) 30°

2. (a2-g5-30) Aylananing uzunligi 24π ga teng. Shu aylananing 120° li yoyi uzunligi nechaga teng?
A) 9π B) 6π C) 8π D) 18π

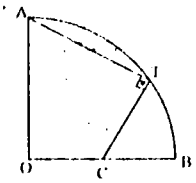
3. (a3-g15-30) Radiusi 4 sm li aylananing markazidan 8 sm uzoqlikda joylashgan nuqtadan aylanaga ikki urinma o'tkazildi. Urinmalarning aylanadan ajratgan kichik yoyining uzunligini toping.
A) $\frac{2\pi}{3}$ B) $\frac{4\pi}{3}$ C) 2π D) $\frac{8\pi}{3}$

4. (a6-g7-25) AC va BD vatarlar va ular O nuqtada kesishadi. Agar AOD burchak 75° bo'lsa, BC va AD vatarlar tortib turgan yoylarning yig'indisini toping.
A) 210°
B) 150°
C) 105°
D) aniqlab bo'lmaydi

5. (a6-g11-24) Aylananing 90° li yoyini tortib turuvchi vatarning uzunligi $2x - 5$ ga, 120° li yoyini tortib turuvchi vatarning uzunli $2x + 4$ ga teng. Shu aylananing 60° li yoyini tortib turuvchi vatarning uzunligini toping.
A) aniqlab bo'lmaydi
B) $\frac{18}{2\sqrt{3}-2\sqrt{2}}$
C) $\frac{5\sqrt{3}+2\sqrt{2}}{2\sqrt{2}+2\sqrt{3}}$
D) $\frac{5\sqrt{3}+4\sqrt{2}}{2\sqrt{3}-2\sqrt{2}}$

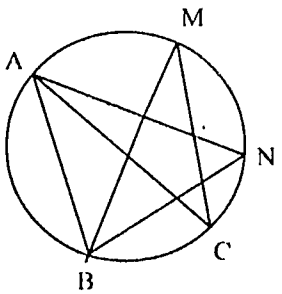
146. Ichki chizilgan burchaklar

1. (a2-g3-23) $|AO| = |AT| = 4$, $|AT| \perp |TC|$, $|OC| = ?$



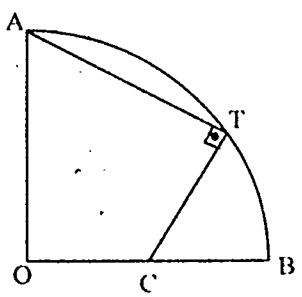
A) $\frac{4}{5}\sqrt{3}$ B) $\frac{4\sqrt{3}}{3}$
C) $4\sqrt{3}$ D) $2\sqrt{3}$

2. (a3-g8-30)



Shaklda AB = AC va BMC burchak 40° bo'lsa, ANB burchakni toping.
A) 60° B) 50° C) 80° D) 70°

3. (a3-g17-31)



$|AO| = |AT| = 6$, AO kesma OB kesmaga va AT kesma TC kesmaga perpendikular. OC ni toping.
A) $\frac{4}{5}\sqrt{3}$ B) $\frac{4\sqrt{3}}{3}$
C) $4\sqrt{3}$ D) $2\sqrt{3}$

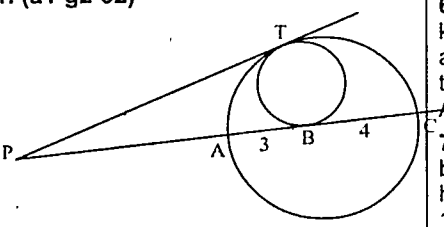
4. (a5-g1-30) Rasmda markazi O nuqtada joylashgan aylana tasvirlangan. Berilganlardan foydalanib x burchakning qiymatini toping.

A) 90° B) 120°
C) 150° D) 110°

5. (a5-g19-25) AE kesma yarim aylana diametri. Yarim aylanadan ketma-ket B, C va D nuqtalar olindi.
$\angle EAB + \angle AED + \angle BCD$ ni hisoblang.
A) aniqlab bo'lmaydi
B) 270°
C) 180°
D) 210°

147. Kesuvchi va urinma. Ular orasidagi burchak

1. (a1-g2-32)



Rasmdan foydalanib PT kesma uzunligini toping.
A) 9 B) 10 C) 12 D) 15

2. (a2-g18-30) Aylanadan tashqaridagi nuqtadan aylananing markazidan o'tuvchi kesuvchi va urinma o'tkazilgan. Aylananing radiusi 4,5 ga, nuqtadan urinish nuqtasigacha bo'lgan masofa 6 ga teng bo'lsa, nuqtadan aylanagacha bo'lgan eng qisqa masofani toping.
A) 3 B) 1,5 C) 9 D) 12

3. (a3-g4-30) Aylanadan tashqaridagi P nuqtadan aylanaga PT urinma va aylanani A va B nuqtalarda kesib o'tuvchi chiziq o'tkazildi ($|PB| > |PA|$). $PT = 8$ va $PA = 4$ bo'lsa, AB vatar uzunligini toping.
A) 10 B) 12 C) 16 D) 6

4. (a4-g5-30) Aylanadan tashqaridagi P nuqtadan aylanaga PT urinma va aylanani A va B nuqtalarda kesib o'tuvchi chiziq o'tkazildi. ($|PB| > |PA|$). $PT = 8$ va $PA = 4$ bo'lsa, AB vatar uzunligini toping.
A) 10 B) 12 C) 16 D) 6

148. Doira yuzi

1. (a1-g10-29) Kesishuvchi ikki doiraning umumiy vatari 60° va 90° li yoylarni tortib turadi. Katta doira yuzining kichik doira yuziga nisbatini toping.
A) 4:1 B) 2:1 C) 9:4 D) 3:2

2. (a1-g10-31) Tomoni 6 ga teng bo'lgan kvadratga ichki va tashqi chizilgan aylanalar hosil qilgan halqaning yuzini toping.
A) 72π B) 36π
C) 18π D) 9π

3. (a1-g15-30) O_1 markazli aylana O_2 markazli aylanaga ichkaridan urinadi va O_2 aylana markazidan o'tadi. Agar O_1 markazli aylana radiusi 3 ga teng bo'lsa, bu ikki aylana orasida qolgan soha yuzini toping.
A) 18π B) 27π C) 15π D) 36π

4. (a1-g16-32) Diametri 50 ga teng to'rtta vodoprovod quvurini suv o'tkazish qobiliyati shu to'rt quvurnikiga teng bo'lgan bitta quvur bilan almashtirish kerak. Katta quvurning diametrini toping.
A) $50\sqrt{2}$ B) $50\sqrt{3}$
C) 100 D) 200

5. (a2-g3-33) Doira yuzini 96% ga orttirish uchun uning radiusini necha % ga orttirish kerak?
A) 40 B) 15 C) 20 D) 35

6. (a2-g5-31) Tomoni 6 ga teng bo'lgan kvadratga ichki va tashqi chizilgan aylanalar hosil qilgan halqaning yuzini toping.
A) 72π B) 36π C) 18π D) 9π

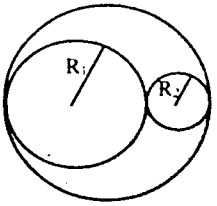
7. (a2-g7-30) Markazlari bir nuqtada bo'lgan ikki aylana yordamida halqa hosil qilindi. Agar katta aylananing 16 ga teng bo'lgan vatari kichik aylanaga urinsa, halqaning yuzini toping.
A) 256π B) 32π
C) 16π D) 64π

8. (a2-g10-29) Kesishuvchi ikki doiraning umumiy vatari 90° va 120° li yoylarni tortib turadi. Katta doira yuzining kichik doira yuziga nisbatini toping.
A) 4:3 B) 3:2 C) 16:9 D) 2:1

9. (a2-g14-24) Markazi bir nuqtada bo'lgan ikki doiradan kichigining radiusi kattasining radiusidan 10% ga kam. Ularning orasidagi halqaning yuzasi kichik doiraning yuzasidan necha marta ko'p?
A) $0,(21)$ B) $\frac{19}{3}$
C) $\left(\frac{81}{19}\right)^{1}$ D) 0,19

10. (a2-g19-36) Radiusi 20 sm bo'lgan sharning markazidan 10 sm uzoqlikdagi kesimda hosil bo'lgan doiraning yuzasi necha sm^2?
A) 225π B) 375π
C) 300π D) 100π

11. (a3-g1-30)



Yondagi shaklda markazlari bir chiziqda yotuvchi uchta aylana berilgan. $R_1 = 6$ va $R_2 = 5$ bo'lsa, bo'yalgan sohaning yuzini toping.
A) 56π B) 60π C) 28π D) 30π

12. (a3-g7-30) Aylananing vatari, shu aylanaga konsentrik bo'lgan boshqa aylanaga urinadi. Agar vatarning uzunligi 12 ga teng bo'lsa, aylanalar orasida qolgan halqaning yuzini toping.
A) 144π
B) 72π
C) 36π
D) aniqlab bo'lmaydi

13. (a3-g11-30) Kesishuvchi ikki doiraning umumiy vatari 90° va 120° li yoylarni tortib turadi. Katta doira yuzining kichik doira yuziga nisbatini toping.
A) 3:2 B) 4:3 C) 16:9 D) 2:1

14. (a3-g13-32) Doiraga ichki chizilgan to'g'ri to'rtburchakning tomonlari 12 va 10 ga teng bo'lsa, doiraning yuzini toping.
A) 72π B) 244π
C) 122π D) 61π

15. (a3-g14-30) Markazlari bir nuqtada bo'lgan ikki aylanalardan kattasining 12 ga teng bo'lgan vatari kichik aylanaga urinadi. Aylanalar orasida qolgan halqa yuzini toping.
A) 36π B) 144π
C) 9π D) 18π

16. (a3-g17-30) Doira yuzini 125% ga orttirish uchun uning radiusini necha % ga orttirish kerak?
A) 25 B) 50
C) 20 D) $5\sqrt{5}$

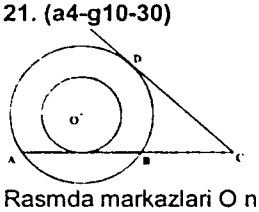
17. (a3-g19-30) Radiusi 12 sm li doira o'zaro parallel ikki to'g'ri chiziq bilan kesildi. To'g'ri chiziqlar orasidagi masofa 6 sm va ularning biri markazdan o'tgan bo'lsa, doiraning shu ikki chiziq orasida qolgan qismi yuzini toping.
A) $24\pi + 36\sqrt{3}$
B) $72\pi + 24\sqrt{3}$
C) $48\pi + 36\sqrt{3}$
D) $18\pi + 24\sqrt{3}$

18. (a4-g1-30) Doira yuzini 32,25% ga orttirish uchun uning radiusini necha % ga orttirish kerak?
A) 5,5 B) 15 C) 25 D) 22,5

19. (a4-g1-36) Radiusi 20 sm bo'lgan sharning markazidan 14 sm uzoqlikdagi kesimda hosil bo'lgan doiraning yuzasi necha sm^2?
A) 204π B) 400π
C) 196π D) 51π

20. (a4-g2-30) Markazlari bir nuqtada bo'lgan ikki aylanalardan kattasining 14 ga teng bo'lgan vatari kichik aylanaga urinadi. Aylanalar orasida qolgan halqa yuzini toping.
A) 196π B) 100π
C) 49π D) 98π

21. (a4-g10-30)



Rasmda markazlari O nuqtada bo'lgan aylanalar tasvirlangan. CD katta aylanaga, CA kichik aylanaga urinma. Agar $CD = 4\sqrt{3}$ va $BC = 4$ bo'lsa, aylanalar orasida qolgan halqa yuzini toping.
A) 12π B) 8π C) 24π D) 16π

22. (a4-g19-30) Yarim aylana ichiga kichikroq yarim aylana ichki chizilgan. Kichik yarim aylana katta yarim aylana yuzini teng ikki bo'lakka bo'ladi. Bu yarim aylanalar radiuslari nisbatini toping.
A) 4 B) 2 C) $\sqrt{2}$ D) $2\sqrt{2}$

23. (a4-g24-30) Markazlari bir nuqtada bo'lgan katta aylananing 12 ga teng vatari kichik aylanaga urinadi. Bu aylanalar hosil qilgan halqaning yuzini toping.
A) 144π B) 36π
C) 48π D) 72π

24. (a5-g9-31) Tomoni 6 ga teng bo'lgan kvadratga ichki va tashqi chizilgan aylanalar hosil qilgan, halqaning yuzini toping.
A) 72π B) 36π C) 18π D) 9π

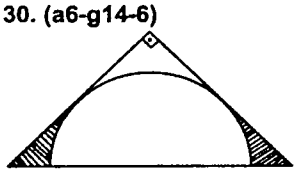
25. (a5-g15-30) Markazi bir nuqtada bo'lgan ikki doiradan kichigining radiusi kattasining radiusidan 30% ga kam. Ularning orasidagi halqaning yuzasi katta doira yuzasining qancha qismini tashkil etadi?
A) 0,51 B) 0,49
C) $\left(\frac{51}{49}\right)^{-1}$ D) 0,7

26. (a5-g16-25) Bir aylananing 60°li yoyi uzunligi, ikkinchi aylananing 120° li yoyi uzunligiga teng. Bu aylanalar hosil qilgan doiralar yuzlari nisbatini toping.
A) $\frac{1}{4}$ B) $\frac{1}{2}$ C) $\frac{1}{8}$ D) $\frac{1}{16}$

27. (a5-g23-25) Aylananing 2 ga teng vatari α yoyni, 6 ga teng vatari β yoyni tortib turadi. $\alpha + \beta = 180°$ bo'lsa, bu aylana hosil qilgan doira yuzini toping.
A) 8π B) 10π C) 20π D) 16π

28. (a6-g13-28) Kvadrat va doiraning perimetrlari teng. Doira yuzining kvadrat yuziga nisbatini toping.
A) $\frac{\pi}{4}$ B) $\frac{\pi}{6}$ C) $\frac{4}{\pi}$ D) $\frac{6}{\pi}$

30. (a6-g14-6)



Rasmda keltirilgan uchburchak asosining uchlari aylana markazidan bir xil uzoqlikda yotadi. Agar aylananing radiusi 2 ga teng bo'lsa, shtrixlangan sohalar yuzalari yig'indisini toping.
A) $4 - \pi$ B) $2 - \frac{\pi}{2}$
C) $2 - \pi$ D) $8 - \pi$

31. (a6-g16-28) Markazi bir nuqtada bo'lgan ikki doiradan kichigining radiusi kattasining radiusidan 30% ga kam. Ularning orasidagi halqaning yuzasi katta doira yuzasining qancha qismini tashkil etadi?
A) 0,51 B) 0,49
C) $\left(\frac{51}{49}\right)^{-1}$ D) 0,7

32. (a6-g18-21) Tomonlari 5 sm va 4 sm ga teng bo'lgan parallelogramning 30° li o'tkir burchaklaridan biri aylana markazida, ikkinchisi esa aylanada yotibdi. Aylana hosil qilgan doiraning parallelogramm tashqarisida qolgan qismi yuzasini hisoblang. ($\pi = 3$ deb olinsin)
A) $113 + 60\sqrt{3}$
B) $113 - 60\sqrt{3}$
C) $183 - 30\sqrt{3}$
D) $63 + 60\sqrt{3}$

149. Sektor yuzi

1. (a2-g2-24) Hosilalar uchun formulalarning qaysilari to'g'ri?
1) $(u \cdot v)' = u' \cdot u + v' \cdot v$;
2) $\left(f(\varphi(x))\right)' = \varphi'(x) \cdot f'(\varphi(x))$;
3) $(u \pm v)' = u'v \pm uv'$;
4) $\left(\frac{u}{v}\right)' = \frac{u'v - uv'}{v^2}$
$(\operatorname{ctg} x)' = -\frac{1}{\sin^2 x}$.
A) 3; 4; 5 B) 2; 4; 5
C) 2; 3; 5 D) 1; 2; 3

2. (a2-g16-30) Radiusi $2\sqrt{3} + 3$ ga teng bo'lgan aylananing 120° li yoyiga uning ikki tarafi va yoyiga urinadigan aylana ichki chizilgan. Shu ichki chizilgan aylana radiusini toping.
A) $\sqrt{3}$ B) $2\sqrt{3}$ C) 6 D) 3

3. (a2-g17-29) Ichki burchaklari yig'indisi tashqi burchaklari yig'indisidan 5 marta ko'p bo'lgan ko'pburchakning nechta diagonali bor?
A) 54 B) 35 C) 20 D) 77

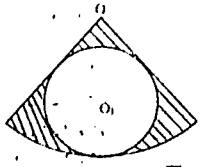
4. (a2-g21-30) Yuzasi, radiusi 12 ga teng bo'lgan doiraning 40° li sektori yuziga teng bo'lgan doiraning perimetrini toping.
A) 12π B) 18π
C) 16π D) 8π

5. (a4-g17-30) Yondagi rasmda A markazli aylana chorak qismining AB va AC radiuslariga uringan aylana ichki chizilgan. $AC=2+2\sqrt{2}$ bo'lsa, shtrixlangan soha yuzini toping. ($\pi = 3$)

A) $\frac{1}{2}$ B) $\frac{3}{2}$

C) 2 D) 1

6. (a4-g18-30) O markazli sektorning markaziy burchagi 120° va radiusi 3 ga teng, O_1 markazli aylana sektorning ikki yon tarafiga va katta aylanaga urinadi. Rasmdagi shtrixlangan soha yuzini toping.



A) $189\pi - 108\sqrt{3}\pi$

B) $3\sqrt{3}\pi\left(2-\sqrt{3}\right)$

C) $108\sqrt{3}\pi - 186\pi$

D) $144\sqrt{3}\pi - 216\pi$

7. (a4-g22-30) 50° li sektori yuzi 30π ga teng doiraning eng katta vatari uzunligini toping.

A) 12 B) $12\sqrt{6}$

C) 24 D) $6\sqrt{6}$

8. (a4-g25-30) Doiraning 20° li yoyining uzunligi 3 sm. Ushbu yoy ajratgan sektor yuzasini toping.

A) $\frac{9}{\pi}$ B) $\frac{27}{4\pi}$

C) $\frac{81}{2\pi}$ D) $\frac{9}{4\pi}$

9. (a5-g13-25) Doiraning 20° li yoyining uzunligi 3 sm. Ushbu yoy ajratgan sektor yuzasini toping.

A) $\frac{9}{\pi}$ B) $\frac{27}{4\pi}$

C) $\frac{81}{2\pi}$ D) $\frac{9}{4\pi}$

10. (a5-g22-25) Radiusi 6 ga teng aylanaga 5 ta teng vatarlar yordamida beshburchak ichki chizildi. Bu vatarlar hosil qilgan sektorlar yuzalari yig'indisini toping.

A) $18\pi - 45\sin 36°$

B) $36\pi - \sin 36°$

C) $18\pi - 45\sin 72°$

D) $36\pi - 90\sin 72°$

11. (a6-g15-22) Doiraning 40° li yoyining uzunligi 5 sm. Ushbu yoy ajratgan sektor yuzasini toping.

A) $\frac{25}{\pi}$ B) $\frac{25}{16\pi}$

C) $\frac{225}{4\pi}$ D) $\frac{125}{4\pi}$

150. Segment yuzi

1. (a1-g12-26) Aylananing radiusi 25 sm ga teng. Shu aylananing markazidan 12,5 sm uzoqlikda joylashgan vatari hosil qilgan segmentning yuzini toping.

A) $625\left(\frac{\pi}{3}-\frac{\sqrt{3}}{4}\right)$ B) $625\left(\frac{\pi}{6}-\frac{\sqrt{3}}{4}\right)$

C) $625\left(\frac{\pi}{6}-\frac{1}{4}\right)$ D) $625\left(\frac{\pi}{12}-\frac{1}{4}\right)$

2. (a2-g13-25) Radiusi R ga teng bo'lgan doiraning markazidan bir tomonda ikkita bir-biriga parallel vatarlar o'tkazildi. Bu vatarlardan biri 120°li yoyni, ikkinchisi 60°li yoyni tortib turibdi. Parallel vatarlar orasidagi sohaning yuzini toping.

A) $\frac{\pi R^2}{3}$ B) $\frac{\pi R^2}{8}$

C) $\frac{\pi R^2}{4}$ D) $\frac{\pi R^2}{6}$

3. (a2-g14-36) Radiusi 4 sm bo'lgan sharning markazidan 2 sm uzoqlikda joylashgan kesimning yuzasini toping.

A) $2\sqrt{2}\pi$ B) 12π

C) 8π D) $2\sqrt{3}\pi$

4. (a2-g20-30) Aylananing radiusi 2 ga teng. Radiusni teng ikkiga bo'luvchi vatar o'tkazilgan. Ushbu vatar hosil qilgan kichik yuzani toping. ($\pi = 3$)

A) $6-3\sqrt{2}$ B) $3-\sqrt{3}$

C) $4-\sqrt{6}$ D) $4-\sqrt{3}$

5. (a3-g9-30) Doiraning 120° li yoyini tortib turuvchi vatarining uzunligi 6 ga teng. Shu vatar hosil qilgan segmentning yuzini toping.

A) $12\pi - \frac{9\sqrt{3}}{2}$ B) $8\pi - 6\sqrt{3}$

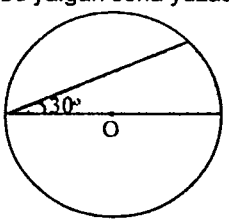
C) $4\pi - 3\sqrt{3}$ D) $8\pi - 3\sqrt{3}$

6. (a3-g23-30) Aylananing radiusi 2 ga teng. Markazdan 1 ga teng masofadan vatar o'tkazilgan. Ushbu vatar hosil qilgan segment yuzini toping. ($\pi = 3$)

A) $6-3\sqrt{2}$ B) $3-\sqrt{3}$

C) $4-2\sqrt{3}$ D) $4-\sqrt{3}$

7. (a3-g24-30) Rasmda ko'rsatilgan aylananing radiusi 6 ga teng. Rasmda bo'yalgan soha yuzasini toping.



A) $12\pi - 6\sqrt{3}$ B) $6\pi + 9\sqrt{3}$

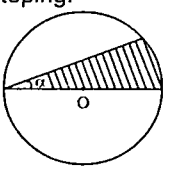
C) $6\pi + 6\sqrt{3}$ D) $9\pi - 3\sqrt{3}$

8. (a4-g20-30) Aylananing radiusi 4 ga teng. Radiusni teng ikkiga bo'luvchi vatar o'tkazilgan. Ushbu vatar hosil qilgan sohalardan kattasining yuzini toping. ($\pi = 3$)

A) $16-8\sqrt{3}$ B) $8\sqrt{3}$

C) 32 D) $32+4\sqrt{3}$

9. (a5-g5-30) Rasmda tasvirlangan α burchak 30°. Doiraning radiusi 12 ga teng bo'lsa, shtrixlangan soha yuzasini toping.



A) $36\sqrt{3}-12\pi$ B) $36\sqrt{3}+24\pi$

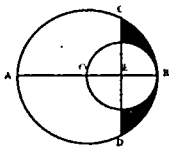
C) $72\sqrt{3}+48\pi$ D) $48\pi-24\sqrt{3}$

10. (a5-g18-31) Radiusi 6 ga teng bo'lgan aylananing bir nuqtasidan o'zaro teng ikki vatar chiqarildi. Bu ikki vatar orasidagi burchak 60° bo'lsa, bu vatarlar hosil qilgan segmentlar yuzalarining yig'indisini toping.

A) $12\pi-9\sqrt{3}$ B) $24\pi-18\sqrt{3}$

C) $6\pi-9\sqrt{3}$ D) $12\pi-18\sqrt{3}$

11. (a5-g21-25) Markazi E nuqtada bo'lgan kichik aylana markazi O nuqtadagi katta aylanaga ichki tomondan urinadi. $|AO| = 18$ va $AB \perp CD$ bo'lsa, bo'yalgan soha yuzasini toping.



A) $36\pi - 27\sqrt{3}$

B) $81\pi - 40{,}5\sqrt{3}$

C) $67{,}5\pi - 81\sqrt{3}$

D) $108\pi - 40{,}5\sqrt{3}$

12. (a6-g5-25) Aylana markazidan turli tomonlarda yotuvchi parallel vatarlardan biri 45° li yoyni, ikkinchisi esa 90° yoyni tortib turadi. Agar aylana radiusi R ga teng bo'lsa, bu ikki vatar orasidagi soha yuzini toping.

A) $\frac{5\pi+4+4\sqrt{2}}{4}R^2$

B) $\frac{3\pi+4\sqrt{2}+2}{8}R^2$

C) $\frac{5\pi+4}{8}R^2$

D) $\frac{5\pi+4+2\sqrt{2}}{8}R^2$

13. (a6-g8-25) Aylananing radiusiga teng vatari ajratgan yuzalar nisbatini toping

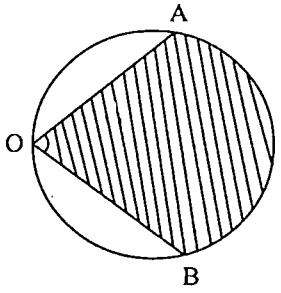
A) $\frac{2\pi-3\sqrt{3}}{10\pi+3\sqrt{3}}$

B) $\frac{2\pi+3\sqrt{3}}{10\pi-3\sqrt{3}}$

C) $\frac{2\pi-3\sqrt{3}}{10\pi-3\sqrt{3}}$

D) berilganlar yetarli emas

14. (a6-g18-10)



Rasmdagi aylananing radiusi R ga va AOB burchak α ga teng. OA = OB bo'lsa, bo'yalgan soha yuzini toping.

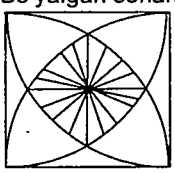
A) $\frac{\alpha}{2}R^2+\cos\alpha$

B) $\frac{\alpha}{2}R^2+R^2\sin\alpha$

C) $\alpha R^2+R^2\sin\alpha$

D) $\alpha R^2+R^2\cos\alpha$

15. (a6-g23-17) Rasmda ko'rsatilgan kvadratning tomoni 1 ga teng. Bo'yalgan sohaning yuzini toping.



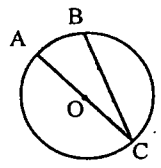
A) $\frac{\pi-3-\sqrt{3}}{3}$

B) $\frac{\pi-\sqrt{3}}{3}$

C) $\frac{\pi+3-3\sqrt{3}}{3}$

D) $\frac{\pi+2-\sqrt{3}}{3}$

16. (a6-g23-29) Rasmda ACB burchak 30° va aylana radiusi 12 ga teng. Bo'yalgan soha yuzini toping.



A) $24\pi+36\sqrt{3}$

B) $12\pi+36\sqrt{3}$

C) $24\pi+48\sqrt{3}$

D) $36\pi+24\sqrt{3}$

151. Aylana tenglamasi

1. (a1-g8-32) $(x+1)^2+(y+3)^2=5$ aylananing y o'qidan ajratgan kesmasi uzunligini toping.
A) 3 B) 5 C) 2 D) 4

2. (a1-g15-32) Markazi (1; –2) nuqtada joylashgan va koordinata boshidan o'tuvchi aylana tenglamasini ko'rsating.
A) $x^2+y^2-2x+4y-5=0$
B) $x^2+y^2-2x+4y=0$
C) $x^2+y^2+2x-4y-5=0$
D) $x^2+y^2+2x-16y=0$

3. (a2-g3-21) A $x^2+y^2-6x+2y-26=0$ aylanadagi bir nuqta, B $x^2+y^2-6x+2y+6=0$ aylanadagi bir nuqta. |AB| ning eng kichik qiymati nechaga teng bo'lishi mumkin?
A) 2 B) 3 C) 4 D) 6

4. (a2-g10-33) Markazi (0,25; –1) nuqtada joylashgan va radiusi 1 ga teng bo'lgan aylana tenglamasini ko'rsating.
A) $16x^2+16y^2-8x+32y+1=0$
B) $x^2+y^2-8x+2y+16=0$
C) $16x^2+16y^2+8x-32y+1=0$
D) $4x^2+4y^2-2x+16y+2=0$

5. (a2-g17-31) Tomoni 4 ga teng rombga radiusi 1,5 ga teng aylana ichki chizilgan. Romb diagonallari yig'indisini toping.
A) $7\sqrt{4}$ B) $2\sqrt{14}$
C) $4\sqrt{7}$ D) $3\sqrt{10}$

6. (a2-g17-32) Koordinata boshidan $x^2+y^2+10x-10y+41=0$ aylanagacha bo'lgan eng qisqa masofani toping.
A) $5-3\sqrt{2}$ B) $5\sqrt{2}-3$
C) $9-5\sqrt{2}$ D) $3\sqrt{2}+2$

7. (a2-g18-32) Markazi $\left(-\frac{1}{3};2\right)$ nuqtada joylashgan va radiusi 4 ga teng bo'lgan aylana tenglamasini ko'rsating.
A) $4x^2+4y^2+24x-4y-27=0$
B) $9x^2+9y^2+6x-36y-107=0$
C) $x^2+y^2+6x-4y-3=0$
D) $9x^2+9y^2-6x+36y-107=0$

8. (a2-g22-32) $(x-2)^2+(y+1)^2=4$ aylanaga konsentrik bo'lgan va A(3; 1) nuqtadan o'tuvchi aylana tenglamasini ko'rsating.

A) $(x+2)^2+(y-1)^2=\sqrt{5}$

B) $(x-2)^2+(y+1)^2=\sqrt{5}$

C) $(x+2)^2+(y-1)^2=5$

D) $(x-2)^2+(y+1)^2=5$

9. (a2-g23-31) Tenglamasi $x^2+y^2-10x+4y+13=0$ bo'lgan aylananing radiusini toping.
A) 2 B) 5 C) 3 D) 4

10. (a3-g11-32) Markazi $\left(\frac{1}{3};-\frac{1}{2}\right)$ nuqtada joylashgan va radiusi 2 ga teng bo'lgan aylana tenglamasini ko'rsating.
A) $36x^2+36y^2+24x-36y-131=0$
B) $36x^2+6y^2-4x+6y-19=0$
C) $36x^2+36y^2-24x+36y-131=0$
D) $x^2+y^2-6x+4y+9=0$

11. (a3-g17-32)
A $x^2+y^2-12x+2y-12=0$ aylanadagi bir nuqta,
B $x^2+y^2-12x+2y+21=0$ aylanadagi bir nuqta. |AB| ning eng kichik qiymati nechaga teng bo'lishi mumkin?
A) 2 B) 3 C) 4 D) 6

12. (a3-g23-32) $(x-2)^2+(y+1)^2=4$ aylanaga konsentrik bo'lgan va A(3;1) nuqtadan o'tuvchi aylana tenglamasini ko'rsating.

A) $(x+2)^2+(y-1)^2=\sqrt{5}$

B) $(x-2)^2+(y+1)^2=\sqrt{5}$

C) $(x+2)^2+(y-1)^2=5$

D) $(x-2)^2+(y+1)^2=5$

13. (a5-g9-32) Markazi koordinata tekisligining to'rtinchi choragida yotgan aylananing radiusi 4 ga teng va u koordinata o'qlariga urinadi. Aylana tenglamasini ko'rsating.
A) $x^2+y^2-8x+8y+32=0$
B) $x^2+y^2+8x-8y+16=0$
C) $x^2+y^2-8x+8y=0$
D) $x^2+y^2-8x+8y+16=0$

14. (a5-g10-32) $(x-4)^2+(y+1)^2=16$ aylana $y=mx-3$ ga urinsa, m ning qiymatini toping.
A) –0,(6) B) –0,75
C) –0,5 D) –0,4

15. (a6-g14-11) Tenglamasi $x^2+y^2-4y-12=0$ bo'lgan aylananing OY o'qining musbat yo'nalishi hamda OX o'qining manfiy yo'nalishini kesib o'tuvchi nuqtalari orasidagi masofani toping.
A) $4\sqrt{3}$ B) $2\sqrt{10}$
C) $2\sqrt{3}$ D) 4

16. (a6-g15-5) Quyida keltirilgan aylanalardan qaysi biri OY o'qi bilan 2 ta umumiy nuqtaga ega?
A) $4+x^2+y^2+25-10x-4y=29$
B) $9+x^2+y^2+36-12x+6y=16$
C) $25+x^2+y^2+8x-6y=16$
D) $16+x^2+y^2+21+8x+10y=0$

17. (a6-g26-27) $x^2+y^2-10y+12x=-37$ tenglama bilan berilgan aylana radiusini toping.
A) 9 B) $2\sqrt{6}$
C) $\sqrt{85}$ D) 7

5-bob. Aylana va ko'pburchak

152. Uchburchakka ichki chizilgan aylana

1. (a1-g3-7) Quyidagi tasdiqlarning qaysilari noto'g'ri?
1) Uchburchakka ichki chizilgan aylananing markazi bissektrisalar kesishgan nuqtada bo'ladi;
2) Teng yonli uchburchakning balandliklari kesishish nuqtasidan 2:1 nisbatda bo'linadi;
3) Qavariq n burchakning bir uchidan chiqarilgan diagonallar ko'pburchakni n – 3 ta uchburchakka ajratadi;
4) Trapetsiyaning diagonallari kesishish nuqtasidan diagonal teng ikki bo'lakka bo'linadi;
5) O'xshash figuralarning yuzlari nisbati chiziqli o'lchovlari nisbati kvadratiga teng.
A) 1; 3; 5 B) 2; 3; 5
C) 2; 3; 4 D) 1; 4; 5

2. (a2-g6-31) Uchburchak va aylana shunday chizilganki, markazi uchburchakning bir tomonida yotib, qolgan ikki tomonlariga urinadi. Agar uchburchakning yuzi 48, ikkita urinuvchi tomonlari esa 9 va 7 ga teng bo'lsa, aylananing radiusini toping.
A) 6 B) 4 C) 3 D) 8

3. (a2-g8-32) ABCD to'g'ri to'rtburchakning AB va BC tomonlari mos ravishda 12 va 5 ga teng. ADC uchburchakka ichki chizilgan aylana markazidan B uchgacha bo'lgan masofani toping.
A) 13 B) 11
C) $\sqrt{85}$ D) $\sqrt{109}$

4. (a2-g12-26) Uchburchak va aylana shunday chizilganki, aylananing markazi uchburchakning bir tomonida yotib, qolgan ikki tomonlariga urinadi. Agar uchburchakning yuzi 26, ikkita urinuvchi tomonlari esa 6 va 7 ga teng bo'lsa, aylananing radiusini toping.
A) 1 B) 2 C) 3 D) 4

5. (a2-g15-31) Katetlari *a* va *b*, gipotenuzasi *c* ga teng to'g'ri burchakli uchburchakka ichki chizilgan aylana markazidan to'g'ri burchak uchigacha bo'lgan masofani (d) toping.
A) $d=(a+b-c)\sqrt{2}$
B) $d=\frac{a+b-c}{\sqrt{2}}$
C) $d=\frac{a^2+b^2+c^2}{9}$
D) $d=\frac{a+b+c}{\sqrt{3}}$

6. (a2-g16-31) To'g'ri burchakli uchburchakka ichki chizilgan aylana gipotenuzani urinish nuqtasidan 6 va 10 ga teng bo'lgan kesmalarga ajratadi. Bu uchburchakning yuzini toping.
A) 60 B) 30 C) 45 D) 40

7. (a2-g19-31) Katetlari *a* va *b*, gipotenuzasi *c* ga teng to'g'ri burchakli uchburchakka ichki chizilgan aylana markazidan to'g'ri burchak uchigacha bo'lgan masofani (D) toping.
A) $d=\frac{a+b-c}{\sqrt{2}}$
B) $d=(a+b-c)\sqrt{2}$
C) $d=\frac{a+b+c}{\sqrt{3}}$
D) $d=\frac{a^2+b^2+c^2}{9}$

8. (a2-g22-31) Radiusi 5 ga teng bo'lgan doiraga uchburchak shunday ichki chizilganki, uchburchakning bir tomoni aylananing diametriga teng. Shu uchburchakka ichki chizilgan doiraning radiusi 1 ga teng bo'lsa, uchburchakning yuzini toping.
A) 22 B) 11
C) $8\sqrt{2}$ D) $6\sqrt{2}$

9. (a3-g3-32) ABCD to'g'ri to'rtburchakning AB va BC tomonlari mos ravishda 12 va 5 ga teng. ADC uchburchakka ichki chizilgan aylana markazidan B uchgacha bo'lgan masofani toping.
A) 13 B) 11
C) $\sqrt{85}$ D) $\sqrt{109}$

10. (a3-g4-31) Katetlari *a* va *b*, gipotenuzasi *c* ga teng to'g'ri burchakli uchburchakka ichki chizilgan aylana markazida to'g'ri burchak uchigacha bo'lgan masofani (*d*) toping.
A) $d=\frac{a+b-c}{\sqrt{2}}$
B) $d=(a+b-c)\sqrt{2}$
C) $d=\frac{a+b+c}{\sqrt{3}}$
D) $d=\frac{a^2+b^2+c^2}{9}$

11. (a3-g7-36) Uchburchakning tomonlari sharga urinadi. Sharning radiusi 4 ga teng. Shar markazidan uchburchak tekisligigacha masofa 3 ga teng bo'lsa, uchburchakka ichki chizilgan aylana radiusini toping.
A) $\sqrt{7}$ B) 1 C) 5 D) 2

12. (a3-g12-31) Katetlari *a va b*, gipotenuzasi *c* ga teng to'g'ri burchakli uchburchakka ichki chizilgan aylana markazidan to'g'ri burchak uchigacha bo'lgan masofani (*d*) toping.
A) $d=\frac{a+b-c}{\sqrt{2}}$
B) $d=(a+b-c)\sqrt{2}$
C) $d=\frac{a-b+c}{\sqrt{3}}$
D) $d=\frac{a^2+b^2+c^2}{9}$

13. (a3-g18-31) Katetlari 3 va 4 ga teng to'g'ri burchakli uchburchakka ichki chizilgan aylana markazidan to'g'ri burchak uchigacha bo'lgan masofani (d) toping.
A) $\sqrt{2}$ B) $2\sqrt{2}$ C) $4\sqrt{3}$ D) $\frac{50}{9}$

14. (a3-g20-32) To'g'ri burchakli uchburchakka ichki chizilgan aylana gipotenuzaga urinish nuqtasidan gipotenuzani 4 va 21 ga teng bo'laklarga ajratadi. Aylananing radiusini toping.
A) 2 B) 3 C) 8 D) 6

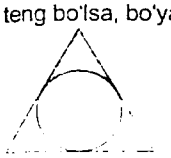
15. (a3-g21-31) To'g'ri burchakli uchburchakning katetlari 7 va 24 ga teng. Shu uchburchakka ichki chizilgan aylana gipotenuzani urinish nuqtasidan qanday uzunliklardagi kesmalarga ajratadi?
A) 17 va 8 B) 10 va 15
C) 21 va 4 D) 20 va 5

16. (a4-g8-31) Katetlari *a* va *b*, gipotenuzasi *c* ga teng to'g'ri burchakli uchburchakka ichki chizilgan aylana markazida to'g'ri burchak uchigacha bo'lgan masofani (d) toping.
A) $d=\frac{a+b-c}{\sqrt{2}}$
B) $d=(a+b-c)\sqrt{2}$
C) $d=\frac{a+b+c}{\sqrt{3}}$
D) $d=\frac{a^2+b^2+c^2}{9}$

17. (a4-g11-12) Quyidagi tasdiqlarning qaysilari to'g'ri?
1) Uchburchakka ichki chizilgan doiraning yuzasi $\frac{\pi}{4}\left(\frac{4S}{a+b+c}\right)^2$ formula (*a*, *b*, *c* uchburchakning tomonlari, S uchburchakning yuzasi) yordamida ifodalanadi; 2) o'xshash figuralarning yuzlarining nisbati ularning mos burchaklari sinusi kvadratining nisbatiga teng;
3) balandliklari va asoslarining radiusi teng bo'lgan konus va silindrning hajmlari nisbati 3 ga teng; 4) silindrning yon sirti yuzasi $2\pi R(R+h)$ formula yordamida topiladi; 5) Ixtiyoriy ko'pburchakning ichki burchaklariga qo'shni bo'lgan burchaklar yig'indisi 360 ga teng.
A) 1, 5 B) 2, 3, 5
C) 3, 4 D) 1, 2, 5

18. (a4-g24-31) Rasmda muntazam uchburchakka ichki chizilgan aylana tasvirlangan.

Agar uchburchakning tomoni $4\sqrt{3}$ ga teng bo'lsa, bo'yalgan soha yuzini toping.



A) $\frac{12\sqrt{3}-4\pi}{3}$ B) $\frac{8\sqrt{3}-2\pi}{3}$

C) $\frac{6\sqrt{3}-2\pi}{3}$ D) $\frac{8\sqrt{3}-4\pi}{3}$

19. (a5-g4-31) ABC to'g'ri burchakli uchburchakning BC kateti aylana diametrida yotadi va diametrga teng. AB katet esa B nuqtada aylanaga urinadi. AC gipotenuza aylanani D nuqtada kesib o'tadi. Agar AB = 15 va DC = 16 bo'lsa, aylana radiusini toping.
A) 10 B) 9 C) 12 D) 6

20. (a5-g11-26) ABCD to'g'ri to'rtburchakning AB va BC tomonlari mos ravishda 8 va 15 ga teng. ADC uchburchakka ichki chizilgan aylana markazidan B uchgacha bo'lgan masofani toping.
A) $3\sqrt{2}$ B) 13
C) $5\sqrt{2}$ D) $8\sqrt{2}$

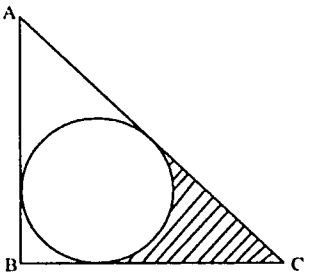
21. (a5-g15-11) Muntazam uchburchakka aylana ichki chizilgan. Shu aylanaga esa muntazam oltiburchak ichki chizilgan. Uchburchak va oltiburchak yuzlarining nisbatini toping.
A) $\frac{1}{\sqrt{3}}$ B) 4
C) $\frac{2}{3}$ D) 2

22. (a5-g17-26) Teng yonli uchburchakka ichki chizilgan aylana yon tomonini urinish nuqtasidan, uchidan boshlab 3 va 7 ga teng kesmalarga ajratadi. Shu aylana radiusini toping.
A) $\frac{7\sqrt{51}}{17}$ B) 3
C) $\frac{7\sqrt{51}}{10}$ D) $\frac{3\sqrt{51}}{10}$

23. (a5-g24-26) Tomonlari 7, 9 va 12 bo'lgan uchburchakka aylana ichki chizilgan. Uchburchakning aylanaga urinish nuqtalarini ketma-ket tutashtirishdan hosil bo'lgan uchburchak yuzini toping.
A) $\frac{308\sqrt{5}}{27}$ B) $\frac{35\sqrt{5}}{18}$
C) $\frac{63\sqrt{5}}{14}$ D) $\frac{70\sqrt{5}}{27}$

24. (a5-g25-26) ABC to'g'ri burchakli uchburchakka ichki chizilgan aylana BC gipotenuzaga K nuqtada urinadi, BK = 4 va KC = 6. AK kesma uzunligini toping.
A) $\sqrt{\frac{116}{5}}$ B) $\sqrt{\frac{59}{3}}$
C) $\sqrt{\frac{127}{2}}$ D) $\sqrt{\frac{209}{3}}$

25. (a6-g4-26)



Rasmda berilgan to'g'ri burchakli uchburchakning AB va BC katetlari mos ravishda 9 va 12 ga teng bo'lsa, bo'yalgan soha yuzini toping.
A) 27 – 9arctg3 B) 18 – 9arcctg2
C) 27 – 9arcctg3 D) 18 – 9arctg2

26. (a6-g15-25) Tomoni 18 ga teng kvadratning diagonali uni ikki uchburchakka ajratadi. Shu uchburchaklarga ichki chizilgan aylanalar markazlari orasidagi masofani toping.
A) $36-9\sqrt{2}$ B) $18+18\sqrt{2}$
C) $36-18\sqrt{2}$ D) $18-9\sqrt{3}$

27. (a6-g20-3) ABC uchburchakning AB, BC va AC tomonlari mos ravishda 9, 12 va 14 ga teng. Bu uchburchakka aylana ichki chizilgan. Aylanaga o'tkazilgan urinma AC tomonni M nuqtada, BC tomonni N nuqtada kesib o'tadi. CMN uchburchak perimetrini toping.
A) 11 B) 7 C) 17,5 D) 17

28. (a6-g22-21) Kateti 12 bo'lgan teng yonli to'gri burchakli uchburchakka ichki chizilgan aylana markazidan o'tkir burchak uchigacha masofani toping.
A) 10 B) $6\sqrt{2+\sqrt{2}}$
C) $12\sqrt{2-\sqrt{2}}$ D) $12\sqrt{\sqrt{2}-1}$

29. (a6-g26-26) Tomonlari uzunliklari 11, 60 va 61 bo'lgan uchburchakka ichki chizilgan aylana radiusini toping.
A) 5 B) 30,5 C) 55 D) 27,5

153. Uchburchakka tashqi chizilgan aylana

1. (a1-g1-12) Quyidagi mulohazalardan qaysi biri noto'g'ri?
A) Uchburchakka ichki chizilgan aylana markazi bissektrisalar kesishish nuqtasida bo'ladi.
B) Teng yonli uchburchakka ichki chizilgan aylana radiusi uning balandligiga teng bo'ladi.
C) Eng katta burchagi 96° bo'lgan uchburchakka tashqi chizilgan aylana markazi uchburchak tashqarisida yotadi.
D) Tog'ri burchakli uchburchakka tashqi chizilgan aylana radiusi gipotenuzaga tushirilgan medianaga teng.

2. (a1-g9-31) Uchburchakning kichik tomoni 3 ga teng. Unga tashqi chizilgan aylananing diametri esa $3\sqrt{2}$ ga teng. Uchburchakning kichik burchagini toping.
A) 45° B) 60° C) 120° D) 135

3. (a1-g13-31) Radiusi 5 ga teng bo'lgan doiraga uchburchak shunday ichki chizilganki, uchburchakning bir tomoni aylananing diametriga teng. Shu uchburchakka ichki chizilgan doiraning radiusi 1 ga teng bo'lsa, uchburchakning yuzini toping.
A) 11 B) 22
C) $8\sqrt{2}$ D) 12

4. (a2-g7-31) Tomonlari 10, 14 va 18 bo'lgan uchburchakka ichki va tashqi chizilgan aylanalar markazlari orasidagi masofani toping.
A) $\sqrt{\frac{160}{11}}$ B) $\sqrt{\frac{120}{11}}$
C) $\sqrt{\frac{240}{11}}$ D) $\sqrt{\frac{280}{11}}$

5. (a2-g14-32) Bir tomoni 20, unga yopishgan burchaklari 105° va 45°. Uchburchakka tashqi chizilgan aylana diametrini toping.
A) 40 B) 30 C) 20 D) 10

6. (a3-g15-31) Quyidagi mulohazalardan qaysilari to'g'ri?
1) Uchburchakka tashqi chizilgan aylananing radiusi $R=\frac{abc}{2S}$ (a, b, c – uchburchakning tomonlari, S – uchburchak yuzasi) formula bilan hisoblanadi; 2) O'xshash figuralarning yuzlarining nisbati ularning mos chiziqli o'lchovlarining kvadratlari nisbatiga teng; 3) Bir tomoni a ga va shu tomon qarshisidagi burchagi α ga teng uchburchakka tashqi chizilgan aylana radiusi $R=\frac{2a}{\sin\alpha}$ formula bilan hisoblanadi; 4) Tomonlari a, b va c bo'lgan uchburchakka ichki chizilgan aylananing radiusi $r=\frac{2S}{a+b+c}$ formula bilan hisoblanadi (S – uchburchak yuzasi); 5) Katetlari a va b, gipotenuzasi c ga teng to'g'ri burchakli uchburchakka ichki chizilgan aylana radiusi $r=\frac{a+b-c}{2}$ formula bilan hisoblanadi.
A) 1, 2, 5
B) 2, 4, 5
C) 1, 3, 4
D) 1, 4, 5

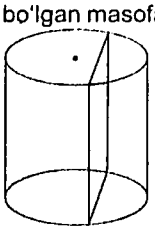
7. (a3-g23-31) To'g'ri burchakli uchburchakning tomonlari 10; 24 va 26 bo'lsa, unga ichki va tashqi chizilgan aylanalar markazlari orasidagi masofani toping.

A) $2\sqrt{13}$ B) $\sqrt{65}$
C) $\sqrt{39}$ D) $\sqrt{78}$

8. (a4-g1-31) To'g'ri burchakli uchburchak katetlarining gipotenuzadagi proyeksiyasi 9 va 16 ga teng. Uchburchakka ichki chizilgan aylana radiusi shu uchburchakka tashqi chizilgan aylana radiusining necha foizini tashkil qiladi?

A) 20% B) 30%
C) 40% D) 60%

9. (a4-g2-31) Asosi 24 va yon tomonlari 13 bo'lgan teng yonli uchburchakka tashqi chizilgan aylana markazidan uchburchakning yon tomonigacha bo'lgan masofani toping.



A) 15,6 B) 16,9 C) 13 D) 2,4

10. (a4-g10-31) Aylanadan A, B va C nuqtalar shunday tanlab olindiki, ABC muntazam uchburchak hosil bo'ldi. D nuqta esa BC kichik yoyda yotadi. BD = 3 va DC = 7 bo'lsa, AD kesma uzunligini toping.

A) 10 B) 9 C) 12 D) 14

11. (a5-g2-31) ABC uchburchakka aylana tashqi chizilgan. AB = 3, AC = 8 va AN bissektrisaning uzunligi 2 ga teng. AN bissektrisa davom ettirilganda aylanani D nuqtada kesib o'tadi. DN kesma uzunligini toping.

A) 10 B) 8 C) 9 D) 12

12. (a6-g2-26) ABC uchburchakda AB = 8, BC = 7 va sinA + sinC = 1,5 bo'lsa, uchburchakka tashqi chizilgan aylana radiusini toping.

A) 4 B) 5 C) 10 D) 7,5

13. (a6-g19-28) Tomonlari uzunliklari 9, 40 va 41 bo'lgan uchburchakka tashqi chizilgan aylana radiusini toping.

A) 20,5 B) 36
C) 4 D) 25

14. (a6-g21-27) Tomoni 15 ga, unga yopishgan ikki burchaklari 36° va 84° bo'lgan uchburchakka tashqi chizilgan aylana diametrini toping.

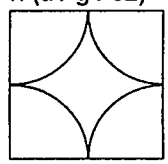
A) $15\sqrt{2}$ B) 7,5
C) $7,5\sqrt{2}$ D) $10\sqrt{3}$

15. (a6-g25-10) To'g'ri burchakli uchburchakka ichki va tashqi chizilgan aylanalar radiusi 2 va 5 ga teng. Uchburchakning yuzini toping.

A) 24 B) 40
C) $\sqrt{51}$ D) $4\sqrt{6}$

154. Kvadratga ichki chizilgan aylana. To'rtburchak va aylana

1. (a1-g4-32)



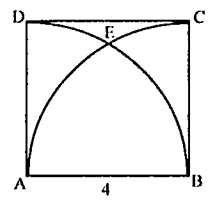
Rasmda ko'rsatilgan kvadratning tomoni 4 sm. Uning ichiga to'rtta bir xil aylananing chorak qismli yoylari chizilgan. Yoylar orasidagi sohaning yuzini toping.

A) 16 B) $16-4\pi$
C) $8-2\pi$ D) $16+\pi$

2. (a1-g5-30) Doira va kvadratning perimetrlari teng. Kvadrat yuzining doira yuziga nisbatini toping.

A) $\frac{\pi}{8}$ B) $\frac{\pi}{4}$ C) $\frac{8}{\pi}$ D) $\frac{4}{\pi}$

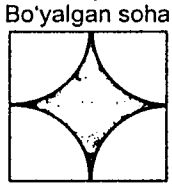
3. (a1-g8-30)



ABCD kvadrat. Unga markazlari A va B nuqtada bo'lgan chorak doiralar ichki chizilgan va bu chorak doiralar E nuqtada kesishadi. Bo'yalgan soha yuzasini toping. ($\pi = 3$)

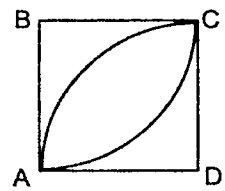
A) $16-4\sqrt{3}$ B) $16\sqrt{3}-8$
C) $16-8\sqrt{3}$ D) $8\sqrt{3}-8$

4. (a1-g14-31) Rasmdagi kvadrat radiusi 1 ga teng bo'lgan aylananing chorak qismlari yordamida kesilgan. Bo'yalgan sohaning yuzini toping.



A) $1-\frac{\pi}{4}$ B) $2-\frac{\pi}{2}$
C) $4-\pi$ D) $4-\frac{\pi}{2}$

5. (a1-g17-31) ABCD kvadrat tomonining uzunligi 6 sm. Unga markazlari B va D nuqtalarda bo'lgan aylanalarning chorak qismlar ichki chizilgan. Bo'yalgan soha yuzini toping ($\pi = 3$)



A) 36 B) 18 C) 12 D) 9

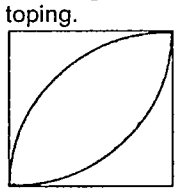
6. (a2-g2-31) Aylana tomonlari 8 va 6 ga teng bo'lgan to'g'ri to'rtburchakning ikki kichik va bir katta tomoniga urinadi. Shu aylananing to'rtinchi tomondan ajratgan kesmasi uzunligini toping.

A) $2\sqrt{3}$ B) $2\sqrt{2}$
C) $4\sqrt{3}$ D) $3\sqrt{2}$

7. (a2-g10-31) Kvadratga ichki va tashqi chizilgan aylanalar hosil qilgan halqaning yuzi 16π ga teng bo'lsa, shu kvadratning perimetrini toping.

A) 48 B) 64 C) 16 D) 32

8. (a3-g5-31) Rasmda tomonining uzunligi 6 ga teng bo'lgan kvadrat va unga chizilgan chorak aylanalar ko'rsatilgan. Bo'yalgan sohaning yuzini toping.

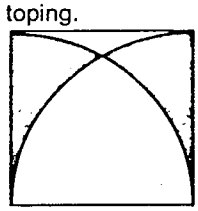


A) $9\pi-18$ B) $18\pi-18\sqrt{2}$
C) $9\pi-9\sqrt{2}$ D) $18\pi-36$

9. (a3-g19-31) Tomoni 16 ga teng kvadratning diagonali uni ikki uchburchakka ajratadi. Shu uchburchaklarga ichki chizilgan aylanalar markazlari orasidagi masofani toping.

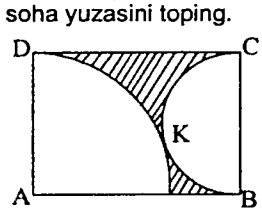
A) $32+8\sqrt{2}$ B) $32-16\sqrt{2}$
C) $16-8\sqrt{2}$ D) $16+16\sqrt{3}$

10. (a4-g7-31) Rasmda tomoni 12 ga teng bo'lgan kvadrat hamda unga ichki chizilgan chorak aylanalar ko'rsatilgan. Bo'yalgan sohalar yuzalari yig'indisini toping.



A) $36\sqrt{3}-12\pi$ B) $48\pi-72\sqrt{3}$
C) $72\sqrt{3}-24\pi$ D) $24\pi-36\sqrt{3}$

11. (a5-g12-26) Rasmdagi ABCD to'g'ri to'rtburchakka ichki chizilgan yarim va chorak aylanalar K nuqtada urinadi. Agar AB = 8 bo'lsa, bo'yalgan soha yuzasini toping.



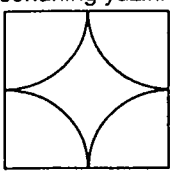
A) $32\sqrt{2}-10\pi$ B) $48\sqrt{2}-16\pi$
C) $32\sqrt{2}-12\pi$ D) $\frac{2\sqrt{2}}{5}$

12. (a6-g14-23) Mahsulotning narxi birinchi marta 20% ga, ikkinchi marta yangi bahosi yana 10% ga kamaytirildi. Mahsulotning oxirgi bahosi necha foizga oshirilsa, uning narxi dastlabki narxiga teng bo'ladi?

A) $24\frac{8}{33}$ B) 25

C) $38\frac{8}{9}$ D) 30

13. (a6-g16-3) Rasmda ko'rsatilgan kvadratning tomoni 8 sm. Uning ichiga to'rtta bir xil aylananing chorak qismli yoylari chizilgan. Yoylar orasidagi sohaning yuzini toping.



A) $64-15\pi$ B) $64-8\pi$

C) $64-8\pi$ D) $64-16\pi$

155. To'g'ri to'rtburchakka tashqi chizilgan aylana

1. (a1-g3-22) Yuzasi 225π bo'lgan doiraga to'g'ri to'rtburchak ichki chizilgan. Agar shu to'rtburchakning bir tomoni 24 ga teng bo'lsa, uning ikkinchi tomonini toping.

A) 18 B) $32\sqrt{2}$

C) 48 D) $16\sqrt{2}$

2. (a1-g6-31) Doiraga ichki chizilgan to'g'ri to'rtburchakning tomonlari 4 va 6 ga teng bo'lsa, doiraning yuzini toping.

A) 12π B) 16π C) 13π D) 20π

3. (a1-g15-31) Tomonlarining nisbati 8:15 ga teng bo'lgan to'g'ri to'rtburchak aylanaga ichki chizilgan. Agar aylana radiusi 34 sm bo'lsa, to'rtburchak perimetrini toping.

A) 92 B) 184 C) 46 D) 138

4. (a3-g7-31) Radiusi 25 sm bo'lgan aylana kichik tomoni 32 sm bo'lgan to'g'ri to'rtburchakning uchta tomoniga urinadi. To'g'ri to'rtburchakning to'rtinchi tomonidan aylanani kesib o'tgan qismi uzunligining tomoni necha sm?

A) 36 B) 48 C) 24 D) 40

5. (a3-g10-31) Aylana tomonlari 18 va 12 ga teng bo'lgan to'g'ri to'rtburchakning ikki kichik va bir katta tomoniga urinadi. Shu aylananing to'rtinchi tomondan ajratgan kesmasi uzunligini toping.

A) $4\sqrt{3}$ B) $6\sqrt{2}$

C) $8\sqrt{3}$ D) $12\sqrt{2}$

6. (a3-g11-31) Tomonlari 10 va 8 ga teng bo'lgan to'g'ri to'rtburchakning ikkita kichik va bir katta tomoniga urinadigan aylana chizilgan. Shu aylana to'rtburchakning ikkinchi katta tomonidan qanday uzunlikdagi kesma ajratadi?

A) 3 B) 4 C) 6 D) 8

7. (a4-g13-36) To'rtta nuqta aylanani 0,5; 1,5; 2,5; 5,5 sonlariga proporsional yoylarga ajratadi. Shu nuqtalarni ketma-ket tutashtirish natijasida hosil bo'lgan to'rtburchak diagonallari orasidagi o'tmas burchakni toping.

A) 54 B) 72

C) 108 D) 126

8. (a4-g18-31) Radiusi 8 ga teng bo'lgan aylanaga ichki chizilgan to'g'ri to'rtburchakning bir tomoni 12 ga teng. Shu to'rtburchakning ikki katta tomoniga urinadigan doira yuzini toping.

A) 28π B) 36π

C) 56π D) 144π

9. (a5-g6-31) ABCD to'g'ri to'rtburchakning A uchidan BD diagonaliga tushirilgan AH balandlik 6 ga teng. Agar AB = 10 bo'lsa, bu to'rtburchakka tashqi chizilgan aylana radiusini toping.

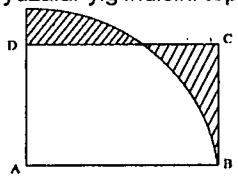
A) 12,5 B) 4 C) 8 D) 6,25

10. (a5-g21-26) Tomonlari 10 va 24 ga teng to'g'ri to'rtburchakning katta tomonini diametr qilib aylana chizilgan. Aylananing to'rtburchak diagonalidan ajratgan kesmasi uzunligini toping.

A) $\frac{60}{13}$ B) $\frac{288}{13}$

C) $\frac{120}{13}$ D) $\frac{144}{13}$

11. (a5-g22-26) Rasmda $|AB| = 2|BC| = 4$ sm ABCD to'g'ri to'rtburchak. Rasmdagi shtrixlangan yuzalar yig'indisini toping.



A) $8+\frac{2\pi}{3}-4\sqrt{3}$ B) $8+\frac{4\pi}{3}-4\sqrt{3}$

C) $8+\frac{4\pi}{3}-2\sqrt{3}$ D) $8+\frac{2\pi}{3}-2\sqrt{3}$

12. (a6-g9-26) Aylanaga to'g'ri to'rtburchak ichki chizilgan va uning tomonlari 4:3 nisbatda. To'rtburchakning tomonlari va diagonali hosil qilgan uchburchakka ichki chizilgan doira yuzining katta aylanaga tashqi chizilgan muntazam uchburchak yuziga nisbatini toping.

A) $\frac{16\pi}{225\sqrt{3}}$ B) $\frac{4\pi}{75\sqrt{3}}$

C) $\frac{64\pi}{225\sqrt{3}}$ D) $\frac{4\pi}{225\sqrt{3}}$

156. Aylana va romb

1. (a2-g17-30) 50° li sektori yuzi 30π ga teng doiraning eng katta vatari uzunligini toping.

A) 12 B) $12\sqrt{6}$

C) 24 D) $6\sqrt{6}$

2. (a2-g21-31) Rombning tomoni unga ichki chizilgan aylananing urinish nuqtasidan 5 va 20 ga teng kesmalarga bo'linadi. Ichki chizilgan aylana uzunligini toping.

A) 10π B) 20π C) 5π D) 40π

3. (a4-g5-31) Rombning tomoni unga ichki chizilgan aylananing urinish nuqtasidan 5 va 20 ga teng kesmalarga bo'linadi. Ichki chizilgan aylana uzunligini toping.

A) 10π B) 20π

C) 5π D) 40π

4. (a4-g22-31) Tomoni 4 ga teng rombga radiusi 1,5 ga teng aylana ichki chizilgan. Romb diagonallari yig'indisini toping.

A) $7\sqrt{4}$ B) $2\sqrt{14}$

C) $4\sqrt{7}$ D) $3\sqrt{10}$

5. (a5-g20-26) Radiusi 6 ga teng yarim aylanaga romb shunday ichki chizilganki, rombning bir uchi aylana markazida, qolgan uchlari esa aylanada yotadi. Yarim aylananing romb tashqarisida qolgan qismi yuzasini toping.

A) $18\cdot(\pi-\sqrt{3})$

B) $36\cdot(\pi-\sqrt{3})$

C) $18\cdot(\pi-1)$

D) $36\cdot(\pi-\sqrt{2})$

157. Trapetsiyaga tashqi chizilgan aylana. Trapetsiyaga ichki chizilgan aylana

1. (a1-g2-33) Teng yonli trapetsiyaga ichki chizilgan aylananing markazi trapesiya asoslarining uchlaridan 9 va 12 ga teng masofada joylashgan. Shu trapetsiyaga ichki chizilgan aylana uzunligini toping.

A) $9,6\pi$ B) $17,6\pi$

C) $19,2\pi$ D) $14,4\pi$

2. (a1-g11-31) Asoslari 10 sm va 16 sm bo'lgan teng yonli trapetsiyaga ichki chizilgan doiraning yuzini toping.

A) 25π B) 36π C) 40π D) 80π

3. (a1-g16-33) Teng yonli trapetsiyaga ichki chizilgan aylananing markazi kichik asosining uchidan 3 ga, katta asosining uchidan 4 ga teng masofada joylashgan. Shu trapetsiyaga ichki chizilgan doiraning yuzini toping.

A) $2,56\pi$ B) $4,84\pi$

C) $3,24\pi$ D) $5,76\pi$

4. (a2-g3-29) Radiusi $\sqrt{3}$ ga teng bo'lgan doiraga o'tkir burchagi 60° bo'lgan teng yonli trapesiya tashqi chizilgan. Trapesiyaning o'rta chizig'ini toping.
A) 3 B) 4 C) 6 D) 8

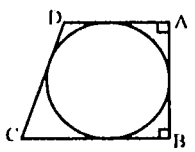
5. (a2-g9-31) Asoslari 10 sm va 16 sm bo'lgan teng yonli trapetsiyaga ichki chizilgan doiraning yuzini toping.
A) 20π B) 30π
C) 40π D) 80π

6. (a2-g20-31) Aylanaga tashqi chizilgan teng yonli trapesiyaning asoslari 8 va 18 ga teng. Aylananing diametrini toping.
A) 14 B) 12 C) 13 D) 11

7. (a3-g1-31) Aylanaga ichki chizilgan trapetsiyaning katta asosi aylana markazidan o'tadi. Trapetsiyaning o'tkir burchagi 60°. Agar aylananing radiusi 8 ga teng bo'lsa, trapetsiyaning perimetrini toping.
A) $24+16\sqrt{3}$ B) 48
C) $32+24\sqrt{3}$ D) 40

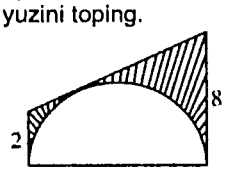
8. (a3-g11-33) xOy tekisligida yotgan $\vec{b}$ vektor $\vec{a}(2;-4;5)$ vektorga perpendikulyar. Agar $|\vec{b}|=4\sqrt{5}$ bo'lsa, uning absissasi va ordinatasi ko'paytmasini toping.
A) 32 B) 8 C) 36 D) 16

9. (a4-g3-33)



Rasmda ABCD to'g'ri burchakli trapetsiya. Bu trapetsiyaga aylana ichki chizilgan. AD = 3 sm va AB = 4 sm bo'lsa, bo'yalgan sohaning yuzasi necha sm^2? ($\pi = 3$)
A) 6 B) 9 C) 4 D) 8

10. (a4-g6-31) Rasmda ko'rsatilgan trapetsiyaning uch tomoni yarim aylanaga urinadi. Shtrixlangan soha yuzini toping.



A) $40-8\pi$ B) $20-8\pi$
C) $40-16\pi$ D) $20+8\pi$

11. (a4-g9-31) ABCD parallelogrammda C o'tmas burchak va DC tomondan E nuqta olingan. ABCE trapetsiyaga aylana ichki chizilgan. AB = 11 va DE = 5 bo'lsa, ABCE trapetsiyaning perimetrini toping.
A) 32 B) 30
C) 34 D) 22

12. (a4-g20-31) Aylanaga tashqi chizilgan teng yonli trapetsiyaning asoslari 32 va 18 ga teng. Aylananing diametrini toping.
A) 14 B) 24 C) 20 D) 28

13. (a5-g13-26) Asoslari a va c ($a > c$) ga teng bo'lgan teng yonli trapetsiyaga aylana ichki chizilgan. Shu trapetsiya katta asosidagi burchak kosinusini toping.
A) $\frac{a-c}{2a+c}$ B) $\frac{a}{a+c}$
C) $\frac{c}{a+c}$ D) $\frac{a-c}{a+c}$

14. (a5-g18-2) Aylanaga ichki chizilgan trapetsiyaning asosidagi burchagi 60° va diagonallaridan biri $12\sqrt{3}$ ga teng. Aylananing radiusini toping.
A) 18 B) 36 C) 12 D) 24

158. Aylanaga ichki chizilgan ko'pburchak

1. (a1-g6-30) To'rtta nuqta aylanani 3; 4; 5 va 6 sonlariga proporsional yoylarga ajratadi. Shu to'rtta nuqtani ketma-ket tutashtirishdan hosil bo'lgan to'rtburchakning diagonallari orasidagi kichik burchakni toping.
A) 60° B) 80° C) 45° D) 90°

2. (a1-g11-30) Aylana yoyidan tanlab olingan to'rt nuqta aylanani uzunliklari 2; 5; 6 va 7 sonlariga proporsional yoylarga ajratadi. Shu to'rt nuqtani ketma-ket birlashtirishdan hosil bo'lgan to'rtburchakning diagonallari orasidagi burchakni toping.
A) 84° B) 72°
C) 90° D) 60°

3. (a1-g12-33) Aylanaga ichki chizilgan to'rtburchakning tomonlari ketma-ket ravishda 3, 4, 4 va 5 ga teng. 3 va 4 ga teng tomonlar orasidagi burchak kosinusini toping.
A) $\frac{1}{2}$ B) $-\frac{1}{4}$ C) $-\frac{1}{2}$ D) $\frac{1}{4}$

4. (a2-g4-31) Teng yonli trapetsiyaga aylana ichki chizilgan. Trapetsiya diagonali o'rta chiziqni 7 va 3 ga teng kesmalarga ajratadi. Shu trapetsiyaning yuzasini toping.
A) 60 B) $20\sqrt{21}$
C) $40\sqrt{21}$ D) 80

5. (a2-g6-30) Aylanadan olingan to'rt nuqta aylanani 4; 5; 7 va 8 sonlariga proporsional ravishda bo'ladi. Bu nuqtalarni ketma-ket tutashtirish natijasida hosil bo'lgan to'rtburchak diagonallari orasidagi o'tkir burchakni toping.
A) 77,5 B) 82,5 C) 70 D) 65

6. (a2-g9-30) Aylana yoyidan tanlab olingan to'rt nuqta aylanani uzunliklari 2; 5; 6 va 7 sonlariga proporsional yoylarga ajratadi. Shu to'rt nuqtani ketma-ket birlashtirishdan hosil bo'lgan to'rtburchakning diagonallari orasidagi burchakni toping.
A) 84° B) 72° C) 90° D) 60°

7. (a2-g11-31) Aylana tomonlari 16 va 12 ga teng bo'lgan to'g'ri to'rtburchakning ikki kichik va bir katta tomoniga urinadi. Shu aylananing to'rtinchi tomondan ajratgan kesmasi uzunligini toping.
A) $4\sqrt{3}$ B) $6\sqrt{2}$
C) $8\sqrt{3}$ D) $9\sqrt{2}$

8. (a3-g6-31) Tomoni a ga teng beshburchakka tashqi chizilgan aylana uzunligini toping.
A) $\frac{\pi a}{\sqrt{2-2\sin 36^\circ}}$
B) $\frac{2\pi a}{\sqrt{2-2\cos 72^\circ}}$
C) $\frac{2\pi a}{\sqrt{1+2\cos 72^\circ}}$
D) $\frac{2\pi a}{\sqrt{1-\sin 36^\circ}}$

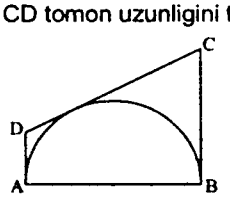
9. (a3-g16-30) Qavariq ko'pburchakka ichki chizilgan aylananing radiusi 3 ga teng. Agar ko'pburchakning perimetri 24 ga teng bo'lsa, ko'pburchakning yuzini toping.
A) 72 B) 36 C) 18 D) 144

10. (a5-g1-31) Tomoni 8 ga teng bo'lgan muntazam oltiburchakka aylana tashqi chizilgan. Aylana va oltiburchak orasida qolgan sohalar yig'indisini toping.
A) $64\pi-96\sqrt{3}$ B) $32\pi-48\sqrt{3}$
C) $64\pi-48\sqrt{3}$ D) $32\pi-32\sqrt{3}$

11. (a6-g8-26) Bir aylanaga ichki chizilgan muntazam uchburchak, kvadrat va muntazam oltiburchak yuzalarining nisbatini toping.,
A) $2\sqrt{3}:4:6\sqrt{3}$
B) $\sqrt{2}:\sqrt{3}:2$
C) $3\sqrt{3}:8:6\sqrt{3}$
D) $2\sqrt{3}:6:8\sqrt{3}$

159. Aylanaga tashqi chizilgan ko'pburchak

1. (a2-g1-31) Chizmada AB kesmaning uzunligi 8 ga teng. Agar BC tomon AD tomondan 4 marta katta bo'lsa, CD tomon uzunligini toping.



A) 15 B) 10 C) 12 D) 9

2. (a2-g14-26) $x^2 + y^2 = y - x$ tenglama bilan berilgan aylana markazining koordinatalari ko'paytmasini toping.

A) –0,25 B) $b = -\sqrt{15} - \sqrt{14}$

C) $\frac{1}{4}$ D) –0,5

3. (a2-g18-31) Tomonlari 10 va 8 ga teng bo'lgan to'rtburchakning ikkita kichik va bir katta tomoniga urinadigan aylana chizilgan. Shu aylana to'rtburchakning ikkinchi katta tomonidan qanday uzunlikdagi kesma ajratadi?

A) 3 B) 4 C) 6 D) 8

4. (a3-g24-31) Ko'pburchakka ichki chizilgan aylananing radiusi 3 ga teng. Agar shu ko'pburchakning yuzasi 24 ga teng bo'lsa, ko'pburchakning perimetrini toping.

A) 16 B) 8 C) 24 D) 12

5. (a4-g15-31) Sakkizburchakka ichki chizilgan aylana radiusining unga tashqi chizilgan aylana radiusiga nisbatini toping.

A) cos22,5° B) sin22,5°
C) tg22,5° D) ctg22,5°

6. (a4-g21-31) Ko'pburchakka ichki chizilgan aylana radiusi 6 ga teng. Agar shu ko'pburchakning perimetri 48 ga teng bo'lsa, ko'pburchakning yuzini toping.

A) 288 B) 92 C) 144 D) 216

7. (a5-g7-31) Muntazam ko'pburchakning tomoni a ga, unga ichki chizilgan aylana radiusi r ga teng bo'lsa, tashqi chizilgan aylana radiusini toping.

A) aniqlab bo'lmaydi

B) $r^2 + a^2$

C) $r^2 - \frac{a^2}{4}$

D) $r^2 + \frac{a^2}{4}$

8. (a6-g6-26) Ikkita aylananing umumiy vatari aylanalardan biri uchun ichki chizilgan kvadratning tomoni, ikkinchisi uchun esa ichki chizilgan muntazam oltiburchakning tomoni bo'lib xizmat qiladi. Agar aylanalardan kichigining radiusi $\sqrt{6} - \sqrt{2}$ bo'lsa, ularning markazlari orasidagi masofani toping?

A) 4 B) B) $2\sqrt{2}$

C) C) $\sqrt{2}$ D) 2

9. (a6-g8-23) Muntazam sakkizburchak yuzining unga ichki chizilgan doira yuziga nisbatini toping.

A) $\frac{4(\sqrt{2}-1)}{\pi}$ B) $\frac{4(\sqrt{2}+1)}{\pi}$

C) $\frac{8(\sqrt{2}+1)}{\pi}$ D) $\frac{8(\sqrt{2}-1)}{\pi}$

10. (a6-g11-36) Quyidagi qaysi qavariq to'rtburchakka ham ichki, ham tashqi aylana chizish mumkin?

A) trapetsiya
B) to'g'ri to'rtburchak
C) romb
D) parallelogramm

11. (a6-g24-10) Ko'pburchakning perimetri 26 ga teng. Agar ko'pburchakning yuzi 78 ga teng bo'lsa, unga ichki chizilgan aylana radiusini toping.

A) $3\sqrt{2}$ B) 3

C) $3\sqrt{3}$ D) 6

6-bob. Koordinatalar sistemasi

160. Nuqta koordinatasi, kesma o'rtasi koordinatasi

1. (a2-g15-32) Quyidagi nuqtalardan qaysi biri OXY tekislikda yotadi?

A) (0; 0; 7) B) (3; 0; –2)
C) (–2; 3; 0) D) (0; –2; –3)

2. (a2-g19-32) Quyidagi nuqtalardan qaysi biri OXZ tekislikda yotadi?

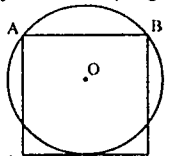
A) (0; 5; 0) B) (3; 0; –2)
C) (–2; 3; 0) D) (4; –2; –3)

3. (a3-g10-21) Birlik aylanaga tegishli va radian o'lchovi $5\pi/6$ bo'lgan nuqtaning koordinatalari qaysi javobda to'g'ri ko'rsatilgan?

A) $\left(\frac{1}{2}; -\frac{\sqrt{3}}{2}\right)$ B) $\left(-\frac{\sqrt{3}}{2}; \frac{1}{2}\right)$

C) $\left(-\frac{1}{2}; \frac{\sqrt{3}}{2}\right)$ D) $\left(\frac{\sqrt{3}}{2}; -\frac{1}{2}\right)$

4. (a4-g14-31) Rasmda ko'rsatilgan, tomoni 8 ga teng bo'lgan ABCD kvadratga O markazli doira E nuqtada urinadi. Shakldagi doira yuzasini toping.



A) 5π B) 25π C) 15π D) 16π

5. (a5-g2-32) A(2; 3; 5) va B(–4; 1; 1) nuqtalar o'rtasining koordinatasini toping.

A) (–2; 4; 6)
B) (6; 2; 4)
C) (–1; 2; 3)
D) (3; 1; 2)

6. (a5-g25-27) $y = 4$ to'g'ri chiziqda olingan nuqta B(–2; –3) va C(4; 2) nuqtalardan bir xil uzoqlikda joylashgan. Shu nuqtaning absissasini toping.

A) –3,(6) B) –2,75
C) 1,5 D) –2

7. (a6-g6-27) A(–6; 4) va B(2; –3) nuqtalar yordamida hosil qilingan kesmani A dan boshlab 4:5 nisbatda bo'luvchi nuqtaning koordinatalari x_0 va y_0 bo'lsa, $\frac{1}{x_0} + \frac{1}{y_0} = ?$

A) $\left(\frac{88}{63}\right)^{-1}$ B) $\left(\frac{63}{88}\right)^{-1}$

C) $\left(\frac{14}{88}\right)^{-1}$ D) $\left(-\frac{88}{14}\right)^{-1}$

8. (a6-g10-26) ABC muntazam uchburchak koordinatalar tekisligida shunday joylashganki, A uchi (–5, 5) nuqtada, B va C uchlari $y = -1$ to'g'ri chiziqda yotadi. B va C nuqtalarning absissalari yig'indisini toping.

A) –10 B) $4\sqrt{3}$

C) $5 - 2\sqrt{3}$ D) 0

9. (a6-g19-14) A(3; 5; –2) va C(7; –3; 6) kesmaning uchlari. A uchidan boshlab 1:3 nisbatda bo'luvchi B nuqtaning koordinatalarini toping.

A) (4; 3; 0) B) (6; –1; 4)
C) (5, 1; 2) D) (6; 0; 5)

161. Nuqtalar orasidagi masofa. Medianalar kesishish nuqtalarining koordinatalari

1. (a1-g1-13) Uchlari A(3; 4), B(–1; 2) va C(–3; –4) nuqtada bo'lgan uchburchakning AD medianasi uzunligini toping.

A) 5 B) 6
C) $5\sqrt{2}$ D) $6\sqrt{3}$

2. (a1-g3-9) Uchlari A(3; 4), B(–5; 6) va C(0; 0) nuqtalarda bo'lgan uchburchakning C uchidan chiqqan medianasi uzunligini toping.

A) 5 B) $\sqrt{17}$
C) $\sqrt{26}$ D) 6

3. (a1-g6-32) A(–4; 1; 3) va B(–2; 4; 5) nuqtalar orasidagi masofani toping

A) $\sqrt{17}$ B) $\sqrt{23}$ C) 3 D) $\sqrt{13}$

4. (a1-g16-25) M (2, 2) nuqtadan $y = x + 1$ to'g'ri chiziqqacha bo'lgan masofa a ga va $y = -x - 2$ to'g'ri chiziqqacha bo'lgan masofa b ga teng bo'lsa, $a + b$ ifodaning qiymatini aniqlang.

A) $\frac{6\sqrt{2}}{2}$ B) $\frac{\sqrt{2}}{2}$

C) $\frac{7}{\sqrt{2}}$ D) $\frac{1}{2}$

5. (a1-g17-32) A(3; 2) va B(4; 1) nuqtalardan bir xil uzoqlikda joylashgan C(a; –1) nuqtaning abssisasini toping.

A) 1 B) 3 C) –5 D) –8

6. (a2-g1-32) Uchlari A(2; 4), B(–2; 3) va C(3; 2) joylashgan uchburchakning medianalar kesishish nuqtasi A nuqtadan qanday masofada joylashgan?

A) $\frac{4}{3}$ B) 2

C) $2\sqrt{2}$ D) $\sqrt{2}$

7. (a2-g2-32) A(–6; 4; 7) nuqtadan OZ o'qigacha bo'lgan masofani toping.

A) $\sqrt{39}$ B) $2\sqrt{13}$

C) $\sqrt{85}$ D) $\sqrt{63}$

8. (a2-g5-32) A(–4; 1; 3) va B(–2; 4; 5) nuqtalar orasidagi masofani toping

A) $\sqrt{17}$ B) $\sqrt{23}$ C) 3 D) $\sqrt{13}$

9. (a2-g6-32) A(–1, 2) va B(4, –3) nuqtalar berilgan. AB kesmada C nuqta olingan va $\frac{AC}{AB}=\frac{3}{5}$. C nuqta koordinatalari yig'indisini toping

A) 1 B) –1 C) 2 D) –2

10. (a2-g16-32) Uchlari A(1; 4; –2); B(3; –1; –2) va C(5; 3; 1) nuqtalarda bo'lgan uchburchakning B uchidan medianalar kesishgan nuqtagacha bo'lgan masofani toping.

A) 4

B) $2\sqrt{2}$

C) $\frac{1}{a}<\frac{1}{a+c}<\frac{1}{a+b}$

D) $\frac{1}{a+c}<\frac{1}{a+b}<\frac{1}{a}$

11. (a2-g23-33) ABCD parallelogramning uchlari A (4; 1), B (6; 3), D (7; $\sqrt{171}-1$) nuqtalar bo'lsa, AC diagonalning uzunligini toping.

A) 12 B) $\sqrt{140}$

C) $\sqrt{221}$ D) 14

12. (a3-g8-32) x ning qanday qiymatida $M(x; 0; 0)$ nuqta $M_1\left(1; 2; \sqrt{3}\right)$ va $M_2(-2; 1; 0)$ nuqtalar dan baravar uzoqlashgan?

A) 0,5 B) 0 C) –1 D) –2

13. (a4-g9-32) Uchburchakning uchlari A(1; 5), B(–2; 3) va C(4; 9) nuqtalarda joylashgan. A uchdan chiqqan mediana uzunligini toping.

A) 5 B) 1 C) 11 D) 3

14. (a4-g11-33) A(3; 4), B(3; 5), C(–5; 3) nuqtalar yordamida hosil qilingan ABC uchburchakning V_a medianasining uzunligi nechaga teng?

A) 1 B) 5 C) 3 D) 4

15. (a4-g12-32) M(x; y) nuqtaning koordinatalari yig'indisi 8 ga teng. Bu nuqta va koordinata boshi orasidagi eng qisqa masofa qanchaga teng bo'la oladi?

A) 4 B) $2\sqrt{3}$ C) $4\sqrt{2}$ D) $3\sqrt{2}$

16. (a4-g15-32) A(1; –3; 4) va B(–5; –1; 0) nuqtalari o'rtasining koordinatasini toping.

A) (–4; –4; 4) B) (6; –4; 4)

C) (–2; –2; 2) D) (3; –2; 2)

17. (a4-g16-33) Bir uchburchakda $\vec{AB}$ (–2; –5), $\vec{AC}$ (2; –2) bo'lsa, BC tomon uzunligini toping.

A) 6 B) 8 C) 5 D) 3

18. (a4-g23-32) Uchburchakning uchlari A(–1; 4), B(2; 2) va C(5; –3) nuqtalarda joylashgan. Uchburchakning og'irlik markazi qaysi nuqtada joylashgan?

A) (–2; 1) B) (1; –2)

C) (2; 1) D) (–2; –1)

19. (a4-g24-34) A(3; 4), B(3; 5), C(–5; 3) nuqtalar yordamida hosil qilingan ABC uchburchakning A uchidan chiqqan mediana uzunligi nechaga teng?

A) 5 B) 2 C) 3 D) 4

20. (a5-g4-32) A(2; 5; –7) nuqtadan OX o'qigacha bo'lgan eng qisqa masofani toping.

A) 7 B) $\sqrt{78}$

C) 2 D) $\sqrt{74}$

21. (a5-g5-32) Uchlari A(3; 4); B(–4; 2) va C(–1; –6) nuqtalarda bo'lgan uchburchakning B uchidan chiqqan mediana uzunligini toping.

A) $2\sqrt{29}$ B) 5

C) $2\sqrt{5}$ D) $\sqrt{34}$

22. (a6-g12-26) ABC uchburchakning medianalari M nuqtada kesishadi $\left|\vec{MA}+\vec{MB}+\vec{MC}\right|=?$

A) $2\left|\vec{AB}\right|$

B) $\left|\vec{AB}+\vec{AC}+\vec{BC}\right|$

C) 0

D) $\left|2\vec{AB}+2\vec{AC}+2\vec{CB}\right|$

23. (a6-g17-27) $\vec{AB}(-9; 3; 2)$ va $\vec{AC}(-5; 7; 6)$ vektorlar ABC uchburchakning tomonlari. Shu uchburchakning AN medianasi uzunligini toping.

A) $\sqrt{90}$ B) $2\sqrt{90}$

C) $2\sqrt{3}$ D) $4\sqrt{3}$

162. Nuqtaga, to'g'ri chiziqqa nisbatan simmetriya

1. (a2-g4-32) A(3; 7; –5) nuqtaning OX o'qqa nisbatan simmetrigini toping.

A) (–3; 7; –5) B) (3; –7; 5)

C) (3; –7; –5) D) (–3; –7; 5)

2. (a2-g9-32) XZ tekislikka nisbatan A(3; –2; 4) nuqtaga simmetrik bo'lgan nuqta koordinatalarini ko'rsating.

A) (3; 2; 4)

B) (–3; –2; –4)

C) (3; –2; –4)

D) (–3; 2; –4)

3. (a2-g14-25) M(x, y) nuqta koordinata tekisligining II choragida joylashgan bo'lsa, quyidagilardan qaysi biri IV chorakda joylashgan?

A) (x, y) B) (–x, y)

C) (x, –y) D) (–x, –y)

4. (a4-g11-11) A(1; –3), B(–3; 5). AB kesmaning o'rta nuqtasini $x = 2$ to'g'ri chiziqqa nisbatan simmetrik nuqtasini ko'rsating.

A) (5; 1) B) (2; 3)

C) (3; 5) D) (3; 4)

5. (a4-g17-32) A(–4; 1) nuqtaning $x = 2$ to'g'ri chiziqqa nisbatan simmetrigi – B nuqta. Bu nuqtaning $y = –5$ to'g'ri chiziqqa nisbatan simmetrik nuqtasi koordinatalarini ko'rsating.

A) (8; –11) B) (6; –9)

C) (–8; –1) D) (8; 1)

6. (a4-g18-32) A(–2; 3; 7) va B(4; –5; –1) nuqtalar o'rtasining OXY tekislikka nisbatan simmetrigini toping

A) (1; –1; –3) B) (1; –1; 3)

C) (–1; 1; 3) D) (–1; 1; –3)

7-bob. Vektorlar

163. Vektor haqida tushuncha. Vektor koordinatasi

1. (a1-g12-32) $\vec{AB}$ (1; –1,5; –1,5) va $\vec{BC}$ (3; –4,5; –0,5) vektorlar parallelogramning tomonlaridir. Shu parallelogramning diagonallari orasidagi burchakni toping.

A) $\arccos\frac{6}{7}$ B) $\arccos\left(-\frac{5}{9}\right)$

C) $\arccos\frac{5}{9}$ D) $\arccos\frac{3}{7}$

164. Koordinatalari bilan berilgan vektorlar ustida amallar

1. (a1-g11-33) $\vec{a}$ (3, x, –2) va $\vec{b}$ (–1, 1, 2) vektorlar berilgan. x ning qanday qiymatida $\left(\vec{a}-2\vec{b}\right)^2=\left(\vec{a}+\vec{b}\right)^2$ tenglik o'rinli bo'ladi?

A) 4 B) 5 C) 10 D) 8

2. (a1-g13-32) ABCD parallelogram C uchi koordinatalari (5; 8). O(4; 5) esa parallelogramm diagonallarining kesishish nuqtasi. Parallelogramm A uchining koordinatalarini toping.

A) (4; 1)

B) (1; 4)

C) (3; 2)

D) (2; 3)

3. (a2-g1-33) ABCDEF muntazam oltiburchak. $\overrightarrow{AF}=\vec{m}$, $\overrightarrow{AB}=\vec{n}$ bo'lsa, AD vektorni $\vec{m}$ va $\vec{n}$ orqali ifodalang.
A) $\vec{m}+\vec{n}$ B) $2\vec{m}+2\vec{n}$
C) $\frac{3}{2}\vec{m}+\frac{3}{2}\vec{n}$ D) $3\vec{m}+3\vec{n}$

4. (a2-g4-33) $\vec{a}=(4;1)$, $\vec{b}=(-2;5)$, $\vec{c}=(x+1;y-1)$ va $\vec{a}-\vec{c}=2\vec{b}$ bo'lsa, $x+y=?$
A) –1 B) –2 C) 2 D) 1

5. (a2-g7-33) $\vec{a}$ (4; 2; 4) va $\vec{b}$ (3; –2; 1) vektorlar berilgan $|\vec{a}+\vec{b}|$ ning $|\vec{a}-\vec{b}|$ ga nisbatini toping.
A) $\sqrt{\frac{74}{26}}$ B) $\frac{6}{\sqrt{14}}$
C) $\frac{\sqrt{3}}{2}$ D) $\sqrt{\frac{86}{29}}$

6. (a2-g9-33) $\vec{a}(3, x, -2)$ va $\vec{b}(-1, 1, 2)$ vektorlar berilgan. x ning qanday qiymatida $(\vec{a}-2\vec{b})^2=(\vec{a}+\vec{b})^2$ tenglik o'rinli bo'ladi.
A) 4 B) 5 C) 10 D) 8

7. (a2-g10-32) $\vec{x}=\vec{i}-4\vec{j}+\vec{k}$ va $\vec{y}=-\vec{i}+2\vec{j}-2\vec{k}$, bo'lsa, $\vec{x}-\vec{y}$ yo'nalishdagi birlik vektor koordinatalari yig'indisini toping.
A) $\frac{1}{7}$ B) $\sqrt{3}$
C) $-\sqrt{3}$ D) $-\frac{1}{7}$

8. (a2-g13-32) $\vec{a}$ (x, 1, –1) va $\vec{b}$ (1, 0, 1) vektolar berilgan. x ning qanday qiymatida $(\vec{a}+3\vec{b})^2=(\vec{a}-2\vec{b})^2$ tenglik o'rinli bo'ladi.
A) $-\frac{1}{2}$ B) 0 C) 1 D) $\frac{1}{2}$

9. (a2-g20-32) ABCD parallelogramm C uchi koordinatalari (5; 8). O(4; 5) esa parallelogramm diagonallarining kesishish nuqtasi. Parallelogramm A uchining koordinatalarini toping.
A) (4; 1) B) (1; 4)
C) (3; 2) D) (2; 3)

10. (a3-g6-33) B(3; 6; –4) nuqta $\vec{a}(-4;1;5)$ vektorning oxiri bo'lsa, bu vektor boshining koordinatalarini toping.
A) (–1; 7; 1) B) (–7; –5; 9)
C) (1; –7; –1) D) (7; 5; –9)

11. (a3-g17-33) $\vec{a}$ (2; –5; 4) va $\vec{b}$ (2; –3; 2) vektorlar berilgan. $\vec{c}=2\vec{b}-4\vec{a}$ vektorning koordinatalarini toping.
A) (–4; 14; –12) B) (12; –26; 20)
C) (4; –8; 5) D) (–11; 7; 20)

12. (a3-g19-33) $\vec{a}(3;-2;5)$ va $\vec{b}(-2;5;3)$ vektorlar berilgan $\vec{c}=\vec{b}-3\vec{a}$ vektorning koordinatalarini toping.
A) (9; –17; –4) B) (7; 1; 18)
C) (–9; 19; 20) D) (–11; 11; –12)

13. (a3-g21-32) ABC to'g'ri burchakli uchburchakning koordinatalari A(a, 2); B(–3; 0) va C(2; 0) bo'lsa, a ning musbat qiymatini toping.
A) 1 B) 3 C) 2 D) 6

14. (a4-g19-33) $\vec{a}$ (–2; 5; 7) b (3; –4; 1) va vektorlar berilgan. $\vec{c}=3\vec{b}-\vec{a}$ vektorning koordinatalarini toping.
A) (11; –17; –4) B) (7; –7; 10)
C) (–9; 19; 20) D) (–11; 7; 20)

15. (a4-g20-33) $\vec{a}=(4;1)$, $\vec{b}=(-2;5)$, $\vec{c}=(x+1;y-1)$ va $\vec{a}-\vec{c}=2\vec{b}$ bo'lsa, $x+y=?$
A) –1 B) –2 C) 0 D) 4

16. (a4-g24-33) $\vec{a}=(4;1)$, $\vec{b}=(-2;5)$, $\vec{c}=(x+1;y-1)$ va $\vec{a}-\vec{c}=2\vec{b}$ bo'lsa, $x+y=?$
A) –1 B) –2 C) 0 D) 2

17. (a4-g25-33) $\vec{a}$ (3; –2; 5) va $\vec{b}$ (–2; 5; 3) vektorlar berilgan. $\vec{c}=\vec{b}-3\vec{a}$ vektorning koordinatalarini toping.
A) (9; –17; –4) B) (7; 1; 18)
C) (–9; 19; 20) D) (–11; 11; –12)

18. (a5-g5-33) $\vec{a}$ (4; –7); $\vec{b}$ (–2; 1) va $\vec{a}=2\vec{c}-3\vec{b}$ bo'lsa, $\vec{c}$ vektor koordinatalarini toping.
A) (–1; –2) B) (2; –6)
C) (6; –8) D) (–6; 8)

19. (a5-g9-33) $\vec{a}$ (12; –16; 15) vektorga qarama-qarshi yo'nalgan birlik vektorni ko'rsating.
A) $\left(-\frac{12}{25};\frac{16}{25};-\frac{3}{5}\right)$
B) $\left(-\frac{3}{5};\frac{4}{5};-\frac{3}{4}\right)$
C) $\left(-\frac{2}{5};\frac{8}{15};-\frac{1}{2}\right)$
D) $\left(\frac{3}{25};-\frac{4}{25};\frac{1}{5}\right)$

20. (a5-g13-27) $\vec{a}$ (3; –2; 5) va $\vec{b}$ (–2; 5; 3) vektorlar berilgan. $\vec{c}=\vec{b}-3\vec{a}$ vektorning koordinatalarini toping.
A) (9; –17; –4)
B) (7; 1; 18)
C) (–9; 19; 20)
D) (–11; 11; –12)

21. (a5-g19-27) ABCD parallelogramning AD tomonidan E nuqta, BC tomonidan F nuqta olindi. BF = FC va 2AE = ED. Agar $\overrightarrow{AB}$ $\vec{a}$ va $\overrightarrow{BC}$ $\vec{b}$ bo'lsa, EF vektorni $\vec{a}$ va $\vec{b}$ vektorlarga yoying.
A) $2\vec{a}-\frac{\vec{b}}{3}$ B) $\frac{\vec{a}}{2}+\frac{2\vec{b}}{3}$
C) $\vec{a}+\frac{\vec{b}}{6}$ D) $\frac{\vec{a}+3\vec{b}}{2}$

22. (a5-g23-27) $\vec{a}$ (3; –2; 5) va $\vec{b}$ (–2; 5; 3) vektorlar berilgan. $\vec{c}=\vec{b}-3\vec{a}$ vektorning koordinatalarini toping.
A) (9; –17; –4) B) (7; 1; 18)
C) (–9; 19; 20) D) (–11; 11; –12)

23. (a6-g5-27) $\vec{a}$ (2; –3; 6) vektorga perpendikulyar vektorning koordinatalari mos ketma-ketlikda ayirmasi 3 ga teng bo'lgan o'suvchi arifmetik progressiyani tashkil etadi. Shu vektorning koordinatalari yig'indisini toping.
A) –7,2 B) 7,2 C) 5,4 D) –5,4

24. (a6-g19-1) ABCD to'g'ri to'rtburchak. $\overrightarrow{AB}+\overrightarrow{AC}+\overrightarrow{CD}$ yig'indi quyidagilardan qaysi biriga teng?
A) $\overrightarrow{BC}$ B) $\overrightarrow{AD}$ C) $\overrightarrow{AC}$ D) $\overrightarrow{BD}$

165. Vektor uzunligi va moduli

1. (a1-g1-22) ABC uchburchakning AB va BC tomonlari mos ravishda 3 va 4 ga teng. Ular orasidagi burchak 120°. $\overrightarrow{AB}+\overrightarrow{BC}+\overrightarrow{AC}$ yig'indini hisoblang.
A) 10 B) 5
C) C) $2\sqrt{37}$ D) D) $2\sqrt{13}$

2. (a1-g6-33) Parallelogramning tomonlari $\vec{a}=(4;2;-2)$ va $\vec{b}=(-3;1;4)$ vektorlardan iborat. Bu parallelogramning diagonallari uzunliklari yig'indisini toping.
A) $\sqrt{14}+\sqrt{86}$ B) 7
C) $10\sqrt{3}$ D) $\sqrt{7}+\sqrt{21}$

3. (a1-g9-34) $\vec{a}(x;1;2)$ vektorning uzunligi $\sqrt{21}$ ga teng bo'lsa, x ning qiymatini toping.
A) 1 B) ±4 C) ±2 D) 2

4. (a1-g14-32) Uchlari A(2; 4), B(–1; 3) va C(6; –4) nuqtalarda bo'lgan uchburchakning B uchidan chiqqan mediana uzunligini toping
A) $3\sqrt{2}$ B) 5
C) 4 D) $\sqrt{34}$

5. (a1-g15-33) $|\vec{a}+\vec{b}|=12$, $|\vec{a}-\vec{b}|=8$ va $|\vec{a}|=5$ bo'lsa, $|\vec{b}|=?$
A) $\sqrt{79}$ B) $\sqrt{61}$
C) 9 D) 7

6. (a2-g3-28) $|\vec{a}+\vec{b}|=12$, $|\vec{a}-\vec{b}|=8$ va $|\vec{a}|=5$ bo'lsa $|\vec{b}|=?$

A) $\sqrt{79}$ B) $\sqrt{61}$ C) 9 D) 7

7. (a2-g5-33) Parallellogramning tomonlari $\vec{a}=(4;2;-2)$ va $\vec{b}=(-3;1;4)$ vektorlardan iborat. Bu parallellogramning diagonallari uzunliklari yig'indisini toping.

A) $\sqrt{14}+\sqrt{86}$ B) 7

C) $10\sqrt{3}$ D) $\sqrt{7}+\sqrt{21}$

8. (a2-g6-33) Agar $|\vec{a}|=\sqrt{2}$, $|\vec{b}|=5$ va $\vec{a}\wedge\vec{b}=45^0$ bo'lsa, $3\vec{a}-\vec{b}$ va $\vec{a}-2\vec{b}$ vektorlar yordamida yasalgan parallellogramning diagonallari kvadratlari yig'indisini toping.

A) 210 B) 190 C) 240 D) 150

9. (a2-g8-34) Vektorlar haqida keltirilgan formulalardan qaysi biri noto'g'ri?

A) $|\vec{a}+\vec{b}|\le|\vec{a}|+|\vec{b}|$

B) $|\vec{a}-\vec{b}|\le|\vec{a}|+|\vec{b}|$

C) $|\vec{a}+\vec{b}|\ge|\vec{a}|-|\vec{b}|$

D) $|\vec{a}-\vec{b}|\le|\vec{a}|-|\vec{b}|$

10. (a2-g17-33) Quyidagilardan qaysi biri modullari 8 va 3 ga teng bo'lgan vektorlarning yig'indisi moduliga teng bo'la olmaydi?

A) 4 B) 5 C) 9 D) 10

11. (a2-g18-33) Agar $|\vec{a}-\vec{b}|=9$, $|\vec{b}|=12$ va $|\vec{a}|=7$ bo'lsa, $|\vec{a}+\vec{b}|$ ni toping.

A) $\sqrt{305}$ B) $\sqrt{275}$

C) $\sqrt{206}$ D) $\sqrt{186}$

12. (a2-g19-33) $\vec{a}(5;4;2)$ va $\vec{b}(2;-2;5)$ vektorlar berilgan. $|\vec{a}+\vec{b}|$ ning $|\vec{a}-\vec{b}|$ ga nisbatini toping.

A) $\sqrt{\frac{51}{11}}$ B) $\sqrt{\frac{102}{63}}$

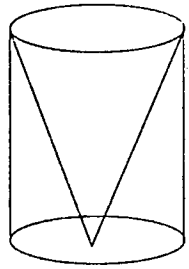
C) $\sqrt{\frac{15}{11}}$ D) $\frac{\sqrt{17}}{3}$

13. (a2-g21-33) $\vec{AB}(4;2;5)$ va $\vec{AC}(8;-2;-3)$ vektorlar ABC uchburchakning tomonlari. Shu uchburchakning AN medianasi uzunligini toping.

A) $\sqrt{24}$ B) $\sqrt{148}$

C) $\sqrt{37}$ D) $\sqrt{96}$

14. (a3-g1-32) A(–4; –3); B(1; 5) va C(2; –5) nuqtalar ABC uchburchakning uchlari. Uchburchakning BM medianasi uzunligini toping.



A) $\sqrt{85}$ B) $\sqrt{73}$

C) $\sqrt{68}$ D) $3\sqrt{10}$

15. (a3-g1-33) ABCD to'g'ri to'rtburchakning tomonlari 24 va 10 ga teng. O nuqta to'rtburchakning diagonallari kesishish nuqtasi bo'lsa, $\vec{BC}-\vec{DC}+\vec{OB}$ vektorning uzunligini toping.

A) 34 B) 60 C) 13 D) 47

16. (a3-g2-33) $\vec{a}(-1;2;11)$ va $\vec{b}(3;4;5)$ vektorlar berilgan $\vec{c}=2\vec{b}-\vec{a}$ vektorning uzunligni toping.

A) $\sqrt{68}$ B) $\sqrt{86}$

C) $2\sqrt{10}$ D) $\sqrt{104}$

17. (a3-g3-34) Vektorlar haqida keltirilgan formulalardan qaysi biri noto'g'ri?

A) $|\vec{a}+\vec{b}|\le|\vec{a}|+|\vec{b}|$

B) $|\vec{a}-\vec{b}|\le|\vec{a}|+|\vec{b}|$

C) $|\vec{a}+\vec{b}|\ge|\vec{a}|-|\vec{b}|$

D) $|\vec{a}-\vec{b}|\le|\vec{a}|-|\vec{b}|$

18. (a3-g5-32) Ikki vektorning yig'indisi moduli, ayirmasi modulidan 4 marta katta. Agar bu vektorlarning modullari 3 va 4 ga teng bo'lsa, vektorlarning yig'indisi modulini toping.

A) $8\sqrt{\frac{10}{7}}$ B) $20\sqrt{\frac{2}{17}}$

C) $4\sqrt{\frac{5}{3}}$ D) $4\sqrt{\frac{5}{34}}$

19. (a3-g5-33) Modullari 5 va 4 ga teng bo'lgan vektorlarning yig'indi vektorining moduli quyidagilardan qaysi biriga teng bo'la olmaydi?

A) 1 B) 9 C) 7 D) 20

20. (a3-g7-33) Bir uchburchakda $\vec{AB}(-4;6)$, $\vec{AC}(2;-2)$ bo'lsa, $\vec{BC}$ vektorning uzunligini toping.

A) 10 B) $2\sqrt{10}$

C) 6 D) 14

21. (a3-g13-33) Parallelogramning tomonlari $\vec{a}(1;4;3)$ va $\vec{b}(-3;-2;5)$ vektorlardan iborat. Bu parallelogramning diagonallari uzunliklari ko'paytmasini toping.

A) $10\sqrt{3}$ B) $4\sqrt{21}$

C) $2\sqrt{247}$ D) $12\sqrt{28}$

22. (a3-g19-32) A(–9; 7; –1) va B(3; –2; 5) nuqtalar berilgan. AB kesmada shunday C nuqta olinganki $2\cdot|BC|=|AC|$ tenglikni qanoatlantiradi. C nuqtaning koordinatalarini toping.

A) (–5; 4; 1) B) (–3; 2,5; 2)

C) (–1; 1; 3) D) (–4; 3; 3)

23. (a3-g20-33) ABC teng tomonli uchburchak bo'lsa, $\vec{BA}-\vec{CA}$ ayirma quyidagilardan qaysi biriga teng?

A) $\vec{AB}$ B) $2\vec{AC}$

C) $\vec{BC}$ D) 0

24. (a3-g22-33) Agar $|\vec{a}|=\sqrt{137}$, $|\vec{a}+\vec{b}|=20$, $|\vec{a}-\vec{b}|=9\sqrt{2}$ bo'lsa, $|\vec{b}|=?$

A) $8\sqrt{2}$ B) 15

C) $7\sqrt{2}$ D) 12

25. (a3-g24-33) ABC uchburchak berilgan. Quyidagilardan qaysi biri $\vec{AC}-\vec{AB}$ ga teng?

A) $\vec{CB}$ B) $2\vec{BC}$

C) $-\vec{CB}$ D) $2\vec{CB}$

26. (a4-g5-33) $\vec{AB}(4;2;5)$ va $\vec{AC}(8;-2;-3)$ vektorlar ABC uchburchakning tomonlari. Shu uchburchakning AN medianasi uzunligini toping.

A) $\sqrt{24}$ B) $\sqrt{148}$

C) $\sqrt{37}$ D) $\sqrt{96}$

27. (a4-g7-33) $\vec{AB}(7;3;-1)$ va $\vec{AC}(-4;6;2)$ vektorlar uchburchakning tomonlari bo'lsa, shu uchburchakning B uchidan chiqqan mediana uzunligini toping.

A) $\sqrt{85}$ B) $\sqrt{74}$ C) $\sqrt{68}$ D) $\sqrt{29}$

28. (a4-g9-33) $|\vec{a}|=5$, $|\vec{b}|=13$, $|\vec{b}-\vec{a}|=2\sqrt{17}$ bo'lsa, $|\vec{a}+\vec{b}|=?$

A) $\sqrt{6}$ B) $4\sqrt{3}$ C) $8\sqrt{5}$ D) $5\sqrt{6}$

29. (a4-g10-33) Agar $|\vec{a}|=\sqrt{2}$, $|\vec{b}|=5$ va $\vec{a}\wedge\vec{b}=45^0$ bo'lsa, $3\vec{a}-\vec{b}$ va $\vec{a}-2\vec{b}$ vektorlar yordamida yasalgan parallelogramning diagonallari kvadratlari yig'indisini toping.

A) 210 B) 190 C) 240 D) 150

30. (a4-g18-33) $\vec{a}(1;-3;-7)$ va $\vec{b}(-1;2;-6)$ vektorlar yordamida yasalgan parallelogramning katta diagonali uzunligini toping.

A) $\sqrt{30}$ B) $\sqrt{170}$

C) $\frac{\sqrt{99}}{2}$ D) 8

31. (a4-g21-33) Bir uchburchakda $\vec{AB}(-2;-5)$, $\vec{AC}(2;-2)$ bo'lsa, BC tomon uzunligini toping.
A) 6 B) 8 C) 5 D) 3

32. (a4-g22-33) Quyidagilardan qaysi biri modullari 8 va 3 ga teng bo'lgan vektorlarning yig'indisi moduliga teng bo'la olmaydi?
A) 4 B) 5 C) 9 D) 10

33. (a5-g3-33) A(4; 2), B(–3; 5) va $\vec{AB}-2\vec{AC}=\vec{BC}$ bo'lsa, C nuqtaning koordinatalarini toping.

A) $\left(-\frac{1}{2};-\frac{5}{3}\right)$ B) (–2,5; 1)

C) $\left(9;-\frac{11}{3}\right)$ D) $\left(-\frac{2}{3};4\right)$

34. (a5-g22-27) Ikki vektorning uzunliklari mos ravishda 7 va 14 ga teng. Bu vektorlar ayirmasi nechta butun qiymat qabul qilishi mumkin?
A) 13 B) 21 C) 15 D) 14

35. (a5-g24-27) Tomoni 6 ga teng bo'lgan, ABC muntazam uchburchakning medianalari g nuqtada kesishadi. $\left|\vec{AG}+\vec{BG}+\vec{GC}\right|$ ni hisoblang.

A) 0 B) 12
C) $4\sqrt{3}$ D) 6

36. (a6-g1-27) K nuqta ABCD tetraedrda AC qirra markazi va $\vec{BA}=\vec{a}$, $\vec{BC}=\vec{b}$ va $\vec{BD}=\vec{c}$ bo'lsa, $\vec{DK}$ vektorni ushbu vektorlar orqali ifodalang.

A) $\frac{1}{2}(\vec{a}+\vec{b})+\vec{c}$ B) $\vec{a}+\vec{b}+\vec{c}$

C) $\vec{a}+\vec{b}-\vec{c}$ D) $\frac{1}{2}(\vec{a}+\vec{b})-\vec{c}$

37. (a6-g2-27) AB ABCD trapetsiyaning katta asosi va A burchak 27° va B burchak 33°. AD va BC yon tomonlari mos ravishda 7 va 4 ga teng bo'lsa, $\left|\vec{AD}+\vec{BC}\right|$ ni toping.

A) 9 B) $\sqrt{37}$
C) $\sqrt{93}$ D) $2\sqrt{21}$

38. (a6-g10-27) ABCD rombning BD va AC diagonallari 6 va 8 ga teng bo'lsa, $\left|\vec{AB}-\vec{BD}+\vec{AD}-\vec{DC}\right|$ ning qiymatini toping.
A) 15 B) 5 C) 10 D) 8

39. (a6-g15-2) 2. $\vec{a}(-2;5;-3)$ vektorga qarama-qarshi yo'nalgan va uzunligi 8 ga teng vektorni toping.

A) $\left(\frac{16}{\sqrt{38}};-\frac{40}{\sqrt{38}};\frac{24}{\sqrt{38}}\right)$

B) $\left(-\frac{24}{\sqrt{10}};\frac{40}{\sqrt{10}};-\frac{16}{\sqrt{10}}\right)$

C) $\left(4;-6;2\sqrt{3}\right)$

D) $\left(\frac{16}{\sqrt{29}};-\frac{32}{\sqrt{29}};\frac{24}{\sqrt{29}}\right)$

40. (a6-g21-3) k ning qanday qiymatlarida $\vec{a}(-1;3k;5)$ vektorning uzunligi $b(3;-4;9)$ vektorning uzunligidan qisqa bo'ladi?

A) $\left(-\frac{4\sqrt{5}}{3};\frac{4\sqrt{5}}{3}\right)$

B) $\left(-\frac{\sqrt{5}}{7};\frac{\sqrt{5}}{7}\right)$

C) $\left(-\frac{8\sqrt{5}}{3};\frac{8\sqrt{5}}{3}\right)$

D) $\left(-\frac{3\sqrt{5}}{4};\frac{3\sqrt{5}}{4}\right)$

166. Vektorlarning skalyar ko'paytmasi

1. (a1-g3-23) Agar $\vec{a}$ vektor $\vec{b}(3;-2;1)$ vektorga kollinear va $\vec{a}\cdot\vec{b}=7$ bo'lsa, $\vec{a}$ ning uzunligini toping.

A) 1 B) $\frac{\sqrt{14}}{2}$

C) $\frac{\sqrt{7}}{2}$ D) 2

2. (a1-g4-34) ABC tomoni 4 sm bo'lgan teng tomonli uchburchak bo'lsa, $\vec{AB}\cdot\vec{AC}+\vec{BA}\cdot\vec{BC}=?$
A) 2 B) 4 C) 8 D) 16

3. (a1-g8-33) ABC uchburchakning AB kateti 3 ga teng. Uning BC katetiga AD kesma o'tkazilgan. $\vec{AB}\cdot\left(\vec{AD}+\vec{AC}\right)$ ko'paytmaning qiymatini toping.
A) 18 B) 12 C) 9 D) 6

4. (a1-g13-33) $\vec{AB}$ (–3; 1; 4), $\vec{BC}$ (–2; 3; –7) va $\vec{CD}$ (5; –1; 4) lar ABCD to'rtburchakning tomonlari bo'lsa, shu to'rtburchakning AC va BD diagonallaridan iborat vektorlar skalyar ko'paytmasini toping.
A) 12 B) 16 C) 5 D) 2

5. (a2-g15-33) m ning qanday qiymatida $\vec{a}(m^2+1;3;2m-3)$ va $\vec{b}(1;m;5)$ vektorlar skalyar ko'paytmasi eng kichik qiymatga erishadi?
A) –6,5 B) 1 va –14
C) 56,25 D) –10

6. (a2-g20-33) $\vec{AB}$ (–3; 1; 4), $\vec{BC}$ (–2; 3; –7) va $\vec{CD}$ (5; –1; 4) lar ABCD to'rtburchakning tomonlari bo'lsa, shu to'rtburchakning diagonallaridan iborat vektorlar skalyar ko'paytmasini toping.
A) 12 B) 16 C) 5 D) 2

7. (a3-g4-33) m ning qanday qiymatida $\vec{a}(m-1;7;m^2-2)$ va $\vec{b}(3;-m;1)$ vektorlar skalyar ko'paytmasi eng kichik qiymatga erishadi?
A) 0 B) 2
C) 5 va –1 D) –9

8. (a3-g9-32) DABC tetraedrning uchlari. Tetraedrning qirrasi 6 sm ga teng. $\vec{DC}\cdot\vec{DB}-\vec{AB}\cdot\vec{BC}$ ni hisoblang.
A) – 36 B) 0 C) 36 D) 18

9. (a3-g12-33) m ning qanday qiymatida $\vec{a}(m-1;7;m^2-2)$ va $\vec{b}(3;-m;1)$ vektorlar skalyar ko'paytmasi eng kichik qiymatga erishadi?
A) 0 B) 2
C) 5 va – 1 D) – 9

10. (a3-g18-33) $\vec{a}(m-1;7;m^2-2)$va $\vec{b}(3;-m;1)$ vektorlar skalyar ko'paytmasining eng kichik qiymatini toping.
A) 0 B) –9 C) –1 D) 2

11. (a3-g21-33) $\vec{a}(2;3;x)$ va $\vec{b}(x;3;-2)$ vektorlarning skalyar ko'paytmasini toping.
A) $4x+9$ B) $9-8x$
C) 9 D) 8

12. (a3-g23-33) $\vec{A}=3\vec{i}-2\vec{j}$, $\vec{B}=6\vec{j}-3\vec{i}$ bo'lsa, $\left(\vec{B}+\vec{A}\right)\cdot\left(\vec{B}-\vec{A}\right)$ ning qiymati nechaga teng?
A) 32 B) 58 C) –58 D) –32

13. (a4-g4-33) ABC uchburchakning AB, BC va AC tomonlari mos ravishda 4, 8 va 6 ga teng. $\vec{BC}\cdot\left(\vec{AB}+\vec{CA}\right)$ vektorlarning skalyar ko'paytmasini toping.
A) –64 B) –48 C) –32 D) –24

14. (a4-g6-33) ABC tomoni 4 sm bo'lgan teng tomonli uchburchak bo'lsa, $\vec{AB}\cdot\vec{AC}+\vec{BA}\cdot\vec{BC}=?$
A) 2 B) 4 C) 8 D) 16

15. (a4-g8-33) m ning qanday qiymatida $\vec{a}(m-1;7;m^2-2)$ va $\vec{b}(3;-m;1)$ vektorlar skalyar ko'paytmasi eng kichik qiymatga erishadi?
A) 0 B) 2
C) 5 va –1 D) –9

16. (a4-g15-33) $\vec{a}(x;2;-1)$ va $\vec{b}(1;1;2)$ vektorlar berilgan. x ning qanday qiymatida $\left(\vec{a}-3\vec{b}\right)^2=\left(\vec{a}+2\vec{b}\right)^2$ tenglik o'rinli bo'ladi?
A) –1 B) 2 C) 3 D) –3

17. (a4-g17-33) ABC muntazam uchburchakning BC tomonidan K nuqta olindi. BK = 3KC ga teng. $\overrightarrow{AC}\cdot\overrightarrow{AK}$ vektorlar ko'paytmasi $\overrightarrow{KC}^2$ dan necha marta katta?
A) 9 B) 14 C) 12 D) 13

18. (a4-g23-33) $\vec{a}\,(x, 2, -1)$ va $\vec{b}\,(1, 1, 2)$vektorlar berilgan. x ning qanday qiymatida $(\vec{a}-3\vec{b})^2=(\vec{a}+2\vec{b})^2$ tenglik o'rinli bo'ladi?
A) –1 B) 2 C) 3 D) –3

19. (a5-g1-33) ABC uchburchakda $a = 5$, $b = 7$ va $c = 3$. $\overrightarrow{BC}\cdot\overrightarrow{BA}$ vektorlar skalyar ko'paytmasini toping.
A) 5 B) –10,5
C) –7,5 D) 3,5

20. (a5-g2-33) $\vec{a}=\sin25°\vec{i}+\cos25°\vec{j}$ va $\vec{b}=\cos35°\vec{i}+\sin35°\vec{j}$ vektorlarning skalyar ko'paytmasini toping.
A) $\frac{1}{2}$ B) $\frac{\sqrt{3}}{2}$ C) $\frac{\sqrt{2}}{2}$ D) 0

21. (a5-g4-33) ABC uchburchakda $\angle A = 75°$; $\angle B = 45°$ va AC = 4 bo'lsa, $\overrightarrow{CA}$ va $\overrightarrow{CB}$ vektorlarning skalyar ko'paytmasini toping.
A) $4\sqrt{6}$ B) $4+4\sqrt{3}$
C) $12\sqrt{2}$ D) $4+2\sqrt{3}$

22. (a5-g7-33) Parallelogramning tomonlari $\vec{a}\,(4; -1)$ va $\vec{b}\,(3; 1)$ vektorlardan iborat. Shu parallelogramning yuzini toping.
A) 10 B) 7 C) 17 D) 11

23. (a5-g11-27) $|\vec{m}|=3$, $|\vec{n}|=4$ va bu vektorlar orasidagi burchak 60°. $(2\vec{m}+3\vec{n})\cdot(3\vec{m}-2\vec{n})$ ni hisoblang.
A) 18 B) –42 C) –12 D) 42

24. (a5-g16-27) $|\vec{a}|=5$, $|\vec{b}|=12$. $\vec{a}$ va $\vec{b}$ vektorlar orasidagi burchak 60° bo'lsa, $|\vec{a}-\vec{b}|$ ning qiymatini toping.
A) 13 B) $\sqrt{229}$
C) 17 D) $\sqrt{109}$

25. (a5-g17-12) $|\vec{a}|=12$ va $|\vec{b}|=5$. Bu ikki vektor orasidagi burchak 120° ni tashkil etadi. $|\vec{a}-\vec{b}|$ ning qiymatini toping.
A) 7 B) $\sqrt{229}$
C) $\sqrt{109}$ D) 13

26. (a6-g3-27) $|\vec{m}|=7$ va $|\vec{n}|=8$ va bu vektorlar orasidagi burchak 120° ga teng bo'lsa, $(2\vec{m}-3\vec{n})\cdot(3\vec{m}+\vec{n})$ ni hisoblang.
A) 298 B) –94 C) 490 D) 682

27. (a6-g4-27) ABCD to'g'ri to'rtburchakning AB va AD tomonlari 8 va 12 ga teng. E – DC tomonning, F esa BC tomonning o'rtalari. $\overrightarrow{AF}\cdot\overrightarrow{AE}$ ko'paytmani toping.
A) 104 B) $24\sqrt{6}$
C) $48\sqrt{2}$ D) 50

28. (a6-g18-29) $\vec{a}(\sin36°; \cos24°)$ va $\vec{b}(\sin24°; -\cos36°)$ bo'lsa, $\vec{a}\cdot\vec{b}$ ni hisoblang.
A) $\frac{\sqrt{3}}{2}$ B) cos12°
C) sin12° D) –0,5

29. (a6-g20-22) $\vec{a}(x; 2; -1)$ va $\vec{b}(1; 3; 2)$ vektorlar berilgan. x ning qanday qiymatida $(\vec{a}-3\vec{b})^2=(\vec{a}+2\vec{b})^2$ tenglik o'rinli bo'ladi?
A) –2 B) 0,5 C) 0,(3) D) 3

30. (a6-g23-18) $\vec{a}(m^2+24; 2; 2m-4)$ va $\vec{b}(1; m; 3)$ vektorlar berilgan. m ning qanday qiymatlarida a va b vektorlarning skalyar ko'paytmasi eng kichik bo'ladi?
A) –6; –2 B) –4
C) –3; –4 D) –16

31. (a6-g24-14) $\vec{a}$ va $\vec{b}$ vektorlar kollinear va $\vec{b}\perp\vec{c}$ bo'lsa, $(\vec{a}+\vec{b}+\vec{c})\cdot\vec{c}$ quyidagilardan qaysi biriga teng?
A) $\vec{c}$ B) 0
C) $\vec{c}^2$ D) $\vec{a}+\vec{b}$

167. Vektorlar orasidagi burchak

1. (a1-g2-34) m ning qanday qiymatida $\vec{a}(3; m^2+1; 1)$ va $\vec{b}(2m-1; 3; 3)$ vektorlar perpendikulyar bo'ladi?
A) 0; 1 B) –2; 1
C) –1 D) –2

2. (a1-g5-33) $|\vec{a}|=4$ va $|\vec{b}|=6$ hamda $|\vec{a}|$ va $|\vec{b}|$ vektorlar orasidagi burchak 60° bo'lsa, $\vec{c}=2\vec{a}+\vec{b}$ vektorning uzunligini toping.
A) $2\sqrt{13}$ B) 10
C) $2\sqrt{37}$ D) $2\sqrt{31}$

3. (a1-g7-33) m ning qanday qiymatida $\vec{a}(3; m^2+1; 1)$ va $\vec{b}(2m-1; 3; 3)$ vektorlar perpendikulyar bo'ladi?
A) –1 B) –2; 1
C) 0; 1 D) –2

4. (a1-g10-32) m ning qanday qiymatida $\vec{a}(3; m^2+1; 1)$ va $\vec{b}(2m-1; 3; 3)$ vektorlar perpendikulyar bo'ladi?
A) –1 B) –2; 1
C) 0; 1 D) –2

5. (a1-g14-33) $\vec{a}\,(2; 4)$ va $\vec{b}\,(-1; 2)$ vektorlar orasidagi burchak sinusini toping.
A) $\frac{\sqrt{10}}{5}$ B) $\frac{\sqrt{10}}{15}$
C) $\frac{3}{5}$ D) $\frac{4}{5}$

6. (a1-g16-34) m ning qanday qiymatida $\vec{a}\,(3; m^2+1; 1)$ va $\vec{b}\,(2m-1; 3; 3)$ vektorlar perpendikulyar bo'ladi?
A) 0; 1 B) –2; 1
C) –1 D) –2

7. (a2-g2-33) Uchlari A(4; –2; 6), B(0; 4; 2) va C(–4; 6; –2) uchburchakning B uchidan chiqqan mediana va AC tomon orasidagi burchakni toping.
A) $\arccos\frac{\sqrt{3}}{6}$ B) $\arccos\frac{\sqrt{2}}{6}$
C) $\arccos\frac{\sqrt{3}}{9}$ D) $\arccos\frac{1}{\sqrt{3}}$

8. (a2-g11-33) Uchlari A(–2; 4; –4), B(2; 2; 2) va C(6; –2; 2) uchburchakning A uchidan chiqqan mediana va BC tomon orasidagi burchakni toping.
A) $\arccos\frac{7}{3\sqrt{22}}$ B) $\arccos\frac{5}{2\sqrt{11}}$
C) $\arccos\frac{7}{2\sqrt{11}}$ D) $\arcsin\frac{9}{2\sqrt{22}}$

9. (a2-g12-31) Bir uchi koordinatalar boshida, ikkinchi uchi OX o'qida yotuvchi muntazam uchburchakning uchinchi uchi A(a; 9) nuqtada yotadi. Shu uchburchakning yuzini toping.
A) $18\sqrt{3}$ B) $9\sqrt{3}$
C) $\frac{81}{4}\sqrt{3}$ D) $27\sqrt{3}$

10. (a2-g12-32) Agar $\vec{x}(1; -\cos\alpha; \sin\alpha)$ va $\vec{y}(0; \sin\alpha; \cos\alpha)$ bo'lsa, $2\vec{x}$ va $0{,}5\vec{y}$ orasidagi burchak kosinusini toping.
A) 90° B) 1 C) 0 D) 0,5

11. (a2-g14-28) $\vec{x}(0, 4)$ vektori bilan orasidagi burchak 30° va uzunligi 6 birlik bo'lgan vektorni ko'rsating.
A) $(-3, 3\sqrt{3})$ B) $(\sqrt{3}, 0)$
C) 2^{3^4} D) $(0, 1)$

12. (a2-g16-33) $|\vec{a}|=3$ va $|\vec{b}|=4$ ga teng. $\vec{p}=2\vec{a}-3\vec{b}$ va $\vec{q}=3\vec{a}+2\vec{b}$ vektorlar bir-biriga perpendikulyar bo'lsa, $\vec{a}$ va $\vec{b}$ vektorlar orasidagi burchakni toping.

A) $\arccos 0,7$ B) $\arccos\frac{7}{15}$

C) $\arccos\left(-\frac{7}{15}\right)$ D) $\arccos(-0,7)$

13. (a2-g22-33) $\vec{a}$ va $\vec{b}$ vektorlar $60°$ li burchka tashkil qiladi va $\vec{a}\cdot\vec{b}=8$. Shu vektorlarga qurilgan uchburchakning yuzini toping.

A) $8\sqrt{3}$ B) 4

C) 8 D) $4\sqrt{3}$

14. (a3-g8-33) $\overrightarrow{AB}(-2;-0,5;-1)$ va $\overrightarrow{BC}(4;8,5;17)$ vektorlar parallelogramning qo'shni tomonlari. Uning AC va BD diagonallari orasidagi burchakni toping.

A) $\arccos\frac{62}{63}$ B) $\arccos\left(-\frac{62}{63}\right)$

C) $\arccos\frac{58}{63}$ D) $\arccos\frac{34}{63}$

15. (a3-g10-33) Uchlari A(4; –2; 6), B(0; 4; 2) va C(–4; 6; –2) uchburchakning B uchidan chiqqan mediana va AC tomon orasidagi burchakni toping.

A) $\arccos\frac{2}{\sqrt{3}}$ B) $\arccos\frac{1}{3}$

C) $\arccos\frac{2}{3}$ D) $\arccos\frac{1}{\sqrt{3}}$

16. (a3-g14-33) $|\vec{a}|=3$ va $|\vec{b}|=4$. Bu ikki vektor orasidagi burchak qanday bo'lganda $2\vec{a}-\vec{b}$ va $\vec{a}-3\vec{b}$ vektorlar perpendikulyar bo'ladi?

A) $\arccos\frac{66}{84}$ B) $\arccos\frac{16}{21}$

C) $\arccos\frac{4}{7}$ D) 0°

17. (a3-g16-33) m ning qanday qiymatida $\vec{a}(1;m^2+2;1)$ va $\vec{b}(m-1;3;-5)$ vektorlar perpendikulyar bo'ladi?

A) 0;1 B) 1

C) 0; –0,(3) D) 0,(3)

18. (a4-g1-32) A(2; 5), B(–1; 3) va C(m; 6) va $\overrightarrow{AB}\perp\overrightarrow{BC}$ bo'lsa, m = ?

A) –3 B) –1 C) 3 D) 1

19. (a4-g2-33) $|\vec{a}|=5$ va $|\vec{b}|=4$. Bu ikki vektorlarning orasidagi burchak qanday bo'lganda $2\vec{a}-3\vec{b}$ va $3\vec{a}-\vec{b}$ vektorlar perpendikulyar bo'ladi?

A) $\arccos\frac{21}{50}$ B) $\arccos\frac{9}{10}$

C) $\arccos\frac{3}{5}$ D) $\arccos\frac{\sqrt{19}}{10}$

20. (a4-g10-32) Uchburchakning uchlari A(1; 2), B(3; 6) va C(6; 3) nuqtalarda yotadi. Shu uchburchakning AC tomoni va shu tomonga tushirilgan mediana orasidagi burchakni toping.

A) $\arcsin\frac{5}{\sqrt{13}}$ B) 60°

C) 75° D) $\arccos\frac{1}{5\sqrt{13}}$

21. (a4-g12-33) xOy tekisligida yotgan $\vec{b}$ vektor $\vec{a}(2;-4;5)$ vektorga perpendikulyar. Agar $|\vec{b}|=4\sqrt{5}$ bo'lsa, uning absissasi va ordinatasi qiymatlari ko'paytmasini toping.

A) 16 B) 8 C) 36 D) 32

22. (a5-g8-33) $|\vec{a}|=5$, $|\vec{b}|=12$. $\vec{a}$ va $\vec{b}$ vektorlar orasidagi burchak 60° bo'lsa, $|\vec{a}+\vec{b}|$ ning qiymatini toping.

A) 13 B) $\sqrt{229}$

C) 17 D) $\sqrt{109}$

23. (a5-g10-33) xOy tekislikda yotgan $\vec{b}$ vektor $\vec{a}$ (2; –4; 5) vektorga perpendikulyar. Agar $|\vec{b}|=4\sqrt{5}$ bo'lsa, uning absissasi va ordinatasi qiymatlari ko'paytmasini toping.

A) 32 B) 8 C) 36 D) 16

24. (a5-g14-27) A(1; –4; 3), B(–2; 3; 2), C(5; 2; –3) va D(–2; –1; –1) to'rtburchakning uchlari. Bu to'rtburchakning diagonallari orasidagi burchakni toping.

A) $\arccos\frac{4\sqrt{2}}{55}$ B) $\arccos\frac{3}{55}$

C) $\arccos\frac{\sqrt{22}}{55}$ D) $\arccos\frac{3\sqrt{22}}{110}$

25. (a5-g15-9) $|\vec{a}|=4$ va $|\vec{b}|=6$ hamda $\vec{a}$ va $\vec{b}$ vektorlar orasidagi burchak 60° bo'lsa, $\vec{c}=2\vec{a}+\vec{b}$ vektorning uzunligini toping.

A) $2\sqrt{13}$ B) 10

C) $2\sqrt{37}$ D) $2\sqrt{31}$

26. (a5-g18-26) $|\vec{a}|=5$ va $|\vec{b}|=7$. Bu vektorlar orasidagi burchak 120° bo'lsa, $\vec{a}$ va $\vec{b}-\vec{a}$ vektorlar orasidagi burchakning kosinusini toping.

A) $\frac{-7}{2\sqrt{109}}$ B) $\frac{-17}{2\sqrt{109}}$

C) $\frac{3}{2\sqrt{39}}$ D) $\frac{3}{2\sqrt{109}}$

27. (a6-g8-27) $\vec{b}$ (–3; 0) vektor bilan 60° li burchak hosil qiluvchi va uzunligi 2 birlikka teng bo'lgan vektorni toping.

A) $(-\sqrt{3};-1)$ yoki $(-\sqrt{3};1)$

B) $(\sqrt{3};-1)$ yoki $(-\sqrt{3};-1)$

C) $(-1;-\sqrt{3})$ yoki $(-1;\sqrt{3})$

D) $(1;-\sqrt{3})$ yoki $(1;\sqrt{3})$

28. (a6-g14-2) α $\vec{a}$ va $\vec{b}$ vektorlar orasidagi burchak bo'lsa, quyidagi mulohazalardan nechtasi to'g'ri?

1) $|\vec{a}-\vec{b}|<|\vec{a}+\vec{b}|$ agar $0<\alpha<90°$;

2) $|\vec{a}-\vec{b}|>|\vec{a}+\vec{b}|$ agar $90°<\alpha<180°$;

3) $|\vec{a}-\vec{b}|=|\vec{a}+\vec{b}|$ agar $\alpha=90°$;

4) $\overrightarrow{AB}=\overrightarrow{BA}$ 5) $(\overrightarrow{AB})^2=(\overrightarrow{BA})^2$.

A) 5 B) 1 C) 2 D) 4

29. (a6-g16-8) $|\vec{a}|=4$ va $|\vec{b}|=6$ hamda $\vec{a}$ va $\vec{b}$ vektorlar orasidagi burchak 60° bo'lsa, $\vec{c}=2\vec{a}+\vec{b}$ vektorning uzunligini toping.

A) $2\sqrt{13}$ B) 10

C) $2\sqrt{37}$ D) $2\sqrt{31}$

168. Kollinyar vektorlar

1. (a3-g15-33) $\vec{a}$ (3; –6; 6)vektorga kollinear va $\vec{a}\vec{b}=40,5$ tenglikni qanoatlantiruvchi $\vec{b}$ vektorni toping.

A) (3; 6; 9) B) (1,5; –3; 3)

C) (–3; 6; –6) D) (0,5; –1; 1)

2. (a4-g11-21) 21. $\vec{A}(-8;15)$ vektorga parallel birlik vektorni toping.

A) $\left(-\frac{1}{\sqrt{2}};\frac{1}{\sqrt{2}}\right)$ B) $\left(-\frac{8}{17};\frac{15}{17}\right)$

C) $\left(-\frac{8}{7};\frac{15}{7}\right)$ D) (1; 1)

3. (a4-g14-34) $\vec{A}(1;1)$, $\vec{B}(a;3)$, $\vec{C}(2;b)$ $\overrightarrow{AC}$ vektor $\vec{B}$ vektorga kollinear va $\vec{B}\perp\vec{A}$ bo'lsa, b = ?

A) –1 B) –3 C) –2 D) 0

4. (a5-g21-27) $\vec{a}$ (12; –16; 15) vektorga qarama-qarshi yo'nalgan birlik vektorni ko'rsating.

A) $\left(-\frac{12}{25};\frac{16}{25};-\frac{3}{5}\right)$

B) $\left(-\frac{3}{5};\frac{4}{5};-\frac{3}{4}\right)$

C) $\left(-\frac{2}{5};\frac{8}{15};-\frac{1}{2}\right)$

D) $\left(\frac{3}{25};-\frac{4}{25};\frac{1}{5}\right)$

5. (a6-g11-33) $\vec{a}$ (6; –24; –8) vektorga qarama-qarshi yo'nalgan birlik vektorni ko'rsating.

A) $\left(-\frac{3}{26}; \frac{12}{26}; \frac{4}{26}\right)$

B) $\left(\frac{8}{26}; -\frac{12}{26}; -\frac{6}{26}\right)$

C) $\left(-\frac{3}{13}; \frac{12}{13}; \frac{4}{13}\right)$

D) $\left(-\frac{3}{20}; \frac{3}{5}; \frac{1}{5}\right)$

8-bob. Fazoda to'g'ri chiziq va tekisliklar

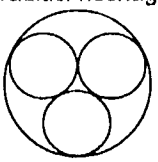
169. Perpendikulyar, og'ma, og'maning tekislikdagi proyeksiyasi

1. (a1-g1-23) Fazodagi nuqtadan tekislikka uzunliklari 11 va 9 ga teng bo'lgan og'malar tushirildi. Bu og'malarning proyeksiyalari bir-biriga perpendikulyar. Agar shu nuqtadan tekislikkacha bo'lgan eng qisqa masofa 7 ga teng bo'lsa, og'malarning tekislikdagi uchlari orasidagi masofani toping.

A) $2\sqrt{26}$ B) $2\sqrt{13}$

C) $\sqrt{202}$ D) $\sqrt{98}$

2. (a1-g1-24) Radiusi 3 ga teng bo'lgan kichik aylanalar bir-biriga urinadi. Katta aylana kichik aylanalarning har biriga tashqaridan urinadi. Katta aylananing radiusi nechaga teng?



A) $2\sqrt{3}+1$ B) $2\left(\sqrt{3}+1\right)$

C) $2\sqrt{3}+3$ D) $\sqrt{3}+3$

3. (a1-g3-8) Tekislikka tushirilgan og'maning uzunligi uning proyeksiyasidan 3 marta katta. Og'ma va tekislik orasidagi burchakni toping.

A) $\arcsin\frac{2\sqrt{2}}{3}$ B) arctg3

C) $\arcsin\frac{1}{3}$ D) $\arccos\frac{2}{3}$

4. (a1-g9-33) A nuqtadan tekislikka ikkita bir xil og'ma tushirilgan. Bu og'malar orasidagi burchak 90°. Og'malarning uzunligi 13. A nuqtadan tekislikkacha bo'lgan masofa 5 ga teng bo'lsa, bu og'malarning tekislikdagi proyeksiyalari orasidagi burchak kosinusini toping.

A) $y = C\cdot e^{\frac{1}{3}x}$ B) $-\frac{5}{13}$

C) $-\frac{25}{144}$ D) $-\frac{144}{169}$

5. (a1-g11-34) Tekislikka perpendikulyar bo'lgan AB kesma tekislikni E nuqtada kesib o'tgan. Kesma uchlaridan tekislikdagi C nuqtaga ikki og'ma tushirildi. Agar |BC| = 13, |AB| = 14 va |AC| = 15 bo'lsa, AE ning uzunligini toping.

A) 5 B) 9 C) 10 D) 12

6. (a1-g12-12) Tekislikka og'ma tushirilgan. Og'ma va balandlik orasidagi burchak $\arccos\frac{9}{41}$ ga, og'maning uzunligi 61,5 ga teng. Og'maning tekislikdagi proyeksiyasini toping.

A) 13,5 B) 60

C) 40 D) 30

7. (a1-g13-34) Tekislikka og'ma va perpendikulyar tushirilgan. Og'maning tekislikdagi proeksiyasi 12 ga, perpendikulyarning uzunligi 16 ga teng. Og'ma va perpendikulyar orasidagi burchakni toping.

A) $\arcsin\frac{4}{5}$ B) $\arcsin\frac{3}{5}$

C) $\arcsin\frac{3}{4}$ D) $\arccos\frac{3}{10}$

8. (a1-g17-34) Tekislik va og'ma orasidagi burchak arccos0,96 ga teng. Agar og'maning uzunligi 37,5 sm bo'lsa, og'maning tekislikdagi proyeksiyasi uzunligini toping.

A) 36 B) 24 C) 10,5 D) 7

9. (a2-g1-34) Bir nuqtadan tekislikka tushirilgan og'maning uzunligi 10 ga, proyeksiyasining uzunligi 6 ga teng. Balandlik va proyeksiya orasidagi burchakning sinusini toping.

A) 1 B) 0

C) 0,6 D) 0,8

10. (a2-g5-34) Tekislikka og'ma va pendikulyar tushirilgan. Og'ma va tekislik orasidagi burchak $\arccos\frac{24}{25}$ ga, og'maning uzunligi 50 ga teng. Og'maning tekislikdagi proyeksiyasini toping.

A) 14 B) 12 C) 7 D) 48

11. (a2-g6-34) Tekislikka og'ma va perpendikulyar tushirilgan. Og'ma bilan tekislik orasidagi burchak $\arccos\frac{12}{13}$ ga teng. Agar proyeksiyaning uzunligi 36 ga teng bo'lsa, perpendikulyarning uzunligini toping.

A) 39 B) 15 C) 30 D) 24

12. (a2-g9-34) Tekislikka perpendikulyar bo'lgan AB kesma tekislikni E nuqtada kesib o'tgan. Kesma uchlaridan tekislikdagi C nuqtaga ikki og'ma tushirildi. Agar |BC| = 13, |AB| = 14 va |AC| = 15 bo'lsa, AE ning uzunligini toping.

A) 5 B) 9 C) 10 D) 12

13. (a2-g10-34) Quyidagi mulohazalardan qaysi biri noto'g'ri?

A) Ikki tekislik kesishishidan to'g'ri chiziq hosil bo'ladi

B) Ixtiyoriy uchta nuqtadan faqat bitta tekislik o'tkazish mumkin

C) Og'maning uzunligi uning proyeksiyasi va og'madan tekislikkacha bo'lgan masofalar yig'indisidan kichik bo'ladi

D) Nuqtadan chiziqqacha bo'lgan eng qisqa masofa chiziqqa shu nuqtadan o'tkazilgan perpendikulyar kesmaning uzunligiga teng

14. (a2-g17-34) Bir nuqtadan tekislikka og'ma va perpendikulyar tushirildi. Perpendikulyarning uzunligi 15 sm va og'maning tekislikdagi proyeksiyasi 36 sm bo'lsa, og'ma va tekislik orasidagi burchak kosinusini toping.

A) $\frac{5}{13}$ B) $\frac{5}{12}$ C) $\frac{12}{13}$ D) $\frac{7}{13}$

15. (a2-g18-34) Tekislikka bir nuqtadan ikkita og'ma tushirildi. Og'malar uzunliklarining nisbati 13:20 hamda ularning tekislikdagi proyeksiyalari 10 sm va 32 sm bo'lsa, katta og'maning uzunligini toping.

A) 26 sm B) 80 sm

C) 40 sm D) 20 sm

16. (a2-g19-34) Tekislikka tushirilgan og'maning tekislikdagi proyeksiyasi 21 ga, perpendikulyarning uzunligi 20 ga teng. Og'ma va perpendikulyar orasidagi burchakni toping.

A) $\arcsin\frac{20}{21}$ B) $\arcsin\frac{21}{29}$

C) $\operatorname{arctg}\frac{20}{29}$ D) $\arccos\frac{20}{21}$

17. (a2-g20-34) Fazoda nuqtadan tekislikka ikkita og'ma o'tkazilgan. Og'malarning tekislikdagi proyeksiyalari 5 va 3,5 ga teng. Agar nuqtadan tekislikkacha bo'lgan masofa 12 bo'lsa, bu og'malarning uzunliklari farqini toping.

A) 1 B) 0,5

C) 0,25 D) 13

18. (a2-g22-34) A nuqtadan tekislikka ikkita bir xil og'ma tushiriligan. Bu og'malar orasidagi burchak 90°. Og'malarning uzunligi 13. A nuqtadan tekislikkacha masofa 5 ga teng bo'lsa, bu og'malarning tekislikdagi proyeksiyalari orasidagi burchak kosinusini toping.

A) $-\frac{12}{13}$ B) $-\frac{5}{13}$

C) $-\frac{144}{169}$ D) $-\frac{25}{144}$

19. (a2-g23-34) Tekislikka tushirilgan og'ma o'zining proyeksiyasidan 2 marta katta. Og'ma va tekislik orasidagi burchakni toping.

A) 30° B) 60°

C) arctg2 D) arcctg2

20. (a3-g1-34) Tekislikka bir nuqtadan ikkita og'ma tushirildi. Og'malar uzunliklarining nisbati 13:20 hamda ularning tekislikdagi proyeksiyalari 10 sm va 32 sm bo'lsa, katta og'maning uzunligini toping.
A) 26 sm B) 40 sm
C) 80 sm D) 20 sm

21. (a3-g2-34) Quyosh nurlari yerga 60° li burchak ostida tushganda 9 metrli simyog'ochning yerdagi soyasi necha metrga teng bo'ladi?
A) 4,5 B) 6 C) $6\sqrt{3}$ D) $3\sqrt{3}$

22. (a3-g8-34) Tekislikka tushirilgan og'maning tekislikdagi proyeksiyasi 21 ga, perpendikulyarning uzunligi 20 ga teng. Og'ma va perpendikulyar orasidagi burchakni toping.
A) $\arcsin\frac{20}{21}$ B) $\arcsin\frac{21}{29}$
C) $\operatorname{arctg}\frac{20}{29}$ D) $\arccos\frac{20}{21}$

23. (a3-g9-33) Bir nuqtadan tekislikka og'ma va perpendikulyar tushirilgan. Perpendikulyarning uzunligi og'maning proyeksiyadan ikki marta katta bo'lsa, og'ma va tekislik orasidagi burchakni toping?
A) arcctg2 B) $\operatorname{arctg}\frac{1}{2}$
C) $\arccos\frac{2}{\sqrt{5}}$ D) $\arcsin\frac{2\sqrt{5}}{5}$

24. (a3-g13-34) Fazodagi nuqtadan tekislikka og'ma tushirilgan. Og'ma o'zining tekislikdagi proyeksiyasidan 3 marta uzun. Agar nuqtadan tekislikkacha bo'lgan masofa $8\sqrt{2}$ ga teng bo'lsa, og'maning uzunligini toping.
A) 12 B) $16\sqrt{2}$
C) 16 D) $12\sqrt{2}$

25. (a3-g14-34) Tekislikka bir nuqtadan tushirilgan og'ma o'zining proyeksiyasidan 3 marta katta. Nuqtadan tekislikkacha bo'lgan masofa $\sqrt{2}$ ga teng bo'lsa, og'ma uzunligini toping.
A) 1,5 B) 1 C) 1,8 D) 0,5

26. (a3-g15-34) Tekislikka og'ma va perpendikulyar tushirilgan. Og'ma va tekislik orasidagi burchak $\arccos\frac{7}{25}$ ga teng. Og'maningtekislikdagi proyeksiyasi 14 ga teng. Perpendikulyar uzunligini toping.
A) 50 B) 48 C) 28 D) 36

27. (a3-g16-34) Tekislikka tushirilgan perpendikular og'madan 2 marta kichik. Og'ma va tekislik orasidagi burchakni toping.
A) 60° B) 30°
C) arctg2 D) arcctg2

28. (a3-g19-34) 8 metrli simyog'ochning yerdagi soyasi 2 metrga teng bo'lsa, shu paytda quyosh nurlari o'sha yerga qanday burchak ostida tushmoqda?
A) $\arccos\frac{1}{\sqrt{17}}$ B) $\operatorname{arctg}\frac{1}{4}$
C) $\arccos\frac{4}{\sqrt{17}}$ D) arcctg4

29. (a3-g21-34) Fazodagi bir nuqtadan ikkita uzunliklari 25 va 17 ga teng bo'lgan og'malar tushirilgan. Agar bu og'malarning proyeksiyalari ayirmasi 12 ga teng bo'lsa, nuqtadan tekislikkacha bo'lgan masofani toping.
A) 8 B) 12 C) 10 D) 15

30. (a3-g23-34) Fazoda nuqtadan tekislikka ikkita og'ma o'tkazilgan. Og'malarning tekislikdagi proyeksiyalari 5 va 3,5 ga teng. Agar nuqtadan tekislikkacha bo'lgan masofa 12 bo'lsa, bu og'malarning uzunliklari farqini toping.
A) 1 B) 0,25 C) 0,5 D) 13

31. (a3-g24-34) Fazodagi bir nuqtadan tekislikkacha bo'lgan masofa 12 ga teng. Bu nuqtadan tekislikka tushgan og'ma uzunligi 37 ga teng bo'lsa, og'maning tekislikdagi proyeksiyasi uzunligini toping.
A) 33 B) 30 C) 25 D) 35

32. (a4-g1-34) A nuqtadan tekislikka ikkita bir xil og'ma tushirilgan. Bu og'malar orasidagi burchak 90°. Og'malarning uzunligi 15. A nuqtadan tekislikkacha bo'lgan masofa 9 ga teng bo'lsa, bu og'malarning tekislikdagi proyeksiyalari orasidagi burchak kosinusini toping.
A) $-\frac{4}{5}$ B) $-\frac{3}{5}$
C) $-\frac{16}{25}$ D) $-\frac{9}{16}$

33. (a4-g2-34) Tekislikka bir nuqtadan tushirilgan og'ma o'zining proyeksiyasidan 5 marta katta. Nuqtadan tekislikkacha bo'lgan masofa $\sqrt{6}$ ga teng bo'lsa, og'ma uzunligini toping.
A) 2,5 B) 0,5 C) 6 D) 3

34. (a4-g3-35) A nuqtadan tekislikka ikkita bir xil og'ma tushirilgan. Bu og'malar orasidagi burchak 60°. Og'malarning uzunligi 13. A nuqtadan tekislikkacha bo'lgan masofa 5 ga teng bo'lsa, bu og'malarning tekislikdagi proyeksiyalari orasidagi burchak kosinusini toping.
A) $\frac{12}{13}$ B) $\frac{5}{13}$ C) $\frac{119}{288}$ D) $\frac{25}{144}$

35. (a4-g4-34) Berilgan nuqtadan tekislikka ikkita og'ma va perpendikulyar tushirilgan. Og'malarning uzunligi mos ravishda 60 va 39 ga teng hamda ularning proyeksiyalaridan biri ikkinchisidan 33 ga uzun. Perpendikulyarning uzunligini toping.
A) 36 B) 39 C) 45 D) 33

36. (a4-g6-34) Tekislikka og'ma va perpendikulyar tushirilgan. Og'ma va tekislik orasidagi burchak $\arccos\frac{12}{25}$ ga, og'maning uzunligi 50 ga teng. Og'maning tekislikdagi proyeksiyasini toping.
A) 24 B) 14 C) 48 D) 48

37. (a4-g9-34) Bir nuqtadan tekislikka og'ma va perpendikulyar tushirilgan. Perpendikulyarning uzunligi og'maning proyeksiyasidan ikki marta katta bo'lsa, og'ma va tekislik orasidagi burchakni toping.
A) arcctg2 B) $\operatorname{arctg}\frac{1}{2}$
C) $\arccos\frac{2}{\sqrt{5}}$ D) $\arcsin\frac{2\sqrt{5}}{5}$

38. (a4-g10-34) A nuqtadan tekislikka ikkita bir xil og'ma tushirilgan. Bu og'malar orasidagi burchak 90°. Og'malarning uzunligi 13. A nuqtadan tekislikkacha bo'lgan masofa 5 ga teng bo'lsa, bu o'g'malarning tekislikdagi proyeksiyalari orasidagi burchak kosinusini toping.
A) $-\frac{12}{13}$ B) $-\frac{5}{13}$
C) $-\frac{144}{169}$ D) $-\frac{25}{144}$

39. (a4-g11-22) Fazoda nuqtadan tekislikka ikkita og'ma o'tkazilgan. Og'malarning tekislikdagi proyeksiyalari 6 va 15 ga teng. Agar nuqtadan tekislikkacha bo'lgan masofa 8 bo'lsa, bu og'malarning uzunliklari farqini toping.
A) 1 B) 0,5 C) 4 D) 7

40. (a4-g24-32) Fazoda nuqtadan tekislikka ikkita og'ma o'tkazilgan. Og'malarning tekislikdagi proyeksiyalari 5 va 3,5 ga teng. Agar nuqtadan tekislikkacha bo'lgan masofa 12 bo'lsa, bu og'malarning uzunliklari farqini toping.
A) 1 B) 0,5 C) 0,25 D) 13

41. (a4-g25-34) Yerdagi 5 metrlik yog'ochning bir uchini usta 1 metrga ko'targan paytda yog'och yer bilan qanday burchak hosil qiladi?
A) $\arccos\frac{1}{5}$ B) *arctg* $\frac{1}{5}$
C) $\arcsin\frac{1}{5}$ D) $\operatorname{arcctg}\frac{1}{5}$

42. (a5-g4-34) Og'ma proyeksiyasidan 3 marta uzun. Shu og'ma perpendikulyardan necha marta uzun?
A) $\sqrt{3}$ B) $2\sqrt{2}$
C) $\frac{3\sqrt{2}}{4}$ D) $\frac{2\sqrt{3}}{3}$

43. (a5-g9-34) Tekislikka bir nuqtadan ikkita og'ma tushirildi. Ularning uzunliklari 50 va 52 sm hamda proyeksiyalarining nisbati 7:10 bo'lsa, nuqtadan tekislikkacha bo'lgan masofani toping.
A) 24 sm B) 36 sm
C) 48 sm D) 60 sm

44. (a5-g12-28) Tekislikka og'ma va perpendikulyar tushirilgan. Og'maning tekislikdagi proyeksiyasi 8 ga, perpendikulyarning uzunligi 10 ga teng. Og'ma va perpendikulyar orasidagi burchak tangensini toping.
A) 0,8 B) 1,25
C) 0,75 D) 1,(3)

45. (a5-g15-5) Tekislikka bir nuqtadan ikkita og'ma tushirildi. Og'malar uzunliklarining nisbati 8:5 hamda ularning tekislikdagi proyeksiyalari 32 sm va 7 sm bo'lsa, kichik og'maning uzunligini toping.
A) 30 sm B) 40 sm
C) 25 sm D) 20 sm

46. (a5-g17-17) Uzunliklari 25 va 40 sm bo'lgan ikki kesmaning uchlari parallel tekisliklarda yotadi. Katta kesmaning tekisliklardagi proyeksiyasi 32 sm bo'lsa, kichik kesmaning tekisliklardagi proyeksiyasi uzunligini toping.
A) 18 B) 20
C) 7 D) 24

47. (a5-g18-5) Tekislikdan 8 sm uzoqlikdagi nuqtadan tekislikka uzunliklari 24 va 17 ga teng bo'lgan og'malar tushirildi. Agar bu og'malarning tekislikdagi proyeksiyalari orasidagi burchak 135° bo'lsa, og'malarning tekislikdagi uchlari orasidagi masofani toping.
A) $\sqrt{737}$ B) $\sqrt{257}$
C) $\sqrt{667}$ D) $\sqrt{1217}$

48. (a5-g20-28) Uzunligi 8 sm bo'lgan AB kesma α tekislikning bir tomonida yotibdi. AB yotgan to'g'ri chiziq α tekislik bilan hosil qilgan burchak sinusi 0,75. Tekislikka yaqinroq bo'lgan A nuqtadan tekislikkacha masofa 5 sm bo'lsa, B dan tekislikkacha bo'lgan masofani toping.
A) 11 sm B) 13 sm
C) 9 sm D) 15 sm

49. (a5-g21-28) Bir nuqtadan tekislikka og'ma va perpendikulyar tushirilgan. Perpendikulyarning uzunligi og'maning proyeksiyadan ikki marta kichik bo'lsa, og'ma va tekislik orasidagi burchakni toping?
A) $\operatorname{arcctg}\frac{1}{2}$ B) arctg2
C) $\arccos\frac{2}{\sqrt{5}}$ D) $\arcsin\frac{2\sqrt{5}}{5}$

50. (a5-g22-28) Quyidagi mulohazalardan nechtasi to'g'ri?
1) o'zaro parallel bo'lmagan chiziqlar bir tekislikka parallel bo'lishi mumkin;
2) bir tekislikda yotuvchi to'g'ri chiziq unga perpendikulyar tekislikda yotuvchi chiziqqa perpendikulyar bo'ladi;
3) bir tekislikka perpendikulyar to'g'ri chiziq ikkinchi tekislikka perpendikulyar bo'lsa, bu tekisliklar parallel;
4) og'maga perpendikulyar to'g'ri chiziq uning tekislikdagi proyeksiyasiga ham perpendikulyar bo'ladi;
5) perpendikulyar tekisliklardan biriga perpendikulyar bo'lgan chiziq ikkinchi tekislikka parallel bo'ladi.
A) 2 B) 1 C) 3 D) 4

51. (a5-g23-28) Tekislikka tushirilgan og'ma va perpendikulyar orasidagi burchak $\arccos\frac{25}{37}$. Og'ma uzunligi 74 ga teng. Perpendikulyar uzunligini toping.
A) 50 B) 24
C) 54 D) $4\sqrt{186}$

52. (a5-g24-28) Tekislik va og'ma orasidagi burchak deganda qaysi burchak tushuniladi?
A) Og'ma va tekislikda yotuvchi ikki kesishuvchi to'g'ri chiziq orasidagi burchak.
B) Og'maning yuqori uchidan tekislikka tushirilgan perpendikulyarga perpendikulyar, tekislikda yotuvchi to'g'ri chiziq va og'ma orasidagi burchak.
C) Tekislikdagi ixtiyoriy chiziq va og'ma orasidagi burchak.
D) Og'maning tekislikdagi proyeksiyasi hamda og'ma orasidagi burchak.

53. (a6-g2-28) A nuqta tekislikdan 12 sm uzoqlikda joylashgan. Tekislikda yotuvchi A nuqtadan 20 sm uzoqlikda joylashgan nuqtalar hosil qilgan chiziqning uzunligini toping.
A) 32π B) 32 C) 16 D) 16π

54. (a6-g6-28) Yerdagi 6 metrlik yog'ochning bir uchini usta 1,5 metrga ko'targan paytda yog'och yer bilan qanday burchak hosil qiladi?
A) $\arcsin\frac{1}{4}$ B) $\operatorname{arctg}\frac{1}{4}$
C) $\arccos\frac{1}{4}$ D) $\operatorname{arcctg}\frac{1}{4}$

55. (a6-g9-28) Tekislikka bir nuqtadan tushirilgan og'ma o'zining proyeksiyasidan 3 marta katta. Nuqtadan tekislikkacha bo'lgan masofa $4\sqrt{2}$ ga teng bo'lsa, og'ma uzunligini toping.
A) 6 B) 4 C) 7,2 D) 2

56. (a6-g12-29) Tekislikka og'ma va perpendikulyar tushirilgan. Og'ma o'zining proyeksiyasidan 2 sm ga uzun va perpendikulyarning uzunligi 6 ga teng. Og'ma va tekislik orasidagi burchak kosinusini toping.
A) 0,8 B) 0,6
C) 0,2 D) 0,75

57. (a6-g13-3) [illegible]maning uchlari tekislikdan 4 va 1[illegible] uzoqlikda joylashgan. Agar kesm[illegible]ing uzunligi 10 sm bo'lsa, uning tekislikdagi proyeksiyasi uzunligini toping.
A) 6 B) 8
C) $6\sqrt{2}$ D) $5\sqrt{2}$

58. (a6-g14-15) Tekislikdan 4 ga teng masofada joylashgan nuqtadan tekislikka ikkita og'ma perpendikulyar tushirilgan. Agar og'malarning proyeksiyalari 3 va 4 ga teng bo'lib, ular orasidagi burchak 90° bo'lsa, og'malar orasidagi burchak sinusini toping.
A) $\frac{\sqrt{3}}{2}$ B) $\frac{3}{5}$
C) $\frac{2\sqrt{2}}{5}$ D) $\frac{\sqrt{17}}{5}$

59. (a6-g16-4) Tekislikka bir nuqtadan ikkita og'ma tushirildi. Og'malar uzunligining nisbati 8:5 hamda ularning tekislikdagi proyeksiyalari 32 sm va 7 sm bo'lsa, kichik og'maning uzunligini toping.
A) 30 sm B) 40 sm
C) 25 sm D) 20 sm

60. (a6-g21-8) Bir nuqtadan tekislikka og'ma va perpendikulyar tushirilgan. Perpendikulyarning uzunligi og'maning proyeksiyasidan ikki marta katta bo'lsa, og'ma va tekislik orasidagi burchakni toping?
A) arcctg2 B) $\operatorname{arctg}\frac{1}{2}$
C) $\arccos\frac{2}{\sqrt{5}}$ D) $\arcsin\frac{2\sqrt{5}}{5}$

61. (a6-g26-28) Uzunligi 41 ga teng bo'lgan kesmaning uchlari tekislikdan bir tomonda, 25 va 16 ga teng masofalarda joylashgan. Shu kesmaning tekislikdagi proyeksiyasi uzunligini toping.
A) 36 B) $\sqrt{111}$
C) 24 D) 40

170. Fazoda to'g'richiziqlar va tekisliklar

1. (a1-g6-34) Tekislikka og'ma va perpendikulyar tushirilgan. Og'ma va tekislik orasidagi burchak $\arccos\frac{24}{25}$ [illegible]a, og'maning uzunligi 50 ga teng. Og'maning tekislikdagi proyeksiyasini toping.
A) 14 B) 12 C) 7 D) 48

2. (a1-g8-34) Quyidagi fikrlardan qaysi biri noto'g'ri?

A) Ikki tekislikning kesishishidan to'g'ri chiziq hosil bo'ladi.
B) Fazoda kesishmaydigan chiziqlar ayqash chiziqlar hisoblanadi.
C) Bir chiziqning bir nuqtasiga ko'plab perpendikulyar chiziqlar o'tkazish mumkin.
D) Tekislik va to'g'ri chiziq kesishishidan nuqta hosil bo'ladi.

3. (a1-g10-34) Quyidagi mulohazalardan qaysi biri noto'g'ri?
A) Bir chiziqda yotmaydigan uchta nuqtadan faqat bitta tekislik o'tkazish mumkin.
B) To'g'ri chiziq va tekislik kesishidan nuqta hosil bo'ladi.
C) Tekislikdagi ixtiyoriy chiziqqa perpendikulyar bo'lgan chiziq tekislikka ham perpendikulyar bo'ladi.
D) Tekislikdagi to'g'ri chiziq og'maga perpendikulyar bo'lsa, u og'maning proyeksiyasiga ham perpendikulyar bo'ladi.

4. (a1-g14-34) Quyidagi mulohazalardan qaysi biri noto'g'ri?
A) tekislikda yotgan to'g'ri chiziq og'maning proyeksiyasiga perpendikulyar bo'lsa, og'maning o'ziga ham perpendikulyar
B) Agar ikki to'g'ri chiziq uchinchi to'g'ri chiziqqa parallel bo'lsa, ular o'zaro paralleldir
C) Agar bir tekislikda yotgan ikki to'g'ri chiziq ikkinchi tekislikda yotgan ikki to'g'ri chiziqqa mos ravishda parallel bo'lsa, bu tekisliklar paralleldir
D) to'g'ri chiziq tekislikda yotuvchi ikki kesishuvchi to'g'ri chiziqqa perpendikulyar bo'lsa, tekislikning o'ziga ham perpendikulyar

5. (a2-g4-34) Quyidagi mulohazalardan qaysi biri noto'g'ri?
A) Tekislik va to'g'ri chiziqning kesishishidan nuqta hosil bo'ladi.
B) Uchburchakning tekislikdagi proyeksiyasi ham to'g'ri chiziq bo'ladi.
C) Tekislikka tushirilgan og'maga perpendikulyar chiziq uning proyeksiyasiga ham perpendikulyar bo'ladi.
D) Parallel tekisliklarda yotuvchi to'g'ri chiziqlar parallel bo'lmasligi mumkin.

6. (a2-g15-34) Quyidagi mulohazalardan qaysi biri noto'g'ri?
A) Ikki tekislikning kesishishidan to'g'ri chiziq hosil bo'ladi.
B) Tekislikka perpendikulyar bo'lmagan to'rtburchakning tekislikdagi proyeksiyasi ham to'rtburchak bo'ladi.
C) Tekislikdagi og'maga perpendikulyar chiziq uning proyeksiyasi bilan o'tkir burchak hosil qiladi.
D) Parallel tekisliklarda yotuvchi to'g'ri chiziqlar parallel bo'lmasligi mumkin.

7. (a2-g16-34) Ikki tekislik o'zaro 120° burchak ostida kesishadi. Bu ikki tekisliklardan 6 sm uzoqlikda joylashgan nuqtadan tekisliklar kesishish nuqtasigacha bo'lgan masofani toping.
A) 12 B) 3
C) $2\sqrt{3}$ D) $4\sqrt{3}$

8. (a3-g4-34) Quyidagi mulohazalardan qaysi biri noto'g'ri?
A) Tekislik va to'g'ri chiziqning kesishishidan nuqta hosil bo'ladi.
B) Uchburchakning tekislikdagi proyeksiyasi ham to'g'ri chiziq bo'ladi.
C) Tekislikka tushirilgan og'maga perpendikulyar chiziq uning proyeksiyasiga ham perpendikulyar bo'ladi.
D) Parallel tekisliklarda yotuvchi to'g'ri chiziqlar parallel bo'lmasligi mumkin.

9. (a3-g12-34) Quyidagi mulohazalardan qaysi biri noto'g'ri?
A) Tekislik va to'g'ri chiziqning kesishishidan nuqta hosil bo'ladi.
B) Uchburchakning tekislikdagi proyeksiyasi to'g'ri chiziq bo'ladi.
C) Tekislikka tushirilgan og'maga shu tekislikda yotuvchi perpendikulyar chiziq uning proyeksiyasiga ham perpendikulyar bo'ladi.
D) Parallel tekisliklarda yotuvchi to'g'ri chiziqlar parallel bo'lmasligi mumkin.

10. (a3-g18-34) Quyidagi mulohazalardan qaysi biri noto'g'ri?
A) Tekislik va to'g'ri chiziqning kesishishidan nuqta hosil bo'ladi.
B) Uchburchakning tekislikdagi proyeksiyasi ham to'g'ri chiziq bo'ladi.
C) Tekislikka tushirilgan og'maga perpendikulyar chiziq uning proyeksiyasiga ham perpendikulyar bo'ladi.
D) Parallel tekisliklarda yotuvchi to'g'ri chiziqlar parallel bo'lmasligi mumkin.

11. (a3-g20-34) Kesmaning uchi tekislikdan 6 va 12 ga teng masofalarda yotadi. Kesmaning uzunligi 9 ga teng. Bu kesma tekislik bilan hosil qilgan burchagi kosinusini toping.
A) $\frac{\sqrt{5}}{3}$ B) $\frac{2}{3}$ C) $\frac{1}{3}$ D) $\frac{\sqrt{2}}{3}$

12. (a4-g1-33) Quyidagi mulohazalardan qaysi biri noto'g'ri?
A) Tekislikda yotgan to'g'ri chiziq og'maning proyeksiyasiga perpendikulyar bo'lsa, og'maning o'ziga ham perpendikulyar.
B) Agar ikki to'g'ri chiziq uchinchi to'g'ri chiziqqa parallel bo'lsa, ular o'zaro paralleldir.
C) Agar bir tekislikda yotgan ikki to'g'ri chiziq ikkinchi tekislikda yotgan ikki to'g'ri chiziqqa mos ravishda parallel bo'lsa, bu tekisliklar paralleldir.
D) To'g'ri chiziq tekislikda yotuvchi ikki kesishuvchi to'g'ri chiziqqa perpendikulyar bo'lsa, tekislikning o'ziga ham perpendikulyar.

13. (a4-g5-34) ABCD to'g'ri to'rtburchakning AB va BC tomonlari mos ravishda 9 va 15 ga teng. Bu to'rtburchakning AB tomonidan o'tuvchi tekislikdagi proyeksiyasi kvadratdan iborat bo'lsa, to'rtburchak va tekislik orasidagi burchak sinusini toping.
A) 0,5 B) 0,6 C) 0,8 D) $\frac{\sqrt{3}}{2}$

14. (a4-g8-34) Quyidagi mulohazalardan qaysi biri noto'g'ri?
A) Tekislik va to'g'ri chiziqning kesishishidan nuqta hosil bo'ladi.
B) Uchburchakning tekislikdagi proyeksiyasi to'g'ri chiziq bo'ladi.
C) Tekislikka tushirilgan og'maga perpendikulyar chiziq uning proyeksiyasiga ham perpendikulyar bo'ladi.
D) Parallel tekisliklarda yotuvchi to'g'ri chiziqlar parallel bo'lmasligi mumkin.

15. (a4-g16-34) ABCD to'g'ri to'rtburchakning AB va BC tomonlari mos ravishda 16 va 20 ga teng. Bu to'rtburchakning AB tomonidan o'tuvchi tekislikdagi proyeksiyasi kvadratdan iborat bo'lsa, to'rtburchak va tekislik orasidagi burchak sinusini toping
A) 0,5 B) 0,8 C) $\frac{\sqrt{3}}{2}$ D) 0,6

16. (a4-g19-34) Yerdagi 6 metrlik yog'ochning bir uchini usta 1,5 metrga ko'targan paytda yog'och yer bilan qanday burchak hosil qiladi?
A) $\arcsin\frac{1}{4}$ B) $\operatorname{arctg}\frac{1}{4}$
C) $\arccos\frac{1}{4}$ D) $\operatorname{arcctg}\frac{1}{4}$

17. (a4-g20-34) Quyidagi mulohazalardan qaysi biri to'g'ri?
A) Tekislikda yotgan to'g'ri chiziq boshqa tekislikdagi chiziqqa perpendikulyar bo'lsa, bu tekisliklar parallel.
B) Agar ikki to'g'ri chiziq bir tekislikka parallel bo'lsa, ular o'zaro paralleldir.
C) To'g'ri chiziq tekislikda yotuvchi ikki kesishuvchi to'g'ri chiziqqa perpendikulyar bo'lsa, tekislikning o'ziga ham perpendikulyar.
D) Parallel bo'lmagan kesma va tekislik doimo bir nuqtada kesishadi.

18. (a4-g22-34) Bir nuqtadan tekislikka og'ma va perpendikulyar tushirildi. Perpendikulyarning uzunligi 15 sm va og'maning tekislikdagi proyeksiyasi 36 sm bo'lsa, og'ma va tekislik orasidagi burchak kosinusini toping.
A) $\frac{5}{13}$ B) $\frac{5}{12}$ C) $\frac{12}{13}$ D) $\frac{7}{13}$

19. (a4-g23-34) Quyidagi mulohazalardan qaysilari noto'g'ri?
1) Ixtiyoriy parallelogramning diagonallari bir-biriga perpendikulyar;

2) Ixtiyoriy uchburchakka ichki aylana chizish mumkin; 3) $A(x; y; z)$ nuqtaga OXZ tekisligidagi eng yaqin nuqtaning koordinatalari $(x, 0, z)$; 4) Perpendikulyar tekisliklarda yotuvchi chiziqlar doimo bir-biriga perpendikulyar bo'ladi; 5) Asosi kvadrat bo'lgan to'g'ri parallelepipedning 6 ta simmetriya tekisligi mavjud.
A) II, III, IV B) I, IV, V
C) I, II, IV D) II, III, V

20. (a5-g3-34) Uzunligi 17 ga teng kesma tekislikni kesib o'tadi va uchlari tekislikdan 6 va 9 ga teng masofalarda yotadi. Shu kesmaning tekislik bilan hosil qilgan burchagini toping.

A) $\arccos\frac{8}{17}$ B) $\arccos\frac{15}{17}$
C) $\arcsin\frac{3}{17}$ D) $\arccos\frac{3}{17}$

21. (a5-g5-34) Quyidagi fikrlardan qaysi biri noto'g'ri?
A) Uchburchakning tekislikdagi proyeksiyasi kesma bo'lishi mumkin.
B) To'g'ri chiziq tekislikka perpendikulyar bo'lganda uning tekislikdagi proyeksiyasi nuqta bo'ladi.
C) Perpendikulyar tekisliklarda yotuvchi ikki to'g'ri chiziq o'zaro perpendikulyar bo'ladi.
D) Og'maning uzunligi o'zining proyeksiyasidan kichik bo'la olmaydi.

22. (a5-g6-34) Og'ma o'z proyeksiyasidan 4 marta uzun bo'lsa, balandlikdan necha marta uzun?
A) $\sqrt{15}$ B) 2
C) $\frac{4\sqrt{15}}{15}$ D) $\sqrt{8}$

23. (a5-g10-34) ABC uchburchakda $AB = BC = 8$ va A burchak 60°. A nuqtaga uchburchak tekisligiga perpendikulyar qilib uzunligi 6 ga teng MA kesma tushirilgan. M nuqtadan BC to'g'ri chiziqqacha bo'lgan masofani toping.
A) $\sqrt{42}$ B) $2\sqrt{13}$
C) $2\sqrt{21}$ D) 10

171. Tekisliklar orasidagi burchak. Ikkiyoqli va uchyoqli burchaklar. Tekislik tenglamasi

1. (a1-g5-34) Quyidagi mulohazalardan qaysi biri noto'g'ri?
A) Ikki tekislik kesishishidan to'g'ri chiziq hosil bo'ladi.
B) Ixtiyoriy uchta nuqtadan faqat bitta tekislik o'tkazish mumkin.
C) Og'maning uzunligi uning proyeksiyasi va og'madan tekislikkacha bo'lgan masofalar yig'indisidan kichik bo'ladi.
D) Nuqtadan chiziqqacha bo'lgan eng qisqa masofa chiziqqa shu nuqtadan o'tkazilgan perpendikulyar kesmaning uzunligiga teng.

2. (a1-g15-34) Quyidagi mulohazalardan qaysi biri noto'g'ri?
A) Ikki tekislik kesishishidan to'g'ri chiziq hosil bo'ladi
B) Ixtiyoriy uchta nuqtadan faqat bitta tekislik o'tkazish mumkin
C) Og'maning uzunligi uning proyeksiyasi va og'madan tekislikkacha bo'lgan masofalar yig'indisidan kichik bo'ladi
D) Nuqtadan chiziqqacha bo'lgan eng qisqa masofa, chiziqqa shu nuqtadan o'tkazilgan perpendikulyar kesmaning uzunligiga teng

3. (a2-g21-34) ABCD to'g'ri to'rtburchakning AB va BC tomonlari mos ravishda 9 va 15 ga teng. Bu to'rtburchakning AB tomonidan o'tuvchi tekislikdagi proyeksiyasi kvadratdan iborat bo'lsa, to'rtburchak va tekislik orasidagi burchak sinusini toping.
A) 0,5 B) 0,6 C) 0,8 D) $\frac{\sqrt{3}}{2}$

4. (a4-g7-34) Ikki tekislik orasidagi burchak 60°. Bu tekisliklar orasidagi A nuqtadan tekisliklargacha bo'lgan masofa 6 ga teng bo'lsa, shu nuqtadan tekisliklar kesishishidan hosil bo'lgan chiziqqacha bo'lgan masofani toping.
A) $6\sqrt{3}$ B) 12
C) $3\sqrt{3}$ D) 3

5. (a4-g21-34) ABCD to'g'ri to'rtburchakning AB va BC tomonlari mos ravishda 16 va 20 ga teng. Bu to'rtburchakning AB tomonidan o'tuvchi tekislikdagi proyeksiyasi kvadratdan iborat bo'lsa, to'rtburchak va tekislik orasidagi burchak sinusini toping.
A) 0,5 B) 0,8 C) $\frac{\sqrt{3}}{2}$ D) 0,6

6. (a5-g1-34) ABCD to'g'ri to'rtburchakning AB va BC tomonlari mos ravishda 9 va 15 ga teng. Bu to'rtburchakning AB tomonidan o'tuvchi tekislikdagi proyeksiyasi kvadratdan iborat bo'lsa, to'rtburchak va tekislik orasidagi burchak sinusini toping.
A) 0,5 B) 0,6
C) 0,8 D) $\frac{\sqrt{3}}{2}$

7. (a5-g13-28) ABCD to'g'ri to'rtburchakning AB va BC tomonlari mos ravishda 16 va 20 ga teng. Bu to'rtburchakning AB tomonidan o'tuvchi tekislikdagi proyeksiyasi kvadratdan iborat bo'lsa, to'rtburchak va tekislik orasidagi burchak sinusini toping
A) 0,5 B) 0,8
C) $\frac{\sqrt{3}}{2}$ D) 0,6

8. (a5-g19-28) Quyidagilardan qaysi biri noto'g'ri mulohaza?
A) Tekislikdan tashqarida tekislikda yotuvchi ixtiyoriy chiziqqa parallel to'g'ri chiziq tekislikka ham parallel.
B) Parallel tekisliklarda yotuvchi chiziqlar ham o'zaro parallel bo'ladi.
C) Bir tekislikka perpendikulyar bir necha chiziqlar o'zaro parallel bo'ladi.
D) Tekislikdagi o'zaro perpendikulyar chiziqlarga perpendikulyar bo'lgan chiziq tekislikka ham perpendikulyar bo'ladi.

9. (a6-g3-28) Quyidagi mulohazalardan nechtasi noto'g'ri?
1) o'zaro perpendikulyar tekisliklarda yotuvchi chiziqlar ham o'zaro perpendikulyar bo'ladi; 2) tekislikka tik joylashgan uchburchakning proyeksiyasi to'g'ri chiziq bo'ladi; 3) fazodagi uch nuqta orqali faqatgina bir dona tekislik o'tkazish mumkin; 4) ikki tekislik kesishishidan to'g'ri chiziq hosil bo'ladi; 5) kesishmaydigan to'g'ri chiziqlar parallel to'g'ri chiziqlar deyiladi.
A) 1 B) 2 C) 3 D) 4

10. (a6-g4-28) ABCD to'g'ri to'rtburchakning AB va BC tomonlari mos ravishda 15 va 24 ga teng. Bu to'rtburchakning AB tomonidan o'tuvchi tekislikdagi proyeksiyasi kvadratdan iborat bo'lsa, to'rtburchak va tekislik orasidagi burchak sinusini toping.
A) 0,5 B) $\frac{3\sqrt{5}}{8}$
C) $\frac{\sqrt{39}}{8}$ D) $\frac{\sqrt{3}}{2}$

11. (a6-g7-28) Burchaklari 30°, 60° va 90° bo'lgan uchburchakning kichik kateti orqali tekislik o'tkazilgan va bu tekislik uchburchak tekisligi bilan 45° burchak hosil qiladi. Uchburchak gipotenuzasi va tekislik orasidagi burchak sinusini toping.
A) $\frac{\sqrt{3}}{4}$ B) $\frac{\sqrt{6}}{4}$ C) $\frac{\sqrt{3}}{6}$ D) $\frac{\sqrt{2}}{6}$

12. (a6-g10-28) Tomoni 4 ga teng muntazam uchburchakning tekislikdagi proyeksiyasi teng yonli to'g'ri burchakli uchburchakdan iborat. Muntazam uchburchak va tekislik orasidagi burchakni toping.
A) 60° B) $\arccos\frac{1}{\sqrt{3}}$
C) $\operatorname{arctg}\frac{1}{\sqrt{2}}$ D) $\arcsin\frac{2}{\sqrt{5}}$

13. (a6-g18-15) A burchagi 30° bo'lgan ABC to'g'ri burchakli uchburchakning BC kateti orqali tekislik o'tkazildi. Agar uchburchak tekislik bilan 45° hosil qilgan bo'lsa, AC gipotenuza tekislik bilan hosil qilgan burchak sinusini toping.
A) $\frac{\sqrt{6}}{4}$ B) $\frac{1}{\sqrt{6}}$
C) $\frac{\sqrt{6}}{3}$ D) $\frac{2}{\sqrt{6}}$

172. Nuqtadan tekislikkacha bo'lgan masofa

1. (a1-g7-31) Tekislikka bir nuqtadan og'ma va perpendikulyar tushirilgan. Og'ma bilan tekislik orasidagi burchak $\arccos\frac{12}{13}$ ga teng. O'g'maning uzunligi 39 ga teng bo'lsa, nuqtadan tekislikkacha bo'lgan masofani toping.
A) 8 B) 36 C) 24 D) 15

2. (a1-g11-32) XZ tekislikka nisbatan A(3; –2; 4) nuqtaga simmetrik bo'lgan nuqta koordinatalarini ko'rsating.
A) (3; 2; 4) B) (–3; –2; –4)
C) (3; –2; –4) D) (–3; 2; –4)

3. (a3-g2-32) OXZ tekisligiga nisbatan A(–3; 4; –8) nuqtaga simmetrik bo'lgan nuqtani toping
A) (3; –4; 8) B) (–3; –4; 8)
C) (–3; –4; –8) D) (3; 4; 8)

4. (a3-g4-32) Quyidagi nuqtalardan qaysi biri OYZ tekislikda yotadi?
A) (3; 0; 0) B) (3; 0; –2)
C) (–2; 3; 0) D) (0; –2; –3)

5. (a3-g6-32) *m* ning qanday qiymatlarida P(–3; 4; *m*) nuqtadan OX o'qigacha bo'lgan masofa 11 ga teng bo'ladi?
A) $\pm\sqrt{6}$ B) $\pm\sqrt{112}$
C) $\pm\sqrt{105}$ D) ±7

6. (a3-g6-34) To'g'ri burchakli uchburchakning AB va AC katetlari 15 va 20 ga teng. A nuqtaga uchburchak tekisligiga perpendikulyar qilib uzunligi 5 ga teng NA kesma tushirilgan. N nuqtadan gipotenuzagacha bo'lgan masofani toping.
A) $\sqrt{145}$ B) 11
C) $5\sqrt{26}$ D) 13

7. (a3-g11-34) ABC uchburchakda AB = BC = 8 va A burchak 30°. A nuqtaga uchburchak tekisligiga perpendikulyar qilib uzunligi 6 ga teng MA kesma tushirilgan. m nuqtadan BC to'g'ri chiziqqacha bo'lgan masofani toping.
A) $\sqrt{42}$ B) $2\sqrt{13}$
C) $2\sqrt{21}$ D) 10

8. (a3-g12-32) Quyidagi nuqtalardan qaysi biri OYZ tekislikda yotadi?
A) (3; 0; 0) B) (3; 0; –2)
C) (–2; 3; 0) D) (0; –2; –3)

9. (a3-g14-32) A(–4; 3; –1) nuqtadan shu nuqtaga OX o'qiga nisbatan simmetrik nuqtagacha bo'lgan masofani toping.
A) 8 B) 6
C) $2\sqrt{10}$ D) $2\sqrt{26}$

10. (a3-g15-32) Quyidagi nuqtalardan qaysi biri XZ tekislikda yotadi?
A) (3; 0; –5) B) (0; –5; 8)
C) (–2; 1; 0) D) (0; –6; 0)

11. (a3-g16-31) *Oxz* tekisligiga nisbatan (–5; 3; –4) nuqtaga simmetrik bo'lgan nuqtani toping.
A) (5; –3; 4) B) (–5; 3; 4)
C) (5; –3; –4) D) (–5; –3; –4)

12. (a3-g18-32) Quyidagi nuqtalardan qaysi biri OXY tekislikda yotadi?
A) (0; 0; 3) B) (3; 0; –2)
C) (–2; 3; 0) D) (0; –2; –3)

13. (a3-g22-32) OZ o'qida shunday m nuqtani topingki, undan A(2; –3; 1) nuqtagacha bo'lgan masofa 7 ga teng bo'lsin.
A) (0; 0; 7) va (0; 0; –5)
B) (0; 0; 7)
C) (0; 0; –2) va (0; 0; 6)
D) (0; 0; 2) va (0; 0; –2)

14. (a3-g22-34) AB kesmaning uzunligi 12 sm. A uchi tekislikdan 11 sm, B uchi esa 7 sm uzoqlikda joylashgan. Shu kesma davomida yotuvchi tekislikdan 2 sm uzoqlikda joylashgan nuqta kesmaning B uchidan necha sm uzoqlikda joylashgan
A) 12 B) 9 C) 10 D) 15

15. (a3-g24-32) Oxy tekislikka nisbatan A(–2; 3; 5). Nuqtaga nisbatan simmetrik nuqtaning koordinatalarini toping.
A) (–2; 3; –5) B) (2; –3; 5)
C) (–2; –3; –5) D) (2; 3; 5)

16. (a4-g2-32) A(3; –5; 2) nuqtadan, shu nuqtaga OX o'qiga nisbatan simmetrik nuqtagacha bo'lgan masofani toping.
A) 6 B) $2\sqrt{38}$
C) 3 D) $2\sqrt{29}$

17. (a4-g5-32) $K\left(-10; 5; 4\sqrt{6}\right)$ nuqtadan OY o'qqacha bo'lgan masofani toping.
A) 13 B) 14 C) 15 D) 16

18. (a4-g7-32) A(3; *y*; 5) nuqtadan OX o'qqacha bo'lgan masofa 13 ga teng bo'lsa, shu nuqtadan OXZ tekislikkacha bo'lgan eng qisqa masofani toping.
A) $\sqrt{153}$ B) 12
C) $\sqrt{34}$ D) 5

19. (a4-g8-32) Quyidagi nuqtalardan qaysi biri OYZ tekislikda yotadi?
A) (3; 0; 0) B) (3; 0; –2)
C) (–2; 3; 0) D) (0; –2; –3)

20. (a4-g12-34) ABC uchburchakda AB = BC = 6 va A burchak 30°. A nuqtaga uchburchak tekisligiga perpendikulyar qilib uzunligi 4 ga teng MA kesma tushirilgan. m nuqtadan BC to'g'ri chiziqqacha bo'lgan masofani toping.
A) $\sqrt{43}$ B) $\sqrt{11}$ C) $2\sqrt{13}$ D) 5

21. (a4-g15-34) AB kesmaning uchlari tekislikdan 8 va 16 ga teng bo'lgan masofalarda yotadi. Agar kesmaning tekislikdagi proyeksiyasi uzunligi 6 ga teng bo'lsa, kesmaning uzunligini toping.
A) 12 B) 9 C) 8 D) 10

22. (a4-g17-34) Kesmaning A va B uchlari tekislikdan 12 va 5 ga teng masofalarda joylashgan. AB kesmadan C nuqta olindi. AC ning CB ga nisbati 3:2 ga bo'lsa, C nuqta tekislikdan qanday masofada joylashgan?
A) 7,8 B) 9,2 C) 6,4 D) 10

23. (a4-g18-34) Uzunligi 17 ga teng bo'lgan kesmaning uchlari tekislikdan 7 va 15 ga teng masofalarda yotadi. Kesmaning tekislikdagi proyeksiyasi uzunligini toping.
A) $\sqrt{189}$ B) $\sqrt{168}$
C) 8 D) 15

24. (a4-g19-32) A(6; –5; –10) nuqtadan OXZ tekisligigacha bo'lgan masofani toping.
A) $2\sqrt{34}$ B) $\sqrt{161}$
C) 8 D) 5

25. (a4-g25-32) A(–4; 12; 6) nuqtadan OXZ tekisligigacha bo'lgan masofani toping.
A) $6\sqrt{5}$ B) $2\sqrt{13}$ C) 4 D) 12

26. (a5-g2-34) AB kesmaning uchlari tekislikdan 6 va 12 ga teng bo'lgan masofalarda yotadi. Agar kesmaning tekislikdagi proyeksiyasi uzunligi 8 ga teng bo'lsa, kesmaning uzunligini toping.
A) 12 B) 10 C) 8 D) 9

27. (a5-g6-32) A(3; –4; 5) nuqtaga OXZ tekislikdagi eng yaqin nuqta koordinatalarini ko'rsating.
A) (3; 0; 5) B) (3; –4; 0)
C) (0; –4; 5) D) (0; –4; 0)

28. (a5-g8-34) A nuqtadan tekislikkacha bo'lgan masofa 8 ga teng. A nuqtadan tekislikdagi B nuqtagacha masofa 17 ga, C nuqtagacha masofa 10 ga teng. B va C nuqtalar orasidagi masofani toping.
A) aniqlab bo'lmaydi
B) 9
C) 13
D) 7

29. (a5-g11-28) Fazodagi bir nuqtadan ikkita uzunliklari 25 va 17 ga teng bo'lgan og'malar tushirilgan. Agar bu og'malarning proyeksiyalari ayirmasi 12 ga teng bo'lsa, nuqtadan tekislikkacha bo'lgan masofani toping.
A) 8 B) 12 C) 10 D) 15

30. (a5-g16-28) A nuqtadan tekislikkacha bo'lgan masofa 8 ga teng. A nuqtadan tekislikdagi B nuqtagacha masofa 17 ga, C nuqtagacha masofa 10 ga teng. B va C nuqtalar bir chiziqda yotadi. B va C nuqtalar orasidagi masofani toping.

A) aniqlab bo'lmaydi
B) 9
C) 13
D) 7

31. (a5-g25-28) Uzunligi 17 ga teng bo'lgan tekislikni kesib o'tuvchi kesmaning uchlari tekislikdan 5 va 3 ga teng masofalarda joylashgan. Kesmaning tekislikdagi proyeksiyasi uzunligini toping.

A) $\sqrt{285}$ B) $2\sqrt{66}$
C) $2\sqrt{70}$ D) 15

32. (a6-g17-28) AB kesmaning uchlari tekislikdan 9 va 17 ga teng masofalarda joylashgan. Bu kesma o'rtasi tekislikdan qanday uzoqlikda joylashgan?

A) 15 B) 10 C) 12 D) 13

33. (a6-g23-26) Quyidagi nuqtalardan qaysi biri OYZ tekislikda yotadi?

A) (3; 0; 0) B) (3; 0; –2)
C) (–2; 3; 0) D) (0; –2; –3)

34. (a6-g24-28) Fazodagi kesmaning uchlari tekislikdan 24 va 18 sm uzoqlikda joylashgan. Shu kesmaning o'rtasi tekislikdan qanday masofada joylashgan?

A) 15 B) 9 C) 21 D) 12

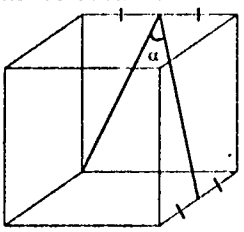
35. (a6-g25-24) Kesmaning uchlari tekislikdan 15 va 27 ga teng masofalarda joylashgan. Tekislikdan 20 ga teng masofada joylashgan nuqta kesmani qanday nisbatdagi bo'laklarga bo'ladi?

A) 5:7 B) 7:12
C) 5:12 D) 12:19

9-bob. Ko'p yoqlar

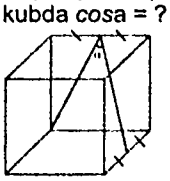
173. Kub va uning xossalari

1. (a3-g23-35) Shaklda ko'rsatilgan kubda cosα = ?



A) $\frac{\sqrt{30}}{10}$ B) $\frac{10\sqrt{3}}{30}$
C) $\frac{\sqrt{30}}{20}$ D) $\frac{\sqrt{3}}{10}$

2. (a4-g10-35) Shaklda ko'rsatilgan kubda cosa = ?



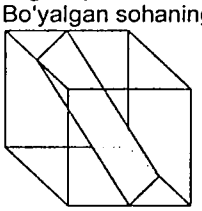
A) $\frac{\sqrt{30}}{30}$ B) $\frac{10\sqrt{3}}{30}$
C) $\frac{\sqrt{10}}{30}$ D) $\frac{\sqrt{30}}{10}$

3. (a6-g10-29) Kubning simmetriya markazidan uchigacha bo'lgan masofa $56\sqrt{3}$ ga teng. Kub uchidan unga ichki chizilgan shar sirtigacha bo'lgan eng yaqin masofani toping.

A) 56 B) $28\sqrt{3}-28$
C) 28 D) $56\sqrt{3}-56$

174. Kub sirtining yuzi

1. (a2-g4-35) Rasmdagi kubning tomoni 6 ga teng. Tekislik o'zi kesib o'tgan qirralar o'rtasidan o'tadi. Bo'yalgan sohaning yuzini toping.



A) $18\sqrt{3}$ B) 18
C) $12\sqrt{3}$ D) $9\sqrt{10}$

2. (a3-g20-35) Kubning barcha qirralari 20% qisqartirilsa, kubning to'la sirti necha foiz kamayadi?

A) 48,8 B) 36 C) 20 D) 50

175. Kub hajmi

1. (a1-g17-35) A kubning hajmi B kubning hajmidan 3 marta katta. B kubning to'la sirti 18 ga teng bo'lsa, A kubning hajmini toping.

A) $6\sqrt{3}$ B) $9\sqrt{3}$ C) 6 D) 18

2. (a4-g6-35) Asosining tomonlari 4 va 6 ga teng bo'lgan to'g'ri burchakli parallelepipedning ichida suv bor. Bu suvning ichiga qirrasi 3 ga teng bo'lgan kub solindi. Kubning $\frac{2}{3}$ qismi botganda kub parallelepiped tubiga tegib qoldi. Kub tashlanishidan avval parallelepiped ichidagi suvning balandligi nechaga teng bo'lgan?

A) 1 B) 1,25
C) 1,2 D) 0,6

176. Parallelepiped va uning xossasi

1. (a1-g4-35) Asosining tomonlari 4 va 6 ga teng bo'lgan to'g'ri burchakli parallelepipedning ichida suv bor. Bu suvni ichiga tomoni 3 ga teng bo'lgan kub tashlandi. Kubning 2/3 qismi botganda, kub parellelipiped tubiga tegib qoldi. Kub tashlanishidan avval parellelipiped ichidagi suvning balandligi nechaga teng bo'lgan?

A) 1 B) 1,25 C) 1,2 D) 0,6

2. (a1-g9-35) To'g'ri parallelepiped asosining tomonlari 6 va $\sqrt{3}$ ga teng bo'lib, 30° burchak tashkil qiladi. Parallelepipedning kichik diagonali $\sqrt{42}$ ga teng. Shu diagonal asos tekisligi bilan hosil qilgan burchakni toping.

A) 30° B) 60°
C) 45° D) arctg$\sqrt{2}$

3. (a2-g3-35) To'g'ri to'rtburchakli parallelipipedning balalndligi 21 sm bo'lib, u bo'yi bilan enining ayirmasiga teng. Bo'yi enidan 4 marta katta bo'lsa, parallelepiped yon sirtini toping.

A) 1470 B) 1862
C) 1588 D) 1324

4. (a2-g21-29) ABCD parallelogramning AB va BC tomonlari mos ravishda 13 va 7 ga teng. D burchak bissektrissasi AB tomonni E nuqtada kesadi. EB kesma uzunligini toping.

A) 10 B) 7 C) 6 D) 3

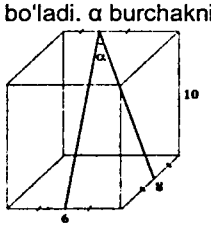
5. (a3-g19-35) To'g'ri burchakli parallelepiped asosining tomonlari 3 va 5 m, balandligi esa 7 m. Parallelepiped diagonali asos tekisligi bilan hosil qilgan burchak kosinusini toping.

A) $\frac{5}{\sqrt{83}}$ B) $\frac{7}{\sqrt{83}}$ C) $\sqrt{\frac{34}{83}}$ D) $\sqrt{\frac{24}{34}}$

6. (a5-g14-28) Quyidagi mulohazalardan qaysilari to'g'ri?
1) To'g'ri to'rtburchakning diagonallari bir-biriga perpendikulyar; 2) Ixtiyoriy uchburchakka tashqi aylana chizish mumkin; 3) A(x; y; z) nuqtaga OYZ tekisligidagi eng yaqin nuqtaning koordinatlari (0, y, z); 4) Parallel tekisliklarda yotuvchi chiziqlar bir-biriga parallel bo'ladi; 5) Asosi kvadrat bo'lgan to'g'ri parallelepipedning 5 ta simmetriya tekisiligi mavjud.

A) 2, 3, 4 B) 1, 4, 5
C) 1, 2, 4 D) 2, 3, 5

7. (a5-g18-35) Rasmda to'g'ri burchakli parallelepiped va uning tomonlari uzunliklari tasvirlangan. O'tkazilgan kesmalar tomonlarni teng ikki bo'lakka bo'ladi. α burchakni toping.



A) $\arccos\frac{66}{5\sqrt{205}}$
B) $\arccos\frac{255}{8\sqrt{1189}}$
C) $\arccos\frac{305}{8\sqrt{1189}}$
D) $\arccos\frac{107}{10\sqrt{205}}$

8. (a6-g13-26) Quyidagi mulohazalardan qaysilari to'g'ri?
1) To'g'ri to'rtburchakning diagonallari bir-biriga perpendikulyar; 2) Ixtiyoriy uchburchakka tashqi aylana chizish mumkin; 3) $A(x; y; z)$ nuqtaga OYZ tekisligidagi eng yaqin nuqtaning koordinatalari $(0, y, z)$; 4) Parallel tekisliklarda yotuvchi chiziqlar bir-biriga parallel bo'ladi; 5) Asosi kvadrat bo'lgan to'g'ri parallelepipedning 5 ta simmetriya tekisiligi mavjud.
A) 2, 3, 4 B) 1, 4, 5
C) 1, 2, 4 D) 2, 3, 5

177. Parallelepiped sirtlarining yuzi

1. (a1-g1-32) To'g'ri burchakli parallelepiped diagonalining uzunligi 6 sm. Uning barcha qirralari yig'indisi 32 sm ga teng. Shu parallelepipedning to'la sirtini toping.
A) 14 B) 36 C) 28 D) 24

2. (a3-g17-35) To'g'ri to'rtburchakli parallelepipedning balandligi 21 sm bo'lib, u bo'yi bilan enining ayirmasiga teng. Bo'yi enidan 4 marta katta bo'lsa, parallelepiped to'la sirtini toping.
A) 1470 B) 1862
C) 1588 D) 1324

3. (a4-g14-36) Diagonallari uzunligi 6 sm bo'lgan to'g'ri burchakli parallelepipedning o'lchovlari x, y va z; $x + y + z = 8$. Parallelepipedning to'la sirti necha sm^2?
A) 28 B) 42 C) 24 D) 36

4. (a5-g7-35) To'g'ri burchakli parellelepipedning uchta turli qirralari yig'indisi 12 ga, diagonali 9 ga teng. Shu parallelepipedning to'la sirtini toping.
A) 63 B) 81
C) 144 D) 112,5

178. Parallelepiped hajmi

1. (a1-g8-35) Tomonlari uzunliklari 1, 3 va 5 sonlariga mutanosib bo'lgan to'g'ri burchakli parallelepipedning diagonali uzunligi $3\sqrt{35}$ sm. Shu parallelepipedning hajmini toping.
A) 635 B) 765 C) 405 D) 625

2. (a4-g18-22) Kvadratning tomoni 30 sm. Uning har uchidan tomoni x smli kvadratchalar kesib,olinib, kesilgan joyidan buklab quti yasaldi. Qutining hajmi eng katta bo'lishi uchun x necha sm bo'lishi kerak?
A) 5 B) 3 C) 9 D) 15

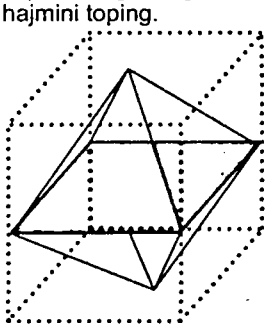
3. (a4-g18-35) Beruniy metrosidagi suv havzasining eni 50 m, bo'yi 20 m. Chuqurligi esa 1,8 m dan 2,2 m ga tekis ortadi. Suv havzasiga necha litr suv sig'adi?
A) 2000 B) 2200
C) 2000000 D) 2200000

4. (a5-g13-29) Tomonining uzunligi x ga teng bo'lgan kvadratning to'rt uchidan tomoni 3 sm bo'lgan kvadratchalar kesib tashlandi. Hosil bo'lgan shaklning chetlarini yuqoriga buklab quticha yasaldi. Agar qutining hajmi 192 sm^3 ga teng bo'lsa, x ning qiymatini toping.
A) 8 B) 11 C) 14 D) 16

5. (a5-g25-29) Tomonlari 1, 3 va 6 sonlariga proporsional to'g'ri burchakli parallelepipedning to'la sirti 216 sm^2 bo'lsa, hajmi necha sm^3?
A) 116 B) 124
C) 144 D) 152

6. (a6-g4-29) Parallelepipedning barcha chiziqli o'lchovlari 30% ga orttirilsa, hajmi necha foizga ortadi?
A) 119,7 B) 69
C) 169 D) 125

7. (a6-g5-29) Rasmda parellelepiped va unga ichki chizilgan oktaedr ko'rsatilgan. Agar parallelepipedning hajmi 186 ga teng bo'lsa, oktaedrning hajmini toping.



A) 31 B) 62 C) 93 D) 46,5

8. (a6-g12-2) To'g'ri burchakli parallelepipedning diagonali 13 sm ga, yon yoqlari diagonallari $4\sqrt{10}$ sm va $3\sqrt{17}$ sm ga teng. Parallelepipedning hajmini toping.
A) 144 B) 72
C) 288 D) 36

179. Prizma va uning xossasi. Prizma sirtlarining yuzalari

1. (a2-g14-34) Sakkiz burchakli muntazam prizmaning nechta diagonal kesimi mavjud?
A) 20 B) 18 C) 16 D) 24

2. (a3-g21-35) Muntazam oltiburchakli prizmaning balandligi asosining tomonidan 1,5 marta katta. Agar prizmaning eng katta diagonali 20 ga teng bo'lsa, bu prizmaning yon sirtini toping.
A) 288 B) 432
C) 576 D) 900

3. (a4-g1-35) To'rtburchakli muntazam prizma asosining diagonali 8, yon yog'ining diagonali 7 bo'lsa, shu prizmaning diagonalini toping.
A) 10 B) 9 C) 6 D) 12

4. (a5-g8-35) Muntazam oltiburchakli prizmaning balandligi 7 ga, katta diagonali 25 ga teng. Prizmaning kichik diagonali uzunligini toping.
A) $12\sqrt{3}$ B) $8\sqrt{3}$
C) $\sqrt{481}$ D) $\sqrt{241}$

5. (a5-g16-29) Muntazam oltiburchakli prizmaning balandligi 9 ga, katta diagonali 41 ga teng. Prizmaning kichik diagonali uzunligini toping.
A) $\sqrt{1281}$ B) $\frac{\sqrt{5529}}{3}$
C) $20\sqrt{3}$ D) $\frac{40}{\sqrt{3}}$

6. (a5-g20-29) Muntazam piramidaning yon sirti to'la sirtining 75% ini tashkil etadi. Piramida asosidagi ikki yoqli burchak sinusini toping.
A) berilganlar yetarli emas
B) $\frac{1}{3}$
C) $\frac{1}{2\sqrt{2}}$
D) $\frac{2\sqrt{2}}{3}$

7. (a5-g22-29) Prizmaning qirralari soni uning yoqlari sonidan 24 taga ortiq. Shu prizmaning nechta uchi mavjud?
A) 26 B) 24 C) 12 D) 13

8. (a6-g7-29) Qirralari soni yoqlari sonidan 24 taga ortiq bo'lgan prizma asosining ichki burchaklari yig'indisini toping.
A) 2340° B) 1800°
C) 1980° D) 2160°

9. (a6-g18-6) Prizmaning yoqlari soni tomonlari sonidan 2,(6) marta ko'p. Shu prizmaning uchlari sonini toping.
A) 16 B) 32 C) 18 D) 36

180. Prizma hajmi

1. (a1-g6-35) Muntazam oltiburchakli to'g'ri prizmaning yon yog'i kvadratdan iborat bo'lib, kvadratning diagonali $4\sqrt{2}$ ga teng. Prizmaning hajmini toping.
A) $84\sqrt{2}$ B) $72\sqrt{3}$
C) $96\sqrt{3}$ D) 108

2. (a2-g5-35) Muntazam oltiburchakli to'g'ri prizmaning yon yoqi kvadratdan iborat bo'lib, kvadratning diagonali $4\sqrt{2}$ ga teng. Prizmaning hajmini toping.
A) $84\sqrt{2}$ B) $72\sqrt{3}$
C) $96\sqrt{3}$ D) 108

3. (a2-g10-35) Hajmi 176 ga va balandligi 4 ga teng bo'lgan muntazam to'rtburchakli piramidaning apofemasini toping.
A) $\sqrt{38}$ B) 9 C) 8 D) 7

4. (a2-g11-34) Barcha qirralari o'zaro perpendikulyar bo'lgan uchburchakli piramidaning qirralari 12, 8 va 9 ga teng. Shu piramidaning hajmini toping.
A) 144 B) 288
C) 324 D) 108

5. (a3-g10-34) Barcha qirralari o'zaro perpendikulyar bo'lgan uchburchakli piramidaning qirralari 6, 5 va 7 ga teng. Shu piramidaning hajmini toping.
A) 140 B) 105 C) 35 D) 70

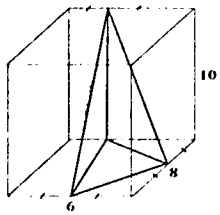
6. (a3-g11-35) Muntazam oltiburchakli to'g'ri prizmaning yon yog'i kvadratdan iborat bo'lib, kvadratning diagonali $4\sqrt{2}$ ga teng. Prizmaning hajmini toping.
A) $84\sqrt{2}$
B) $72\sqrt{3}$
C) $96\sqrt{3}$
D) 108

7. (a4-g19-35) Muntazam oltiburchakli prizma hajmi ikki baravar ortishi uchun balandligi 1,5 marta kattalashtirilganda asosining tomoni qanday o'zgartirilishi kerak?
A) $\frac{\sqrt{3}}{\sqrt{2}}$ marta kattalashtirish kerak
B) $\sqrt{3}$ marta kattalashtirish kerak
C) $\frac{2\sqrt{3}}{3}$ marta kattalashtirish kerak
D) aniqlab bo'lmaydi.

8. (a4-g25-35) Muntazam oltiburchakli prizma hajmi uch baravar ortishi uchun balandligi 1,5 marta kattalashtirilganda, asosining tomoni qanday o'zgartirilishi kerak?
A) $\frac{\sqrt{3}}{\sqrt{2}}$ marta kattalashtirish kerak
B) $\sqrt{3}$ marta kattalashtirish kerak
C) $\sqrt{2}$ marta kattalashtirish kerak
D) aniqlab bo'lmaydi

9. (a5-g17-29) Prizmaning asosi *n* burchakli, tomoni *a ga* teng muntazam ko'pburchak. Agar shu prizmaning balandligi *h ga* teng bo'lsa, prizmaning hajmini toping.
A) $\frac{a^2hn}{4\operatorname{tg}\frac{360^\circ}{n}}$ B) $\frac{a^2hn}{2\operatorname{tg}\frac{360^\circ}{n}}$
C) $\frac{a^2hn}{4\operatorname{tg}\frac{180^\circ}{n}}$ D) $\frac{a^2hn}{2\operatorname{tg}\frac{180^\circ}{n}}$

10. (a5-g19-29) Rasmda to'g'ri burchakli parallelepiped va uning tomonlari uzunliklari tasvirlangan. O'tkazilgan kesmalar tomonlarni teng ikki bo'lakka bo'ladi. Qalin chiziqlar yordamida hosil qilingan piramida hajmini toping.



A) 40 B) 80 C) 120 D) 60

11. (a5-g23-30) Tomoni 24 sm bo'lgan romb to'g'ri prizmaning asosini tashkil etadi. Prizmaga radiusi 6 sm li shar ichki chizilgan bo'lsa, prizma hajmini toping.
A) 1728 B) 6912
C) 5184 D) 3456

12. (a6-g1-29) Muntazam oltiburchakli prizmaning eng katta diagonali uning asos qirrasidan 4 marta katta va balandligi $6\sqrt{3}$ ga teng. Prizmaning hajmini toping.
A) 243 B) 81 C) 162 D) 286

13. (a6-g3-30) Tomoni 15 sm bo'lgan romb to'g'ri prizmaning asosini tashkil etadi. Prizmaga radiusi 6 sm li shar ichki chizilgan bo'lsa, prizma hajmini toping.
A) 540 B) 6480
C) 900 D) 2160

14. (a6-g8-29) Uchburchakli muntazam prizmaning yon yoqlari kvadratlardan iborat. Prizma yon sirtining yuzi a^2 ga teng. Uchlari prizmaning hamma yoqlarining markazlarini tutashtirishdan hosil bo'lgan ko'pyoqning hajmini toping.
A) $\frac{a^3}{144}$ B) $\frac{a^3}{48}$
C) $\frac{a^3}{72}$ D) $\frac{a^3}{36}$

15. (a6-g15-17) Muntazam oltiburchakli prizma hajmi ikki baravar ortishi uchun balandligi 1,5 marta kattalashtirilganda, asosining tomoni qanday o'zgartirilishi kerak?
A) $\frac{\sqrt{3}}{\sqrt{2}}$ marta kattalashtirish kerak
B) $\sqrt{3}$ marta kattalashtirish kerak
C) $\frac{2\sqrt{3}}{3}$ marta kattalashtirish kerak
D) aniqlab bo'lmaydi

16. (a6-g15-20) Tomoni 15 sm bo'lgan romb to'g'ri prizmaning asosini tashkil etadi. Prizmaga radiusi 6 sm li shar ichki chizilgan bo'lsa, prizma hajmini toping.
A) 2160 B) 6480 C) 900 D) 540

17. (a6-g21-20) Muntazam oltiburchakli prizma yon yog'ining diagonali *d* ga teng va u asos bilan α burchak tashkil etadi. Prizma hajmini toping.
A) $\frac{3\sqrt{3}}{2}d^3\sin^2\alpha\cos\alpha$
B) $\frac{3\sqrt{3}}{4}d^3\sin 2\alpha\cos\alpha$
C) $3\sqrt{3}d^3\sin 2\alpha\cos\alpha$
D) $\frac{3\sqrt{3}}{2}d^3\sin\alpha\cos 2\alpha$

18. (a6-g22-25) Muntazam oltiburchakli prizma yon yog'ining diagonali d ga teng va u asos bilan α burchak tashkil etadi. Prizma hajmini toping.
A) $\frac{3\sqrt{3}}{2}d^3\sin^2\alpha\cos\alpha$
B) $\frac{3\sqrt{3}}{4}d^3\sin 2\alpha\cos\alpha$
C) $3\sqrt{3}d^3\sin 2\alpha\cos\alpha$
D) $\frac{3\sqrt{3}}{2}d^3\sin\alpha\cos 2\alpha$

181. Piramida va uning elementlari

1. (a1-g10-35) Hajmi va asosining yuzi 108 ga teng bo'lgan muntazam to'rtburchakli piramidaning apofemasini toping.
A) 6 B) 7 C) 8 D) 9

2. (a1-g12-22) Barcha yon qirralari asos tekisligi bilan bir xil burchak hosil qiluvchi piramidaning asosi to'g'ri burchakli uchburchakdan iborat hamda katetlari 14 va 48 ga teng. Agar piramidaning balandligi 25 ga teng bo'lsa, uning yon qirrasini toping.
A) $25\sqrt{2}$ B) $25\sqrt{3}$
C) 50 D) 25

3. (a1-g13-35) Asosi kvadrat bo'lgan piramidaning asos yuzasi 196 sm^2, yon sirti 700 sm^2. Shu piramidaning balandligini toping.
A) 24 B) 30 C) 25 D) 12

4. (a2-g7-35) Piramidaning asosi muntazam oltiburchakdan iborat. Piramidaning balandligi 8 ga teng. Agar piramida asosining tomoni $4\sqrt{3}$ ga teng bo'lsa, shu piramidaning apofemasini toping.
A) $8\sqrt{3}$
B) 10
C) $16\sqrt{3}$
D) 12

5. (a2-g15-35) Muntazam beshburchakli piramidaning yon sirti asos yuzasidan 2 marta katta. Piramida balandligi 12 ga teng bo'lsa, apofema uzunligini toping.
A) $12\sqrt{3}$ B) 16
C) $8\sqrt{3}$ D) 24

6. (a2-g20-36) Muntazam to'rtburchakli piramidaning balandligi 6 sm, apofemasi 6,5. Piramidaning asos perimetrini toping.
A) 20 B) 24 C) 12 D) 10

7. (a3-g5-35) Piramidaning asosi tomonlarining o'lchamlari 10, 24 va 26 sm ga teng uchburchakdan iborat. Agar piramidaning barcha yon qirralari 15 sm ga teng bo'lsa, bu piramidaning balandligini toping.
A) $3\sqrt{7}$ B) $2\sqrt{7}$
C) $4\sqrt{2}$ D) $2\sqrt{14}$

8. (a3-g6-35) Piramida asosi 6 va 8 ga teng bo'lgan to'g'ri to'rtburchakdan iborat. Piramidaning barcha yon qirralari 7 ga teng bo'lsa, uning balandligini toping.
A) $2\sqrt{6}$ B) $\sqrt{74}$ C) 6 D) $\sqrt{33}$

9. (a3-g7-35) Piramidaning barcha qirralarining uzunliklari teng va yon yoqlari asos tekisligiga bir xil burchak ostida og'ishgan. Quyida keltirilgan figuralardan qaysi biri bu piramidaning asosi bo'lishi mumkin?
A) romb
B) to'g'ri burchakli uchburchak
C) muntazam oltiburchak
D) teng yonli uchburchak

10. (a3-g9-35) Piramidaning yon qirralari asos tekisligi bilan bir xil burchak tashkil etgan bo'lsa, uning asosi qanday shakllardan iborat bo'lishi mumkin?
1) to'g'ri burchakli uchburchak;
2) kvadrat; 3) romb; 4) to'gri to'rtburchak; 5) to'g'ri burchakli trapetsiya.
A) 1; 2; 3 B) 1; 2; 4
C) 2; 4; 5 D) 2; 3; 4

11. (a3-g12-35) Muntazam beshburchakli piramidaning yon sirti asos yuzasidan 2 marta katta. Piramida apofemasi 18 ga teng bo'lsa, balandligini toping.
A) $9\sqrt{3}$ B) 9
C) $6\sqrt{3}$ D) 12

12. (a3-g18-35) Muntazam beshburchakli piramidaning yon sirti asos yuzasidan 2 marta katta. Piramida apofemasi 18 ga teng bo'lsa, balandligini toping.
A) $9\sqrt{3}$ B) 9 C) $6\sqrt{3}$ D) 12

13. (a3-g24-35) Uchburchakli piramidaning barcha ikki yoqli burchaklari 60° ga teng. Agar asosidagi uchburchakning tomonlari 24, 7 va 25 ga teng bo'lsa, shu piramidaning yon sirtini toping.
A) 84 B) 168 C) 126 D) 42

14. (a4-g8-35) Muntazam beshburchakli piramidaning yon sirti asos yuzasidan 2 marta katta. Piramida apofemasi 18 ga teng bo'lsa, balandligini toping.
A) $9\sqrt{3}$ B) 9 C) $6\sqrt{3}$ D) 12

15. (a4-g9-35) Piramidaning yon qirralari asos tekisligi bilan bir xil burchak tashkil etgan bo'lsa, uning asosi qanday shakllardan iborat bo'lishi mumkin?
1) to'g'ri burchakli uchburchak;
2) kvadrat; 3) romb; 4) to'gri to'rtburchak; 5) to'g'ri burchakli trapetsiya.
A) 1; 2; 3 B) 1; 2; 4
C) 2; 4; 5 D) 2; 3; 4

16. (a4-g12-35) Muntazam piramidaning yon sirti to'la sirtining 60% ni tashkil etadi. Piramida yon yoqlari asos tekisligi bilan qanday burchak tashkil etadi?
A) $\arccos\frac{1}{4}$ B) 60°
C) $\arccos\frac{3}{5}$ D) $\arccos\frac{2}{3}$

17. (a4-g20-35) To'g'ri to'rtburchakli prizmaning tomonlari a, b va c. To'la sirti 84 sm^2 va hajmi 45 sm^3 bo'lsa, $\frac{1}{a}+\frac{1}{b}+\frac{1}{c}=?$
A) $\frac{14}{15}$ B) $\frac{28}{15}$ C) $\frac{46}{15}$ D) $\frac{15}{23}$

18. (a5-g3-35) Asosi rombdan iborat piramidaning barcha yon yoqlari asos tekisligi bilan bir xil burchak hosil qiladi. Shu piramidaning nechta simmetriya tekisligi mavjud?
A) 2 B) 4 C) 3 D) 5

19. (a5-g4-35) Asosi tomonlari 6 va 8 ga teng bo'lgan to'g'ri to'rtburchakli piramidaning qirralari asos tekisligi bilan 45° hosil qiladi. Shu piramidaning kichik yon yog'ining asos tekisligi bilan hosil qilgan burchagining tangensini toping.
A) 1,25 B) 0,6 C) 0,6 D) 0,8

20. (a5-g15-22) Hajmi va asosining yuzi 108 ga teng bo'lgan muntazam to'rtburchakli piramidaning apofemasini toping.
A) 6 B) 5 C) 8 D) 9

21. (a6-g14-25) Asosi muntazam uchburchakdan iborat bo'lgan piramidaning asos qirrasi uzunligi a ga teng. Uning yon qirrasi asosi tekisligi bilan α burchak hosil qiladi. Piramida asos uchidan yon yog'igacha bo'lgan masofani toping.
A) $\frac{\sqrt{12\operatorname{tg}^2\alpha+3}}{a\operatorname{tg}\alpha}$
B) $\frac{\sqrt{3}a\operatorname{tg}\alpha}{\sqrt{4\operatorname{tg}^2\alpha+1}}$
C) $\frac{a\operatorname{tg}\alpha}{\sqrt{3\operatorname{tg}^2\alpha+2}}$
D) $\frac{\sqrt{3tg^2\alpha+1}}{2a\operatorname{tg}\alpha}$

22. (a6-g17-29) Piramidaning yon yoqlari asos tekisligi bilan bir xil burchak tashkil etgan bo'lsa, uning asosi qanday shakllardan iborat bo'lishi mumkin?
1) parallelogramm; 2) kvadrat; 3) romb; 4) to'g'ri to'rtburchak; 5) teng yonli trapetsiya.
A) 1, 2, 3 B) 1, 2, 4
C) 2, 4, 5 D) 2, 3, 4

182. Piramida sirtlarining yuzi

1. (a1-g14-35) Asosidagi ikki yoqli burchaklari 60° bo'lgan piramida asosining tomoni 6 ga, o'tkir burchagi 30° ga teng rombdan iborat. Piramidaning to'la sirtini toping.
A) 54 B) 27 C) 36 D) 72

2. (a2-g12-36) Diagonal kesimi asosiga tengdosh bo'lgan to'rtburchakli muntazam piramida asosining tomoni a bo'lsa, uning yon sirtini toping.
A) $\frac{3a^2}{2}$ B) $3a^2$
C) a^2 D) $\frac{a^2\sqrt{3}}{5}$

3. (a2-g21-35) Oktaedrning ikki uchi orasidagi masofa 18 ga teng. Oktaedrning hajmini toping.
A) 243 B) 486 C) 729 D) 972

4. (a4-g2-35) Barcha qirralari asos tekisligi bilan 45° burchak hosil qiladigan piramidaning asosi tomonlari 6 ga teng bo'lgan muntazam oltiburchakdan iborat. Piramidaning yon sirti yuzini toping.
A) $54\sqrt{3}$ B) $27\sqrt{7}$
C) $54\sqrt{7}$ D) $54\sqrt{2}$

5. (a4-g23-35) Asosidagi ikki yoqli burchaklari 60° bo'lgan piramida asosining tomoni 6 ga, o'tkir burchagi 30° ga teng rombdan iborat. Piramidaning to'la sirtini toping.
A) 54 B) 27 C) 36 D) 90

6. (a5-g5-35) Uchburchakli piramida asosining tomonlari 13, 14 va 15 ga teng. Piramidaning asosidan boshlab balandlikning uchdan bir qismiga teng masofadan tekislik bilan kesildi. Hosil bo'lgan kesimning yuzini toping.
A) $\frac{28}{3}$ B) $\frac{56}{3}$
C) 28 D) $\frac{112}{3}$

7. (a5-g12-29) Muntazam oltiburchakli piramidaning asos perimetri 24 ga, balandligi 2 ga teng bo'lsa, piramidaning yon sirtini toping.
A) 24 B) 36 C) 48 D) 64

8. (a5-g24-29) Uchburchakli piramidaning uchta qirrasi bir-biriga perpendikulyar va 15, 16 va 20 ga teng.

Shu piramidaning to'la sirtini toping.
A) 800 B) 720
C) 680 D) 640

9. (a6-g3-29) Asosidagi ikki yoqli burchaklari 60° bo'lgan piramida asosining tomoni 12 ga, o'tkir burchagi 30° ga teng rombdan iborat. Piramidaning to'la sirtini toping.
A) 144 B) 216 C) 180 D) 90

10. (a6-g11-25) Asosi kvadratdan iborat piramidaning balandligi asosning bir uchidan o'tadi va 8 ga teng. Agar asos qirrasi 15 ga teng bo'lsa, piramidaning to'la sirtini toping.
A) 375 B) $15\sqrt{514}+345$
C) 600 D) $30\sqrt{514}+465$

11. (a6-g24-16) Asosidagi ikki yoqli burchaklari 60° bo'lgan piramida asosining tomoni 6 ga o'tkir burchagi 30° ga teng rombdan iborat. Piramidaning to'la sirtini toping.
A) 54 B) 27 C) 36 D) 90

12. (a6-g26-29) Muntazam to'rtburchakli piramidaning asos qirrasi uzunligi 12 ga, balandligi 4 ga teng. Shu piramidaning to'la sirtini toping.
A) $144+48\sqrt{13}$
B) $144+24\sqrt{13}$
C) $72+24\sqrt{13}$
D) $72+48\sqrt{13}$

183. Piramida hajmi

1. (a1-g2-35) Qirrasi 3 sm ga teng bo'lgan kubning yuqori asosidagi A uchi va pastki asosidagi A bilan umumiy qirraga ega bo'lmagan E, F va G uchlari hosil qiluvchi piramida hajmini hisoblang.
A) $\frac{9}{2}sm^3$ B) $\frac{9}{5}sm^3$
C) $\frac{9}{4}sm^3$ D) $\frac{3}{2}sm^3$

2. (a1-g3-10) Piramidaning asosi tomonlari 10 va 12 bo'lgan to'g'ri to'rtburchakdan iborat. Agar piramidaning har bir qirrasi $\sqrt{161}$ ga teng bo'lsa, uning hajmini toping.
A) 300 B) 400 C) 540 D) 600

3. (a1-g5-35) Hajmi 176 ga va balandligi 4 ga teng bo'lgan muntazam to'rtburchakli piramidaning apofemasini toping.
A) $\sqrt{38}$
B) 9
C) 8
D) 7

4. (a1-g7-34) Asosining yuzi 52 ga teng bo'lgan muntazam to'rtburchakli piramidaning apofemasi 7 ga teng. Piramida hajmini toping.
A) 121 B) 104 C) 156 D) 312

5. (a1-g11-35) Uchburchakli va to'g'ri to'rtburchakli to'g'ri prizmalarning barcha qirralari 6 ga teng. To'rtburchakli prizmaning hajmi uchburchakli prizmaning hajmidan necha marta katta?
A) $\frac{4\sqrt{3}}{3}$ B) $2\sqrt{3}$
C) $\frac{2\sqrt{3}}{3}$ D) $\sqrt{3}$

6. (a1-g15-35) Hajmi 360 ga va balandligi 6 ga teng bo'lgan muntazam to'rtburchakli piramidaning apofemasini toping
A) $\sqrt{38}$ B) $\sqrt{71}$ C) 8 D) 9

7. (a2-g1-36) Balandligi 4 ga teng bo'lgan tetreadrning hajmini toping.
A) $2\sqrt{6}$ B) $\frac{16}{3}\sqrt{2}$
C) $8\sqrt{3}$ D) $16\sqrt{2}$

8. (a2-g2-34) Barcha qirralari o'zaro perpendikulyar bo'lgan uchburchakli piramidaning qirralari 4, 9 va 8 ga teng. Shu piramidaning hajmini toping.
A) 144 B) 96 C) 72 D) 48

9. (a2-g8-36) Qirralari bir xil bo'lgan muntazam to'rtburchakli piramida shaklidagi sut idishining hajmi 1 litr bo'lishi uchun uning bitta qirrasi necha sm bo'lishi kerak?
A) $10\cdot\sqrt[6]{12}$ B) $10\cdot\sqrt[6]{18}$
C) $5\cdot\sqrt[6]{24}$ D) 1

10. (a2-g9-35) Uchburchakli va to'g'ri to'rtburchakli to'g'ri prizmalarning barcha qirralari 6 ga teng. To'rtburchakli prizmaning hajmi uchburchakli prizmaning hajmidan necha marta katta?
A) $\frac{4\sqrt{3}}{3}$ B) $2\sqrt{3}$
C) $\frac{2\sqrt{3}}{3}$ D) $\sqrt{3}$

11. (a2-g14-35) Uchburchakli piramidaning yon qirralari o'zaro perpendikulyar va uzunliklari $\sqrt{70}$, $\sqrt{99}$ va $\sqrt{126}$ ga teng bo'lsa, piramidaning hajmini toping.
A) $21\sqrt{55}$ B) $2\sqrt{110}$
C) $4\sqrt{68}$ D) $29\sqrt{22}$

12. (a2-g18-35) Uchburchakli piramidaning barcha yon qirralari bir-biriga perpendikulyar va 6, 5, 7 ga teng. Shu piramidaning hajmini toping.
A) 210 B) 42 C) 120 D) 35

13. (a2-g19-35) Uchburchakli piramida asosining tomonlari 4, 6 va 7 ga teng. Uning barcha yon qirralari asos tekisligi bilan 60° burchak tashkil qiladi. Piramidaning hajmini toping.
A) $28\sqrt{3}$ B) $7\sqrt{3}$
C) $14\sqrt{3}$ D) $42\sqrt{3}$

14. (a2-g22-35) Piramida asosiga parallel tekislik bilan kesilganda hosil bo'lgan kesimning yuzasi asos yuzasining uchdan biriga teng. Dastlabki piramida hajmi hosil bo'lgan kichik piramida hajmidan necha marta katta?
A) 27 B) 9 C) $3\sqrt{3}$ D) $\sqrt{3}$

15. (a2-g23-35) Uchburchakli piramidaning ikki qirrasi 6 va 4 ga va ular orasidagi burchak 60° ga teng. Agar uchinchi qirrasi 8 ga teng bo'lib, qolgan ikki qirraga perpendikulyar bo'lsa, shu piramidaning hajmini toping.
A) $\frac{64}{3}$ B) $32\sqrt{3}$
C) $16\sqrt{3}$ D) $\frac{32}{3}$.

16. (a3-g1-35) Sakkizburchakli muntazam piramida asosining perimetri 2 marta kichiklashtirildi, balandligi esa 4 marta kattalashtirildi. Uning hajmi qanday o'zgaradi?
A) 2 marta kattalashadi
B) 2 marta kichrayadi
C) 4 marta kattalashadi
D) o'zgarmaydi

17. (a3-g2-35) Muntazam to'rtburchakli piramidaning barcha qirralari 4 ga teng. Piramida hajmini toping.
A) $\frac{32\sqrt{2}}{3}$ B) $16\sqrt{3}$
C) $\frac{16\sqrt{2}}{9}$ D) $\frac{64\sqrt{2}}{3}$

18. (a3-g3-36) Qirralari bir xil bo'lgan muntazam to'rtburchakli piramida shaklidagi sut idishining hajmi 1 litr bo'lishi uchun uning bitta qirrasi necha sm bo'lishi kerak?
A) $10\cdot\sqrt[6]{12}$ B) $10\cdot\sqrt[6]{18}$
C) $5\cdot\sqrt[6]{24}$ D) 1

19. (a3-g8-35) Uchburchakli piramida asosining tomonlari 4, 6 va 7 ga teng. Uning barcha yon qirralari asos tekisligi bilan 60° burchak tashkil qiladi. Piramidaning hajmini toping.
A) $28\sqrt{3}$ B) $7\sqrt{3}$
C) $14\sqrt{3}$ D) $42\sqrt{3}$

20. (a3-g13-35) Muntazam oltiburchakli prizmaning yon yog'i kvadratdan iborat va kvadratning yuzi 12 ga teng. Prizmaning hajmini toping.
A) 216 B) 108 C) 54 D) 27

21. (a3-g14-35) Piramidaning barcha qirralari bir-biriga perpendikulyar va 7, 12 va 10 ga teng. Shu piramidaning hajmini toping.
A) 140 B) 420 C) 210 D) 280

22. (a3-g15-35) Piramida asosiga parallel tekislik bilan kesilganda hosil bo'lgan kesimning yuzasi asos yuzasining yarmiga teng. Dastlabki piramida hajmi hosil bo'lgan kichik piramida hajmidan necha marta katta?
A) 8 B) 4 C) $2\sqrt{2}$ D) $\sqrt{2}$

23. (a3-g16-35) Uchburchakli piramidaning ikki qirrasi 4 va 5 ga va ular orasidagi burchak 30° ga teng. Uchinchi qirrasi 6 ga teng bo'lib, qolgan ikki qirraga perpendikulyar bo'lsa, shu piramidaning hajmini toping.
A) 20 B) 40 C) 10 D) 60

24. (a4-g4-35) To'la sirti $16\sqrt{3}$ ga teng bo'lgan tetraedrning hajmini toping.
A) $\frac{13\sqrt{2}}{3}$ B) $\frac{16\sqrt{2}}{3}$
C) $8\sqrt{2}$ D) $\frac{15\sqrt{2}}{2}$

25. (a4-g5-35) Oktaedrning ikki uchi orasidagi masofa 18 ga teng. Oktaedrning hajmini toping.
A) 243 B) 486 C) 729 D) 972

26. (a4-g15-35) Piramida asosi tomonlari 6 va 4 ga teng to'g'ri to'rtburchakdan iborat. Piramidaning bir yon qirrasi 9 ga teng va asos tekisligi bilan 60° li burchak hosil qilsa, piramidaning hajmini toping.
A) $108\sqrt{3}$ B) $36\sqrt{3}$
C) 108 D) 216

27. (a4-g16-35) Oktaedrning ikki uchi orasidagi masofa 12 ga teng. Oktaedrning hajmini toping.
A) 144 B) 72 C) 288 D) 576

28. (a4-g21-35) Oktaedrning ikki uchi orasidagi masofa 12 ga teng. Oktaedrning hajmini toping.
A) 144 B) 72 C) 288 D) 576

29. (a4-g24-35) Yon qirralari bir-biriga perpendikulyar bo'lgan uchburchakli piramidada yon qirralari mos ravishda 12, 10, 11 ga teng. Piramida hajmini toping.
A) 222 B) 220 C) 660 D) 440

30. (a5-g9-35) Sakkizburchakli muntazam piramida asosining perimetri 2 marta kichiklashtirildi, balandligi esa 4 marta kattalashtirildi. Uning hajmi qanday o'zgaradi?
A) 2 marta kattalashadi
B) 2 marta kichrayadi
C) 4 marta kattalashadi
D) o'zgarmaydi

31. (a5-g11-29) Oktaedrning qirrasi 12 ga teng bo'lsa, uning hajmini toping.
A) $36\sqrt{2}$ B) $144\sqrt{2}$
C) $288\sqrt{2}$ D) $576\sqrt{2}$

32. (a5-g14-29) Qirrasi 12 ga teng bo'lgan kubning pastki asosidagi uchta uchi va usti asosining bir uchini tutashtirib hosil qilingan piramidaning hajmini toping.
A) 576 B) 1152
C) 144 D) 288

33. (a5-g23-29) Piramida asosiga parallel tekislik bilan kesilganda hosil bo'lgan kesimning yuzasi asos yuzasining beshdan biriga teng. Dastlabki piramida hajmi hosil bo'lgan kichik piramida hajmidan necha marta katta?
A) 125 B) 25
C) $5\sqrt{5}$ D) $\sqrt{5}$

34. (a6-g6-29) To'g'ri to'rtburchakli piramidaning bir yon qirrasi 9 ga teng va u asos teksisligi bilan 60° li burchak hosil qiladi. Bu piramida asosining tomonlari 6 va 4 ga teng bo'lsa, piramidaning hajmini toping.
A) $108\sqrt{3}$ B) $36\sqrt{3}$
C) 108 D) 216

35. (a6-g13-15) Qirrasi 6 ga teng bo'lgan kubning pastki asosidagi uchta uchi va ustki asosining bir uchini tutashtirib hosil qilingan piramidaning hajmini toping.
A) 72 B) 144 C) 36 D) 108

36. (a6-g16-20) Hajmi va asosining yuzi 108 ga teng bo'lgan muntazam to'rtburchakli piramidaning apofemasini toping.
A) 6 B) 7 C) 8 D) 9

37. (a6-g19-21) Piramida balandligining asosdan boshlab 2:3 qismidan asosga parallel kesimlik o'tkazildi. Tekislikning yon qirralar bilan kesishgan nuqtalaridan piramida asosidagi bir nuqtaga kesimlar o'tkazildi. Hosil bo'lgan piramida hajmining boshlang'ich piramida hajmiga nisbatini toping.
A) $\frac{1}{27}$ B) $\frac{2}{27}$ C) $\frac{4}{27}$ D) $\frac{8}{27}$

38. (a6-g20-25) Asosining yuzi 52 ga teng bo'lgan muntazam to'rtburchakli piramidaning apofemasi 7 ga teng. Piramida hajmini toping.
A) 121,(3) B) 104
C) 156 D) 312

39. (a6-g23-23) Barcha qirralari 6 ga teng bo'lgan to'rtburchakli piramida hajmini toping.
A) $12\sqrt{3}$ B) $24\sqrt{3}$
C) $108\sqrt{2}$ D) $36\sqrt{2}$

40. (a6-g25-11) To'rtburchakli muntazam kesik piramida asoslarining tomonlari 4 va 16 sm, diagonali 15 sm bo'lsa, piramida hajmini toping.
A) $560\sqrt{5}$ B) 560
C) 140 D) $140\sqrt{5}$

184. Kesik piramida

1. (a4-g22-35) Asos yuzasi S_1, yon sirti S_2 bo'lgan piramida asosiga parallel tekislik bilan kesilganda hajmlari o'zaro teng bo'lgan piramida va kesik piramida hosil bo'ldi. Kesik piramidaning to'la sirtini toping.
A) $S_1 + S_2 - \frac{S_1 + S_2}{\sqrt[3]{2}}$
B) $S_1 + S_2 + \frac{S_1 - S_2}{\sqrt[3]{4}}$
C) $S_1 + S_2 + \frac{S_1 - S_2}{8}$
D) $S_1 + S_2 - \frac{S_1 + S_2}{\sqrt[3]{4}}$

2. (a5-g10-35) Piramidaning asosiga parallel tekislik bilan uning hajmini ikki bo'lakka (kichik piramida va kesik piramida) bo'lindi. Hosil bo'lgan kichik piramidaning hajmi kesik piramidaning hajmidan ikki marta katta bo'lsa, kesik piramida yon sirtining kichik piramida yon sirtiga nisbatini toping.
A) $\frac{\sqrt[3]{9} - \sqrt[3]{4}}{\sqrt[3]{4}}$ B) $\frac{\sqrt[3]{4}}{\sqrt[3]{9}}$
C) $\frac{\sqrt[3]{5}}{\sqrt[3]{4}}$ D) $\frac{\sqrt[3]{9} - \sqrt[3]{4}}{\sqrt[3]{9}}$

3. (a5-g21-29) Muntazam to'rtburchakli kesik piramidaning katta va kichik asoslarining yuzlari mos ravishda to'la sirtining 35% va 15% ini tashkil etadi. Katta asos va yon yoqlari orasida ikki yoqli burchakni toping.
A) $\arccos 0{,}7$ B) $\arccos\frac{3}{7}$
C) $\arccos\frac{5}{7}$ D) $\arccos 0{,}4$

4. (a6-g2-29) Muntazam to'rtburchakli kesik piramidaning asoslari 16 va 10 ga teng. Agar kesik piramidaning yon qirrasi 6 ga teng bo'lsa, uning hajmini toping.
A) $258\sqrt{3}$ B) 416
C) $516\sqrt{3}$ D) 832

10-bob. Aylanish jismlari

185. Silindr sirtlarining yuzi

1. (a1-g14-36) Silindrning yon sirti 90 sm^2, to'la sirti esa 144 sm^2 bo'lsa, bu silindrning balandligi necha sm? ($\pi = 3$ deb hisoblansin)
A) 2,5 B) 5 C) 2 D) 3

2. (a2-g2-35) Silindr radiusi R ga, balandligi H o'qiga parallel kesim yuzi S ga teng bo'lsa, kesim o'qidan qanday d masofada turadi?
A) $d = \frac{\sqrt{R^2H^2 - S^2}}{H}$
B) $d = \frac{\sqrt{4R^2H^2 + S^2}}{2H}$
C) $d = \frac{\sqrt{4R^2H^2 - S^2}}{2H}$
D) $d = \frac{\sqrt{R^2H^2 + S^2}}{H}$

3. (a2-g11-35) Silindr radiusi R ga, balandligi H va o'qiga parallel kesim yuzi S ga teng bo'lsa, kesim o'qidan qanday d masofada turadi?

A) $d=\frac{\sqrt{R^2H^2-S^2}}{H}$

B) $d=\frac{\sqrt{4R^2H^2+S^2}}{2H}$

C) $d=\frac{\sqrt{4R^2H^2-S^2}}{2H}$

D) $d=\frac{\sqrt{R^2H^2+S^2}}{H}$

4. (a2-g17-36) Balandligi 3 sm, asos radiusi 5 sm bo'lgan (silindrik) konserva qutisini yasash uchun necha sm^2 tunuka ketgan? ($\pi = 3$)
A) 195 B) 225 C) 240 D) 280

5. (a2-g23-32) Diametri 50 ga teng to'rtta vodoprovod quvurini suv o'tkazish qobiliyati shu to'rt quvurnikiga teng bo'lgan bitta quvur bilan almashtirish kerak. Katta quvurning diametrini toping.
A) $50\sqrt{2}$ B) $50\sqrt{3}$
C) 100 D) 70

6. (a3-g10-35) Silindr radiusi R ga, balandligi H va o'qiga parallel kesim yuzi S ga teng bo'lsa, kesim o'qidan qanday d masofada turadi?

A) $d=\frac{\sqrt{R^2H^2-S^2}}{H}$

B) $d=\frac{\sqrt{4R^2H^2+S^2}}{2H}$

C) $d=\frac{\sqrt{4R^2H^2-S^2}}{2H}$

D) $d=\frac{\sqrt{R^2H^2+S^2}}{H}$

7. (a4-g2-36) Rasmda ko'rsatilgan silindrning radiusi 6 ga teng. Kesim hosil qilgan to'rtburchakning diagonali 12 ga teng. Agar silindrning o'qidan kesimgacha bo'lgan masofa 3 ga teng bo'lsa, kesimning yuzini toping.
A) $18\sqrt{3}$ B) 108
C) $36\sqrt{3}$ D) 54

8. (a4-g22-36) Balandligi 3 sm, asos radiusi 5 sm bo'lgan (silindrik) konserva qutisini yasash uchun necha sm^2 tunuka ketgan? ($\pi = 3$)
A) 195 B) 225 C) 240 D) 280

9. (a5-g4-36) Radiusi 6 ga teng bo'lgan silindrning o'qidan 3 ga teng masofada tekislik bilan kesildi. Hosil bo'lgan kesimning yuzi silindrning o'q kesimi yuzidan necha marta kichik?
A) $\frac{2\sqrt{3}}{3}$ B) $\frac{\sqrt{3}}{2}$
C) $\sqrt{3}$ D) 2

10. (a5-g17-14) ABCD to'g'ri to'rtburchakning AB tomoni 6 ga, AD tomoni esa 8 ga teng. Shu to'rtburchakni AD atrofida aylantirishdan hosil bo'lgan jismning to'la sirti S_1. Shu to'rtburchakni BD diagonal bo'yicha kesib tashlab, hosil bo'lgan ABD uchburchakni AD tomon atrofida aylantirishdan hosil bo'lgan jismning to'la sirti S_2. S_1 ning S_2 ga nisbatini toping.
A) $\frac{7}{4}$ B) $\frac{25}{14}$
C) $\frac{7}{6}$ D) 3

186. Silindr hajmi

1. (a1-g5-36) Tomonlari a va b ga teng bo'lgan to'g'ri to'rtburchak b tomoni atrofida aylantirilganda hosil bo'lgan jismning hajmi radiusi 3 ga teng bo'lgan sharning hajmiga teng. Quyidagi a va b orasidagi munosabatlardan qaysi biri to'g'ri?
A) $a^3b = 12$
B) $a^2b = 36$
C) $ab^2 = 36$
D) $ab^3 = 12$

2. (a1-g10-36) Silindrning o'q kesimi diagonali l ga teng bo'lgan to'g'ri to'rtburchakdan iborat. Diagonal asos tekisligi bilan α burchak tashkil etadi. Silindrning hajmini toping.

A) $\frac{1}{4}\pi l^3\sin\alpha\cos 2\alpha$

B) $\frac{1}{4}\pi l^3\cos\alpha\sin^2\alpha$

C) $\frac{1}{8}\pi l^3\cos^2\alpha\sin\alpha$

D) $\frac{1}{8}\pi l^3\sin 2\alpha\cos\alpha$

3. (a1-g17-36) Radiuslar r ga teng bo'lgan silindr bilan sharning hajmlari teng. Silindrning balandligini toping.
A) $\frac{3r}{4}$ B) $4r$
C) $\frac{4r}{3}$ D) $\frac{r}{4}$

4. (a2-g8-35) Silindr asosining radiusi 10% ga kichraytirilsa va balandligi 20% ga kattalashtirilsa, uning hajmi qanday o'zgaradi?
A) 2,8% ga kamayadi
B) 1,4% ga kamayadi
C) 8% ga ortadi
D) o'zgarmaydi

5. (a2-g10-36) Silindrning o'q kesimi diagonali l ga teng bo'lgan to'g'ri to'rtburchakdan iborat. Diagonal asos tekisligi bilan α burchak tashkil etadi. Silindrning hajmini toping.

A) $\frac{1}{4}\pi l^3\sin\alpha\cos 2\alpha$

B) $\frac{1}{4}\pi l^3\cos\alpha\sin^2\alpha$

C) $\frac{0,5}{1-\left(\frac{1}{2}\right)^2}+\frac{0,4}{1-\left(\frac{3}{5}\right)^2}-\frac{0,2}{1-\frac{6}{5}}$

D) $\frac{1}{8}\pi l^3\sin 2\alpha\cos\alpha$

6. (a3-g3-35) Silindr asosining radiusi 10% ga kichraytirilsa va balandligi 20% ga kattalashtirilsa, uning hajmi qanday o'zgaradi?
A) 2,8% ga kamayadi
B) 1,4% ga kamayadi
C) 8% ga ortadi
D) o'zgarmaydi.

7. (a3-g6-36) Silindr balandligi 16 marta orttirildi. Uning hajmi o'zgarmasligi uchun asos radiusini necha marta kamaytirish kerak?
A) 256 B) 16 C) 4 D) 8

8. (a3-g9-36) Silindr asosining radiusi 7 sm. Agar uning balandligi 6 sm uzaytirilsa, hajmi 75% ga ortadi. Dastlabki silindr hajmini toping.
A) 686π B) 392π
C) 224π D) 348π

9. (a3-g11-36) Silindrning o'q kesimi diagonali l ga teng bo'lgan to'g'ri to'rtburchakdan iborat. Diagonal asos tekisligi bilan α burchak tashkil etadi. Silindrning hajmini toping.

A) $\frac{1}{4}\pi l^3\sin\alpha\cos 2\alpha$

B) $\frac{1}{4}\pi l^3\cos\alpha\sin^2\alpha$

C) $\frac{1}{8}\pi l^3\cos^2\alpha\sin\alpha$

D) $\frac{1}{8}\pi l^3\sin 2\alpha\cos\alpha$

10. (a3-g14-36) 0,5 metr uzunligidagi silindrik g'o'la 5 marta dumalaganda 3 metr masofani bosib o'tadi. G'o'la hajmini (m^3) toping. ($\pi = 3$)
A) 0,005 B) $\frac{25}{144}$
C) $\frac{25}{432}$ D) $\frac{3}{200}$

11. (a3-g21-36) Silindr o'q kesim diagonali 12 ga teng va asos tekisligi bilan 30° tashkil qiladi. Silindr hajmini toping.
A) 104π B) 162π
C) 112π D) 96π

12. (a4-g9-36) Silindr asosining radiusi 7 sm. Agar uning balandligi 6 sm uzaytirilsa, hajmi 75% ga ortadi. Dastlabki silindr hajmini toping.
A) 686π B) 392π
C) 224π D) 348π

13. (a4-g15-36) Silindrsimon stakanning ichiga sig'ishi mumkin bo'lgan eng katta hajmli yog'och to'g'ri burchakli to'g'ri parallelepiped solindi.

Agar stakanning asos radiusi 4 sm ga, balandligi 6 sm ga teng bo'lsa, yog'och solingan stakanga necha sm^3 suv sig'adi? ($\pi = 3$)
A) 96 B) 144 C) 72 D) 288

14. (a5-g2-36) Silindrsimon stakanning ichiga eng katta hajmli yog'och to'g'ri burchakli parallelepiped solindi. Agar stakanning asos radiusi 5 sm ga, balandligi 10 sm ga teng bo'lsa, yog'och solingan stakanga necha sm^3 suv sig'adi? ($\pi = 3$)
A) 750 B) 300 C) 150 D) 250

15. (a5-g5-36) Asosining uzunligi balandligiga teng bo'lgan silindrning yon sirti $36\pi^2$ bo'lsa, silindrning hajmini toping.
A) 54 B) 108π
C) $36\pi^3$ D) $54\pi^2$

16. (a5-g20-30) Ichki diametri 6 sm, umumiy balandligi 8 sm va qalinligi 0,5 sm bo'lgan silindr shaklidagi krujkani tayyorlash uchun qancha sm^3 material (chinni) ishlatilgan (eslatma: krujka tagining qalinligi ham 0,5 sm)?
A) 26π B) $30,5\pi$
C) $32,5\pi$ D) $28,5\pi$

17. (a6-g6-30) Silindrsimon stakanning ichiga eng katta hajmli to'g'ri burchakli parallelepiped shaklidagi yog'och solindi. Agar stakanning asos radiusi 4 sm ga, balandligi 6 sm ga teng bo'lsa, yog'och solingan stakanga necha sm^3 suv sig'adi? ($\pi = 3$)
A) 96 B) 144 C) 72 D) 288

18. (a6-g7-30) Umidjonning choy ichadigan chashkasi silindrsimon bo'lib, uning diametri 7 sm va balandligi 14 sm. Umidjon chaskasining ichiga tomoni 3 sm bo'lgan kub shaklidagi qanddan 3 dona soldi. Umidjonga chashkasini to'ldirib choy damlab berish uchun necha millilitr qaynagan suv kerak bo'ladi ($\pi = 3$)?
A) 433,5 B) 487,5
C) 1977 D) 8151

19. (a6-g11-11) Asos radiusi 6 ga, balandligi 8 ga teng bo'lgan silindrsimon go'ladan eng katta hajmli kub yo'nib olindi. Hosil bo'lgan kub hajmining silindr hajmiga nisbatini toping.
A) $\frac{1,5\sqrt{2}}{\pi}$ B) $\frac{3\sqrt{2}}{\pi}$
C) $\frac{16}{9\pi}$ D) $\frac{8}{9\pi}$

20. (a6-g13-17) Muntazam to'rtburchakli piramidaning asos qirrasi 6 ga, balandligi 8 ga teng.
Shu piramida ichiga chizish mumkin bo'lgan eng katta hajmli silindrning asos radiusini toping.
A) 1,5 B) 1 C) 0,75 D) 2

21. (a6-g17-30) Silindr asosining radiusi 9 sm. Agar uning balandligi 8 sm uzaytirilsa, hajmi 75% ga ortadi. Hosil bo'lgan silindr hajmini toping.
A) 1512π B) 1176π
C) 972π D) 864π

22. (a6-g20-26) Silindr o'q kesimining perimetri 20 sm^2 ga teng. Uning radiusi necha sm bo'lganda u eng katta hajmga ega bo'ladi?
A) $\frac{10}{3}$ B) 5 C) $\frac{5}{2}$ D) $\frac{10}{6}$

23. (a6-g21-11) Silindr asosining radiusi 7 sm. Agar uning balandligi 6 sm uzaytirilsa, hajmi 75% ga ortadi. Dastlabki silindr hajmini toping.
A) 686π B) 392π
C) 224π D) 348π

24. (a6-g26-30) Silindr asosining radiusi 7 sm. Agar uning balandligi 6 sm uzaytirilsa, hajmi 75% ga ortadi. Dastlabki silindr hajmini toping.
A) 686π B) 392π
C) 224π D) 348π

187. Konus sirtining yuzi

1. (a1-g3-11) Radiusi 17 sm bo'lgan shar markazidan 8 sm uzoqlikdagi tekislik bilan kesildi. Asosi kesimdagi doira, uchi esa sharning markazida bo'lgan konusning yon sirti necha sm^2?
A) 120π B) 136π
C) 189π D) 255π

2. (a1-g13-36) Konusning o'q kesimi tomoni $\frac{4\sqrt{2}}{\sqrt{\pi}}$ ga teng muntazam uchburchakdan iborat. Konus yon sirti yuzini toping.
A) 12 B) 8 C) 6 D) 16

3. (a2-g3-34) Konusning balandligi asosining diametriga teng. Konusning asos yuzining yon sirti yuziga nisbatini toping.
A) 1 B) $\frac{\sqrt{2}}{2}$
C) $\frac{\sqrt{7}}{7}$ D) $\frac{\sqrt{5}}{5}$

4. (a2-g6-36) Konusning balandligi asos radiusining yarmiga teng. Konus asos yuzining yon sirti yuziga nisbatini toping.
A) $\frac{5}{4}$ B) $\frac{3}{2}$
C) $\frac{\sqrt{7}}{7}$ D) $\frac{2}{\sqrt{5}}$

5. (a2-g16-36) Konusning balandligi asosining diametriga teng. Konusning asos yuzi va yon sirti yuziga nisbatini toping.
A) $\frac{5}{4}$ B) $\frac{3}{2}$
C) $\frac{\sqrt{7}}{7}$ D) $\frac{\sqrt{5}}{5}$

6. (a2-g23-36) Konusning yasovchisi 10 ga teng. Radiusi balandligidan 2 ga kichik. Konusning yon sirtini toping.
A) 60π B) 30π
C) 45π D) 90π

7. (a3-g16-36) Konusning radiusi 5 ga teng. Balandligi yasovchisidan 1 ga kichik. Konusning yon sirtini toping.
A) 156π B) 60π
C) 78π D) 65π

8. (a3-g17-34) Konusning balandligi asosining diametridan 2 marta katta. Konus asos yuzining yon sirti yuziga nisbatini toping.
A) $\frac{5}{2}$ B) $\frac{\sqrt{5}}{2}$
C) $\frac{\sqrt{17}}{17}$ D) $\frac{\sqrt{5}}{5}$

9. (a4-g11-23) Konusning o'q kesimi tomoni $\frac{6\sqrt{3}}{\sqrt{\pi}}$ ga teng muntazam uchburchakdan iborat. Konus yon sirti yuzini aniqlang.
A) 54 B) 36 C) 72 D) 108

10. (a4-g12-36) Konusning yasovchisi 25 ga, uning asos tekisligi bilan tashkil qilgan burchagining sinusi 0,6 ga teng. Konus o'q kesimining perimetrini aniqlang.
A) 80 B) 360 C) 90 D) 105

11. (a4-g17-36) Konusning to'la sirti asos yuzidan uch marta katta. Agar konusning balandligi $6\sqrt{3}$ ga teng bo'lsa, uning yon sirtini toping.
A) 36π B) 108π
C) 72π D) 48π

12. (a4-g24-36) Radiusi 10 sm bo'lgan shar markazidan 8 sm uzoqlikdan tekislik bilan kesildi. Kesimdagi doira asosi, sharning markazi uchi bo'lgan konusning yon sirti necha sm^2?
A) 48π B) 54π C) 60π D) 96π

13. (a6-g8-30) $R = \sqrt[3]{2}$ radiusli metall shar eritilib yon sirti asosi yuzidan 3 marta katta bo'lgan konus qilib quyildi. Konusning balandligini toping.
A) $\sqrt{2}$ B) $2\sqrt{2}$
C) 4 D) 8

188. Konus hajmi

1. (a1-g7-35) To'g'ri konusning asos radiusi a marta, balandligi b marta kattalashsa hajmi 6 marta kattalashadi, shunga ko'ra b ning qiymati nimaga teng bo'ladi?
A) $\frac{6}{a^2}$ B) $\frac{4}{a^2}$ C) $\frac{18}{a^2}$ D) $\frac{12}{a^2}$

2. (a1-g9-36) Tomoni 6 sm bo'lgan muntazam ABC uchburchakning AB tomoni atrofida 360° aylantirilishi natijasida hosil bo'lgan jismning hajmini toping.
A) 54π B) 36π
C) 96π D) 72π

3. (a1-g12-23) Konus va silindrning asos radislari teng. Konusning o'q kesimi muntazam uchburchakdan, silindrniki esa kvadratdan iborat. Silindr hajmining konus hajmiga nisbatini toping.
A) 3 B) $3\sqrt{3}$
C) 6 D) $2\sqrt{3}$

4. (a1-g15-36) Konusning o'q kesimi kateti l ga teng bo'lgan to'g'ri burchakli uchburchakdan iborat. Konusning hajmini toping.
A) $\frac{\sqrt{2}}{12}\pi l^3$ B) $\frac{1}{12}\pi l^3$
C) $\frac{1}{6}\pi l^3$ D) $\frac{\sqrt{3}}{12}\pi l^3$

5. (a2-g2-36) Muzqaymoq idishi konus shaklida bo'lib, uning asos radiusi 4 ga, balandligi esa 17 ga teng. Bu idishga radiusi 4 ga teng bo'lgan shar shaklidagi muzqaymoq solindi. Muzqaymoq erib ketsa, uning qanchasi idishdan toshib ketadi?
A) $16\pi/3$ sm^3 B) $4\pi/3$ sm^3
C) 16π sm^3 D) toshmaydi

6. (a2-g4-36) Konusning o'q kesimi to'g'ri burchakli uchburchakdan iborat va bu uchburchakning yuzi 18 ga teng. Konusning hajmini toping.
A) $12\sqrt{2}\pi$ B) $9\sqrt{2}\pi$
C) $18\sqrt{2}\pi$ D) $24\sqrt{2}\pi$

7. (a2-g11-36) Muzqaymoq idishi konus shaklida bo'lib, uning asos radiusi 3 ga, balandligi esa 7 ga teng. Bu idishga radiusi 3 ga teng bo'lgan shar shaklidagi muzqaymoq solindi. Muzqaymoq erib ketsa, uning qanchasi idishdan toshib ketadi?
A) 27π sm^3 B) 15π sm^3
C) 4π sm^3 D) toshmaydi

8. (a3-g8-36) Konus asosiga tomoni $6\sqrt{3}$ bo'lgan muntazam uchburchak ichki chizilgan. Konus yasovchisi 10 bo'lsa, uning hajmini toping.
A) 48π B) 72π C) 96π D) 36π

9. (a3-g10-36) Muzqaymoq idishi konus shaklida bo'lib, uning asos radiusi 3 ga, balandligi esa 8 ga teng. Bu idishga radiusi 3 ga teng bo'lgan shar shaklidagi muzqaymoq solindi. Muzqaymoq erib ketsa, uning qanchasi idishdan toshib ketadi?
A) 2π B) 15π
C) 12π D) toshmaydi

10. (a3-g22-35) Hajmi va to'la sirtining son qiymati teng bo'lgan kubning ichiga joylashtirilgan konus yasovchisining uzunligini toping.
A) $3\sqrt{5}$ B) $3\sqrt{3}$ C) 6 D) 3

11. (a4-g8-36) ABCD trapetsiyaning AD tomoni AB va DC tomonlarga perpendikulyar. AB = 9, BC = 13 va CD = 4. Shu trapetsiyaning AD tomoni atrofida aylantirilishidan hosil bo'lgan jism hajmini toping.
A) 478π B) 586π
C) 532π D) 467π

12. (a4-g14-35) ABCD to'g'ri burchakli trapetsiyaning C burchagi 45° ga teng. AB = AD = $\sqrt{2}$. AD kichik asos. Shu trapetsiyani AB tomon atrofida 360° ga aylantirishdan hosil bo'lgan jismning hajmini toping.
A) $\frac{14}{3}\pi$ B) $\sqrt{392}\pi$
C) $\frac{14\sqrt{2}}{3}\pi$ D) 14π

13. (a5-g12-30) Radiusi 6 ga teng bo'lgan yarim sharga asosining markazi bilan ustma-ust tushadigan konus tashqi chizilgan. Konusning balandligi qanday bo'lganda, uning hajmi eng kichik bo'ladi?
A) $6\sqrt{3}$ B) $3\sqrt{3}$
C) $6\sqrt{2}$ D) $3\sqrt{2}$

14. (a5-g13-30) ABC teng yonli uchburchakning yon tomoni 6 ga teng va A burchagi 120°. Shu uchburchakning AC tomoni atrofida aylantirishdan hosil bo'lgan jismning hajmini toping.
A) 54π B) 18π C) 27π D) 81π

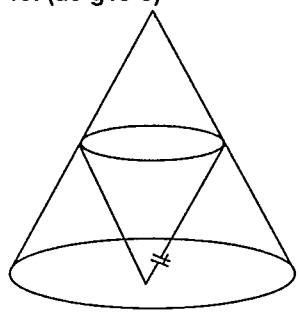
15. (a5-g15-25) Konus asosining radiusi 6 ga, hajmi 48π ga teng. Shu konusning asosiga parallel tekislik bilan kesilishidan hosil bo'lgan aylananing radiusi 3 ga teng bo'lsa, kesilishdan hosil bo'lgan kichik konusning hajmini toping.
A) 24π B) 6π C) 18π D) 12π

16. (a6-g14-5) Yuzasi 36π ga teng bo'lgan doira teng olti sektorga bo'lindi. Hosil bo'lgan sektorlardan yasalgan konuslar hajmlari yig'indisini toping.
A) $\sqrt{140}\pi$ B) $\frac{\sqrt{35}\pi}{3}$
C) $\frac{16\sqrt{2}\pi}{3}$ D) $32\sqrt{2}\pi$

17. (a6-g16-22) Konus asosining radiusi 6 ga hajmi 48π ga teng. Shu konusning asosiga parallel tekislik bilan kesilishidan hosil bo'lgan aylananing radiusi 3 ga teng bo'lsa, kesilishdan hosil bo'lgan kichik konusning hajmini toping.
A) 24π B) 6π C) 18π D) 12π

18. (a6-g18-19) Konus hajmini 80% ga orttirish uchun balandligi 40% ga orttirilganda asos radiusi necha marta orttirilishi kerak?
A) $\frac{7}{3\sqrt{3}}$ B) 1,4
C) $\frac{9}{7}$ D) $\frac{3}{\sqrt{7}}$

19. (a6-g19-5)



Rasmda balandligi h ga teng bo'lgan konus o'rtasidan boshqa konus yasalgan. Bo'yalgan sohada (ikki kichik konus) suv bor. Agar ostdagi konus tagidagi jo'mrak ochib yuborilsa, suv konus balandligining qanday qismigacha ko'tariladi?
A) $h\left(1-\frac{\sqrt[3]{4}}{2}\right)$ B) $\frac{h}{2}$
C) $h\left(1-\frac{1}{\sqrt{2}}\right)$ D) $h\left(1-\frac{\sqrt[3]{6}}{2}\right)$

20. (a6-g23-19) ABC muntazam uchburchakning tomoni 2 ga teng. Shu uchburchakning A uchidan o'tuvchi va BC tomonga parallel o'q atrofida aylanishdan hosil bo'lgan jism hajmini toping.
A) 6π B) 4π C) $5{,}5\pi$ D) 8π

189. Kesik konus sirtlarining yuzi

1. (a2-g17-35) Asos yuzasi S_1, yon sirti S_2 bo'lgan piramida asosiga parallel tekislik bilan kesilganda hajmlari o'zaro teng bo'lgan piramida va kesik piramida hosil bo'ldi. Kesik piramidaning to'la sirtini toping.
A) $S_1+S_2-\frac{S_1+S_2}{\sqrt[3]{2}}$
B) $S_1+S_2+\frac{S_1-S_2}{\sqrt[3]{4}}$
C) $S_1+S_2+\frac{S_1-S_2}{8}$
D) $S_1+S_2-\frac{S_1+S_2}{\sqrt[3]{4}}$

2. (a2-g20-35) To'g'ri konus asosiga parallel tekislik bilan ikkita teng hajmli qismlarga bo'lindi. Kesik konus asos yuzlarining nisbatini toping.
A) 2 B) $\sqrt[3]{2}$ C) $\sqrt{2}$ D) $\sqrt[3]{4}$

3. (a4-g11-35) To'g'ri konus asosiga parallel tekislik bilan teng xajmlarga bo'lindi. Asos yuzlarining nisbati qancha?
A) $2\sqrt{2}$ B) $\sqrt[3]{2}$
C) $\sqrt{2}$ D) $\sqrt[3]{4}$

4. (a5-g3-36) Balandligi 12 ga teng bo'lgan konusning uchidan 3 ga teng masofadan asosiga parallel tekislik bilan kesildi. Hosil bo'lgan kesik konus yon sirtining dastlabki konus yon sirtiga nisbatini toping.
A) $\frac{7}{16}$ B) $\frac{15}{16}$
C) $\frac{1}{16}$ D) $\frac{9}{16}$

190. Kesik konus hajmi

1. (a1-g8-36) ABCD trapetsiyaning B va C burchaklari to'g'ri. AB = 8, BC = 6 va CD = 2. Bu trapetsiyani BC tomon atrofida 360° ga aylantirganda hosil bo'lgan jismning hajmi V_1 ga, AB tomon atrofida 360° ga aylantirganda hosil bo'lgan jismning hajmi V_2 ga teng. $V_1 - V_2$ ni toping.
A) 48π B) 24π C) 36π D) 12π

2. (a1-g11-36) Kesik konus asoslarining radiuslari r va $3r$ ga teng. Agar uning balandligi $2r$ ga teng bo'lsa, kesik konus hajmini toping.
A) $9\pi r^3$ B) $\frac{16}{3}\pi r^3$
C) $\frac{17}{3}\pi r^3$ D) $\frac{26}{3}\pi r^3$

3. (a2-g7-36) Teng yonli trapetsiyaning asoslari 4 va 10 ga teng. Yon tomoni esa 5 ga teng. Shu trapetsiyaning katta asosi atrofida aylantirilishidan hosil bo'lgan jismning hajmini toping.
A) 96π B) 64π C) 72π D) 80π

4. (a2-g9-36) Kesik konus asoslarining radiuslari r va $3r$ ga teng. Agar uning balandligi $2r$ ga teng bo'lsa, kesik konus hajmini toping.
A) $9\pi r^3$ B) $\frac{16}{3}\pi r^3$
C) $\frac{17}{3}\pi r^3$ D) $\frac{26}{3}\pi r^3$

5. (a2-g12-35) Ikkita bir xil hajmda to'ldirilgan piyola suvi bitta stakanga bo'shatildi. Piyolalar ichi asoslarining radiuslari 1 va 3 sm ga, balandligi esa 4 sm bo'lgan kesik konusdan iborat. Stakan esa radiusi 4 sm bo'lgan silindr shaklida. Stakanga quyilgan suvning balandligini toping.
A) $\frac{13}{12}$ B) $\frac{13}{6}$ C) $\frac{18}{16}$ D) $\frac{16}{18}$

6. (a2-g15-36) ABCD trapetsiyaning AD tomoni AB va DC tomonlarga perpendikulyar. AB = 7, BC = 5 va CD = 3. Shu trapetsiyaning AD tomoni atrofida aylantirilishidan hosil bo'lgan jism hajmini toping.
A) 79π B) 86π
C) 58π D) 67π

7. (a2-g16-35) Piramidaning balandligi o'rtasidan asosiga parallel tekislik o'tkazilgan. Hosil bo'lgan kesik piramida hajmining piramidaning kesilishdan oldingi hajmiga nisbatini toping.
A) $\frac{3}{4}$ B) $\frac{7}{8}$ C) $\frac{1}{8}$ D) $\frac{1}{4}$

8. (a2-g18-36) Konus asosining radiusi 6 ga, hajmi 48π ga teng. Shu konusning asosiga parallel tekislik bilan kesilishidan hosil bo'lgan aylananing radiusi 3 ga teng bo'lsa, kesilishdan hosil bo'lgan kichik konusning hajmini toping.
A) 24π B) 18π
C) 6π D) 12π

9. (a3-g4-36) ABCD trapetsiyaning AD tomoni AB va DC tomonlarga perpendikulyar. AB = 9, BC = 13 va CD = 4. Shu trapetsiyaning AD tomoni atrofida aylantirilishidan hosil bo'lgan jism hajmini toping.
A) 478π B) 586π
C) 532π D) 467π

10. (a3-g5-36) Konussimon stakanning tagi radiusi 8, usti radiusi 12 sm bo'lgan aylanalardan iborat. Balandligi 18 sm bo'lgan bu stakan suv bilan to'la. Agar bu suv asos radiusi 4 sm bo'lgan silindrsimon naychaga quyilsa, balandligi necha sm bo'ladi?
A) 114 B) 342 C) 228 D) 156

11. (a3-g12-36) ABCD trapetsiyaning AD tomoni AB va DC tomonlarga perpendikulyar. AB = 9, BC = 13 va CD = 4. Shu trapetsiyaning AD tomoni atrofida aylantirilishidan hosil bo'lgan jism hajmini toping.
A) 478π B) 586π
C) 532π D) 467π

12. (a3-g18-36) ABCD trapetsiyaning AD tomoni AB va DC tomonlarga perpendikulyar. AB = 9, BC = 13 va CD = 4. Shu trapetsiyaning AD tomoni atrofida aylantirilishidan hosil bo'lgan jism hajmini toping.
A) 478π B) 586π
C) 532π D) 467π

13. (a5-g6-36) ABCD to'g'ri burchakli trapetsiyaning A va D burchaklari to'g'ri. AD = 3, CD = 2 va AB = 5. Shu trapetsiyaning AB tomon atrofida aylantirishdan hosil bo'lgan jism hajmini toping.
A) 27π B) 39π
C) 45π D) 117π

14. (a5-g18-12) Balandligi 25 sm bo'lgan chelak kesik konus shaklida bo'lib, asos radiuslari 20 sm va 30 sm. Shu chelak yordamida hajmi 570 m^3 bo'lgan hovuzni to'ldirish uchun necha marta suv to'kish lozim? ($\pi = 3$ deb olinsin)
A) 6000 B) 1200
C) 600 D) 12000

15. (a5-g21-30) ABCD trapetsiyaning AD tomoni AB va DC tomonlarga perpendikulyar. AB = 9, BC = 13 va CD = 4. Shu trapetsiyaning AD tomoni atrofida aylantirilishidan hosil bo'lgan jism hajmini toping.
A) 478π B) 586π
C) 532π D) 467π

191. Sfera. Sfera sirti. Sfera tenglamasi. Shar. Shar hajmi

1. (a1-g1-33) Tomonlari 10, 24 va 26 bo'lgan uchburchakning uchlari shar sirtida yotadi. Agar sharning radiusi 15 ga teng bo'lsa, shar markazidan uchburchak tekisligigacha bo'lgan masofani toping.
A) $2\sqrt{14}$ B) $2\sqrt{13}$
C) $\sqrt{69}$ D) $\sqrt{47}$

2. (a1-g6-36) Sharning radiusi 1 birlikka orttirilganda, to'la sirti 44π ga ortgan bo'lsa, hosil bo'lgan sharning hajmini toping.
A) 144π B) 288π
C) 72π D) 108π

3. (a2-g5-36) Sharning radiusi 1 birlikka orttirilganda, to'la sirti 44π ga ortgan bo'lsa, hosil bo'lgan sharning hajmini toping.
A) 144π B) 288π
C) 72π D) 108π

4. (a2-g21-36) Kesik konusga shar ichki chizilgan. Konus ustki asosining yuzi 16π ga, ostki asosining yuzi esa 25π ga teng. Shar sirtining yuzini toping.
A) 96π B) 77π C) 60π D) 80π

5. (a2-g22-36) Tomoni 4 sm bo'lgan mis kub eritilib, shar shakliga keltirildi. Hosil bo'lgan sharning radiusi necha sm? ($\pi = 3$)
A) $\sqrt[3]{2}$ B) $2\sqrt[3]{2}$
C) 2 D) $2\sqrt{2}$

6. (a3-g13-36) Sharning radiusi 2 birlikka orttirilganda, to'la sirti 64π ga ortgan bo'lsa, hosil bo'lgan sharning hajmini toping.
A) $\frac{256\pi}{3}$ B) $\frac{500\pi}{3}$
C) 100π D) $\frac{376\pi}{3}$

7. (a3-g20-36) Asos radiusi 4 sm va balandligi 6 sm bo'lgan, suv to'ldirilgan to'g'ri silindrga sharcha tashlanganda suvning to'qqizdan bir qismi toshib ketgan bo'lsa, sharchaning radiusi necha sm?
A) 1,(6) B) 1,(3) C) 2 D) 1,5

8. (a4-g3-36) Tomoni 8 sm bo'lgan mis kub eritilib, shar shakliga keltirildi. Hosil bo'lgan sharning radiusi necha sm? ($\pi = 3$)
A) $\sqrt[3]{4}$ B) $4\sqrt[3]{2}$
C) 4 D) 2

9. (a4-g11-13) Markazi OX o'qida, radiusi 3 ga teng bo'lgan aylananing chorak qismini OX o'qi atrofida 360° ga aylantirish natijasida hosil bo'lgan jismning hajmini toping.
A) 54π B) 27π
C) 18π D) 16π

10. (a4-g19-36) Ikki sharning hajmlari nisbati k^2 bo'lsa, sharlarning sirtlari yuzalari nisbatini toping.
A) $k\sqrt[3]{k}$ B) $k\sqrt[3]{k^2}$
C) $k\sqrt{k}$ D) k^3

11. (a5-g7-36) Hajmining son qiymati to'la sirtining son qiymatidan 4 marta katta bo'lgan sharning radiusini toping.
A) 12 B) 16
C) 48 D) 6

12. (a5-g9-36) Radiusi 15 sm bo'lgan shar shaklidagi akvariumning yarmi suv bilan to'ldirilgan. Bu suv qirrasi 30 sm bo'lgan kub shaklidagi akvariumga solinsa, uning necha foizi to'ladi? ($\pi = 3$ deb olinsin)
A) 30% B) 25%
C) 50% D) 33,(3)%

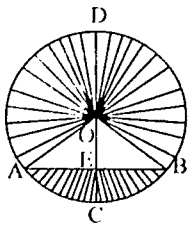
13. (a5-g14-30) Sirti, asos radiusi 8 ga, balandligi 6 ga teng bo'lgan konusning to'la sirtiga teng bo'lgan sharning radiusini toping.
A) $2\sqrt{6}$ B) $4\sqrt{6}$
C) 6 D) $4\sqrt{3}$

14. (a5-g22-30) Qalinligi 3 sm ga teng bo'lgan kovak sharni quyish uchun 516π sm^3 metall ishlatildi. Bu kovak sharning tashqi radiusini toping.
A) 5 B) 6
C) 12 D) 8

15. (a6-g4-30) Radiusi 3 ga orttirilganda hajmi 876π ga ortadigan sharning sirtini toping.
A) 400π B) 256π
C) 196π D) 576π

16. (a6-g9-13) Quyidagilardan qaysi biri to'g'ri?
A) Parallelepiped diagonalining kvadrati qirralari kvadratlari yig'indisiga teng.
B) Sferaning hajmi $\frac{4}{3}\pi R^3$ formula orqali hisoblanadi.
C) Modulli funksiyaning hosilasi mavjud emas.
D) Funksiya argumentining bir qiymatiga funksiyaning ikkita qiymati to'g'ri kelmaydi.

17. (a6-g9-30)



Rasmda AE = EB, CD = 8 va AOB burchak 120° bo'lsa, bo'yalgan sohani DC kesma atrofida 180° ga aylantirishdan hosil bo'lgan jismning hajmini toping.
A) $\frac{92\pi}{3}$ B) $\frac{116\pi}{3}$
C) $\frac{184\pi}{3}$ D) $\frac{232\pi}{3}$

18. (a6-g13-20) Mahmudjon qo'rodam yasamoqda. Qorodamning uchta shari radiuslari 50, 40 va 30 sm ga teng. Qorodamning hajmini toping.
A) 60000 sm^3 B) 30000 sm^3
C) 288000π sm^3 D) 144000π sm^3

192. Shar segmenti. Shar segmentining hajmi

1. (a3-g2-36) Radiusi 8 ga teng shar markazidan 5 ga teng masofadagi tekislik bilan kesildi. Hosil bo'lgan kesim yuzini toping.
A) 27π B) 39π C) 89π D) 41π

2. (a4-g23-36) Radiusi 25 sm bo'lgan shar markazidan 15 sm uzoqlikda tekislik bilan kesilishdan hosil bo'lgan doiraning yuzasini toping.
A) 200π B) 300π
C) 400π D) 600π

3. (a6-g8-28) Quyidagi fikrlardan qaysi biri to'g'ri?
A) Har qanday prizmaning diagonali mavjud.
B) Piramida eng kamida 5 ta yoqdan iborat bo'ladi.
C) Konusning yasovchisi asos diametridan hamma vaqt katta yoki teng bo'ladi.
D) Shardan olingan sektor shu shardan olingan segmentga tengdosh bo'lishi mumkin.

4. (a6-g10-30) Radiusi 5 ga teng bo'lgan yarimshar shaklidagi idishda suv bor. Suv yuzasidan idish tubining eng chuqur joyigacha bo'lgan masofa 3 ga teng. Bu idish yana qancha hajm birligidagi suvni o'z ichiga sig'dira oladi?
A) $\frac{142\pi}{3}$ B) $\frac{250\pi}{3}$
C) $\frac{214\pi}{3}$ D) $\frac{125\pi}{3}$

5. (a6-g24-24) Radiusi 25 sm bo'lgan shar markazidan 15 sm uzoqlikdagi kesishishda hosil bo'lgan doiraning yuzasini toping.
A) 200π B) 300π
C) 400π D) 600π

11-bob. Jismlar kombinatsiyasi

193. Prizmaga ichki chizilgan shar. Prizmaga tashqi chizilgan shar

1. (a2-g6-35) Muntazam tetraedrning qirrasi 2 ga teng. Shu tetraedrga tashqi chizilgan sharning radiusini toping.
A) $\frac{\sqrt{6}}{6}$ B) $\frac{\sqrt{6}}{4}$ C) $\frac{3}{\sqrt{6}}$ D) $\sqrt{6}$

2. (a2-g13-33) Radiusi 3 ga teng bo'lgan sfera asosining tomonlari 2 va 4 ga teng bo'lgan to'g'ri burchakli parallelipipedning barcha uchlaridan o'tadi. Shu parallelipipedning hajmini toping.
A) 32 B) 28
C) 26 D) 14

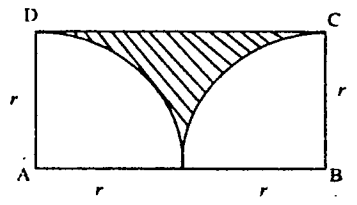
3. (a3-g15-36) Tomoni 13 sm bo'lgan romb to'g'ri prizmaning asosini tashkil etadi. Prizmaga radiusi 6 sm li shar ichki chizilgan bo'lsa, prizma hajmini toping.
A) 468 B) 1872
C) 2808 D) 780

4. (a5-g19-30) Radiusi 12 ga teng bo'lgan sharga balandligi 8 ga teng bo'lgan asosi muntazam uchburchakdan iborat prizma ichki chizilgan. Shu prizma asosi tomoni uzunligini toping.
A) $16\sqrt{6}$ B) $4\sqrt{5}$
C) $8\sqrt{5}$ D) $8\sqrt{6}$

194. Silindrga ichki chizilgan shar. Silindrga tashqi chizilgan shar

1. (a1-g4-36) Radiusi 3 ga teng bo'lgan sharni o'z ichiga sig'dira oladigan eng kichik hajmli silindrning hajmini toping.
A) 18π B) 36π C) 54π D) 48π

2. (a4-g4-36)



Rasmda ABCD to'g'ri to'rtburchak va unga ichki chizilgan ikki aylananing chorak qismlari tasvirlangan. Rasmda shtrixlangan sohani AB o'q atrofida aylantirishdan hosil bo'lgan jismning hajmini toping.

A) $\frac{2\pi r^3}{3}$ B) $\frac{3\pi r^3}{4}$

C) $\frac{\pi r^3}{2}$ D) $\frac{\pi r^3}{3}$

3. (a4-g6-36) Radiusi 3 ga teng bo'lgan sharni o'z ichiga sig'dira oladigan eng kichik hajmli silindrning hajmini toping.
A) 18π B) 36π C) 54π D) 48π

4. (a4-g7-35) Sharni o'z ichiga sig'dira oladigan eng kichik hajmli silindr yasaldi. Agar silindr ichiga shu shar solinsa, silindr hajmining necha foizi ochiq qoladi?
A) 30% B) 27,(6)%
C) 33,(3)% D) 25%

5. (a4-g18-36) Silindrga shar ichki chizilgan. Asosi shar markazida joylashgan to'g'ri konusning uchi shar sirtida yotadi. Silindrning hajmi konusning hajmidan necha marta katta bo'ladi?
A) 6 B) 12
C) 2 D) 8

195. Konusga ichki chizilgan shar

1. (a4-g5-36) Kesik konusga shar ichki chizilgan. Konus ustki asosining yuzi 16π ga, ostki asosining yuzi esa 25π ga teng. Shar sirtining yuzini toping.
A) 96π B) 77π C) 60π D) 80π

2. (a4-g16-36) Kesik konusga shar ichki chizilgan. Konus ustki asosining yuzi 25π ga, ostki asosining yuzi esa 81π ga teng. Shar sirtining yuzini toping.
A) 180π B) 132π
C) 144π D) 192π

3. (a4-g21-36) Kesik konusga shar ichki chizilgan. Konus ustki asosining yuzi 25π ga, ostki asosining yuzi esa 81π ga teng. Shar sirtining yuzini toping.
A) 180π B) 132π
C) 144π D) 192π

4. (a5-g1-36) Kesik konusga shar ichki chizilgan. Konus ustki asosining yuzi 16π ga, ostki asosining yuzi esa 25π ga teng. Shar sirtining yuzini toping.
A) 96π B) 77π
C) 60π D) 80π

5. (a5-g8-36) Balandligi diametridan 2 marta katta bo'lgan silindr ichiga eng katta hajmli konus chizildi. Konusga esa shar ichki chizildi. Agar silindr asosining radiusi R ga teng bo'lsa, shar radiusini toping.

A) $\frac{3R}{4}$ B) $\frac{R}{4}$

C) $\frac{3R}{\sqrt{17}-1}$ D) $\frac{4R}{\sqrt{17}+1}$

6. (a5-g10-36) Radiusi 8 ga teng bo'lgan 270° li doira sektori buklanib konus yasaldi. Ushbu konusga ichki chizilgan shar radiusini toping.

A) $\frac{6\sqrt{7}}{7}$ B) $2\sqrt{7}$

C) $\frac{8\sqrt{7}}{7}$ D) $\frac{4\sqrt{7}}{3}$

7. (a5-g16-30) Balandligi diametridan 3 marta katta bo'lgan silindr ichiga eng katta hajmli konus chizildi. Konusga esa shar ichki chizildi. Agar silindr asosining radiusi R ga teng bo'lsa, shar radiusini toping.

A) $\frac{5R}{6}$ B) $\frac{R}{6}$

C) $\frac{6R}{\sqrt{37}+1}$ D) $\frac{4R}{\sqrt{37}-1}$

8. (a6-g22-16) Kesik konusga shar ichki chizilgan. Konus ustki asosining yuzi 25π ga, ostki asosining yuzi esa 49π ga teng. Shar sirtining yuzini toping.
A) 140π B) 128π
C) 120π D) 96π

196. Konusga tashqi chizilgan shar

1. (a2-g13-31) Radiusi 1 ga teng bo'lgan sharga yasovchi $\sqrt{3}$ ga teng bo'lgan konus ichki chizilgan. Shu konus o'q kesimining asosidagi burchaklari yig'indisini toping.
A) 30 B) 60 C) 90 D) 120

2. (a3-g19-36) Asos radiusi 12 ga, balandligi 18 ga teng bo'lgan konus sharga ichki chizilgan. Shar to'la sirtini toping.
A) 900π B) 676π
C) 576π D) 1024π

3. (a3-g23-36) Sharga ichki chizilgan konusning o'q kesimi teng yonli to'g'ri burchakli uchburchakdan iborat. Konusning hajmi shar hajmining qanday qismini tashkil etadi?
A) 0,25 B) 1/3 C) 2/3 D) 0,75

4. (a4-g13-23) Sharga ichki chizilgan konusning o'q kesimi teng yonli to'g'ri burchakli uchburchakdan iborat. Konusning hajmi shar hajmining qanday qismini tashkil etadi?
A) 1/4 B) 1/3
C) 2/3 D) 1/6

5. (a5-g11-30) Asos radiusi 12 ga, balandligi 36 ga teng bo'lgan konus sharga ichki chizilgan. Shar to'la sirtini toping.
A) 576π B) 800π
C) 1600π D) 144π

6. (a5-g25-30) Asos radiusi 9 ga, balandligi 27 ga teng bo'lgan konus sharga ichki chizilgan. Shar to'la sirtini toping.
A) 600π B) 1296π
C) 576π D) 900π

7. (a6-g12-34) Sharga konus ichki chizilgan. Konus asosi uzunligining sharning eng katta aylanasi uzunligiga nisbati 1:3 kabi. Konus hajmining shar hajmiga nisbatini toping (konus balandligi shar radiusidan katta).

A) $\frac{4+\sqrt{2}}{27}$ B) $\frac{3+2\sqrt{2}}{108}$

C) $\frac{3+2\sqrt{2}}{54}$ D) $\frac{2\sqrt{2}+3}{27}$

8. (a6-g20-18) Radiusi 3 ga teng bo'lgan sharga yasovchisi 5 ga teng bo'lgan konus ichki chizilgan. Shu konusning asosidagi burchak sinusini toping.
A) $\frac{4}{5}$ B) $\frac{3}{5}$ C) $\frac{5}{6}$ D) $\frac{3}{4}$

9. (a6-g25-30) Sharga ichki chizilgan konusning o'q kesimi teng yonli to'g'ri burchakli uchburchakdan iborat. Konusning hajmi shar hajmining qanday qismini tashkil etadi?
A) 0,25 B) 0,(3)
C) 0,(6) D) 0,75

197. Kub va konus. Kub va shar

1. (a1-g2-36) Radiusi 9 ga teng bo'lgan shardan eng katta hajmdagi kub kesib olingan. Kubning qirrasini aniqlang.
A) $6\sqrt{3}$ B) $5\sqrt{3}$
C) $3\sqrt{6}$ D) $4\sqrt{6}$

2. (a1-g16-36) Radiusi 9 ga teng bo'lgan shardan eng katta hajmdagi kub kesib olingan. Kubning qirrasini aniqlang.
A) $6\sqrt{3}$ B) $3\sqrt{3}$
C) $3\sqrt{6}$ D) $4\sqrt{3}$

3. (a2-g1-35) To'la sirtining qiymati hajmining qiymatiga teng bo'lgan kubning ichiga ichki chizilgan eng katta konusning yasovchisi uzunligi nechaga teng?
A) $6\sqrt{6}$ B) $3\sqrt{5}$
C) $3\sqrt{3}$ D) 6

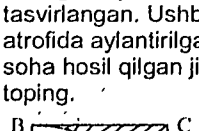
4. (a3-g17-36) Quyidagi mulohazalardan qaysi biri noto'g'ri?
A) Uchburchakning ixtiyoriy 2 ta tomoni yig'indisi uning uchinchi tomonidan katta.
B) Qavariq to'rtburchakning har bir uchidan bittadan olingan tashqi burchaklari yig'indisi 360° ga teng.
C) Parallelogramning tomonlari kvadratlarining yig'indisi uning diagonallari kvadratlari yig'indisidan 2 marta katta.
D) Kubga ichki chizilgan sharning diametri uning tomoniga teng.

5. (a4-g20-36) Diametri $2\sqrt{3}$ bo'lgan shar ichiga chizilgan eng katta hajmli kubning hajmi necha sm^3?

A) 27 B) $24\sqrt{3}$

C) 16 D) 8

6. (a5-g24-30) Rasmda ABCD tomoni 5 ga teng bo'lgan kvadrat va unga ichki chizilgan aylananing chorak qismi tasvirlangan. Ushbu shaklni AD tomon atrofida aylantirilganda shtrixlangan soha hosil qilgan jismning hajmini toping.



A) $62,5\pi - \frac{125\pi}{3}$ B) $125\pi - \frac{250\pi}{3}$

C) $62,5\pi - \frac{125\pi}{6}$ D) $125\pi - \frac{500\pi}{3}$

7. (a6-g2-30) Agar kvadratning tomoni $\sqrt[3]{\frac{60}{\pi\sqrt{2}}}$ bo'lsa uning diaganoli atrofida aylanishidan hosil bo'lgan jism hajmini toping.

A) $15\sqrt{2}$ B) 10

C) 5 D) $10\sqrt{2}$

198. Prizma va silindr

1. (a4-g25-36) Asos radiusi R va balandligi H bo'lgan silindrga ichki chizilgan muntazam uchburchakli prizma to'la sirtini toping.

A) $S_t = 6\sqrt{3}R(R+H)$

B) $S_t = 3\sqrt{3}R\left(\frac{R}{2}+H\right)$

C) $S_t = \frac{3\sqrt{3}}{4}R^2 + \frac{3\sqrt{3}}{2}R\sqrt{4H^2+R^2}$

D) $S_t = 3\sqrt{3}R\left(\frac{R}{4}+H\right)$

199. Silindr va konus

1. (a3-g1-36) Yondagi rasmda silindr ichiga joylashtirilgan konus ko'rsatilgan. Silindrning balandligi 12 ga teng. Konus suv bilan to'la. Agar konusning tagi (uchli tarafi) teshib qo'yilsa, suv qanday balandlikka ko'tariladi?

A) 6 B) 9 C) 4 D) 8

2. (a3-g24-36) O't o'chiruvchilarning konussimon chelagi bilan silindrsimon chelakka teng miqdorda suv sig'adi. Agar ularning balandliklari teng bo'lsa, konus radiusining silindr radiusiga nisbatini toping.

A) 1 B) $\sqrt[3]{3}$ C) $\sqrt{3}$ D) 3

3. (a6-g1-30) Kesik konusning asos radiuslarining nisbati 2 ga teng. Shu konus ichiga sig'dira oladigan eng katta hajmli silindr hajmining kesik konus hajmiga nisbatini toping.

A) $\frac{3}{7}$ B) $24\sqrt{3}$

C) 24 D) $48\sqrt{3}$

200. Ko'pyoqlar kombinatsiyalari

1. (a1-g16-35) Qirrasi $3sm$ ga teng bo'lgan kubning yuqori asosidagi A uchi va pastki asosidagi A bilan umumiy qirraga ega bo'lmagan E, F va G uchlari hosil qiluvchi piramida hajmini hisoblang

A) $\frac{9}{2}sm^3$ B) $\frac{9}{5}sm^3$

C) $\frac{9}{4}sm^3$ D) $\frac{3}{2}sm^3$

2. (a5-g1-35) ABCDEFKL tomoni 4 ga teng kub. ABCDL piramidaning yon sirtini toping.

A) $16\left(\sqrt{2}+1\right)$

B) $8\left(\sqrt{3}+\sqrt{2}\right)$

C) $8\sqrt{3}$

D) $16\sqrt{2}$

INFORMATIKA

AXBOROT

1. Axborotning ko'rinishi, xossalari va turlari

1. (a5-g11-31) Axborot qanday ko'rinishida bo'la olmaydi?
A) videotasvir B) ramka
C) nutq D) jadval

2. (a5-g12-31) Axborotdan hayot faoliyatida foydalana olish uchun qaysi muhim xususiyatlarga ega bo'lishi lozim?
A) qimmatli, to'liqlik va ishonchli
B) tushunarli, qisqa va ishonchli
C) foydali, qisqa va qimmatli
D) ortiqchalilik, to'liqlik va foydali

3. (a5-g17-2) Bilim – ...
A) darsliklar orqali o'rganilgan mavhum boylik
B) axborotlarni diskret uslubda qabul qilish
C) bog'langan axborot yig'indisi
D) axborotlarni analog uslubda qabul qilish

4. (a5-g21-31) Quyidagi keltirilganlardan qaysi biri hayot faoliyatida foydalana olish uchun axborotlar ega bo'lishi lozim bo'lgan xususiyatlarga kirmaydi?
A) ishonchli bo'lishi
B) to'liqlik xususiyatiga ega bo'lishi
C) uzluksiz bo'lishi
D) ma'lum darajada qimmatli bo'lishi

5. (a5-g22-31) Forobiyga ko'ra bilishning qanday bosqichlari mavjud?
A) hissiy va aqliy
B) tarixiy va mantiqiy
C) ilmiy va diniy
D) 5 sezgi organlari

6. (a5-g23-31) Bog'langan axborotlar qanday nomlanadi?
A) ma'lumot
B) ilm
C) bilim
D) axborot obyekti

7. (a5-g24-31) Quyidagilardan qaysi biri axborotning xususiyatlari emas?
A) foydalilik B) raqamlilik
C) to'liqlik D) qimmatlilik

8. (a6-g2-31) Inson quyidagilardan qaysi biri orqali axborotni qabul qila olmaydi?
A) tana sezgisi B) qon tomirlari
C) ko'zi D) burni

9. (a6-g3-31) Nuqtalar o'rniga mos so'zni tanlang. Axborot beradigan narsa va hodisalar axborot ... deyiladi.
A) manbalari B) antennalari
C) modulyatori D) obyektlari

10. (a6-g3-33) Kompyuterdan ma'lumotlarni baytlarda olib baytlarda uzatuvchi portlar qanday nomlanadi?
A) parallel B) ketma-ket
C) universal D) sun'iy

11. (a6-g7-32) Darsda o'qituvchi o'rgatgan mavzuni o'zlashtirish uchun qaysi sezgi organlardan foydalaniladi?
A) qo'l, burun, ko'z
B) quloq va ko'z
C) qo'l, ko'z va quloq
D) burun, ko'z va quloq

12. (a6-g14-32) Axborotlar ishlatish maqsadiga ko'ra qanday turlarga bo'linadi?
A) qisqa, tushunarli, batafsil
B) foydalilik, ortiqchalilik
C) qimmatlik, to'liqlik, ishonchlilik
D) foydalilik, to'liqlik

13. (a6-g22-31) Klod Shennon fikriga ko'ra, axborot nima?
A) Axborot – bizning va sezgilarimizning, tashqi moslashuvimizdagi mazmunning ifodalash.
B) Bilmaslikdan bilishga, sababni bilishdan oqibatni bilishga intilish.
C) Axborot – narsa haqidagi bilimlarimizdagi noaniqlikning bartaraf etilishi.
D) Axborot – bilishning asosini tashkil etuvchi element.

14. (a6-g24-31) Quyidagilardan qaysi biri kibernetika fanining asoschisi?
A) Klod Shennon
B) Paskal
C) Abu Nasr Forobiy
D) Norbert Viner

2. Axboriy jarayonlar. Axborotni kodlash

1. (a5-g16-31) Axborotlar ustida bajariladigan asosiy amallarni ko'rsating.
A) ko'chirish, nusxa olish va saqlash
B) qo'shish, ko'paytirish va bo'lish
C) eslab qolish, ishlatish va yig'ish
D) to'plash, qayta ishlash va uzatish

2. (a5-g16-35) 15 Gbt (gigabayt) necha baytdan iborat?
A) $15 \cdot 10^{12}$ B) $15 \cdot 2^{12}$
C) $15 \cdot 2^{30}$ D) $15 \cdot 8^{12}$

3. (a5-g18-8) 400 Kbit necha bayt bo'ladi?
A) 50000 B) 409600
C) 51200 D) 400000

4. (a5-g19-31) Gretsiya sarkardasi Lisandro o'ylab topgan kodlash usuli qanday nomlanadi?
A) tekis kodlash
B) notekis kodlash
C) axborotni surish
D) o'rin almashtirish

5. (a5-g21-32) Axborotlarni kodlashtirishning Samuel Morze tomonidan ishlab chiqilgan Morze usulida nechta belgi ishlatiladi?
A) 4 B) 3 C) 2 D) 1

6. (a5-g21-35) 21 Gbt (gigabayt) necha bitdan iborat?
A) $21 \cdot 2^{33}$ B) $21 \cdot 2^{20}$
C) $21 \cdot 10^{23}$ D) $21 \cdot 10^{30}$

7. (a5-g23-32) Mobil telefon 20 daqiqada 300 MB informatsiyani qabul qildi. Bu telefonning informatsiya qabul qilish tezligi necha Kbod?
A) 256 B) 512
C) 2048 D) 1024

8. (a5-g23-33) ASCII jadvalida Ł belgisi C-qator, 4-ustunda joylashgan. Shu belgining kompyuterga uzatilish kodi qanday bo'ladi?
A) 01001100 B) 11110010
C) 11010100 D) 11011100

9. (a5-g24-32) «ABITURIYENT» so'zini ASCII kodi yordamida ifodalash uchun nechta raqamdan foydalaniladi?
A) 11 B) 44 C) 88 D) 176

10. (a6-g1-34) Foydalanuvchi internetdan 330 MB hajmli filmni yuklash jarayonining dastlabki ikki daqiqasini 256 kilobayt/sekund bilan, keyingi 6 daqiqasini esa aloqa sifati yaxshilanishi hisobiga 384 kilobayt/sekund tezlik bilan amalga oshirgach, foydalanuvchi hisobidagi trafik miqdori tugagan bo'lsa, u filmning necha foizini yuklashga muvaffaq bo'lgan?
A) 37,5% B) 50%
C) 75% D) 22,5%

11. (a6-g5-31) Quyidagilardan qaysi biri axborotni qayta ishlashga misol bo'la oladi?
A) savol bergan odamga javob berish
B) o'qituvchi o'rgatgan mavzuni daftarga yozish
C) internet orqali maktub jo'natish
D) yosh bolaga ertak aytib berish

12. (a6-g5-32) Umidaning telefoni 3,6 MB lik videorolikni 2 daqiqada ko'chirib oldi. Umidaning telefoni bu videorolikni o'rtacha necha Kbod tezlikda ko'chirib olgan?
A) 30 B) 30,72
C) 30720 D) 30 000

13. (a6-g6-31) Quyidagilardan qaysi biri axborotli jarayon emas?
A) Avtobuslardagi yo'nalish nomeri va boradigan manzillar ro'yxatining yozilishi.
B) O'quvchining darsda mavzularni o'rganishi.
C) Futbolchining jarima to'pini tepishi.
D) CD (kompakt disk)ga yangi qo'shiqlarni yozish.

14. (a6-g9-32) HP rusumli kompyuter 3 daqiqada axborotni ko'chirib oldi. Agar kompyuterning o'rtacha tezligi 45,2 Kbod bo'lsa, film necha Mbaytligini toping.
A) $\frac{2034}{2^8}$ B) $\frac{2034}{2^{11}}$
C) $\frac{1017}{2^8}$ D) $\frac{135,6}{2^{18}}$

15. (a6-g10-31) Qaysi fikr noto'g'ri?
A) Morze kodlash usuli tekis kodlash usuli hisoblanadi.
B) ASCII kodlash jadvali yordamida 256 ta belgini kodlash mumkin.

C) 16 xil rangni kodlash uchun 4 bit informatsiya hajmi kerak bo'ladi.
D) 1PB = 2^{50} bayt

16. (a6-g11-26) Axborotni maxfiy saqlash maqsadida kodlash nima deyiladi?
A) o'rin almashtirish
B) shifrlash
C) raqamlash
D) tekis kodlash

17. (a6-g13-8) Axborotni qayta ishlash vositalari to'g'risidagi fikrlardan qaysi biri noto'g'ri?
A) Ular inson tomonidan ishlab chiqilgan.
B) Ularning eng samaradori – kompyuter.
C) Ular axborotni to'playdi.
D) Ular axborot ustida arifmetik amallarni ham bajaradi.

18. (a6-g15-32) 36 Kbt axborotni 153,6 bod tezlik bilan necha minutda uzatish mumkin?

A) 32 B) 4 C) $\frac{64}{15}$ D) $\frac{128}{15}$

19. (a6-g17-33) ASCII jadvalida «л» belgisi B-qator, A-ustunda joylashgan. Shu belgining kompyuterga uzatilish kodi qanday bo'ladi?
A) 00101111 B) 11110010
C) 10101011 D) 11011100

20. (a6-g18-31) Morze kodlash usulida kodlash qanday uchta belgi yordamida amalga oshiriladi?
A) tire, bo'shliq, undov
B) qo'shish, bo'shliq, nuqta
C) tire, ikki nuqta, undov
D) tire, bo'shliq, nuqta

21. (a6-g18-32) Bir kitobda 220 ta sahifa bo'lib, har bir sahifa 28 ta satrdan va har bir satr 68 ta belgidan iborat bo'lsa, kitobdagi axborot hajmini hisoblang.
A) 418,8 Kbayt B) 52360 bayt
C) 418880 bayt D) 3351040 bayt

22. (a6-g20-32) 3000 MB hajmli axborot 5 minutda uzatilgan bo'lsa, axborot uzatish tezligini (bod) aniqlang.
A) $10 \cdot 2^{23}$ B) 10^7
C) $10 \cdot 2^{20}$ D) $10 \cdot 2^{30}$

23. (a6-g21-31) Qaysi javobda axborotlar ustida bajariladigan asosiy amallar ko'rsatilgan?
A) eshitish, tahlil qilish, uzatish
B) sezgi organlari orqali qabul qilish, uzatish
C) to'plash, qayta ishlash, uzatish
D) to'plash, tahlil qilish, saqlash

24. (a6-g24-32) 12 Megabayt necha bitga teng?
A) $3 \cdot 2^{25}$ B) $12 \cdot 2^{20}$
C) $96 \cdot 10^6$ D) $3 \cdot 2^{15}$

25. (a6-g25-34) Axborotni qayta ishlash vositasi – ...
A) kompyuter.
B) tabiatda mavjud narsalar.
C) inson tomonidan qurilgan qurilmalar.
D) biologik sistema.

26. (a6-g26-31) Axborotni kodlash deganda nima tushuniladi?
A) axborotlarning maxfiyligini ta'minlash
B) axborotlarni viruslardan himoya qilish
C) axborotni boshqa ko'rinishga o'tkazish
D) ikkilik sanoq sistemasiga o'tkazish

3. Sanoq sistemasi. Turli xil sanoq sistemalari bilan ishlash

1. (a5-g11-35) Ikkilik sanoq sistemasida berilgan yig'indini hisoblang.
$11010011_2 + 1001110_2$
A) 110111101_2 B) 100100001_2
C) 100010001_2 D) 11011001_2

2. (a5-g12-32) Ikkilik sanoq sistemasida berilgan 1101110001111 sonini o'n oltilik sanoq sistemasiga o'tkazing.
A) 7055 B) 111815
C) FB81 D) 1B8F

3. (a5-g13-35) Ikkilik sanoq sistemasida berilgan 1101_2 va 1010_2 sonlari ko'paytmasi quyidagilardan qaysi biriga teng?
A) 11010010_2 B) 10100010_2
C) 10000010_2 D) 10101011_2

4. (a5-g16-33) Ikkilik sanoq sistemasida berilgan 1101001110101 sonini 8 lik sanoq sistemasiga o'tkazing.
A) 15165 B) 7064
C) 17076 D) 64721

5. (a5-g17-10) Ikkilik sanoq sistemasidagi 1101011100111001 sonini 16 lik sanoq sistemasiga o'tkazing.
A) D73A B) C83A
C) 9867 D) D739

6. (a5-g19-32) Ikkilik sanoq sistemasidagi 110100111 + 1000110111 yig'indini sakkizlik sanoq sistemasida tasvirlang.
A) 1736 B) 1664
C) 2017 D) 2006

7. (a5-g20-32) O'nlik sanoq sistemasida keltirilgan 5967 sonini sakkizlik sanoq sistemasida tasvirlang.
A) 71531 B) 13517
C) 3191 D) 15731

8. (a5-g21-33) Ikkilik sanoq sistemasida qo'shish amalini bajaring.
$10110_2 + 101011_2 = ?$
A) 1001001 B) 1101001
C) 1100100 D) 1000001

9. (a5-g21-34) O'nlik sanoq sistemasida berilgan sonni ikkilik sanoq sistemasiga o'tkazing. $139_{10} \rightarrow ?_2$
A) 10010001 B) 100010101
C) 10001011 D) 100100110

10. (a5-g22-32) Yig'indining ikkilik sanoq sistemasidagi qiymatini toping.
$175_8 + 1010111_2$
A) 1010100_2 B) 11010100_2
C) 11010001_2 D) 1100110_2

11. (a6-g3-32) Ikkilik sanoq sistemasidagi hisoblashlarni bajaring.
111001,101 – 10011,01
A) 100110,011 B) 10111,100
C) 101001,101 D) 11110,011

12. (a6-g6-1) a va b noldan farqli raqamlar bo'lsa, $\overline{abababab}$ sonini $\overline{ab}$ soniga bo'lgandagi qiymatini toping.
A) 1101101
B) aniqlab bo'lmaydi
C) 1010101
D) 10101010

13. (a6-g6-32) 8 lik sanoq sistemasida berilgan 61273 sonini 16 lik sanoq sistemasida ifodalang.
A) EF59 B) 5F9C
C) 25275 D) 62BB

14. (a6-g7-31) Pozitsiyasiz sanoq sistemasida sanoq sistemasi asosi nechtalik bo'ladi?
A) 10
B) 100
C) 54
D) asosga ega emas

15. (a6-g8-31) Qaysi raqamlar guruhi pozitsiyali sanoq sistemasi hisoblanadi?
A) Rim raqamlari
B) Arab raqamlari
C) Asteklar raqamlari
D) Bobilliklar raqamlari

16. (a6-g16-32) Quyidagilardan qaysi biri pozitsiyali bo'lmagan sanoq sistemasi hisoblanadi?
A) arab raqamlari
B) asteklar raqamlari
C) o'nlik sanoq sistemasi
D) ikkilik sanoq sistemasi

17. (a6-g17-32) Ikkilik sanoq sistemasida berilgan sonni 16 lik sanoq sistemasiga o'tkazing. 110111011000011
A) FAB3 B) AB67
C) 6EC3 D) 7D6B

18. (a6-g20-31) Bo'shliqlarni to'ldiring:
Sonlar alifbosiga kiritilgan bir xonali belgilar ... va ular yordamida hosil qilingan boshqa ko'p xonali belgilar ... deyiladi.
A) sonlar, raqamlar
B) raqamlar, sonlar
C) razryadlar, sanoq sistemalari
D) xona birliklari, sonlar

19. (a6-g21-34) O'n oltilik sanoq sistemasidagi 248A sonini sakkizlik sanoq sistemasiga o'tkazing.
A) 7615 B) 1245
C) 6712 D) 22212

20. (a6-g23-33) O'nlik sanoq sistemasidagi 2047 sonini sakkizlik sanoq sistemasiga o'tkazing.
A) 6777
B) 3777
C) 4567
D) 1234

21. (a6-g25-32) Ikkilik sanoq sistemasidagi sonlarning ayirmasini toping $11101,01_2 - 1011,1_2$.
A) 11101,01 B) 1110,11
C) 10001,11 D) 10110,01

AXBOROT TEXNOLOGIYASI

4. Axborot texnologiyasi

1. (a5-g12-35) Internet tarmog'idagi ma'lumotlar saqlanuvchi kompyuter qanday nomlanadi?
A) gipertekst
B) world wide web
C) web server
D) internet server

2. (a5-g14-35) Signalni ham raqamli ko'rinishdan analog ko'rinishga, ham analog ko'rinishdan raqamli ko'rinishga o'tkazuvchi qurilma qanday nomlanadi?
A) demodulyator B) modem
C) modulyator D) hub

3. (a5-g22-35) Gipermatn nima?
A) Internetdagi faol sahifaning boshqa qismiga yoki boshqa sahifaga yo'naltiruvchi
B) Juda ham katta hajmni egallovchi matn
C) Bir necha shaklda tovlanuvchi animatsion matn
D) Veb sahifadagi reklama roliklari

4. (a5-g23-34) IP protokolining vazifasi ...
A) axborotni paketlarga ajratish
B) barcha paketlarni qabul qiluvchiga uzatish
C) komputerlarga maxsus nomer berish
D) gipermatnlarni saqlash

5. (a5-g25-34) Kompyutening raqamli signali ko'rinishini analog ko'rinishga o'tkazuvchi qurilma ... deyiladi.
A) modulyator B) demodulyator
C) modem D) server

6. (a6-g2-33) Tarmoqdagi kompyuterlarning o'zaro ulanish tuzilmasi ... deyiladi
A) internet
B) tarmoq topologiyasi
C) tarmoq adapteri
D) tarmoq texnologiyasi

7. (a6-g5-35) Nuqtalar o'rniga mos so'zni tanlang. Internetda ma'lumotlarni uzatish qoidalari ... deyiladi.
A) nizom B) WWW
C) protokollar D) browserlar

8. (a6-g7-35) Quyidagilardan qaysi biri axborot texnologiyasining ichki omili hisoblanadi?
A) dars o'tish B) radio
C) kompyuter D) mobil telefon

9. (a6-g8-35) Tarmoq topologiyasi nima?
A) kompyuter tarmoqlarining ulanish tuzilmasi
B) kompyuterning tarmoqlararo o'zaro bog'liqligi
C) tarmoqlararo o'zaro bog'lanish
D) mintaqaviy tarmoq hosil qilish

10. (a6-g9-31) Axborot manbayidan axborotni qabul qilish vositasiga yetkazib beruvchilar qanday nomlanadi?
A) antenna
B) aloqa vositalari
C) axborot jarayonlari
D) axborot tashuvchi vosita

11. (a6-g10-33) Veb saytlar manzili hisoblanmish URL yoyilmasi qaysi javobda to'g'ri ko'rsatilgan?
A) Universal Recalling Language
B) United Remainder Language
C) Uniform Resource Locator
D) Unique Rendering Liability

12. (a6-g17-34) Veb sahifalar saqlanuvchi maxsus kompyuter ... deyiladi.
A) veb-server B) veb sayt
C) Arpanet D) www

13. (a6-g25-31) ... – bu minglab lokal va mintaqaviy kompyuter tarmoqlarini birlashtiruvchi tizim.
A) Modem B) Web site
C) Internet D) ijtimoiy tarmoq

14. (a6-g26-34) Lokal tarmoqda asosiy kompyuterga ulangan kompyuterlar qanday nomlanadi?
A) fayl server
B) provayder
C) stansiya
D) lokal stansiya

5. Internet ishini ta'minlovchi dasturlar

1. (a5-g25-33) Internet Explorer brauzerida Veb sahifalardagi ma'lumotlardan nusxa olish va ko'chirish qaysi menyu buyruqlari asosida amalga oshiriladi?
A) Fayl
B) Tahrir (Правка)
C) Servis
D) Ma'lumot (Справка)

2. (a6-g12-8) Quyidagilarning qaysi biridan veb-brauzer sifatida foydalanilmaydi?
A) AdWiper
B) Mozilla Firefox
C) Mosaic
D) AVP Platinium

3. (a6-g13-32) Nuqtalar o'rniga mos so'zni toping. WWWda axborot ... da saqlanadi.
A) veb brauzer B) veb sahifa
C) veb-sayt D) URL

4. (a6-g15-31) Quyidagi keltirilganlardan qaysi biri Internet Explorer dasturi menyusiga kirmaydi?
A) Jadval B) Tanlangan
C) Ma'lumot D) Servis

5. (a6-g20-33) Quyidagilardan qaysi biri Internet tarmog'idan kerakli ma'lumotlarni qidirib topish uchun xizmat qiladigan qidiruv tizimlaridan biri emas?
A) Yandex B) Yahoo
C) Linux D) Rambler

6. Axborot xavfsizligi va antivirus

1. (a5-g17-25) .com, .dll va .exe kengaytmali fayllarga zarar keltiruvchi virus turlari qanday nomlanadi?
A) tarmoq viruslari
B) makroviruslar
C) boot viruslar
D) fayl viruslari

2. (a5-g24-33) Operatsion sistema yuklanishini taqiqlovchi virus turini ko'rsating.
A) fayl viruslar
B) tarmoq viruslari
C) boot viruslar
D) makroviruslar

3. (a6-g3-34) O'zaro bog'langan kompyuterlarni zararlovchi virus turi qanday nomlanadi?
A) boot viruslar
B) makroviruslar
C) fayl viruslar
D) tarmoq viruslari

4. (a6-g6-35) TR viruslar guruhi qaysi davlatda ishlab chiqarilgan deya tahmin qilinadi?
A) Turkiya B) Turkmaniston
C) Vengriya D) Bolgariya

5. (a6-g8-34) Operatsion sistemaning 0 treyiga yozilib oladigan viruslar qanday nomlanadi?
A) spam B) avenger
C) fayl viruslari D) boot viruslari

6. (a6-g14-35) 1988-yilda ishga tushib ko'pgina kompyuterlarni zararlagan «Morissa» nomli virus qaysi turga mansub?
A) fayl virusi B) boot virusi
C) tarmoq virusi D) makroviruslar

7. (a6-g16-35) Tarmoqqa ulangan barcha yoki ba'zi abonentlarga zarar keltiruvchi viruslar qanday nomlanadi?
A) replikatorlar B) netvirus
C) avenger D) datacrime

8. (a6-g19-32) Quyidagilardan qaysi biri antivirus dasturlari?
1) DrWeb; 2) McAfee; 3) Avast;
4) Ms Internet Explorer; 5) Netscape Navigator; 6) Nod32.
A) 1, 2, 3, 5, 6 B) 1, 3, 4, 6
C) 1, 2, 3, 6 D) 2, 3, 4, 6

9. (a6-g22-32) Quyidagilardan qaysi biri internet orqali yetkazilishi mumkin bo'lgan zararlardan hisoblanmaydi?
A) internetdan uzatilayotgan axborotni yo'lda ushlab olib, undan nusxa olish yoki o'zgartirish
B) jamiyat mafkurasi va ma'naviyatiga zid bo'lgan axborotlarni internetda e'lon qilish
C) internetga kirganingizda sizning kompyuteringizga ruxsatsiz kirib, sizning faoliyatingizga zid tarzda masofadan boshqarish
D) turli internet saytlarida zararli saytlarga yo'llanma(ssilka)lar qo'yish

10. (a6-g23-31) Fayl viruslariga quydagilardan qaysilari kiradi?
1) Pokiston guruhi; 2) CASCADE guruhi; 3) Quddus guruhi;
4) TR guruhi; 5) Datacrime guruhi;
6) BX1–1C; 7) Brain 88; 8) Italiya guruhi.
A) 1, 2, 3, 4, 5, 8
B) 2, 3, 5, 6, 7
C) 1, 2, 3, 4, 5, 6, 7
D) 2, 3, 5, 8

ZAMONAVIY KOMPYUTERLAR

7. Xisoblash texnikasining paydo bo'lish tarixi. Shaxsiy kompyuter

1. (a5-g13-31) Leonardo da Vinchiga tegishli bo'lgan qo'lyozmada necha xonali sonlarni qo'sha oladigan hisoblash qurilmasi sxemasi mavjud edi?
A) 3 B) 10 C) 13 D) 8

2. (a5-g20-33) 2-avlod (1956–1965-yillar) elektron hisoblash mashinalarining ishlashi uchun lozim bo'lgan asosiy element nimadan iborat bo'lgan?
A) tranzistor
B) elektron lampa
C) integral sxema
D) katta integral sxema

3. (a5-g24-34) Qanday elementning ishlab chiqarilishi, kompyuterlar o'lchami, vazni energiya sarfini juda ham o'zgartirib yubordi?
A) elektron lampa
B) tranzistor
C) elektro diod
D) asosiy plata

4. (a5-g25-31) 3-avlod kompyuterlari nima asosida ishlagan?
A) integral sxema
B) tranzistor
C) katta integral sxema
D) elektron lampa

5. (a6-g1-31) Ikkilik sanoq sistemasidagi sondan ildiz chiqara oladigan ilk mashina kim tomonidan kashf etilgan?
A) Blez Paskal
B) Vilgelm Leybnits
C) Charlz Bebbij
D) Al-Farg'oniy

6. (a6-g12-33) Kompyuterlar davriga qadar ma'lumotlar bilan ishlash qanday nomlangan?
A) arxivshunoslik
B) dokumentalistika
C) algoritm asoslari
D) axborotshunoslik

7. (a6-g14-31) Quyidagi elektron hisoblash mashinalari qaysi avlodlarga taalluqli ekanligini toping.
1) MINSK–1; 2) EC–1030; 3) ENIAC;
4) MINSK–22; 5) IBM; 6) IBM 360;
7) Pentium; 8) BESM–6.
A) 1-avlod: 1, 3, 4; 2-avlod: 2, 6; 3-avlod: 5, 7; 4-avlod: 8
B) 1-avlod: 1, 3; 2-avlod: 4, 8; 3-avlod: 2, 6; 4-avlod: 5, 7
C) 1-avlod: 1, 3; 2-avlod: 4, 6; 3-avlod: 2, 8; 4-avlod: 5, 7
D) 1-avlod: 1, 3, 4; 2-avlod: 2, 6; 3-avlod: 5; 4-avlod: 7, 8

8. (a6-g15-33) Ma'lumotlarni ikkilik shaklda vaqtinchalik saqlab turish uchun mo'ljallangan va kompyuterning tezkor xotirasida joylashgan qurilmalar – ... deyiladi.
A) razryadlar B) platalar
C) registrlar D) chiplar

9. (a6-g16-33) Quyidagi shinalardan qaysi biri asosiy plataga tegishli emas?
A) berilgan ma'lumotlar shinasi
B) boshqarish shinasi
C) adreslar shinasi
D) xotira shinasi

10. (a6-g16-36) Asosiy elementi integral-sxemalar bo'lgan elektron mashinalar nechanchi avlod hisoblanishadi?
A) 4 B) 3 C) 2 D) 1

11. (a6-g18-33) 1822-yilda Charlz Bebbij tomonidan ixtiro qilingan, bug'da ishlaydigan va hisoblash jadvalini chop eta oladigan mashina qanday nomlanadi?
A) suan-pan
B) ayirmali mashina
C) triod
D) paskalina

12. (a6-g21-33) Portlar – bu ...
A) asosiy platadagi qurilmalarni boshqaruvchi sxema.
B) axborot almashish magistrali.
C) yaxlit yig'ilgan elektron sxema.
D) qo'shimcha qurilmalar ulanuvchi asosiy platadagi maxsus joylar.

8. Mantiqiy amallar

1. (a5-g18-25) Ifodani soddalashtiring.
$p \wedge (p \vee q)$
A) p B) $p \vee q$
C) $p \wedge q$ D) q

2. (a5-g25-32) $(p \wedge q) \vee (\neg p \wedge r)$ ifoda necha holatda ROST qiymat qabul qiladi?
A) 3 B) 4 C) 5 D) 2

3. (a6-g1-32) Quyidagi rostlik jadvalidan foydalanib oxirgi ustundagi amal quyidagilardan qaysi biriga tengligini aniqlang.

p	q	
1	1	0
1	0	1
0	1	1
0	0	1

A) ¬p ∨ ¬q
B) p ∧ ¬q
C) (p ∧ q) ∨ ¬p
D) ¬p ∧ ¬q

4. (a6-g5-33) $p \vee \neg(q \wedge r)$ mantiqiy ifodaning qiymati yolg'on bo'lsa, p, q va r ning qiymatlarini toping.
A) aniqlab bo'lmaydi
B) 0, 0, 0
C) 1, 0, 0
D) 0, 1, 1

5. (a6-g7-33) $\neg(p \wedge q) \wedge p$ ifoda quyidagilardan qaysi biriga teng?
A) $\neg p \vee q$ B) 1
C) $p \wedge \neg q$ D) $\neg p \wedge q$

6. (a6-g8-32) $A \vee B \wedge C$ ifoda quyidagilardan qaysi biriga teng?
A) $\neg A \wedge B \wedge C$
B) $\neg(\neg A \wedge \neg(B \wedge C))$
C) $\neg A \wedge (\neg B \wedge \neg C)$
D) $\neg(\neg A \wedge \neg B \wedge \neg C)$

7. (a6-g11-16) A=«Abituriyent gazetasi» so'zi 19 baytdan iborat.
B=«$1101_2=D_{16}$»
C=«nota daftarchasi axborot tashuvchi qurilma hisoblanadi.»
bo'lsa, $(A \vee \neg B) \wedge C \vee B$ ifodaning qiymatini toping.
A) yolg'on
B) aniqlab bo'lmaydi.
C) 18
D) rost

8. (a6-g12-15) Ifodani soddalashtiring:
$\left((p \vee q) \wedge \left(p \vee \overline{q}\right)\right) \vee \overline{p}$.
A) 1 B) $\overline{p} \wedge q$
C) $p \vee \overline{q}$ D) $p \vee q$

9. (a6-g12-21) «Formal mantiq ilmi asoslari» qaysi olim tomonidan yaratilgan?
A) Forobiy B) Leybnits
C) Bul D) Arastu

10. (a6-g13-29) Quyidagi ifoda nechta holatda YOLG'ON qiymat qabul qiladi?
$\overline{(\overline{p} \wedge q)} \vee (p \wedge q) \vee r$
A) 4 B) 2 C) 1 D) 6

11. (a6-g18-34) Quyidagilardan qaysi biri $A \wedge B \wedge C \wedge D$ ga teng?
A) $A \vee \neg(\neg B \vee \neg C \vee \neg D)$
B) $\neg(\neg A \vee \neg B \vee \neg C \vee \neg D)$
C) $A \vee B \vee \neg(\neg C \vee \neg D)$
D) $\neg(\neg A \vee \neg B \vee \neg C) \vee D$

12. (a6-g20-34) A=rost; B=yolg'on bo'lsa, quyidagilardan qaysi birining natijasi «yolg'on» bo'ladi?
A) ¬(A ∧ B) B) ¬A ∨ ¬B
C) ¬(A ∨ B) D) A ∧ ¬B

13. (a6-g21-32) Mantiqiy ifodani soddalashtiring $\neg(p \vee q) \wedge (p \wedge q)$.
A) $p \vee q$ B) 1
C) 0 D) $p \wedge q$

14. (a6-g26-32) Ifodani soddalashtiring $\neg q \vee (p \vee q)$.

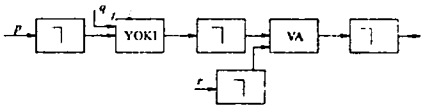
A) p B) q C) 0 D) 1

9. Mantiqiy elementlar

1. (a5-g11-32) $p \vee (q \wedge r)$ mantiqiy ifoda nechta holda rost qiymat qabul qila oladi?

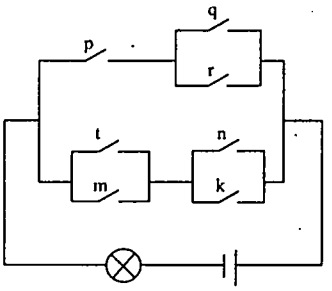
A) 5 B) 4 C) 2 D) 7

2. (a5-g13-36) Ushbu mantiqiy sxemaning natijasi YOLG'ON bo'lsa, mos ravishda p, q va r ning qiymatlarini toping.



A) 0; 0; 0 B) 1; 0; 1
C) 1; 0; 0 D) 0; 1; 0

3. (a6-g2-32)



Quyidagilardan qaysi biri yuqoridagi mantiqiy sxemani ifodalaydi.

A) A) $(p \wedge (q \vee r)) \vee ((m \vee t) \wedge (n \vee k))$

B) B) $(p \vee (q \wedge r)) \wedge ((m \wedge t) \vee (n \wedge k))$

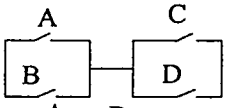
C) C) $(p \wedge (q \vee r)) \wedge ((m \vee t) \wedge (n \vee k))$

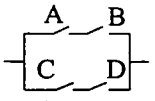
D) D) $(p \vee (q \wedge r)) \vee ((m \wedge t) \vee (n \wedge k))$

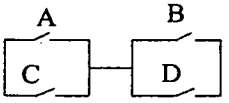
4. (a6-g10-32) $((x < 25) \wedge (x < 23)) \wedge \wedge \neg((x < 22) \vee (x > 23))$ ifoda rost qiymat qabul qilsa, x ning qiymatini toping.

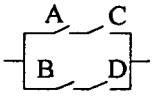
A) 21 B) 22 C) 23 D) 24

5. (a6-g22-33) Quyidagi sxemalardan qaysi birida $(A \vee B) \wedge (C \vee D)$ mantiqiy ifodani ifodalaydi?

A) 

B) 

C) 

D) 

10. Mantiqiy masalalar

1. (a5-g16-34) A = 1-avgustda kirish imtihonlari bo'lib o'tdi.
B = 2014-yilda Argentina futbol bo'yicha jahon chempioni bo'ldi.
C = Hozir 2013-yildamiz.

$A \wedge \neg(A \vee B \wedge C)$

A) rost
B) yolg'on
C) aniqlab bo'lmaydi
D) 24

2. (a6-g11-1) A nuqtadan tekislikkacha bo'lgan masofa 12 ga teng. A nuqtadan tekislikdagi B nuqtagacha masofa 13 ga, C nuqtagacha masofa 20 ga teng. B va C nuqtalar orasidagi masofani toping.

A) aniqlab bo'lmaydi
B) 21
C) 9
D) $\sqrt{261}$

3. (a6-g12-11) «NAVOIY» ATMga tegishli ingliz tili kutubxonasida Grammar, IELTS va Fiction Reading turdagi kitoblar mavjud. Grammar kitoblari barcha kitoblarning 36% ini, IELTS kitoblari esa Grammar kitoblarining 75% ini tashkil etadi. Qolgan 18500 ta kitob esa Fiction reading kitoblari hisoblanadi. Kutubxonamizda ja'mi nechta ingliz tilidagi kitoblar mavjud?

A) 50000 B) 48000
C) 45000 D) 65000

4. (a6-g13-33) Internet orqali sotib olingan mahsulot pochta xizmati bilan birgalikda 6500 pul birligiga sotib olinmoqda. Agar mahsulot narxi 30%, pochta xizmati 20% orttirilganda, mahsulotning yetib kelish narxi 8300 pul birligi bo'lgan bo'lsa, pochta xizmatining narxi 30% oshgandagi qiymatini toping.

A) 1500 B) 1800
C) 2100 D) 1950

5. (a6-g19-35) Quyidagi mantiqiy tenglamaning yechimlar sonini aniqlang. $x \wedge y \wedge \bar{x} \vee y = \text{rost}$

A) 1 B) 2 C) 3 D) 4

11. Shaxsiy kompyuterning asosiy qurilmalari va ularning vazifasi. Shaxsiy kompyuterning atrof qurilmalari

1. (a5-g13-32) Quyidagilardan qaysi biri protsessor qurilmasi hisoblanmaydi?

A) Kesh xotira
B) tovush kartasi
C) registrlar
D) buyruq jamlagich

2. (a6-g1-33) Axborotlarni qayta ishlash qaysi qurilmada sodir bo'ladi?

A) tashqi xotirada
B) tezkor xotirada
C) protsessorda
D) doimiy xotirada

3. (a6-g10-34) DVD-RW disklar ustida bajarib bo'lmaydigan amalni aniqlang.

A) yozish B) o'qish
C) o'chirish D) formatlash

4. (a6-g17-31) Quyidagilardan nechtasi axborot tashuvchi vosita?
1) matematika kitobi; 2) magnitofon;
3) monitor; 4) DVD disk; 5) televizor.

A) 2 B) 3 C) 4 D) 1

5. (a6-g19-31) Quyidagilardan axborot tashuvchi vositalarni ko'rsating.

A) shina, kitob, disk
B) televizor, radio, quloqchin
C) klaviatura, flesh xotira, tovush platasi
D) optik disk, flesh xotira, kitob

6. (a6-g23-34) Quyidagilardan qaysi biri kompyuterning qo'shimcha qurilmasi?

A) sichqoncha B) monitor
C) klaviatura D) sistema bloki

7. (a6-g24-33) Protsessordan ma'lumotlarni baytlarda olib baytlarda uzatuvchi portlar qanday nomlanadi?

A) COM B) USB
C) DXQ D) LPT

AXBOROT TEXNOLOGIYASI

12. Shaxsiy kompyuterning dasturiy ta'minoti

1. (a5-g14-33) Sistema dasturlarining bir bo'lagi bo'lgan yordamchi dasturlar nima deyiladi?

A) utilit B) drayver
C) multimedia D) interfeys

2. (a5-g18-4) Quyidagilardan qaysi biri hardware (kompyuterning texnik qismi) hisoblanmaydi?

A) protsessor B) tezkor xotira
C) monitor D) BIOS

3. (a5-g18-17) Operatsion sistema bilan birgalikda ishga tushib, foydalanuvchiga ushbu sistema bilan ishlashga ko'maklashadigan dastur qanday nomlanadi?

A) BIOS B) qobiq dasturlar
C) Interfeys D) boot record

4. (a5-g20-31) Kompyuterning Hardware qismiga quyida keltirilganlardan qaysi biri kirmaydi?

A) vinchester B) disk yurituvchi
C) word dasturi D) skaner

5. (a5-g20-34) Foydalanuvchi bepul ishlatishi va shu bilan birga o'z ehtiyojlariga ko'ra moslab o'zgartirishi mumkin bo'lgan dasturiy ta'minotlar uchun qanday umumiy nom ishlatiladi?

A) Freeware
B) Open source software
C) Shareware
D) Open access software

6. (a6-g2-34) Quyidagilardan qaysi biri sistema dasturlari vazifalariga kirmaydi?
A) kompyuter resurslarini boshqarish
B) kompyuterning ishlash imkoniyatlarini tekshirish
C) kompyuter uchun yangi dasturlar tayyorlash va tahrirlash
D) kompyuter haqida ma'lumot berish

7. (a6-g5-34) Quyidagi ta'riflardan qaysi biri Shareware dasturlarga mos keladi?
A) Sinovdan o'tkazish uchun dasturni reklama qilish maqsadida chiqarilgan naqli.
B) Foydalanuvchilarga bepul tarqatiladigan dasturlar.
C) Dastur tuzilgan kodi bilan birgalikda tekinga taqdim qilinuvchi dasturlar.
D) To'liq to'lov amalga oshirilgandan so'ng olinadigan dastur turlari.

8. (a6-g6-33) Quyidagilardan qaysi biri uskunaviy sistemalar turiga kiradi?
A) Visual Basic
B) Microsoft Excel
C) makroassemblerlar
D) Paradox

9. (a6-g7-34) Quyidagilardan qaysi biri dasturlash sistemasi hisoblanmaydi.
A) Borland Delphi
B) C++
C) Adobe Photoshop
D) Turbo Pascal

10. (a6-g8-33) Kompyuterning asosiy qurilmalari bilan qo'shimcha qurilmalarni o'zaro bog'lovchi dastur qanday nomlanadi?
A) drayver B) utilit
C) plagin D) antispoon

11. (a6-g9-34) Dasturlarning qurilmalar bilan o'zaro munosabati ... interfeys deyiladi.
A) apparatli
B) foydalanuvchi
C) dasturiy
D) apparatli-dasturiy

12. (a6-g11-3) Informatikaning Brainware yo'nalishi nimani o'rganadi?
A) robotlar texnologiyasini
B) algoritmlar tuzish va ularni ishlab chiqish
C) dasturiy ta'minot va kompyuter mutanosibligini
D) fikrlash doirasini

13. (a6-g12-24) Nuqtalar o'rniga mos so'zni tanlang. Dastur va kompyuterning inson bilan muloqoti ... interfeysi deyiladi.
A) dasturiy
B) apparatli
C) apparatli-dasturiy
D) foydalanuvchi

14. (a6-g22-34) O'zaro ta'sir, muvofiqlashtirish vositasi qanday nomlanadi?
A) communication
B) interfeys
C) operatsion sistema
D) multics

13. Operatsion tizimlar. Dasturlar va buyruqlar

1. (a5-g11-33) Kompyuter ishga tushirilgandan so'ng foydalanuvchi bilan kompyuter orasidagi muloqotni ta'minlovchi dastur ... deyiladi.
A) operatsion sistema
B) Windows
C) uskunaviy dasturlar
D) Microsoft Office

2. (a5-g12-33) Kompyuter ilk ishga tushirilganida kiritish va chiqarish amallarni bajaruvchi, kompyuter qurilmalari sozligini tekshiruvchi dastur ... deb nomlanadi.
A) DOS B) BIOS
C) WINDOWS D) Linux

3. (a5-g14-34) Quyidagilardan qaysi biri operatsion sistema hisoblanmaydi?
A) CP/M
B) Linux
C) Microsoft Office
D) MS DOS

4. (a5-g17-20) Quyidagilardan qaysi biri operatsion sistemaning o'zak dasturi hisoblanmaydi?
A) fayl sistemasi ishini boshqarish
B) jarayonlarni hosil qilish va o'chirish
C) jarayonlarni bir holatdan boshqasiga o'tkazish
D) jarayonlar necha marta yuz berganini hisoblash

5. (a5-g19-33) Operatsion sistemani faollashtiruvchi dastur qanday nomlanadi?
A) IO.sys B) BIOS
C) Boot Record D) Msconfig

6. (a5-g22-34) Operatsion sistemada amallar bajarishda yuzaga kelishi mumkin bo'lgan uzilishlarni tahlil qilish moduli qanday nomlanadi?
A) Msdos.sys
B) Command.com
C) IO.sys
D) Boot record

7. (a5-g24-35) Bir vaqtda bir necha dasturlarni ishlata oladigan sistemalarning umumiy nomi qanday?
A) ko'p masalali
B) ko'p yacheykali
C) ko'p reestrli
D) ko'p foydalanuvchili

14. Fayl. Papka. Yorliqlar

1. (a5-g23-35) D:\Abdulla\Musiqa\gulbadan.mp3 faylinng bosh katalogini ko'rsating.
A) gulbadan.mp3
B) D:
C) Abdulla
D) Musiqa

2. (a6-g6-34) Quyidagilardan qaysi biri fayl nomi bo'la olmaydi?
A) yu%mshoq.doc
B) yu<mshoq.doc
C) yum_shoq.doc
D) yum^shoq.doc

3. (a6-g17-35) Dinamik kutubxona fayllarining kengaytmasi qanday ko'rinishda bo'ladi?
A) exe B) com
C) bak D) dll

4. (a6-g18-35) Qaysi javobda ona katalogdan faylga borish yo'li to'g'ri ko'rsatilgan?
A) C:\ Qo'ng'irot\Rustambek\test.doc
B) \ Qo'ng'irot\Rustambek\test.doc
C) C:\ Qo'ng'irot\Rustambek
D) C:Qo'ng'irot\Rustambek\test.doc

5. (a6-g19-34) html.rar faylning turini aniqlang
A) matnli
B) arxivlangan
C) web-sahifa
D) sistemali

15. Shaxsiy kompyuterning tashki xotira bilan ishlashi

1. (a5-g19-34) Quyidagi dasturlardan qaysi biri vinchester (hard diskni) bo'laklarga bo'lish uchun ishlatiladi?
A) F disk
B) Moy kompyuter
C) defregmentatsiya
D) Adobe acrobat

16. Windows operatsion tizimi

1. (a6-g1-35) «Мой Компьютер» dasturida fayllarni qidirish uchun qaysi tugmalardan foydalaniladi?
A) Ctrl+F B) Alt+F7
C) F3 D) F2

17. Windows yo'l boshlovchisi – Проводник

1. (a5-g13-33) WINDOWS operatsion sistemasining fayllar bilan ishlovchi qobiq dasturini ko'rsating.
A) Provodnik
B) Internet Explorer
C) Microsoft Office
D) Paint

2. (a5-g22-33) Windows yo'lboshchisi (Проводник) dasturini ishga tushirish uchun klaviaturadagi qaysi klavishlarni bosish lozim?
A) bayroqcha + Pause
B) bayroqcha + D
C) bayroqcha + E
D) bayroqcha + R

3. (a6-g24-34) Provodnikni ishga tushirish uchun Windows operatsion sistemasidan qaysi tugmalarni bosish lozim?
A) winkey+D
B) winkey+L
C) winkey+E
D) winkey+S

XUJJATLARNI QAYTA ISHLASH TEXNOLOGIYASI

18. Matn muxarrirlari

1. (a6-g1-36) HTMLda boshqa veb-sahifa yoki veb saytga yo'llanma berish uchun qaysi buyruqdan foydalaniladi?
A) <A INPUT=...>...</A>
B) <A SELECT=...>...</A>
C) <A OPTION=...>...</A>
D) <A HREF=...>...</A>

2. (a6-g12-19) Quyidagi yozuvlarning qaysi biri Abituriyent so'zining ustiga bosganda abituriyent.uz saytiga yo'naltiradi?
A) <A HREF=«Abituriyent»> http://abituriyent.uz</A>
B) <A HREF=«http://abituriyent.uz»> Abituriyent</A>
C) <A HREF=http://abituriyent.uz> «Abituriyent»</A>
D) <A HREF=Abituriyent> «http://abituriyent.uz»</A>

19. MS Word matn protsessori

1. (a5-g17-31) Quyidagilardan qaysi biri belgilangan matnni qirqib olish va boshqa joyga o'rnatish ketma-ketligini ifodalaydi?
A) Ctrl + X, Ctrl + V
B) Ctrl + C, Ctrl + V
C) Ctrl + X, Ctrl + P
D) Ctrl + X, Ctrl + P

MS EXCEL ELEKTRON JADVAL

20. Elektron jadvalning asosiy elementlari. Menyular satri. Uskunalar paneli

1. (a5-g12-34) Quyidagilardan qaysi biri elektron jadval hisoblanmaydi?
A) MS Access
B) 1C buxgalteriya
C) Framework
D) Master

2. (a5-g20-35) Microsoft Excel jadvallaridagi katakchalarga (ularning adresini o'zgartirmagan holda) absolyut murojaat qilish uchun qaysi belgidan foydalaniladi?
A) £ B) = C) # D) $

3. (a6-g15-35) Microsoft Excel dasturida Varaq 2 (Лист 2) dagi B3 katakda berilgan ma'lumotni Varaq 1 (Лист 1) dagi A2 katakda ko'rish uchun u katakka qanday formula kiritish kerak?
A) =Лист2!B3 B) =Лист2.B3
C) =Лист2:B3 D) =Лист2;B3

4. (a6-g16-34) Excel dasturida ma'lumotlarni alfavit yoki o'sish tartibida joylashtirish buyrug'i qaysi menyu ostida joylashgan?
A) Вставка B) Данные
C) Вид D) Вставка

5. (a6-g23-32) Birinchi elektron jadval dasturi qanday nom bilan ishlab chiqarilgan?
A) VisiCalc
B) Framework
C) 1C-Bugalteriya
D) MS Excel

6. (a6-g23-35) MS Excel 2003 dasturida D2 katakchadagi «=$A1*B3» formulanining E3 katakchadagi nusxasini toping.
A) =$A1*C4 B) =$A2*C3
C) =$A2*C2 D) =$A2*C4

21. Matematik amallar va funksiyalarni qullash

1. (a6-g9-33) EXCEL dasturida B2 katakchasida =A$1+$B1 formula turibdi. Shu formulani D3 katakchaga ko'chirsa, nima hosil bo'ladi?
A) =C2+C2 B) =C$1+$C2
C) =C$1+$B2 D) =$C2+C$1

2. (a6-g19-33) MS Excel 2003 da matndan bochlang'ich o'rindan boshlab berilgan sondagi belgilarni ajratib olish funksiyasini ko'rsating.
A) Длстр B) Пстр
C) Значен D) Сцепить

22. Matematik funksiyalar bilan ishlash

1. (a5-g16-32) Microsoft Excel dasturidagi *Градусы* (*Darajalar*) buyrug'i qanday amalni bajaradi?
A) Farangeit o'lchovida berilgan harorartni gradusda ifodalaydi.
B) Graduslarda berilgan burchakni radianlarda hisoblaydi.
C) Radianlarda berilgan burchakni graduslarda ifodalaydi.
D) Kelvin o'lchovida berilgan haroratni graduslarda ifodalaydi.

2. (a6-g10-35) MS Excel 2003 dasturida yozilgan «=КОРЕНЬ(ABS(–36))* *ЗНАК(28) + ОСТАТ(32;13)» formulaning qiymati nechaga teng?
A) 174 B) 18 C) 12 D) 31

3. (a6-g25-33) Elektron jadvalda A1 yacheykaga 10 soni, B1 yachenkaga =A1/2 formula, C1 yacheykaga =СУММ(A1:B1)*2 formula kiritilgan. C1 yacheykada hosil bo'lgan sonni toping.
A) 25 B) 50 C) 36 D) 30

23. Elektron jadvalda mantikiy elementlarning qullanilishi

1. (a5-g13-34) Microsoft Excel yacheykasida yozilgan ushbu formula yozilgan:
=ЕСЛИ(ИЛИ(A1>6;A2<4); 3*B1+4*B2;3*B1-4*B2)
Agar A1 yacheykada 12, A2 yacheykada 6, B1 yacheykada 5 va B2 yacheykada 4 yozilgan bo'lsa, natija qanday bo'ladi.
A) –1 B) 12 C) 31 D) 60

2. (a5-g19-35) Microsoft Excelning A1 yacheykasida 3, B1 yacheykasida 8 soni turibdi.
=ЕСЛИ(ИЛИ(A1>3; 1+B1<12);18; 24) formula yozilgan yacheykada qanday natija hosil bo'ladi?
A) 24 B) 18 C) 21 D) 12

3. (a6-g11-20) Microsoft Excel dasturidagi A2 katakka kiritilgan sonning manfiy, musbat yoki nolga tengligini aniqlab uni B2 katakka yozish uchun B2 katakda qanday formula kiritish lozim?
A) =ЕСЛИ(A2<0;«Manfiy»;A2>0; «Musbat»;A2=0;«Nolga teng»)
B) =ЕСЛИ(A2<0;«Manfiy»;ИЛИ(A2>0; «Musbat»;«Nolga teng»))
C) =ЕСЛИ(A2<0;«Manfiy»; «Musbat»;ИЛИ(A2=0;«Nolga teng»)
D) =ЕСЛИ(A2<0;«Manfiy»; ЕСЛИ(A2>0;«Musbat»;«Nolga teng»))

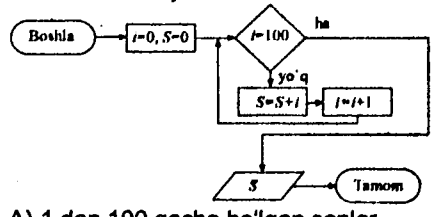
4. (a6-g14-33) MS Excelda «=ЕСЛИ(A1>A2; A2;A1)» buyrug'i nima vazifani bajaradi?
A) A1 va A2 katakchadagi sonlardan kattasini tanlaydi.
B) A1 va A2 katakchadagi sonlarining tengligini tekshiradi.
C) A1 va A2 katakchadagi sonlardan kichigini tanlaydi.
D) A1 katakchadagi son A2 dan katta bo'lsa, Ложь qiymatini oldi.

5. (a6-g20-35) Microsoft Excel dasturidagi A2 katakka kiritilgan sonning manfiy, musbat yoki nolga tengligini aniqlab, uni B2 katakka yozish uchun B2 katakka qanday formula kiritish lozim?
A) =ЕСЛИ(A2>0;«Musbat»; A2<0;«Manfiy»;A2=0;«Nolga teng»)
B) =ЕСЛИ(A2>0;«Musbat»; ЕСЛИ(A2<0;«Manfiy»;«Nolga teng»))
C) =ЕСЛИ(A2>0;«Musbat»; ИЛИ(A2<0;«Manfiy»;«Nolga teng»))
D) =ЕСЛИ(A2>0;«Musbat»;«Manfiy»; ИЛИ(A2=0;«Nolga teng»))

ALGORITM ASOSLARI (ALGORITMLASH)

24. Algoritm. Algoritmning xossalari

1. (a5-g11-36) Quyidagi blok-sxema nima amalni bajaradi?



A) 1 dan 100 gacha bo'lgan sonlar yig'indisini hisoblaydi
B) 1 dan 100 gacha bo'lgan sonlarni yozib chiqadi

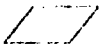
C) 1 dan 99 gacha bo'lgan sonlarni yozib chiqadi
D) 1 dan 99 gacha bo'lgan sonlar yig'indisini hisoblaydi

2. (a5-g14-36) Quyida keltirilgan algoritm qanday amalni bajaradi?
1) *a*, *n* va *S* sonlari olinsin; 2) $a = 4$, $n = 0$ va $S = 0$ deb belgilab olinsin; 3) $S = S + a$ tenglik hisoblansin; 4) $a = a \cdot 3$ va $n = n + 1$ hisoblansin; 5) Agar $n = 20$ bo'lsa, keyingi bandga, aks holda, 3-bandga o'tilsin; 6) *S* ning qiymati chiqarilsin.
A) Birinchi hadi 4 ga, ayirmasi 3 ga teng bo'lgan arifmetik progressiyaning dastlabki 20 ta hadini hisoblaydi.
B) Birinchi hadi 4 ga, ayirmasi 3 ga teng bo'lgan arifmetik progressiyaning dastlabki 19 ta hadini hisoblaydi.
C) Birinchi hadi 4 ga, maxraji 3 ga teng bo'lgan geometrik progressiyaning dastlabki 19 ta hadini hisoblaydi.
D) Birinchi hadi 4 ga, maxraji 3 ga teng bo'lgan geometrik progressiyaning dastlabki 20 ta hadini hisoblaydi.

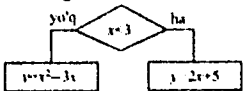
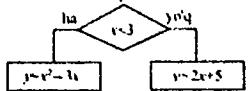
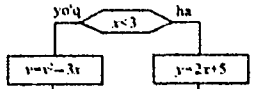
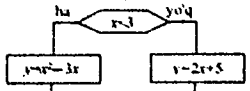
3. (a5-g16-36) Quyidagilardan qaysi biri algoritmlarning mantiqiy tuzilishiga ko'ra turlariga kirmaydi?
A) takrorlanuvchi algoritmlar
B) funksional algoritmlar
C) chiziqli algoritmlar
D) tarmoqlanuvchi algoritmlar

4. (a5-g21-36) Blok-sxema usuli algoritmlarni ifodalashning qaysi turiga kiradi?
A) formula yordamida ifodalanishi
B) grafik yordamida ifodalanishi
C) jadval yordamida ifodalanishi
D) so'zlar yordamida ifodalanishi

5. (a5-g25-36) Quyidagi blok-sxemalardan qaysi biri yordamchi dasturga murojaatni ifodalaydi.

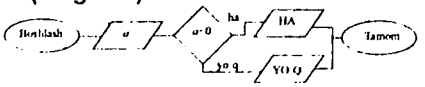
A)  B) 
C)  D) 

6. (a6-g2-36) $y = \begin{cases} x^2 - 3x, & x \geq 3 \\ 2x + 5, & x < 3 \end{cases}$ funksiyani hisoblovchi blok sxemani ko'rsating.

A) 
B) 
C) 
D) 

7. (a6-g3-35) Obyektning tuzilishi va tabiati aynan bir xil bo'lib, faqat o'lchamlari bilan farqlanuvchi model qanday nomlanadi?
A) iqtisodiy model
B) biologik
C) fizik model
D) matematik model

8. (a6-g5-36)



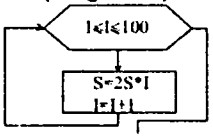
Yuqoridagi blok-sxema qanday ishni amalga oshiradi?
A) Berilgan sonning musbatligini tekshiradi.
B) Berilgan sonlar ichidan manfiylari yig'indisini hisoblaydi.
C) Berilgan sonning manfiyligini tekshiradi.
D) Berilgan sonlar ichidan musbatlari yig'indisini hisoblaydi.

9. (a6-g6-36) Quyidagi savollarni yechish uchun algoritm tuzilganida, qaysi birida faqatgina tarmoqlanuvchi algoritmlardan foydalaniladi?
A) 1 dan 200 gacha toq sonlar yig'indisini topish
B) berilgan 3 ta sonning yig'indisini hisoblash
C) shartli funksiyalarni hisoblash
D) arifmetik progressiyaning yig'indisini hisoblash uchun

10. (a6-g11-32) Nuqtalar o'rniga mos so'zni toping. Haqiqiy obyektning izlanish olib borilayotgan sohaning ma'lum talablarga javob beradigan nusxasi ... deyiladi.
A) masshtab
B) virtual nusxa
C) model
D) subyekt

11. (a6-g13-18) O'rganilayotgan obyektni matematik munosabatlar va belgilar orqali ifodalash jarayoni ... deyiladi.
A) algoritmlash
B) kodlashtirish
C) tenglama tuzish
D) matematik modellashtirish

12. (a6-g16-31)



Rasmdagi blok-sxema qismi nimani hisoblaydi?
A) 1 dan 100 gacha bo'lgan natural sonlar ko'paytmasi ikkilanganini
B) 1 dan 100 gacha bo'lgan juft sonlar ko'paytmasini
C) 1 dan 200 gacha bo'lgan juft sonlar ko'paytmasini
D) 1 dan 100 gacha bo'lgan natural sonlar ko'paytmasi ikkilanganini

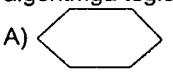
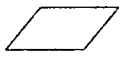
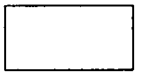
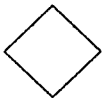
13. (a6-g22-35) Dasturga tuzilgan algoritmning ijrochisi kim?
A) kompyuter
B) dasturdan foydalanuvchi
C) dasturchi
D) dastur tuziladigan platforma

14. (a6-g24-35) Algoritm natijasini aniqlang: a:=12; a:=a*a; a:=a+5.
A) 144 B) 289 C) 149 D) 25

15. (a6-g25-35) O'rganilayotgan jarayon, hodisa yoki narsa qanday nomlanadi?
A) obyekt B) model
C) tavsif D) nusxa

16. (a6-g26-33) Quyidagilardan qaysi biri matematik model emas?
A) Arximed kuchini hisoblash
B) Neptun sayyorasining kashf etilishi
C) qon aylanish sistemasi harakati
D) Pifagor teoremasi

17. (a6-g26-36) Quyidagi blok sxemalardan qaysi biri shartli algoritmga tegishli?

A)  B) 
C)  D) 

DASTURLASH (PASKAL INTEGRALLASHGAN MUXITI)

25. Jadvalli kattaliklar. Massivlar

1. (a5-g12-36) Pascal tilida o'zgaruvchilarni tavsiflash uchun qaysi identifikator ishlatiladi?
A) *x* va *y* B) char
C) const D) var

2. (a6-g13-22) Quyidagilardan qaysi bir yuqori darajali dasturlash tillariga kirmaydi?
A) Turbo Pascal
B) Karat
C) Visual Basic
D) Delphi

3. (a6-g20-36) Satrli o'zgaruvchilarni tavsiflash uchun Turbo Pascal dasturlash tilida qanday maxsus so'z qo'llaniladi?
A) Var B) Char
C) Boolean D) String

4. (a6-g21-36) Quyidagilardan qaysi birini Pascal identifikatori sifatida ishlatish mumkin?
A) public B) resident
C) object D) private

26. Standart funksiyalar va algebraik ifodalar

1. (a5-g18-33) Turbo Pascal dasturida c: = odd(25); writeln(c); buyruqlar ketma-ketligida ekranda nima hosil bo'ladi?
A) 1 B) TRUE
C) FALSE D) 25

2. (a6-g7-36) Quyidagilardan qaysi birini Pascal identifikatori shaklida ishlatib bo'lmaydi?
A) down B) str
C) object D) input

3. (a6-g9-36) $\frac{\sqrt{\sin x+|x|}}{x^5y-2y}$ ifodaning Pascal tilidagi yozilishini ko'rsating
A) sqrt(sinx+absx)/(sqr(sqrx))*x*y-2*y)
B) sqrt(sin(x)+abc(x))/(sqr(sqr(x))*x*y-2*y)
C) sqrt(sin(x)+abs(x))/(sqr(sqr(x))*x*y-2*y)
D) sqr(sin(x)+abs(x))/(sqrt(sqr(x))*x*y-2*y)

4. (a6-g14-34) Pascalda yozilgan quyidagi dasturda d ning qiymatini hisoblang: a:=3; b:=15; c:=12; d:=(a+c mod b)*(b div c*a);
A) 45 B) 30
C) 0 D) 18

5. (a6-g15-36) 36. Pascal dasturlash tilida $\frac{\sin^2\frac{\pi}{3}}{3^4}$ ifodaning qiymatini hisoblash uchun qanday buyruqdan foydalanish kerak?
A) sin(sqr(Pi/3))/(sqr(3)*3)
B) sqr(sin(Pi/3))/(exp(4*ln(3)))
C) sqr(sin (Pi/3))/(sqr(sqrt(3)))
D) sin(sqr (Pi/3))/(sqr(3*3))

6. (a6-g19-36) Paskalda yozilgan quyidagi ifodani oddiy yozuv ko'rinishiga o'tkazing Sqrt(sqrt(x)-4)-(4-x)/5+x.
A) $\sqrt{\sqrt{x-4}-\frac{4-x}{5+x}}$
B) $\sqrt{\sqrt{x-4}-\frac{4-x}{5}+x}$
C) $\sqrt{\sqrt{x}-4-\frac{4-x}{5+x}}$
D) $\sqrt{\sqrt{x}-4-\frac{4-x}{5}+x}$

7. (a6-g23-36) Paskal tilida yozilgan ifodaning algebraik yozuvini ko'rsating. *sqrt(x-sqrt(x)*x+sqr(sqr(x))*x)*
A) $\sqrt{x}.-x^2+x^5$
B) $\sqrt{2x-x^5}$
C) $\sqrt{x-x\sqrt{x}+x^5}$
D) $\sqrt{x-x\sqrt{x}+x^5}$

27. Operatorlar

1. (a5-g19-36) Turbo Pascal dasturida D diskda yangi futbol.txt nomli fayl ochib unga matn kiritish uchun qaysi buyruqlar ketma-ketligidan foydalaniladi?
A) Open(d, D:\futbol.txt); Write(d)
B) Assign(d, D:\futbol.txt); Write(d)
C) Open(d, D:\futbol.txt); Rewrite(d)
D) Assign(d, D:\futbol.txt); Rewrite(d)

2. (a5-g20-36) Turbo Pascal dasturlash tilida protseduralarning sarlavhasi qanday umumiy ko'rinishga ega bo'ladi?
A) Procedure>*protsedure nomi<(parametrlar)*
B) Procedure*/protsedure nomi/[(parametrlar)]*
C) Procedure<*protsedure nomi>(parametrlar)*
D) Procedure:*«protsedure nomi»(parametrlar)*

3. (a5-g22-36) Quyidagi dasturlardan biri $y=\begin{cases}2x+4, & x>3\\ 25, & x=3\\ x^2-7, & x<3\end{cases}$ funksiyani to'g'ri hisoblaydi?
A) if x>3 then y=2*x+4; else if x<=3 then y=sqr(x)-7; else y:=25;
B) if x>3 then y:=2*x+4 else if x<3 then y:=sqr(x)-7 else y:=25;
C) if x:>3 then y:=2*x+4 else if x:<=3 then y:=sqr(x)-7 else y:=25;
D) if x>3 then y=2*x+4; else if x:<=3 then y:=sqr(x)-7 else y:=25;

4. (a5-g23-36) S: = 0; For i: = 1 to 26 do S: = S + 3*i; Buyruqlar ketma-ketligi qanday amalni bajaradi?
A) 1 dan 26 gacha bo'lgan sonlar yig'indisini hisoblaydi
B) 26 dan kichik 3 ga karrali sonlar yig'indisini hisoblaydi
C) 0 dan 78 gacha bo'lgan sonlar yig'indisini hisoblaydi
D) 3 ga karrali ilk 26 ta son yig'indisini hisoblaydi

5. (a5-g24-36) Quyidagilardan qaysi birida berilgan ikki sonning geometrik o'rtachasini hisoblash dasturi to'g'ri ko'rsatilgan?
A) Program average;
Var a, b, c: Real;
Begin
Readln(ikki sonni kiriting); Writeln(a, b);
c: = Sqrt(a*b);
Readln('geometrik o'rtachasi-', c);
End;
B) Program average;
Var a, b, c: Real;
Begin
Writeln(ikki sonni kiriting); Readln(c);
Sqrt(a*b): = c;
Writeln('geometrik o'rtachasi-', c);
End;
C) Program average;
Var a, b, c: Real;
Begin
Readln(ikki sonni kiriting); Writeln(c);
Sqrt(a*b): = c;
Readln('geometrik o'rtachasi-', c);
End;
D) Program average;
Var a, b, c: Real;
Begin
Writeln(ikki sonni kiriting); Readln(a, b);
c: = Sqrt(a*b);
Writeln('geometrik o'rtachasi-', c);
End;

6. (a6-g10-36) Paskal dasturida shakllarning chegara chiziqlari rangi qaysi protsedura bilan tanlanadi?
A) DrawPoly B) SetColor
C) SetBkColor D) InitGraph

7. (a6-g17-36) Agar x < 3 yoki y > 4 bo'lsa, a = x^2 + y^2ni hisobla Turbo Pascal tilida qanday yoziladi?
A) If and (x<3; y>4) then a:=sqr(x)+sqr(y);
B) If OR(x<3; y>4) then a:=sqr(x)+sqr(y);
C) If x<3 OR y>4 then a:=sqr(x)+sqr(y);
D) If x<3 and y>4 then a:=sqr(x)+sqr(y);

8. (a6-g18-36) Quyidagi dasturda natija ekranda qanday ko'rinadi?
Var a, t, r: integer;
Begin t:=4; r:=-2;
a:=t*r; write('a ning qiymati', a); end.
A) a ning qiymati –8,0000000 E–0
B) a ning qiymati 8,0000000 E–0
C) a ning qiymati=–8,0
D) a ning qiymati –8

9. (a6-g22-36) Turbo Pascal dasturlash tilida Reset(f) buyrug'ining vazifasi nima?
A) kompyuterni o'chirib, yoqish
B) f faylni belgilab olish
C) diskdagi fayllarni o'qish uchun ochish
D) Pascal dasturini yopib, boshqatdan ishga tushirish

10. (a6-g24-36) Pascalda Reset(f); buyrug'ining vazifasini toping.
A) Yaratilgan faylga yozish imkonini beradi.
B) Yozish uchun fayl yaratadi.
C) Yaratilgan faylni o'qish uchun ochadi.
D) Yaratilgan faylga qo'shimcha ma'lumot yozish uchun ochadi.

11. (a6-g25-36) Turbo Pascal dasturida ichini istalgan shaklda, istalgan rangga bo'yalgan ko'pburchak chizadigan buyruqni toping.
A) FillEllipse B) FillPoly
C) DrawPoly D) Polygon

28. Belgili va chiziqli ifodalar

1. (a5-g17-9) S: = 'Abituriyent judayam foydali gazeta'; Delete(S, 28, 7); write(S); Ushbu buyruqlar ketma-ketligi bajarilgach, ekranda nima hosil bo'ladi?
A) Abituriyent foydali gazeta
B) Abituriyent judayam gazeta
C) Abituriyent judayam foydali
D) Abituriyent foydali gazeta

2. (a6-g3-36) a:='O'zbekiston go'zal diyor'; n:=Length(a); writeln(n); dastur ekranda nima chiqarib beradi?
A) 22 B) 24 C) 20 D) 26

3. (a6-g8-36) Paskal dasturlash tilida a:=copy ('FARG'ONA', 6, 3) operatori bajarilganda a ning qiymati nimaga teng?

A) G'ONA
B) ONA
C) FARG'
D) FARG'ONA

4. (a6-g11-34) Quyidagi Pascal tilida yozilgan dasturning natijasini toping.
S:='Teleprogramma'; Pos('S', 'm');
A) 0 B) 12 C) 11 D) 10

WEB-SAXIFA (HTML)

29. HTML. Web-saxifaga matn kiritish

1. (a5-g25-35) HTML so'zining ma'nosi nima?
A) Gipermatnni nusxalash tili
B) Guruhli tahrirlash tili
C) Guruhli nusxalash tili
D) Gipermatnli markerlash tili

2. (a6-g2-35) HTML kodida matnni yangi satrga o'tkazish uchun qaysi tegdan foydalaniladi?
A) <P> B) <H2>
C)
 D) <Tr>

3. (a6-g9-35) Quyidagilardan qaysi biri web sahifalarning tashkil etilish texnologiyasiga bog'liq turi emas?
A) avtomatik
B) statik
C) dinamik
D) interaktiv

4. (a6-g14-36) HTMLda <s>abituriyent</s> tegi natijasida ekranda nima hosil bo'ladi?
A) abituriyent
B) «abituriyent»
C) ABITURIYENT
D) abituriyent

5. (a6-g26-35) HTML tilida asosiy matn qanday belgilar orasida bo'ladi?
A) <HTML>...</HTML>
B) <Body>...</Body>
C) <B>...</B>
D) <Head>...</Head>

30. Web-saxifada grafika

1. (a5-g18-16) HTML dasturida D:\Guruh papka ichida joylashgan telefon.jpg nomli rasmni ko'rsatish uchun qanday buyruq yoziladi?
A) < IMG > SRC = 'D:\Guruh\telefon.jpg' < IMG >
B) < IMAGE > SRC = 'D:\Guruh\telefon.jpg' < IMAGE >
C) < IMAGE SRC = 'D:\Guruh\telefon.jpg' >
D) < IMG SRC = 'D:\Guruh\telefon.jpg' >

2. (a6-g15-34) HTML dasturida web sahifaga rasmni joylashtirish uchun ishlatiladigan VSPACE=20 buyrug'i qanday vazifani bajaradi?
A) Rasmning o'ng va chap tomonlaridan 20 pikseldan bo'sh joy qoldiradi.
B) Rasmni web sahifaning chap tomonidan boshlab 20 piksel joy qoldirib joylashtiradi.
C) Rasmning bo'yining kattaligi 20 piksel bo'lishini ta'minlaydi.
D) Rasmning ust va pastidan 20 pikseldan bo'sh joy qoldiradi.

31. Web-saxifada jadval o'rnatish

1. (a6-g13-5) HTML da yozilgan <TH> juft tegi nima vazifani bajaradi?
A) Jadval ustunini hosil qiladi.
B) Jadval satrini hosil qiladi.
C) Jadvalda sarlavhali katakcha hosil qiladi.
D) Jadvalda ma'lumotli katakcha hosil qiladi.

JAVOBLAR

Abituruyent 1*

	g1	g2	g3	g4	g5	g6	g7	g8	g9	g10	g11	g12	g13	g14	g15	g16	g17
1	D	A	B	D	B	D	C	C	B	A	B	C	B	A	C	D	A
2	D	C	C	C	D	B	A	B	D	D	A	B	C	A	D	D	D
3	B	C	D	B	A	B	B	A	A	A	B	D	D	B	A	C	D
4	B	D	A	C	C	C	A	A	D	C	C	B	B	A	A	A	B
5	C	B	D	C	D	A	B	D	B	C	A	C	D	D	D	A	D
6	C	B	D	A	C	A	C	B	B	A	D	A	A	C	D	B	B
7	A	B	C	B	A	B	D	C	D	C	B	D	A	D	A	B	A
8	D	A	A	A	B	A	D	B	C	B	D	A	A	C	A	C	C
9	D	B	C	C	B	D	C	C	A	C	A	C	C	B	C	A	B
10	B	C	B	B	A	C	D	B	C	C	A	C	D	B	A	C	D
11	B	A	D	D	C	C	C	D	A	B	C	B	B	D	C	D	A
12	B	D	A	B	C	D	B	A	C	D	B	B	A	A	B	A	B
13	C	D	C	D	D	C	C	B	C	A	B	A	C	D	D	A	C
14	C	C	A	C	D	D	D	C	C	D	C	D	D	C	B	B	C
15	A	C	B	A	C	B	B	D	A	A	D	C	B	B	C	A	C
16	D	D	C	B	A	C	C	C	C	C	D	B	B	B	C	C	A
17	B	B	C	A	C	D	B	B	B	D	C	A	D	D	A	D	C
18	B	A	D	C	D	B	D	B	B	D	C	A	D	A	D	C	D
19	A	C	C	A	C	A	C	A	B	B	C	C	C	A	D	A	A
20	C	B	A	B	B	C	D	D	D	D	B	B	C	A	A	C	A
21	D	D	B	D	C	A	A	B	D	D	A	B	C	B	B	B	B
22	C	C	A	A	B	C	A	C	B	C	D	A	A	A	B	C	A
23	A	C	B	A	A	B	D	A	C	D	C	D	D	B	A	C	B
24	C	C	C	D	A	A	A	B	B	B	A	D	D	D	C	D	C
25	C	D	D	A	C	A	C	A	C	B	B	B	C	C	C	C	A
26	D	D	B	A	B	D	A	A	B	C	B	A	B	A	B	D	B
27	D	C	D	B	D	B	B	C	A	C	A	C	A	C	C	A	A
28	D	B	B	D	B	D	C	B	D	C	D	A	B	C	D	B	B
29	B	D	C	C	A	D	C	C	B	B	D	D	C	B	C	B	A
30	A	A	A	B	B	B	B	A	D	A	B	D	C	A	B	C	C
31	D	B	D	C	C	C	D	B	A	D	C	B	A	C	B	D	B
32	C	C	D	B	C	A	B	D	B	A	A	A	C	D	B	C	A
33	A	D	D	D	D	A	A	A	C	D	C	B	D	D	A	D	D
34	D	C	A	D	B	D	B	B	B	C	B	C	B	C	B	C	A
35	C	A	B	B	D	C	A	C	C	A	A	A	A	A	D	A	B
36	C	A	A	C	B	B	D	B	A	D	D	B	D	B	A	A	C

* g1, g2, g3... – «Abituriyent» gazetasing sonlari. Bu kitobda variantning tartib raqami bo'lib kelgan.
* a1, a2, a3... – «Abituriyent. Testlar to'plami» nomli kitobning qismlari.

Abituruyent 2

	g1	g2	g3	g4	g5	g6	g7	g8	g9	g10	g11	g12	g13	g14	g15	g16	g17	g18	g19	g20	g21	g22	g23
1	A	A	A	A	D	C	D	B	B	A	B	D	D	D	C	C	B	D	B	B	D	A	C
2	D	C	C	C	B	D	C	A	A	B	C	B	B	B	B	B	D	D	A	B	D	D	D
3	D	D	C	B	B	A	B	D	B	D	A	B	D	D	C	A	C	B	D	C	B	B	B
4	B	C	B	A	C	B	D	C	C	A	C	A	C	B	C	C	D	A	A	D	A	D	C
5	B	D	A	C	B	B	A	D	A	C	A	C	B	C	D	B	D	C	C	C	C	C	C
6	B	B	B	C	A	A	B	B	D	A	A	C	A	c	C	B	B	C	B	A	D	D	D
7	A	A	D	B	A	C	C	B	B	D	D	C	B	C	B	A	B	B	A	A	C	A	C
8	C	B	C	B	A	C	A	A	D	D	C	C	A	C	A	A	D	C	D	C	C	B	A
9	B	C	C	C	A	D	C	B	A	C	C	B	C	C	B	D	B	A	C	D	B	D	C
10	D	D	C	C	C	D	B	C	A	C	B	C	C	B	C	D	C	D	B	B	B	A	B
11	A	D	D	D	B	C	A	D	C	A	C	C	D	A	A	A	B	B	C	C	C	A	A
12	A	A	A	C	C	B	A	D	B	D	C	C	B	A	B	C	D	C	B	B	A	C	C
13	C	A	B	C	D	D	D	B	B	C	C	D	B	D	B	B	A	A	D	C	B	B	D
14	C	A	D	C	C	A	B	A	C	D	B	A	D	C	D	B	D	A	A	D	A	D	A
15	C	C	D	C	D	C	D	C	D	A	A	D	C	D	C	D	C	C	C	B	B	A	B
16	A	C	A	B	A	B	C	A	D	C	B	A	C	C	D	C	B	B	A	A	A	C	D
17	C	C	D	D	A	B	D	C	C	B	B	B	A	C	A	D	B	B	A	A	D	B	C
18	D	D	D	D	C	A	B	C	C	A	D	A	A	A	A	A	B	B	D	D	A	D	B
19	D	C	C	C	B	B	C	D	C	A	A	C	D	D	B	B	A	B	A	B	B	B	D
20	C	B	B	A	C	C	A	B	B	B	C	B	A	C	D	B	B	C	B	B	D	D	A
21	B	C	C	D	D	A	D	A	A	C	C	A	D	B	A	D	A	D	C	C	B	C	A
22	C	B	D	D	A	C	C	B	D	B	B	C	B	C	C	C	C	A	A	D	D	B	D
23	B	A	B	D	A	C	A	B	C	B	B	D	C	C	A	B	A	A	D	B	D	D	C
24	C	B	C	C	D	C	C	D	A	A	B	B	C	C	D	B	D	C	C	A	C	A	B
25	A	C	B	D	B	C	B	A	B	C	C	D	D	D	B	D	D	D	B	A	A	A	C
26	B	A	A	A	A	B	A	B	B	A	C	D	D	A	D	C	A	D	A	B	A	D	D
27	A	B	C	C	B	B	B	B	A	D	D	A	B	A	D	C	B	A	B	A	A	B	D
28	B	C	A	C	A	D	D	D	D	A	A	C	D	A	B	B	B	B	B	A	A	A	C
29	A	D	B	D	D	A	D	B	D	B	A	C	D	A	A	B	A	D	A	C	C	C	B
30	C	C	A	D	C	B	D	C	B	A	C	B	B	D	C	D	B	A	C	D	D	D	A
31	B	C	C	B	D	A	C	B	C	D	C	D	D	B	B	A	C	D	A	B	B	B	D
32	D	B	C	B	A	A	C	D	A	D	A	A	B	A	C	C	B	B	B	C	B	D	C
33	B	D	A	A	A	B	A	C	C	A	B	B	A	C	A	D	A	A	D	D	C	D	D
34	A	D	D	B	D	B	B	D	B	B	A	C	C	A	C	D	C	C	B	B	C	D	B
35	B	C	A	A	C	C	B	A	A	D	C	B	C	A	C	B	B	D	C	D	D	C	C
36	C	D	C	C	B	D	A	B	D	D	B	B	A	B	A	D	C	C	C	A	D	B	A

Abituruyent 3

	g1	g2	g3	g4	g5	g6	g7	g8	g9	g10	g11	g12	g13	g14	g15	g16	g17	g18	g19	g20	g21	g22	g23	g24
1	D	A	B	C	B	D	D	C	C	D	A	B	D	B	B	B	C	B	D	B	B	A	A	D
2	B	C	A	D	D	B	C	C	A	B	D	C	B	D	A	A	C	C	C	A	C	B	B	D
3	B	D	D	C	B	A	B	C	B	C	C	D	C	D	C	C	B	D	B	C	C	C	A	B
4	A	A	C	B	A	C	D	A	D	D	C	D	B	A	B	D	D	D	B	D	D	D	C	A
5	C	C	D	A	A	B	C	B	A	C	B	D	B	C	D	A	A	A	C	C	A	A	D	C
6	C	B	D	D	A	B	A	A	C	D	B	D	B	A	A	A	A	C	D	A	D	B	B	C
7	B	B	B	C	A	D	A	B	C	B	A	A	D	A	B	C	A	A	B	D	A	C	C	B
8	C	D	A	A	C	A	B	B	D	D	C	D	D	A	A	A	C	B	D	B	B	D	D	A
9	D	A	B	B	B	C	D	A	D	A	B	B	D	B	D	C	D	B	A	A	B	A	C	D
10	A	B	C	B	C	C	A	B	B	A	C	B	C	C	C	B	C	B	C	D	A	D	A	B
11	A	C	D	C	A	D	D	D	A	D	C	B	B	B	C	C	B	C	C	B	B	C	D	C
12	C	D	B	D	C	C	.	C	D	D	C	C	A	A	A	C	D	C	D	C	C	D	B	A
13	D	B	B	B	C	B	A	B	A	D	C	A	C	B	C	B	B	A	C	D	D	B	C	C
14	B	D	D	A	D	C	A	D	B	A	B	A	A	D	A	D	D	C	A	C	D	A	D	B
15	C	A	B	C	B	A	C	D	C	B	B	A	B	B	D	A	B	B	B	B	C	B	B	D
16	D	C	C	D	A	D	A	D	A	C	A	C	B	C	B	C	C	A	D	D	A	C	B	C
17	A	B	B	A	A	B	B	B	C	B	B	D	B	A	B	A	C	C	B	C	D	A	A	B
18	D	A	C	C	B	C	D	D	B	D	B	C	D	C	D	B	A	D	D	A	C	D	D	A
19	D	D	C	C	C	D	B	C	B	C	A	B	B	D	A	B	C	C	A	D	D	A	C	A
20	B	B	D	D	B	A	D	D	C	D	A	B	C	A	A	A	A	B	C	A	B	A	B	D
21	D	C	A	A	C	B	A	C	D	B	B	B	B	A	B	D	B	A	B	B	B	D	D	C
22	D	A	B	B	C	B	B	D	B	C	C	C	C	B	C	C	C	C	B	B	A	B	A	C
23	A	C	A	D	C	C	B	C	B	D	C	C	C	D	D	C	C	B	B	B	C	B	D	A
24	C	D	D	B	A	B	C	A	B	D	D	A	D	D	A	B	A	B	D	B	A	D	B	B
25	D	C	A	C	B	B	D	B	C	B	A	A	C	C	C	A	C	A	C	C	A	C	C	A
26	A	A	B	D	D	C	A	B	B	B	A	C	B	C	B	C	A	C	D	C	B	A	C	B
27	B	B	B	C	D	D	D	D	D	D	D	B	A	D	C	B	C	B	A	C	C	A	B	C
28	C	C	D	A	A	A	B	D	A	C	A	C	A	C	D	A	D	C	B	C	B	D	B	D
29	A	A	A	A	B	A	C	B	A	B	D	A	C	B	A	D	D	A	C	A	D	C	C	D
30	D	D	C	B	B	C	C	D	C	B	A	B	B	A	D	B	B	C	A	D	D	B	D	B
31	D	B	B	A	D	B	B	D	D	D	D	A	C	C	B	D	D	A	B	A	C	B	B	A
32	A	C	D	D	B	C	A	A	C	A	C	D	D	C	A	B	B	C	C	B	C	A	D	A
33	C	B	C	B	D	D	A	A	D	D	A	B	D	A	B	C	A	B	D	C	C	D	A	C
34	B	D	D	B	C	D	C	B	C	C	C	B	A	A	B	B	C	B	A	A	D	D	C	D
35	D	A	A	A	D	A	C	C	B	C	C	A	B	A	C	C	B	A	C	B	C	A	A	B
36	C	B	B	C	A	C	A	C	B	C	D	C	B	D	B	D	C	C	B	C	B	A	A	C

Abituruyent 4

	g1	g2	g3	g4	g5	g6	g7	g8	g9	g10	g11	g12	g13	g14	g15	g16	g17	g18	g19	g20	g21	g22	g23	g24	g25
1	C	C	C	B	C	B	C	B	C	B	B	D	A	A	B	D	B	A	C	D	D	D	A	D	C
2	A	D	A	D	B	C	D	C	B	C	D	A	C	B	C	D	D	B	C	A	B	A	C	B	A
3	B	B	D	C	A	A	C	D	C	D	C	C	B	A	D	C	A	A	C	A	C	C	B	A	D
4	B	B	A	C	D	B	C	D	D	A	B	C	D	D	B	B	C	D	C	B	B	D	C	A	B
5	D	B	C	C	C	D	D	D	A	B	B	B	C	D	D	A	C	C	A	C	A	A	D	C	D
6	D	A	A	B	B	D	B	D	A	C	B	B	C	C	B	A	A	A	A	D	A	B	D	B	C
7	A	A	D	A	C	C	A	A	B	A	D	A	A	D	C	B	B	B	C	C	B	B	A	C	A
8	A	A	D	C	B	A	C	B	C	D	C	C	A	A	A	C	A	D	B	B	C	D	C	D	D
9	D	D	D	D	A	D	A	B	C	B	A	D	B	B	D	B	D	C	A	C	B	C	A	C	B
10	C	D	C	C	A	A	B	B	B	D	B	C	B	B	D	B	B	B	C	B	B	D	C	C	B
11	B	B	B	A	C	D	B	B	D	C	A	D	D	C	C	A	C	C	B	D	A	B	D	A	D
12	B	C	B	C	B	B	A	C	A	D	A	C	C	A	B	D	D	D	D	C	D	C	A	C	C
13	D	C	C	B	A	A	B	A	D	B	C	D	D	A	A	D	D	C	D	A	D	A	C	B	A
14	A	D	D	B	A	C	D	A	C	C	B	B	D	B	A	A	A	B	B	B	A	D	B	D	A
15	C	A	B	C	C	B	D	A	A	A	A	A	B	D	D	B	C	B	C	B	B	C	B	B	D
16	B	B	C	A	B	C	A	C	D	C	B	D	A	D	B	C	D	B	A	C	C	B	D	C	B
17	C	B	C	D	C	A	D	A	A	B	C	D	C	A	D	D	D	B	C	B	D	B	D	A	D
18	D	B	D	A	B	A	A	C	A	D	C	B	D	A	B	D	C	C	B	D	D	B	C	A	B
19	B	C	A	B	D	C	C	B	B	D	A	A	A	C	A	A	A	C	A	A	A	A	A	C	A
20	A	C	D	D	C	D	B	B	B	D	A	C	A	B	A	C	B	A	C	C	C	B	C	C	C
21	C	A	A	C	B	D	A	A	C	D	B	C	C	C	B	D	A	D	D	B	D	A	C	A	A
22	B	B	D	B	D	A	D	C	D	A	D	D	D	A	B	B	D	A	D	B	B	C	A	D	B
23	C	B	B	A	B	D	C	C	C	C	A	D	A	A	A	C	A	B	A	C	C	A	D	C	B
24	B	C	B	C	A	C	B	A	A	C	B	C	D	D	D	B	A	D	D	A	B	D	B	A	B
25	D	D	A	B	C	B	B	A	C	C	A	B	B	C	C	A	B	A	B	B	A	D	B	D	C
26	B	D	A	C	D	C	D	C	B	A	C	D	C	A	C	B	A	B	D	B	B	A	C	B	C
27	D	A	B	B	C	A	A	B	D	B	A	A	A	B	D	A	A	B	C	D	A	B	D	A	C
28	D	A	B	A	A	C	C	C	A	D	A	C	C	B	A	D	C	C	A	A	D	B	A	D	B
29	A	D	B	B	C	B	A	A	B	C	D	B	A	C	D	C	D	C	B	D	C	A	B	A	B
30	B	C	B	A	B	B	D	B	D	D	C	C	B	D	B	A	D	C	C	D	A	B	B	B	C
31	C	A	A	D	B	A	C	A	C	A	C	D	D	B	A	C	C	B	D	B	C	C	A	A	B
32	A	D	A	B	B	D	B	D	B	D	C	C	C	C	C	D	A	A	D	B	D	B	C	B	D
33	C	B	A	A	C	D	A	B	C	B	D	D	C	A	C	C	B	B	A	A	C	A	C	A	D
34	D	A	D	A	C	A	B	B	D	D	B	A	C	D	D	D	A	D	A	C	D	C	B	D	C
35	B	C	C	B	D	B	C	A	B	D	D	D	A	C	B	C	D	C	C	A	C	B	A	B	C
36	A	C	B	A	D	C	D	C	B	A	A	C	D	A	A	A	C	A	A	D	A	C	C	C	B

Abituruyent 5

	g1	g2	g3	g4	g5	g6	g7	g8	g9	g10	g11	g12	g13	g14	g15	g16	g17	g18	g19	g20	g21	g22	g23	g24	g25
1	D	A	D	B	B	A	B	A	B	C	B	B	C	D	A	A	B	A	C	B	B	B	C	A	B
2	A	B	C	C	A	B	C	B	D	D	D	C	B	B	B	A	C	C	A	C	B	B	A	B	C
3	B	D	A	D	C	A	A	D	C	A	A	D	A	A	D	C	A	B	B	D	B	C	B	A	A
4	C	B	C	D	B	D	B	C	A	D	C	B	D	C	C	D	D	D	D	B	A	A	D	C	D
5	B	D	A	B	A	B	D	B	C	A	D	C	C	B	C	D	B	D	D	A	D	D	A	D	B
6	C	C	B	D	D	A	A	C	A	D	B	D	B	A	D	C	A	A	D	C	C	C	B	A	C
7	C	C	A	D	C	B	D	A	D	C	B	C	D	C	C	B	C	B	D	A	C	B	D	C	D
8	A	A	C	D	D	A	C	D	B	A	C	C	C	D	D	B	D	C	D	D	A	A	C	B	A
9	D	D	B	A	D	D	A	D	B	B	C	C	A	C	C	C	C	C	C	D	C	A	A	D	A
10	C	C	B	A	C	C	C	D	C	B	A	D	D	B	C	A	D	A	C	B	C	D	A	C	B
11	C	A	C	D	B	B	A	C	A	C	A	A	D	A	D	D	A	B	A	A	B	D	D	B	C
12	C	B	C	A	C	A	D	C	D	C	D	D	A	A	C	C	B	D	A	C	A	B	B	D	D
13	C	D	A	B	D	D	B	A	B	A	D	C	A	D	C	D	D	A	B	B	B	D	C	D	C
14	A	B	B	B	D	D	C	A	D	B	A	B	B	D	A	C	A	B	B	A	D	C	B	A	D
15	A	A	A	C	A	C	B	C	A	C	C	B	C	A	D	A	B	C	A	D	A	A	D	A	B
16	C	D	A	A	C	C	A	B	C	B	B	D	D	C	A	D	C	D	B	B	C	B	D	C	A
17	D	C	C	A	A	A	D	A	C	D	C	A	D	B	D	B	C	B	C	A	D	C	B	B	C
18	B	D	B	B	A	C	C	C	B	A	D	C	D	B	B	B	A	C	A	C	B	A	B	D	C
19	B	B	C	D	A	C	D	A	A	C	D	D	C	C	D	C	B	A	D	B	D	C	C	B	D
20	C	D	B	B	B	C	A	B	D	D	C	B	A	D	A	A	D	D	B	D	C	D	D	C	A
21	D	B	B	A	B	B	C	A	B	A	A	A	B	D	C	D	D	D	A	C	D	B	A	A	C
22	D	B	D	C	B	D	D	D	C	B	A	C	C	A	A	C	C	B	C	A	A	D	A	D	B
23	B	C	D	D	B	D	B	B	A	C	C	B	A	B	B	A	C	C	C	D	A	C	C	B	D
24	A	C	D	C	D	B	A	D	B	D	B	D	C	C	D	C	B	A	B	C	B	D	C	A	A
25	B	C	D	C	A	D	C	B	B	C	A	D	C	A	B	A	D	A	B	B	C	D	B	A	C
26	A	A	C	C	B	C	D	A	D	B	B	C	D	A	B	B	A	B	C	A	B	C	A	D	A
27	A	D	D	A	C	B	C	D	A	A	C	B	D	D	A	D	A	C	C	C	A	C	D	C	B
28	D	D	B	C	A	C	D	C	C	B	D	A	D	D	A	A	B	D	B	A	C	C	A	D	D
29	A	A	A	B	C	D	B	C	A	C	D	C	C	D	A	A	C	D	A	D	D	A	C	C	C
30	B	B	A	D	B	A	B	A	B	D	C	A	A	C	A	C	B	A	D	B	C	D	D	B	D
31	A	A	C	A	C	D	D	D	C	B	A	C	D	C	D	A	B	D	C	C	A	C	B	A	
32	B	C	D	D	D	A	A	B	D	B	A	D	B	B	B	C	D	D	A	B	B	B	C	C	B
33	C	B	D	B	A	B	B	B	A	A	A	B	A	A	D	A	B	B	C	A	D	C	A		
34	C	B	A	C	C	C	C	A	C	C	C	A	C	C	A	B	C	C	A	B	C	A	B	B	A
35	A	C	A	A	D	B	A	C	D	A	B	C	C	B	B	C	A	A	B	D	A	A	B	A	D
36	D	D	B	A	D	A	A	D	B	A	D	D	C	D	D	B	D	D	D	C	B	B	D	D	D

Abituruyent 6

	g1	g2	g3	g4	g5	g6	g7	g8	g9	g10	g11	g12	g13	g14	g15	g16	g17	g18	g19	g20	g21	g22	g23	g24	g25	g26
1	C	A	C	A	B	C	D	B	A	A	A	B	A	A	C	A	D	B	C	B	B	D	B	D	C	B
2	B	C	A	D	D	C	B	A	D	C	D	A	A	D	A	B	C	A	B	A	C	B	D	A	D	D
3	B	A	D	B	C	D	A	B	A	A	B	C	A	B	D	D	A	A	A	D	A	D	B	C	B	C
4	A	A	C	D	C	A	B	A	A	A	C	D	D	C	B	C	B	D	A	A	B	C	B	C	D	D
5	D	B	B	D	D	B	C	C	B	B	C	A	C	A	A	D	D	C	D	C	D	D	A	C	B	C
6	A	D	C	C	A	B	C	D	C	B	C	B	B	A	C	C	B	B	B	C	A	A	A	D	B	C
7	A	B	B	B	B	C	C	D	D	A	B	D	C	B	B	D	C	C	D	A	B	C	C	A	A	D
8	C	A	D	D	A	A	D	C	C	D	D	D	C	C	C	C	B	B	C	B	D	B	A	B	C	A
9	D	C	B	A	A	A	D	D	B	C	D	C	C	C	D	D	D	B	B	D	A	D	A	C	C	B
10	D	D	A	B	D	B	B	A	B	C	B	B	B	C	C	C	A	C	D	D	B	C	D	D	A	D
11	D	C	C	D	B	ט	B	D	D	A	C	A	A	A	B	C	D	C	A	B	B	D	D	B	B	C
12	A	B	B	A	B	B	A	B	A	C	A	C	A	D	A	A	B	A	A	A	D	A	B	A	C	A
13	B	A	C	A	D	A	A	C	D	A	B	A	B	A	B	B	C	B	B	A	C	C	C	A	D	A
14	B	A	B	C	C	C	C	B	D	A	B	B	A	B	C	A	B	D	A	C	A	C	D	C	D	D
15	D	B	D	C	D	D	A	C	C	C	C	A	C	D	B	D	C	A	C	B	B	B	C	D	A	C
16	C	D	C	B	A	B	D	A	B	B	D	C	D	C	C	B	A	C	B	D	D	A	D	A	D	D
17	C	C	B	C	C	B	D	D	D	B	C	D	D	A	C	D	C	C	C	C	C	A	C	B	A	C
18	C	D	A	C	D	D	A	B	C	D	A	C	D	D	B	A	D	B	D	C	D	D	B	A	C	A
19	B	D	A	D	A	B	D	C	A	C	D	B	C	D	B	C	C	D	C	B	C	B	B	C	C	D
20	D	A	D	A	D	A	C	C	B	D	D	A	C	C	A	A	D	B	A	A	B	C	C	A	D	B
21	B	C	B	B	A	C	D	B	C	D	A	D	C	A	B	B	A	A	B	B	C	C	B	B	B	C
22	A	D	C	B	C	A	A	A	D	D	B	A	B	C	C	B	B	B	D	D	A	A	C	D	A	B
23	C	D	B	C	B	B	B	D	D	C	B	D	A	C	A	B	C	A	C	D	A	B	D	B	C	A
24	C	C	D	D	B	D	D	D	A	D	B	D	D	B	B	A	B	A	D	D	B	C	C	C	A	D
25	B	B	A	B	D	D	B	A	C	B	C	B	A	B	C	A	B	D	D	B	B	B	A	C	D	C
26	D	B	B	A	C	A	C	C	B	A	B	C	D	D	B	A	B	D	C	A	A	A	D	A	D	A
27	D	B	A	A	A	A	C	C	D	B	A	D	A	B	C	D	A	B	C	B	D	D	B	A	A	B
28	A	A	D	C	B	A	B	D	A	B	A	D	C	B	C	A	D	C	A	C	C	A	B	C	B	D
29	A	C	B	A	B	B	C	A	D	D	A	A	C	A	B	C	D	D	A	D	C	D	A	B	B	A
30	A	B	D	C	C	A	A	C	D	A	A	A	C	D	B	B	A	A	B	A	A	D	D	B	A	B
31	B	B	D	B	B	C	D	B	B	A	A	D	B	B	A	C	A	D	D	B	C	C	D	D	C	C
32	A	A	A	D	B	D	B	B	B	B	C	C	B	B	A	B	C	C	C	A	C	D	A	A	C	D
33	C	B	A	A	D	C	C	A	C	C	C	B	D	C	C	D	C	B	B	C	D	A	B	D	D	C
34	B	C	D	B	A	B	C	D	D	D	A	D	A	A	D	B	A	B	B	C	D	B	A	C	C	C
35	C	C	C	D	C	D	A	A	A	C	D	B	B	C	A	A	D	A	B	B	B	A	D	C	A	B
36	D	A	B	D	C	C	C	B	C	B	A	C	B	D	B	B	C	D	D	D	C	C	D	C	B	D

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