SONLI MUSHOHADALAR. EKUB VA EKUK . QOLDIQLI BO'LISHGA OID MASALALAR

1. $[200; 1000]$ kesmada 2,3,5,7 sonlariga bo'lganda qoldiq 1 chiqadigan natural sonlar nechta?
A) B) C) D)
2. $[2; 100]$ kesmada 2,3,5,7 sonlariga bo'lganda qoldiq 1 chiqadigan natural sonlar nechta?
A) B) C) D)
3. $[0; 300]$ kesmada 3 ga bo'lganda qoldiq 1 ga, 4 ga bo'lganda qoldiq 2 ga, 5 ga bo'lganda qoldiq 3 ga, 6 ga bo'lganda qoldiq 4 ga teng chiqadigan natural sonlar nechta?
A) B) C) D)
4. 12345123451234512345 sonida 10 ta raqamni o'chirish orqali hosil qilingan sonlar ichidan eng kattasini toping.
A) B) C) D)
5. Raqamlari yig'indisi 4 ga teng bo'lgan nechta uch xonali son bor?
A) B) C) D)
6. 3234 va 3235 sonlarining umumiy natural bo'luvchilari nechta?
A) B) C) D)
7. $\frac{11n+3}{13n+4}$ kasr qisqaradigan $[1; 25]$ kesmaga tegishli natural sonlar nechta?
A) B) C) D)
8. $a > 3, b > 5$ bo'lsa, quyidagilardan qaysi biri o'rinli?
1) $2a + 3b > 21$ 2) $2a + 3b + ab > 36$
3) $(a + b)^2 > 65$ 4) $2a^2 + 3b^2 > 94$
5) $3a + 2b > 19$
A) B) C) D)
9. 2589,7 sonini standart shaklda yozing.
A) B) C) D)
10. 12 ga karrali, 403 dan katta bo'lmagan barcha natural sonlar yig'indisini toping.
A) B) C) D)
11. $2^{18} \cdot 4^9 \cdot 5^{55} \cdot 8^6$ ko'paytma necha xonali son?
A) B) C) D)
12. Natural n sonning kvadrati 10 ga bo'linganda qanday qoldiqlar chiqishi mumkin?
A) B) C) D)
13. a va b natural sonlarning EKUBi 30 ga, ko'paytmasi 36000 ga teng bo'lsa, shu sonlarning EKUKini toping.
A) B) C) D)
14. Dastlabki 13 ta natural sonlar yig'indisining kvadrati 8281 ga teng bo'lsa, shu sonlar kublarining yig'indisini hisoblang.
A) B) C) D)
15. 2001 ta natural sonning ko'paytmasi 105 ga, yig'indisi 2021 ga teng. Bu sonlarning eng kattasi nimaga teng?
A) B) C) D)
16. Dastlabki 6 ta raqamdan faqat bir martadan foydalanib, uch xonali sonlar hosil qilindi. Bu sonlar musbat ayirmasining eng kichik qiymatini toping.
A) 48 B) 47 C) 56 D) 69

TENGLAMALAR SISTEMASI

1. $\begin{cases} x^2 + y^2 + xy = 3 \\ x^4 + y^4 = 2 \end{cases}$ tenglamalar sistemasining manfiy yechimlari juftligi nechta?
A) B) C) D)
2. $\begin{cases} \frac{1}{3x} + \frac{1}{2y} = \frac{1}{3} \\ \frac{1}{9x^2} + \frac{1}{4y^2} = \frac{1}{4} \end{cases}$ tenglamalar sistemasini qanoatlantiruvchi barcha x va y lar yig'indisini hisoblang.
A) B) C) D)
3. $\begin{cases} x^2 + (y + a)^2 = 25 \\ x^2 + y = -5 \end{cases}$ tenglamalar sistemasi yagona yechimga ega bo'ladigan a qiymatini aniqlang.
A) B) C) D)
4. $\begin{cases} x^2 + (y + a)^2 - 4 = 0 \\ x^2 + y = b \end{cases}$ tenglamalar sistemasi yagona yechimga ega bo'lsa, $a+b$ ni aniqlang.
A) B) C) D)
5. Arifmetik progressiyada $\begin{cases} a_1 + a_2 + a_3 + a_4 = 18 \\ a_4^2 + a_1^2 = 54 \end{cases}$ bo'lsa, progressiya ayirmasini aniqlang.
A) B) C) D)
6. Agar $\begin{cases} \frac{1}{x} + \frac{4}{y} = 0{,}5 \\ \frac{2}{x} + \frac{3}{y} = 0{,}8 \end{cases}$ bo'lsa, y ni toping.
A) B) C) D)
7. $\begin{cases} y = x^8 \\ y = x + 5 \end{cases}$ tenglamalar sistemasi nechta yechimga ega?
A) B) C) D)
8. m va n natural sonlar $m^2 = n^2 + 229$ tenglikni qanoatlantirsa, $2m - n$ ni toping.
A) B) C) D)

IRRATSIONAL TENGLAMA VA TENGSIZLIKLAR

1. $\sqrt{x+3} > x+1$ tengsizlikning butun yechimlari nechta?
A) B) C) D)

2. $\frac{\sqrt{6-x-x^2}}{x^2-1} \le 0$ tengsizlikni yeching.
A) B) C) D)

3. $\sqrt{x^2-6x} < 2x+8$ tengsizlikning natural yechimlari nechta?
A) B) C) D)

4. $4-x < \sqrt{6-x}$ tengsizlikning natural yechimlari yig'indisini toping.
A) B) C) D)

5. $\sqrt{2x+15} - 42 = 2x - 39$ tenglamani yeching.
A) B) C) D)

6. $\sqrt{4x+3} - \sqrt{3x+12} = -\sqrt{x+1}$ tenglama ildizlari yig'indisini toping.
A) B) C) D)

7. $\sqrt[3]{x^2} = \sqrt[3]{x} + 6$ tenglamani yeching.
A) B) C) D)

8. $\sqrt{2x^2-8x+9} = x-1$ tenglama nechta butun yechimga ega?
A) B) C) D)

9. $5x + 2\sqrt{x^2+2{,}5x+2{,}5} = -2x^2 - 1$ tenglamani yeching.
A) B) C) D)

10. $\frac{x-3\sqrt{x}+2}{\sqrt{x}-1} = \frac{4}{\sqrt{2x}-4} - 2$ tenglamani yeching.
A) B) C) D)

11. $2x\sqrt{1-5x} = 7x - 3$ tenglamani yeching.
A) B) C) D)

12. $\sqrt{3x+1} \ge 2x - 2$ tengsizlik nechta butun yechimga ega? 6
A) B) C) D)

13. To'g'ri tenglikni aniqlang:
A) $a^0 = 1,\ a \ne 0$ B) $\sqrt{a^2} = a$
C) $\left(\sqrt{a}\right)^2 = a$ D) $(-a)^{\frac{5}{7}} = a^{\frac{5}{7}}$

14. A) $a^{\frac{m}{n}} = \sqrt[n]{a^m},\ a > 0$ B) $\sqrt{a^2} = a$
C) $\left(\sqrt{a}\right)^2 = a$ D) $(-a)^{\frac{5}{7}} = a^{\frac{5}{7}}$

15. A) $\frac{2n}{3n} = \frac{2}{3}$ B) $\sqrt{a^2} = a$
C) $\left(\sqrt{a}\right)^2 = a$ D) $(-a)^{\frac{5}{7}} = a^{\frac{5}{7}}$

16. $5x + (x-5)^2 - 18 = \sqrt{x^2-5x+9}$ tenglama ildizlari ko'paytmasini toping.
A) B) C) D)

17. $\sqrt{4+3x} < x$ tengsizlikni yeching.
A) B) C) D)

18. $\frac{5}{2} = \sqrt{\sqrt{\frac{x-2}{x+3}} + \sqrt[4]{\frac{x+1}{x-2}}}$ tenglama ildizlari yig'indisini toping.
A) B) C) D)

19. $\sqrt[6]{x^2-1} = \sqrt[3]{x-1} + \sqrt[3]{x+1}$ tenglama nechta haqiqiy ildizga ega?
A) B) C) D)

20. Hisoblang: $\sqrt{1-\frac{1}{2}} \cdot \sqrt{1-\frac{1}{3}} \cdot \sqrt{1-\frac{1}{4}} \cdot \sqrt{1-\frac{1}{5}} \cdot \sqrt{1-\frac{1}{6}} \cdot \sqrt{1-\frac{1}{7}} \cdot \sqrt{1-\frac{1}{8}} \cdot \sqrt{1-\frac{1}{9}}$.
A) B) C) D)

21. $\sqrt{x+2} + |x+3| \le 6$ tengsizlikning butun sonlardan iborat yechimlari yig'indisini toping.
A) B) C) D)

22. $\sqrt{2x^3-5x^2-8x+2} = \sqrt{2}(x-1)$ tenglama nechta yechimga ega?
A) B) C) D)

23. $\sqrt{2x+6} = \sqrt{x-1} + \sqrt{3x-11}$ tenglamaning ildizlari yig'indisini toping.
A) B) C) D)

24. $\frac{(x-5)\sqrt{27+6x-x^2}}{|x+2|} \le 0$ tengsizlikni yeching.
A) B) C) D)

25. $\sqrt[3]{x-2} - \sqrt[3]{x-4} = -\sqrt[3]{3x-8}$ tenglama nechta butun yechimga ega?

26. $2\sqrt{1-x^2} = x - 2$ tenglamani yeching.

27. $x - \sqrt{x+3} - 27 = 0$ tenglamaning ildizlari ko'paytmasini toping.

28. $x - \sqrt{2x} - 4 = 0$ tenglamaning haqiqiy ildizlari ko'paytmasini toping (ildiz yagona bo'lsa o'zini) toping.

29. $\sqrt{2x+15} - 42 = 2x - 39$ tenglamaning ildizlari nechta?

30. $\frac{\sqrt{x^2+x-12}}{x-3} = 0$ tenglamani yeching.

31. $x\sqrt{3-2x-x^2} \ge 0$ tengsizlikni yeching.

32. $a = 1$ bo'lsa, $\sqrt{2a-\sqrt{a^2+2}} \cdot \sqrt{2a+\sqrt{a^2+2}}$ ifodaning qiymatini toping.

33. tenglamani yeching.
$$\sqrt{x^2-x-12} + \sqrt{5x-x^2-4} + tg\frac{\pi}{2x-4} = 1$$

34. Hisoblang: $\sqrt[3]{0{,}5} + \sqrt[3]{4} - \sqrt[3]{13{,}5}$.

35. $\frac{x-4}{\sqrt{x}+2} = x - 8$ tenglama nechta yechimga ega?

36. $\frac{6}{\sqrt[3]{11}-\sqrt[3]{5}}$ kasrning maxrajini irratsionallikdan qutqaring.

37. $\sqrt{x+3} > x+1$ tengsizlikning butun musbat yechimlari nechta?

38. $\sqrt{x^2-6x} < 2x+8$ tengsizlikni qanoatlantirmaydigan natural yechimlar nechta?

39. $|3-\sqrt{x+5}| > \frac{x-8}{6}$ tengsizlikning butun yechimlari nechta ?

40. $2\sqrt{1-x^2} = x-2$ tenglamani yeching.

41. $a = \sqrt[3]{10}+\sqrt[3]{12}$ va $b = 2\sqrt[3]{11}$ bo'lsa, quyidagilardan to'g'risini ayting.

42. Agar $a = \sqrt[3]{4}+\sqrt[3]{2}+1$ bo'lsa, $\frac{1}{a^3}+\frac{3}{a^2}+\frac{3}{a}$ ni toping.

43. $x+\frac{x}{\sqrt{x^2-1}} = \frac{35}{21}$ tenglamaning ildizlari nechta?

44. Kasrning maxrajini irratsionallikdan qutqaring.

$$\frac{2}{\sqrt[3]{9}+\sqrt[3]{3}+2}$$

45. Tenglama nechta yechimga ega?

$$\sqrt{-x}+\sqrt{-x-\sqrt{x+1}} = 1$$

46. Tengsizlikni yeching.

$$3\sqrt{-x^2+x+6} > -2(2x-1)$$

47. Ifodani soddalashtiring.

$$\frac{2\sqrt{6}-1}{\sqrt{2}+\sqrt{3}+\sqrt{6}}$$

48. Soddalashtiring.

$$\sqrt{6+2\sqrt{2}\sqrt{3-\sqrt{\sqrt{2}+\sqrt{12}+\sqrt{18-\sqrt{128}}}}}$$

49. Tenglama nechta yechimga ega?

$$\sqrt{1+x+\sqrt{6x-3}}+\sqrt{1+x-\sqrt{6x-3}} = \sqrt{6}$$

50. a parametrning qanday qiymatlarida

$$\sqrt{1{,}5x-a} = a-x$$

Tenglama yagona yechimga ega bo'ladi?

51. $\frac{0{,}625\cdot 6{,}75^2-3{,}25^2\cdot 0{,}625}{\sqrt{2{,}75^2+7\cdot 2{,}75+3{,}5^2}}$ ni hisoblang.

52. Tengsizlikni yeching.

$$\frac{(x-5)\sqrt{27+6x-x^2}}{|x+2|} \le 0$$

53. $(x^2-1)\sqrt{6-x-x^2} \le 0$ tengsizlikning manfiy butun yechimlari nechta?

54. Tenglamaning ildizlari yig'indisini toping.

$$\sqrt{14+10x+5x^2}+\sqrt{7+6x+3x^2} = 4-2x-x^2$$

55. $5x+2\sqrt{x^2+2{,}5x+2{,}5} = -2x^2-1$ tenglamani yeching.

56. $\sqrt{2x^2-8x+9} = x-1$ tenglama nechta butun yechimga ega?

57. $\sqrt{2x-100}\cdot\sqrt{100-x} \ge 0$ tengsizlikning butun yechimlari yig'indisini toping.

58. Tengsizlikni yeching.

$$(x-2{,}0(7))\cdot\sqrt{6x-x^2+16} \ge 0$$

59. $\sqrt{x^2-7} = \sqrt{x^2+9}-2$ tenglamani yeching.

60. Tenglamaning ildizlari yig'indisini toping.

$$\sqrt{x^2-4x+5}+\sqrt[4]{2x^2-8x+17} = 4$$

MODULLI TENGLAMA VA TENGSIZLIKLAR

1. $\left|\frac{x^2-5+4}{x^2-4}\right| \le 1$ tengsizlikni qanoatlantiruvchi tub sonlar nechta?
A) B) C) D)

2. $|x^2-2x| \le x$ tengsizlikning eng katta va eng kichik butun yechimlari yig'indisini toping.
A) B) C) D)

3. $|x^2+2x-8| = 3a$ tenglama a ning qanday qiymatlarida 4 ta haqiqiy yechimga ega bo'ladi?
A) B) C) D)

4. $|x^2+2x-8| = 3a$ tenglama a ning qanday qiymatlarida 3 ta haqiqiy yechimga ega bo'ladi?
A) B) C) D)

5. $|x^2+2x-8| = 3a$ tenglama a ning qanday qiymatlarida 2 ta haqiqiy yechimga ega bo'ladi?
A) B) C) D)

6. $|x^2+2x-8| = 3a$ tenglama a ning qanday qiymatlarida 1 ta haqiqiy yechimga ega bo'ladi?
A) B) C) D)

7. $|x^2+2x-8| = 3a$ tenglama a ning qanday qiymatlarida haqiqiy yechimga ega emas?
A) B) C) D)

8. $|x^2+2x-8| = 3a$ tenglama a ning qanday qiymatlarida 4 ta musbat yechimga ega bo'ladi?
A) B) C) D)

9. $|x^2+2x-8| = 3a$ tenglama a ning qanday qiymatlarida 3 ta musbat, 1 ta manfiy yechimga ega bo'ladi?
A) B) C) D)

10. $|x^2+2x-8| = 3a$ tenglama a ning qanday qiymatlarida 4 ta manfiy yechimga ega bo'ladi?
A) B) C) D)

11. $|x^2+2x-8|=3a$ tenglama a ning qanday qiymatlarida 3 ta manfiy, 1 ta musbat yechimga ega bo'ladi?
A) B) C) D)

12. $|x^2+2x-8|=3a$ tenglama a ning qanday qiymatlarida 2 ta musbat, 2 ta manfiy yechimga ega bo'ladi?
A) B) C) D)

13. $\frac{1}{|x+1|-1} \geq \frac{2}{|x+1|-2}$ tengsizlikning manfiy butun yechimlari yig'indisini toping.
A) B) C) D)

14. Tengsizlikni yeching: $1 \geq \left|\frac{x^2-3x+2}{x-1}\right|$.
A) B) C) D)

15. $|x-8|=\frac{x}{2}+a$ tenglama a parametrning nechta natural qiymatida yechimga ega emas?
A) B) C) D)

16. $|x+10|=\frac{x}{2}+a$ tenglama 2 ta yechimga ega bo'lsa, a parametrning eng kichik butun qiymatini toping.
A) B) C) D)

17. $|x+9|=\frac{x}{2}+a$ tenglama a parametrning nechta natural qiymatida yechimga ega emas?
A) B) C) D)

18. $|x^2-2x| \leq x$ tengsizlikni qanoatlantiruvchi tub sonlar yig'indisini toping.

19. Agar $|x+3|=\frac{x}{2}+a$ tenglama a parametrning nechta natural qiymatida yechimga ega emas?

20. $|x^2-4ax|=a$ tenglama uchta haqiqiy yechimga ega bo'ladigan a ning barcha qiymatlari yig'indisini toping.

21. Tenglamani yeching.
$$|5x-15|-|4x+20|=|x-3|$$

22. $\frac{|2-3x|-7}{x+1} \geq -1$ tengsizlikni yeching.

23. Quyidagilardan qaysi biri doim o'rinli?
1) $|a-b|<|a+b|$ 2) $|a+b| \leq |a|+|b|$
3) $|a-b| \leq ||a|-|b||$ 4) $|a|^2 \geq a^2$

24. $|x-3| \cdot |x+1|=5$ tenglamaning ildizlari yig'indisini toping.

25. Tengsizlikni qanoatlantiruvchi butun sonlar yig'indisini toping.
$$|7-2x|=|5-3x|+|x+2|$$

26. Ushbu
$$\frac{2x}{|x-3|} \leq |x|$$
Tengsizlikning eng katta manfiy butun yechimi x_0 bo'lsa, $1-x_0$ ni toping.

27. $|x+2|=\frac{x}{2}+a$ tenglama bitta yechimga ega bo'ladigan a ning qiymatini toping.

28. $x^2-|5x+6|>0$ tengsizlikni qanoatalantiradigan eng kichik butun musbat va eng katta butun manfiy sonlar ko'paytmasini toping.

29. Tengsizlikni yeching.
$$1 \geq \left|\frac{2-3x+x^2}{x-1}\right|$$

MATNLI MASALALAR

1. 4 xonali sonning birinchi raqami 5 ga teng. Agar bu raqamni sonning oxiriga qo'yilsa, oldingi sondan 747 ga kam son hosil bo'lsa, bu sonning raqamlar yig'indisini toping.
A) B) C) D)

2. Sonning 8 % i 40 %ining necha foizini tashkil etadi?
A) B) C) D)

3. Shaxmat musobaqasida 17 nafar sportchi ishtirok etdi. Har ikki nafar ishtirokchilar bir-biri bilan bir marta o'ynashi kerak edi. Musobaqa paytida bitta ishtirokchi kasal bo'lib, musobaqani tark etdi. Natijada jami bo'lib 130 ta o'yin o'ynaydi. Kasal bo'lgan shaxmatchi nechta o'yin o'ynamadi?
A) B) C) D)

4. Diyora akalari yoshlarining ko'paytmasi 1664 ga teng. Uning eng kichik akasi eng katta akasidan 2 marta kichik. Diyoraning akalari nechta?
A) B) C) D)

5. Elektron soat ekranida ikkita raqam (00 da 23) va minut ikkita raqam(00 dan 59 gacha) ko'rsatadi. 00:01 dan 23:59 gacha bus oat necha marta chapdan o'ngga va o'ngdan chapga o'qiganda, bir xil bo'lgan vaqtni ko'rsatadi?
A) B) C) D)

6. Poyezd 4 minda 10 km, motosikl 6 min da 10 km masofani bosib o'tadi. Motosiklchining tezligi poyezd tezligining necha foizini tashkil etadi?
A) B) C) D)

7. Ta'lim muassasasida barcha o'quvchilar kamida bitta – ingliz yoki nemis tilida so'zlasha oladi,ayrimlari esa ikkala tilni ham biladi. O'quvchilarning 85% i ingliz tilini, 65% i nemis tilini biladilar. Ikkala tilni ham biladigan o'quvchilar barcha o'quvchilarning necha foizini tashkil qiladi?
A) B) C) D)

8. Bir gala chumchuqlar bittadan shoxga qo'nganda, bitta chumchuq ortib qoladi. Agar

qushlar ikkitadan qo'nsa, bitta shox yetmay qoladi. Qushlar va shoxlar sonini toping.
A) B) C) D)

9. Dastlabki 48 ta natural sonlar orasidan nechtasi 3 ga yoki 4 ga karrali emas?
A) B) C) D)

10. Ishchining maoshi ketma-ket ikki marta 15% ga oshirilgandan keyin, 793500 so'm bo'ldi. Uning dastlabki maoshi necha so'm bo'lgan?
A) B) C) D)

KVADRAT KO'PHADLAR, IFODALAR, TENGLAMALAR, TENGSIZLIKLAR.

1. $x^2-16x=y^2-16y, x\neq y$ bo'lsa, $x+y$ ni toping.
A) B) C) D)

2. Ko'paytuvchilarga ajrating: $-\frac{1}{2}x^2+6x+14$.
A) B) C) D)

3. $x^2+20y^2=9xy$ tenglamada $\frac{x}{y}$ ning eng katta qiymatini toping.
A) B) C) D)

4. $(x-3)^3+(2x+1)^3=27x^3-8$ tenglama ildizlari yig'indisini toping.
A) B) C) D)

5. $3\geq\frac{-2-8x-x^2}{x^2-1}$ tengsizlikning eng katta butun manfiy yechimini toping.
A) B) C) D)

6. $3\geq\frac{-2-8x-x^2}{x^2-1}$ tengsizlikni qanoatlantiruvchi eng katta natural sonni toping.
A) B) C) D)

7. $5x^2-6x+a=0$ tenglamaning bitta ildizi -1 ga teng bo'lsa, ikkinchi ildizi x_2 ni toping.
A) B) C) D)

8. $f(x)=4x^2+ax+103b$ kvadrat uchhad$f(1)+f(4)+f(6)+f(7)-f(2)-f(3)-f(5)-f(8)$ ni toping.
A) B) C) D)

9. $x^2+\frac{1}{x^2}-3\left(x+\frac{1}{x}\right)-2=0$ tenglamaning ildizlari yig'indisini toping.
A) B) C) D)

10. Agar $x=\frac{\sqrt{11}+1}{2}$ bo'lsa, $\frac{x^3-3x^2+6{,}5x-2}{x^2-x+1}$ kasrning qiymatini hisoblang.
A) B) C) D)

11. $\frac{2x+1}{x}+\frac{4x}{2x+1}=5$ tenglama ildizlari yig'indisini toping.
A) B) C) D)

12. x^3+x^2+18 uchhadni ko'paytuvchilarga ajrating.
A) B) C) D)

13. $2(x-3)^2-(x-1)(x+3)\leq 0$ tengsizlikning butun yechimlari yig'indisini toping.
A) B) C) D)

14. $f(x)=x^3-7x^2+8x+12$ ko'phad quyidagilardan qaysi biriga qoldiqsiz bo'linadi?
A) B) C) D)

15. $\frac{2-x^2-x}{x+x^2}\geq 0$ tengsizlikni yeching.

KO'RSATKICHLI TENGLAMA VA TENGSIZLIKLAR

1. $\begin{cases}\sqrt[x]{x+2y}=2\\(2x+4y)\cdot 3^x=72\end{cases}$ tenglamalar sistemasini yeching.
A) B) C) D)

2. $\left(\sqrt{5}-2\right)^{x^2}<\left(\sqrt{5}-2\right)^{2x}$ tengsizlikni yeching.
A) B) C) D)

3. $15\cdot 5^x+3^{2x}=5^x+15\cdot 3^{2x}$ tenglama nechta yechimga ega?
A) B) C) D)

4. $5^{2\sqrt{x}}+5^{\sqrt{x}}<5+5^{\sqrt{x}+1}$ tengsizlikni yeching.
A) B) C) D)

5. $|x+5|^{x^2-1}\geq 1$ tengsizlikni yeching. $(-\infty;-6]\cup[-4;-1]\cup[1;\infty)$
A) B) C) D)

6. $4+\frac{2}{5^x-1}=\frac{3}{5^{x-1}}$ tenglamaning kichik ildizini toping. $1-log_5 4$
A) B) C) D)

7. Tenglamani yeching: $3^x\cdot 2^{x+5}-6^x=1116$.
A) B) C) D)

8. $\sqrt{3}\cdot 3^{\frac{x}{1+\sqrt{x}}}\cdot\left(\frac{1}{3}\right)^{\frac{2+x+\sqrt{x}}{2+2\sqrt{x}}}=81$ tenglamani yeching.
A) B) C) D)

9. $3^{2x}\cdot x^2+5x-6\leq 5x\cdot 3^{2x}-2\cdot 3^{2x+1}$ tengsizlikning eng kichik va eng katta natural yechimlari nisbatini toping.
A) B) C) D)

10. $|x-2|^{10x^2-3x-1}=1$ tenglamani yeching.
A) B) C) D)

11. $\frac{3^x}{3^x-2^x} < 3$ tengsizlikning eng katta butun manfiy va eng kichik butun musbat yechimlari ko'paytmasini toping.
A) B) C) D)
12. $a = 5^{200}, b = 2^{500}$ bo'lsa, quyidagi munosabatlardan qaysi biri o'rinli bo'ladi?
A) B) C) D)
13. $3^{3x} - 3^x = 720$ tenglamani yeching.
A) 2 B) 4 C) 5 D) 3
14. $|x-3|^{3x^2-10x+3} = 1$ tenglamaning butun yechimlari nechta?
15. $|x+5|^{x^2-1} \geq 1$ tengsizlikni qanoatlantirmaydigan eng katta butun sonni toping.
16. $\sqrt{3}\left(4^x + 2^{2x-1}\right) < 3^x + 3^{x+1}$ tengsizlikni yeching.
17. $3 \cdot 16^x + 36^x - 2 \cdot 81^x = 0$ tenglamaning ildizlari yig'indisini toping.
18. $2^{x+2} + 5^{x+2} > 5^{x+1} + 2^{x+3} + 2^{x+4}$ tengsizlikni yeching.
19. $2^{2x+1} - 6^x - 9^x = 0$ tenglamani yeching.
20. $2^{\sqrt{x+1}} \cdot 64 = 4^{\sqrt{x+1}}$ tenglamani yeching.
21. $2^{x-2} + 2^{x-3} + 2^{x-4} = 224$ tenglamani yeching.
22. $4^{4^x} = 2^{2^{3^{2^2}}}$ tenglamani yeching.
23. $x^{x^2-x-6} = 1$ tenglama ildizlari ko'paytmasini toping($x > 0$).
24. Tengsizlikning butun yechimlari nechta?
$\left(3^{\frac{x-2}{2}} - 1\right) \cdot \sqrt{3^x - 10\sqrt{3^x} + 9} \geq 0, x \leq 8$
25. $3^2 \cdot 3^5 \cdot 3^8 \cdot \ldots \cdot 3^{3n-1} = 27^5$ tenglamani yeching.
26. $0{,}1 \cdot \left(10^5\right)^{x-1} = 5^x \cdot 2^x$ tenglamani yeching.
27. $2 \cdot 3^{2x-1} - 5 \cdot 3^{x-1} = 441$ tenglamani yeching.
28. $2^x = a$ bo'lsa, $2^{2^{x+2}}$ ni a orqali ifodalang.
29. $3 \cdot 4^{x^2-x} - 30 \cdot 2^{x^2} + 3 \cdot 2^{2x+4} = 0$ tenglama ildizlari ko'paytmasini hisoblang.
30. Tenglamani yeching.
$$2^{\frac{2-x}{2x+1}} = 2^{\frac{3x-1}{2x+1}} - 1$$

LOGARIFM

1. $log_2\left(2\sqrt{x+5}+5\right) + log_{0,5}(-x-0{,}5) = 1$ tenglama nechta butun yechimga ega? (j:1)
A) B) C) D)
2. $\left|1 - log_{\frac{1}{6}}x\right| + 2 = \left|3 - log_{\frac{1}{6}}x\right|$ tenglamani yeching. $\left[\frac{1}{6}; \infty\right)$
A) B) C) D)
3. $log_{3,5}\left(\sqrt{2x+3} - x\right) \geq 0$ tengsizlikni yeching. $\left[-1{,}5; \sqrt{2}\right)$
A) B) C) D)
4. $log_{12}27 = a$ bo'lsa, $log_6 16$ ni a orqali ifodalang. $\frac{4(3-a)}{3+a}$
A) B) C) D)
5. Hisoblang: $log_3 2 \cdot log_4 3 \cdot log_5 4 \cdot \ldots \cdot log_{10} 9$. $lg2$
A) B) C) D)
6. $log_{\frac{1}{9}} log_{\frac{1}{4}} \frac{x+4}{2x-1} > 0$ tengsizlikning eng katta va eng kichik butun yechimlari yig'indisini toping.
A) B) C) D)
7. $log_{x-1}(3-x) \geq 0$ tengszlikni yeching. Bo'sh to'plam
A) B) C) D)
8. $5 \cdot 0{,}2^{lgx} > 0{,}04^{lg2}$ tengsizlikni yeching. $(0; 40)$
A) B) C) D)
9. $log_2^4 x - log_{0,5}^2 \frac{x^3}{8} + 9log_2 \frac{32}{x^2} < 4log_{0,5}^2 x$ tengsizlikni yeching. $(0{,}125; 0{,}25) \cup (4; 8)$
A) B) C) D)
10. $\sqrt[3]{x^{log_3 \sqrt[3]{x}}} > 3$ tengsizlikning eng kichik natural yechimini toping. 28
A) B) C) D)
11. $log_{0,5}\left(4^x - 5 \cdot 2^x + 6\right) \geq -1$ tengsizlikning nechta butun yechimi bor? 2
A) B) C) D)
12. $\sqrt{1 + log_{\sqrt{x}}\sqrt{27}} \cdot log_3 x + 1 = 0$ tenglamani yeching. 0,(1)
A) B) C) D)
13. $lg^2 x^2 = 4$ tenglama nechta yechimga ega? 4
A) B) C) D)
14. $log_5\left(5^x - 24\right) = 2 - x$ tenglamani yeching. 2
A) B) C) D)
15. $5\sqrt{log_2 x} - 2log_2 4x + 2 = 0$ tenglamani yeching. $16; 4\sqrt{2}$
A) B) C) D)
16. $log_2\left(2^x - 1\right) \cdot log_2\left(2^{x+2} - 4\right) = -1$ tenglamani yeching. $log_2 3 - 1$
A) B) C) D)

17. $2lgx^2 - \big(lg(-x)\big)^2 = 4$ tenglamani yeching. -100
A) B) C) D)

18. $log_{\frac{1}{8}}^2(9-x^2) - 2log_{\frac{1}{8}}(9-x^2) - 8 \le 0$ tengsizlikni qanoatlantirmaydigan eng kichik natural sonni toping.
A) B) C) D)

19. $log_7(x-5)(x^2-19x+88) < 0$ tengsizlikning butun yechimlari yig'indisini toping.
A) B) C) D)

20. $y = log_{1,5}|6x-8|$ funksiyaning aniqlanish sohasini toping.
A) B) C) D)

21. $\frac{\sqrt{x+1}}{log_4|x-2|} \ge 0$ tengsizlikni qanoatlantiruvchi eng kichik butun va eng kichik natural sonlar yig'indisini toping.
A) B) C) D)

22. $\frac{2}{3}cos2\text{p} = log_{3\sqrt{3}}\frac{1}{x}$ tenglamani yeching.
A) B) C) D)

23. $log_3(log_310 \cdot lg27)$ ni hisoblang.
A) B) C) D)

24. $log_310 \cdot lg9$ dan kichik bo'lgan natural sonlar nechta?
A) B) C) D)

25. $log_7(log_210 \cdot lg2)$ ni hisoblang.
A) B) C) D)

26. Hisoblang: $log_{2\sqrt{2}}\left(\left(1+\frac{1}{2}\right)\left(1+\frac{1}{3}\right)\left(1+\frac{1}{4}\right)\cdot \dots \cdot \left(1+\frac{1}{15}\right)\right)$

27. Nechta butun son $log_{0,5}(4^x - 5\cdot 2^x + 6) \ge -1$ tengsizlikning yechimi bo'ladi?

28. $x^{lg5} \cdot 5^{-lgx} = 1$ tenglamani yeching.

29. $a = (0,2)^{\frac{1}{2}log_516 - log_{25}2^8}$ bo'lsa, log_2a ni toping.

30. Hisoblang: $log_6\left(\sqrt{2+\sqrt{3}} + \sqrt{2-\sqrt{3}}\right)$.

31. Hisoblang: $log_5\frac{7\cdot 3^{n+1} - 8\cdot 3^{n-1}}{3^n + 8\cdot 3^{n-1}}$.

32. Hisoblang: $log_2\left(\frac{1}{5\sqrt{2}-7} - \frac{10}{\sqrt{2}} + 7\right)$.

33. Hisoblang: $\frac{1}{log_39} + \frac{1}{log_99} + \frac{1}{log_{27}9} + \frac{1}{log_{81}9} + \frac{1}{log_{243}9} + \frac{1}{log_{729}9} + \frac{1}{log_{2187}9}$.

34. $log_{30}90 = a$ bo'lsa, log_310 ni toping.

35. $log_{x+1}7 > log_{x+1}11$ tengsizlikni yeching.

36. $e^{ln^2x} + x^{lnx} = 2e^4$ tenglamani yeching.

37. $\sqrt{2x-x^2} = 2ln|x-1|$ tenglama nechta butun yechimga ega?

38. $\big|log_4(|x|+3)\big| = |x|$ tenglama ildizlari yig'indisini toping.

39. Hisoblang: $log_2\left(\frac{3}{0,(4)} + \frac{3}{0,(6)} + \frac{3}{0,(8)} + 1{,}375\right)$.

40. Agar m=64 bo'lsa,
$$log_7\left(\frac{\sqrt{m}+27}{\sqrt[3]{m}-2\sqrt[6]{m}-15} : \frac{\sqrt[3]{m}-3\sqrt[6]{m}+9}{\sqrt[3]{m}-25}\right)$$

41. Quyidagi tenglamani qanoatlantiruvchi nuqtalar orasidagi masofani toping.
$log_8(x^2+1) - log_2xy + log_{\sqrt{2}}\sqrt{y^2+4} = 3$

42. $log_x(9x^2)\cdot log_3^2x = 4$ tenglama ildizlari ko'paytmasini toping.

43. Quyidagilardan qaysi biri doim musbat:
$(0 < a < 1, b > 1, c > 1)$
A) $log_ab \cdot log_bc$ B) $log_bc \cdot log_ca$
C) $log_ac \cdot log_c\frac{1}{b}$ D) $log_ac \cdot log_b\frac{1}{c} \cdot log_ca$

44. $y = alog_3(kx+b) + d$ funksiya o'suvchi bo'lsa, quyidagilardan qaysi biri doimo o'rinli?
A) $ak < 0$ B) $ak > 0$ C) $ab + k > 0$
D) $k > 0$

45. Tengsizlikni yeching.
$\frac{log_2(x+5)}{2^{x+5}-4^x} \le log_2(x+5)$

46. Agar $\big(x - |x|^{\lg(-x)}\big)^5$ binom yoyilmasining uchinchi hadi $\left(-10^6\right)$ ga teng bo'lsa, x ni toping.

47. a parametrning qanday qiymatlarida $\ln(x-2a) - 3(x-2a)^2 + 2a = 0$ tenglama yagona ildizga ega bo'ladi?

48. $3xlgx = 1 + algx$ tenglama a parametrning qanday qiymatlarida yagona yechimga ega bo'ladi?

49. Tengsizlikni yeching:
$$log_2log_3\frac{x-1}{x+1} < log_{0,5}log_{0,(3)}\frac{x+1}{x-1}$$

50. Hisoblang:
$$log_plog_p\underbrace{\sqrt[p]{\sqrt[p]{\dots\sqrt[p]{p}}}}_{n\ ta}$$

51. Tenglamani yeching:
$2x(1-lg5) = \lg(4^x + 2x - 6)$ va $\frac{x+3}{2}$ ni toping.

52. $2^{1+log_23} - 3^{log_45} + 5^{log_43} - 1^{log_23}$ ifodaning qiymatini hisoblang.

53. $x^{log_x(x+3)^2} = 16$ tenglamani yeching.

54. $log_{x+2}(1+2x) = log_{\sqrt{1+2x}}(2x^2+5x+2) - 1$ tenglamaning ildizi x_0 bo'lsa, $(\sqrt{17}+5)\cdot x_0$ ni hisoblang.

55. Agar $lg5 = a, lg3 = b$ bo'lsa, $log_{30}8$ ni toping.

56. $\lg(1+4x^2-4x)-0{,}5\lg(5+x^2)=\lg(1-2x)$ tenglama ildizlari ko'paytmasini toping.

57. Agar $lg2=0{,}3, lg3=0{,}5, lg6=0{,}8$ bo'lsa, $n=2^{20}\cdot 3^{30}\cdot 6^{60}$ necha xonali son?

58. Tengsizlikning butun yechimlari yig'indisini toping.

$$log_x\frac{10}{x}\geq log_x 0{,}5$$

59. $2log_2\left(\sqrt{4x+5}-1\right)>log_2(\sqrt{4x+5}+11)$ tengsizlikning yechimi bo'lmaydigan natural sonlar yig'indisini toping.

60. Tengsizlikni yeching.

$$log_7 x-log_3 7\cdot log_3 x>log_2 0{,}25$$

61. Ifodaning qiymatini hisoblang:

$$5log_{1,6}3\cdot log_3 0{,}625$$

62. Ifodaning qiymatini toping:

$$\left(1-log_7 14\right)\cdot\left(1-log_2 14\right)$$

63. $log_2(4{,}5-2x)(12+x-x^2)>0$ tengsizlikning butun yechimlari yig'ndisini toping.

FUNKSIYALAR

1. $y=x^2-6x+13$ parabolaning uchi kordinatalar boshidan qanday masofada joylashgan?

A) B) C) D)

2. $y=\left(x-\sqrt{5}+\sqrt{3}\right)\left(x+\sqrt{5}+\sqrt{3}\right)$ funksiyaning nollari yig'indisini toping.

A) B) C) D)

3. $\sqrt{3}$ soni $y=-2x^2+bx+3$ funksiyaning noli bo'lsa, b ni toping.

A) B) C) D)

4. $f(x)=\frac{x}{x+1}$ funksiya grafigi qaysi choraklardan o'tadi?

A) B) C) D)

5. $y=\sqrt{x^2}+|2x-4|+1$ funksiyaning qiymatlari sohasini toping.

A) B) C) D)

6. a ning qanday qiymatlarida $y=\sqrt{3}x+a$ va $y=\sqrt{3}x+1$ chiziqlar orasidagi masofa 0,5 dan kichik bo'ladi.

A) B) C) D)

7. $f(x)=ax^7+bx^3-2$ funksiya uchun $f(4)=-2$ bo'lsa, $f(-4)$ ni toping.

A) B) C) D)

8. $f(x+1)=x^2-2x+4$ bo'lsa, $f(x)$ funksiyani $\bar{a}(-3;-5)$ vector bo'yicha parallel ko'chirishdan hosil bo'lgan funksiyani toping.

A) B) C) D)

9. $y=\sqrt{9x^2-12x+4}+|x|$ funksiyaning eng kichik qiymatini toping.

10. Ox o'qidan 7 marta, Oy o'qidan 3 marta cho'zilish orqali $y=f(x)$ funksiya grafigidan qaysi funksiya grafigi hosil qilinadi.

A) B) C) D)

11. $f(x+2)+f(x-1)=2(x^2+7)$ bo'lsa, $f(x)$ ni toping.

A) B) C) D)

12. $M(2{,}75;3{,}25)$ nuqtadan o'tuvchi va $\bar{m}(4;-2)$ vectorga perpendikulyar to'g'ri chiziq tenglamasini ko'rsating.

A) B) C) D)

13. $f(x)=ax$ va $g(x)=x+b$ funksiyalardan $f\left(g(x)\right)=x+2$ funksiya tuzilgan. $b-a$ ning qiymatini toping.

A) B) C) D)

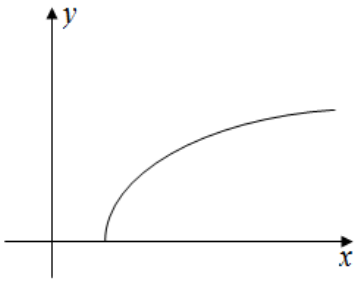
14. Agar $1+2f(x-1)=2f(x)$ va $f(0)=0$ bo'lsa, $f(2016)$ ni toping.

A) B) C) D)

15. Agar $y=kx-2$ funksiyaning grafigi $A(1;2)$ nuqtadan o'tsa, k ning qiymatini toping.

A) B) C) D)

16. Rasmda $y=a\sqrt{bx+c}+d$ funksiya grafigi tasvirlangan va $y=0$ uning eng kichik qiymati. Quyidagilardan qaysi biri doimo o'rinli?

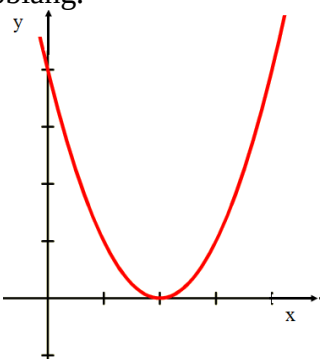


A) $a(c+d)>0$ B) $a(b+d)>0$
C) $a(b+c)<0$ D) $a(c-d)>0$

17. $y=2^{kx^2-5}$ funksiya grafigi k ning qanday qiymatida $N(2;8)$ nuqtadan o'tadi?

A) B) C) D)

18. Rasmda $y=ax^2-bx+4$ funksiya grafigi tasvirlangan. Berilgan ma'lumotlarga ko'ra $a+b$ ni hisoblang.



A) B) C) D)

19. Ox o'qidan ikki marta, Oy o'qidan k marta cho'zish orqali $y=f(x)$ funksiya grafigidan qaysi funksiya grafigi hosil qilinadi?

20. $y=log_2(arcsin2017x+arccos2017x)$ funksiyaning $x=2017$ nuqtadagi qiymatini hisoblang.

A) B) C) D)

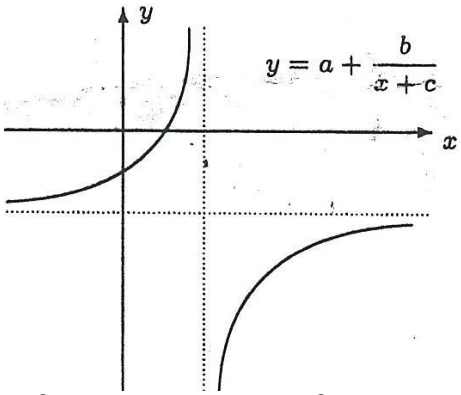
21. a ning nechta qiymatida $y=-x^2+2x+a$ funksiyaning natural qiymatlari yig'indisi 3 ga teng?

A) B) C) D)

22. $y=f(x)$ funksiya D to'plamda noqat'iy kamayuvchi bo'lsin. D to'plamdan olingan ixtiyoriy a, b elementlar uchun (a>b) quyidagi munosabatlarning qaysi biri o'rinli?

A) B) C) D)

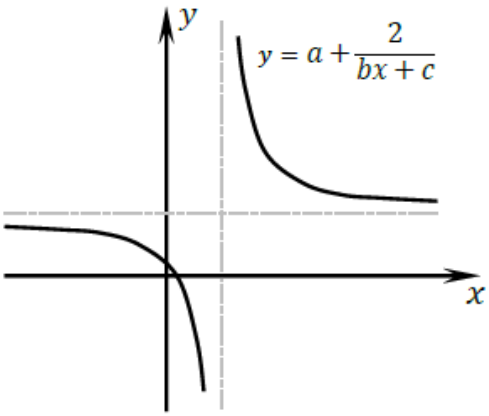
23. Rasmdagiga ko'ra quyidagilardan qaysi biri doimo o'rinli?



A) $a^3-b^3>0$ B) $c^2-b^2>0$

C) $a^2-b^2c>0$ D) $abc>0$

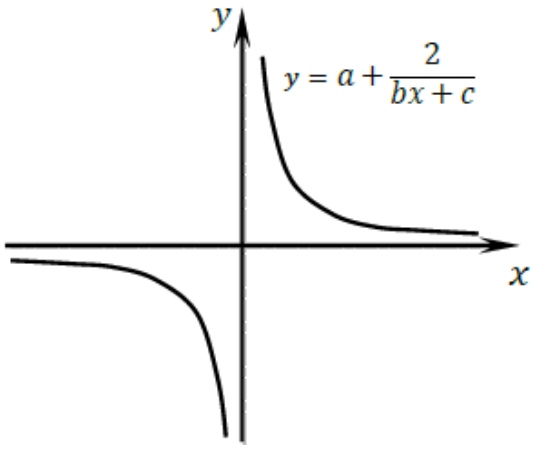
24. Rasmdagiga ko'ra quyidagilardan qaysi biri noto'g'ri?



A) $bc+a>0$ B) $ab>0$

C) $ac-b>0$ D) $a+ab>0$

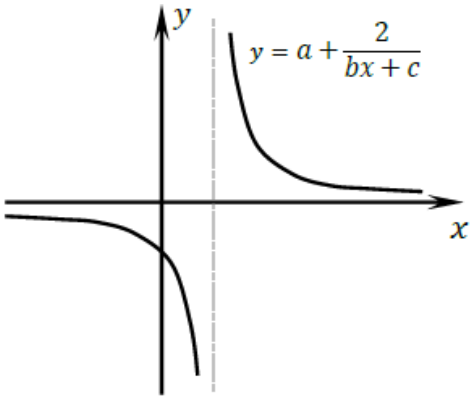
25. Rasmdagiga ko'ra quyidagilardan qaysi biri noto'g'ri?



A) $c(a-b)=0$ B) $b-a=0$

C) $bc-a^2=0$ D) $ac=0$

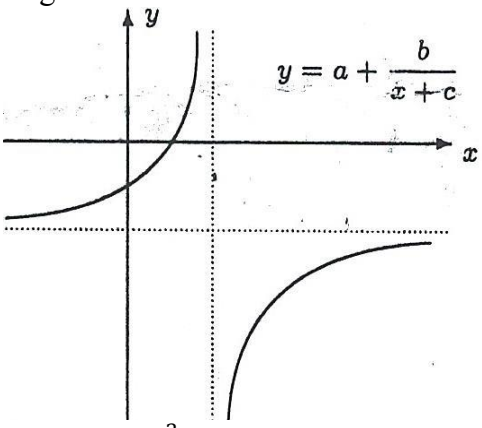
26. Rasmdagiga ko'ra quyidagilardan qaysi biri doimo o'rinli?



A) $ac^3+b>0$ B) $c^3-b^3>0$

C) $acb>0$ D) $cb>0$

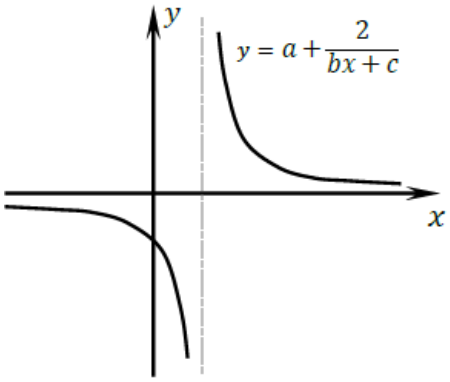
27. Rasmdagiga ko'ra quyidagilardan qaysi biri noto'g'ri?



A) $a^4+b<0$ B) $b^3+a<0$

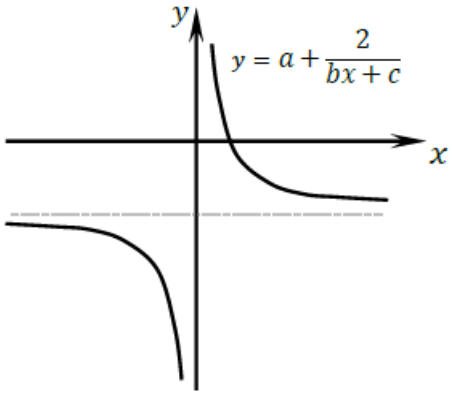
C) $b^3-a^3<0$ D) $ac^2-b^4>0$

28. Rasmdagiga ko'ra quyidagilardan qaysi biri doimo o'rinli?



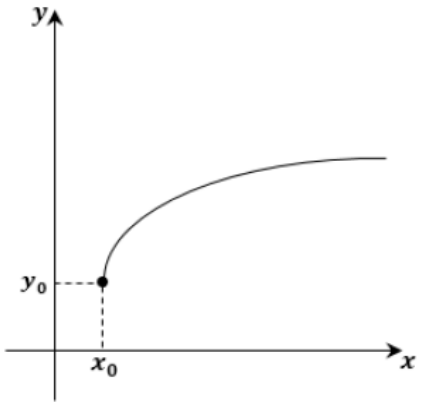
A) $ac^3 + b > 0$ B) $c^3 - b^3 > 0$
C) $abc > 0$ D) $bc > 0$

29. Rasmdagiga ko'ra quyidagilardan qaysi biri doimo o'rinli?



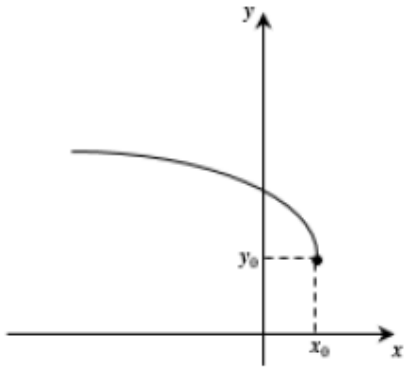
A) $cb + a < 0$ B) $a^3 - b^3 > 0$
C) $ca + ab < 0$ D) $b^3 - a^5 > 0$

30. Rasmda $y = a\sqrt{bx+c} + d$ funksiya grafigi tasvirlangan (y_0 uning eng kichik qiymati). Quyidagilardan qaysi biri doimo o'rinli?



A) $bc > d$ B) $ab < d$
C) $abc > d$ D) $bc < ad$

31. Rasmda $y = a\sqrt{bx+c} + d$ funksiya grafigi tasvirlangan (y_0 uning eng kichik qiymati). Quyidagilardan qaysi biri doimo o'rinli?



A) $ab < 0$ B) $abc > d$
C) $bc < d$ D) $a > c$

HOSILA

1. $f(x) = log_2(arctg2016x + arcctg2016x)$ bo'lsa, $f'(1)$ ni hisoblang.
A) B) C) D)

2. Agar $f(x) = 13^x \cdot 3^x$ berilgan bo'lsa, $f'(x) > 0$ tengsizlikni yeching.
A) B) C) D)

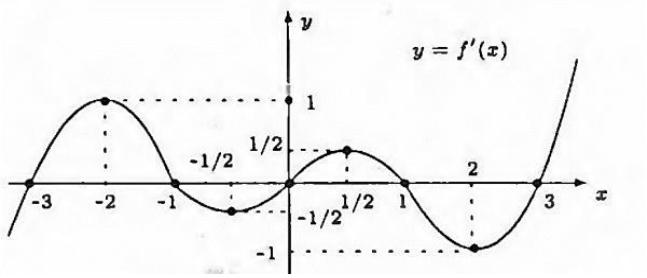
3. $F(x) = 7sin5x + 5sin7x + 12$ funksiya hosilasini toping.
A) B) C) D)

4. $F(x) = \frac{1}{18}x^6 - \frac{1}{15}x^5 + e^{3x} - cos\frac{x}{3} + 6$ funksiyaning hosilasini toping.
A) B) C) D)

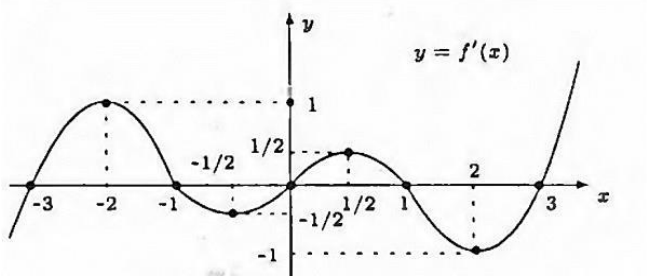
5. $y = 0,(6)x^3 + 1,5x^2 - 0,5x0,(3)$ funksiyaning $x = 1$ nuqtasiga o'tkazilgan urinmaning burchak koeffitsientini toping.
A) B) C) D)

6. $y = log_5(sin^2x + cos^2x)$ funksiyaning $x = 0,5$ nuqtadagi hosilasini toping.

7. Rasmda $y = f'(x)$ funksiya grafigi tasvirlangan. $y = f(x)$ funksiyaning $0 \le x < 3$ oraliqdagi o'sish oralig'ini toping.



8. Rasmda $y = f'(x)$ funksiya grafigi tasvirlangan. $y = f(x)$ funksiya grafigi $x_1 = 2$ va $x_2 = 3$ absissali nuqtalarda o'tkazilgan urinmalar orasidagi o'tkir burchakni aniqlang.



BOSHLANG'ICH FUNKSIYA. ANIQ VA ANIQMAS INTEGRAL

1. Agar x=2017 bo'lsa, $\int_1^3(sin^2 2016x + cos^2 2016x)dx$ ni hisoblang.
A) B) C) D)
2. $f(x) = \frac{x}{x-1}$ funksiyaning boshlang'ich funksiyasini toping.
A) B) C) D)
3. $\int\left(5x^4 - \frac{8\sqrt[5]{x^3}}{5} + 6\right)dx$ ni hisoblang.
A) B) C) D)
4. $\int(x^2 + \sqrt[3]{x} - 7)dx$ ni hisoblang.
A) B) C) D)
5. $f(x) = \frac{x-8}{x-1}$ funksiyaning boshlang'ich funksiyasini toping.
A) B) C) D)
6. $\int \frac{2x+4}{x^2+4x+3}dx$ ni hisoblang.
A) B) C) D)
7. $f(x) = 24sin5x \cdot cos7x$ ning boshlang'ich funksiyasini toping.
A) B) C) D)
8. $f(x) = 72sin11x \cdot cos7x$ ning boshlang'ich funksiyasini toping.
A) B) C) D)
9. Agar $a = -4$ bo'lsa, $\int_a^{a+1}(ln(sin^2 2x + cos^2 2x) + 1)dx$ aniq integralni hisoblang.
A) $\frac{ln2-1}{2}$ B) $2\sqrt{2}$ C) 1 D) $\sqrt{2}$

TRIGONOMETRIYA

1. $arccos\left(\frac{x^2}{4} + x\right) = \frac{2p}{3}$ tenglama ildizlari yig'indisini toping.
A) B) C) D)
2. $arcsin(x^2 - 5x) = arccos\frac{\sqrt{3}}{2}$ tenglama ildizlari yig'indisini toping.
A) B) C) D)
3. $arcsin\left(\frac{x^2}{3} - \frac{x}{2}\right) = \frac{p}{6}$ tenglama ildizlari yig'indisini toping.
A) B) C) D)
4. $1 + cos4x - 3sin2x = 0$ tenglama berilgan. $tg4x$ ni toping. -3
A) B) C) D)
5. Tenglamani yeching:
$$\sqrt{3}ctgx + \sqrt{3}tgx - 4 = 0$$
A) B) C) D)
6. tenglamani yeching: $4sin^2 x - 2(1-\sqrt{3})sinx - \sqrt{3} = 0$. 2
A) B) C) D)
7. $2cos(2-3x) = 1$ tenglamaning $[-3;5]$ kesmadagi eng katta ildizini toping. $\frac{11p+6}{9}$
A) B) C) D)
8. $sin5{,}5x \cdot sin8{,}5x = -0{,}5 \cdot cos14x$ tenglamani yeching.
A) B) C) D)
9. $y = log_2(arcsin2017x + arccos2017x)$ funksiyaning $x = 2017$ nuqtadagi qiymatini toping.
A) B) C) D)
10. $y = 4sin^2 2x + 4\sqrt{3}sinxcosx + 1{,}5 - 2\sqrt{3}$ funksiyaning qiymatlari sohasini toping.
A) B) C) D)
11. $y = 1 + 2(sin^2 x - 3sin4x) + cos8x + cos2x$ funksiyaning qiymatlari sohasiga tegishli nomanfiy butun sonlarning o'rta arifmetigini toping. 3,5
A) B) C) D)
12. $y = ln(6 + 2(sin^2 x - 3sin4x) + cos8x + cos2x)$ funksiyaning qiymatlari sohasini toping.
A) B) C) D)
13. $y = \sqrt{6 + 2(sin^2 x - 3sin4x) + cos8x + cos2x}$ funksiyaning qiymatlari sohasiga tegishli butun sonlar nechta? 4
A) B) C) D)
14. $y = 3sin\left(2x + \frac{p}{4}\right)$ funksiya nechta butun qiymat qabul qila oladi?
A) B) C) D)
15. $y = 3sin^2 x + 3sin^2\left(\frac{2017p}{2} - x\right)$ funksiya qiymatlari sohasiga tegishli butun sonlar nechta?
A) B) C) D)
16. $y = 5cos^2 x + sin^2 x$ funksiya butun qiymatlari yig'indisini toping.
A) B) C) D)

17. Ifodani soddalashtiring. $\left(1+tg3^0\right)\left(1+tg4^0\right)\left(1+tg41^0\right)\left(1+tg42^0\right)$. 4
A) B) C) D)

18. $б+в+г=р, sin\frac{б}{2}\cdot sin\frac{в}{2}\cdot sin\frac{г}{2}=a$ bo'lsa, $cosб+cosв+cosг$ ni a orqali ifodalang.
A) B) C) D)

19. $б+в+г=р, cos\frac{б}{2}\cdot cos\frac{в}{2}\cdot cos\frac{г}{2}=a$ bo'lsa, $sinб+sinв+sinг$ ni a orqali ifodalang.
A) B) C) D)

20. $б+в+г=р, sinб\cdot sinв\cdot sinг=a$ bo'lsa, $sin2б+sin2в+sin2г$ ni a orqali ifodalang.
A) B) C) D)

21. $б+в+г=р, sin2б\cdot sin2в\cdot sin2г=a$ bo'lsa, $sin4б+sin4в+sin4г$ ni a orqali ifodalang.
A) B) C) D)

22. $y=cos2р+4cos^4x-4cos^3x$ funksiyaning eng kichik musbat davrini toping.
A) B) C) D)

23. $б=7,5^0, a=(tgб)^{tgб}, b=(tgб)^{ctgб}, c=(ctgб)^{tgб}, d=(ctgб)^{ctgб}$ bo'lsa, quyidagilardan qaysi biri o'rinli?
A) B) C) D)

24. $\frac{sin2б-tgб}{tgб\cdot cos2б}$ ifodani soddalashtiring.
A) B) C) D)

25. $2log_{sin2x}cos^2x-4+5log_{cos^4x}sin2x=0$ tenglamani yeching.
A) B) C) D)

26. $sinx\cdot tgx+1>sinx+tgx$ tengsizlikni yeching.
A) B) C) D)

27. $\frac{1+cos3x+cos2x+cosx}{2cos^2x+cosx-1}$ ifodani soddalashtiring.
A) B) C) D)

28. $cos(2arccos0,(333))$ ni hisoblang.

29. $\sqrt{sin^4x+5cos^2x}-\sqrt{cos^4x+4sin^2x}$ ifodaning $б=15^0$ bo'lganda, qiymatini toping.
A) B) C) D)

30. $tgx+tg\left(\frac{р}{4}+x\right)<-2$ trigonometrik tengsizlikni yeching.
A) B) C) D)

31. $cos6x\cdot\frac{sin10x+sin2x}{cos10x+cos2x}$ ni soddalashtiring.
A) B) C) D)

32. $tg\left(arctg3+arcsin\frac{2\sqrt{2}}{5}\right)$ ni hisoblang.
A) B) C) D)

33. $sin2x=\frac{1}{2}$ va $б\in\left(\frac{р}{4};\frac{р}{2}\right)$ bo'lsa, $cos3x$ ni hisoblang.
A) B) C) D)

34. $sin\frac{р}{2}\cdot cosx=-\frac{5}{3}$ va $pcos7р<x<-\frac{р}{2}$ bo'lsa, tgx ni toping.
A) B) C) D)

35. $arctg3+arctg2+arctg1$ ni hisoblang.
A) B) C) D)

36. $3cos2x-3\sqrt{3}sin2x>0$ tengsizlikni yeching.
A) B) C) D)

37. Hisoblang: $tg(-3,1р)\cdot\cos(-0,9р)-sin5,6р\cdot ctg4,4р$.
A) B) C) D)

38. $sin2x+9cos^2x-1\le 0$ tengsizlik x ning qanday qiymatlarida o'rinli?
A) B) C) D)

39. Ifodaning eng katta qiymatini toping:
$$\frac{1}{4}cos2б-sin^2б.$$
A) B) C) D)

40. $б=30^0, a=(tgб)^{tgб}, b=(tgб)^{ctgб}, c=(ctgб)^{tgб}, d=(ctgб)^{ctgб}$ bo'lsa, quyidagilardan qaysi biri o'rinli?
A) B) C) D)

41. $sin\left(\frac{р}{4}-б\right)=\sqrt{\frac{3}{8}}$ bo'lsa, $sin2б$ ning qiymatini toping.
A) B) C) D)

42. Agar $tgб=-2$ bo'lsa, $\frac{2cos2б+1}{1-3cos^2б}$ ning qiymatini toping.
A) B) C) D)

43. $cos2x=sin\left(\frac{р}{3}+x\right)$ tenglamaning eng kichik musbat ildizini toping.
A) B) C) D)

44. $cos^2б-\frac{1+cosб}{1-cosб}\cdot tg^2\frac{б}{2}$ ni soddalashtiring.
A) B) C) D)

45. Agar $sin\frac{x-y}{2}\cdot sin\frac{y-z}{2}\cdot sin\frac{z-x}{2}=\frac{1}{4}$ bo'lsa, $\sin(x-y)+\sin(y-z)+\sin(z-x)$ ni hisoblang.
A) B) C) D)

46. Hisoblang: $sin\frac{р}{18}sin\frac{5р}{18}sin\frac{7р}{18}$.
A) $\frac{1}{8}$ B) $\frac{\sqrt{2}}{4}$ C) $\frac{\sqrt{2}}{2}$ D) $sin\frac{\sqrt{3}}{8}$

47. Hisoblang:
$$1,5+tg^2\left(arccos\frac{1}{3}\right)$$

48. $9^{sin^2x}-9^{cos^2x}=8$ tenglamaning $[0;2р]$ kesmadagi ildizlari yig'indisini toping.

49. $y=-6sin^2x+0,75cos^22x+2,25$ funksiyaning eng kichik butun qiymatining eng katta manfiy butun qiymatiga nisbatini toping.

50. $y = ln\left(arctg3x + arcctg3x - \frac{p}{2} + 1\right)$ funksiyaning $x = 0{,}5$ nuqtadagi qiymatini hisoblang.

51. $ctg^2б = 1{,}5$ va $б \in \left(0; \frac{p}{2}\right)$ bo'lsa, $cos^2б - sin^2б$ ni hisoblang.

52. Ifodani soddalashtiring.

$$\frac{1 - tg^2\frac{б}{2}}{1 + tg^2\frac{б}{2}} - \frac{1 + sin2б}{sinб + cosб}, б \in \left(0; \frac{p}{2}\right)$$

53. Hisoblang:

$$\frac{cos^2 31°}{4sin^2 31° + 3cos62° - 1}$$

54. $3(sin^4б + cos^4б) - 2(sin^6б + cos^6б)$ ifodaning qiymatini $б = \frac{13p}{12}$ bo'lganda hisoblang.

55. $y = \log_5(sin^2x + cos^2x)$ funksiyaning $x = 0{,}5$ nuqtadagi ikkinchi tartibli hosilasining qiymatini toping.

56. $sin\left(\frac{p}{5} + \frac{x}{2}\right) = \frac{\sqrt{3}}{2}$ tenglamani yeching.

57. Ifodani soddalashtiring.

$$cos^4 4б + sin8б - sin^4 4б$$

58. $y = 4sin^2 2x + 4\sqrt{3}sinxcosx + 1{,}5cos4x + 1{,}5 - 2\sqrt{3}$ funksiyaning qiymatlari sohasiga tegishli tub sonlar nechta?

59. Ifodaning eng kichik qiymatini toping:

$$0{,}125cos4б + sin^2 2б$$

60. Agar $б = 75°$ va $в = 90°$ bo'lsa, $sinб \cdot \sin(в - б) + sin^2\left(\frac{в}{2} - б\right)$ ni hisoblang.

61. $7^{sin^2x} + 7^{cos^2x} = 8$ tenglamaning $[0; 2p]$ kesmadagi ildizlari yig'indisini toping.

62. Hisoblang:

$$ctg^2\left(arcsin\frac{1}{7}\right) - 15$$

63. $\frac{sin10б + sin6б + sin2б}{cos10б + cos6б + cos2б}$ ni soddalashtiring.

64. $2cos^2x + 3sinx > 0$ tengsizlikni $[0; 2p]$ kesmadagi yechimlari to'plamini toping.

65. Agar $б = 17°$ va $в = 150°$ bo'lsa, $sinб \cdot \sin(в - б) + sin^2\left(\frac{в}{2} - б\right)$ ni hisoblang.

66. Tenglama ildizlari yig'indisini toping.

$$\arcsin(x^2 - 5x) = \arccos\left(-\frac{\sqrt{3}}{2}\right)$$

67. $sin|x| = x^2$ tenglama nechta butun yechimga ega?

68. $y = \lg(4 - x) - arcsin\frac{x-3}{4}$ funksiyaning aniqlanish sohasini toping.

69. $cos\left(\frac{1}{\sqrt{x^2-4}} + \frac{p}{3}\right) > -\frac{p}{e}$ tengsizlikni yeching.

70. Ifodaning qiymatini toping.

$$\sqrt{32}cos^2\frac{p}{8} - \sqrt{8}$$

71. Hisoblang:

$$2\sqrt{13}cos\left(arctg\frac{2}{3}\right)$$

72. Tenglamani yeching.

$$8tg^2\frac{x}{2} = 1 + \frac{1}{cosx}$$

73. $2arcsin\frac{x}{2} + 2arccosx = p$ tenglamaning ildizi 5 dan qancha kam?

74. Funksiyaning eng kichik musbat davrini toping.

$$y = 4(0{,}5cos^2(-0{,}5x + 3) + 4) + 1$$

75. $cos7x - \sqrt{3}sin7x = -\sqrt{2}$ tenglama $\left(0{,}4p; \frac{6p}{7}\right)$ oraliqda nechta yechimga ega?

76. $ctx + ctg^3x > tg2x \quad \left(0 < x < \frac{p}{4}\right)$ tengsizlikni yeching.

77. Tenglama $[-3p; -1{,}5p]$ oraliqda nechta yechimga ega?

$$\frac{13sin^2x - 5sinx}{13cosx + 12} = 0$$

78. Tengsizlikni yeching.

$$sin\left(\frac{x}{\sqrt{1-x}} + \frac{1}{x}\right) \geq -1$$

79. $tg\frac{px}{3} = -\sqrt{3}$ tenglamaning eng kichik musbat ildizini toping.

80. $\arcsin(cos7)$ ni toping.

81. Hisoblang.

$$tg9° - tg63° + tg81° - tg27°$$

82. Tengsizlikni yeching.

$$log_{\frac{4}{3}}cosx \geq log_{\frac{4}{9}}1{,}5 \quad , -2 < x < 3$$

83. Tenglamaning eng kichik musbat yechimi x_0 bo'lsa, $x_0 - \frac{p}{2}$ ni toping.

$$sinx + tgx = \frac{1}{cosx} + \cos(x + p)$$

84. Tengsizlikni yeching.

$$\begin{cases} tgx \geq -\sqrt{3} \\ sinx < 0{,}5 \end{cases}$$

85. Hisoblang.

$$arcsin\left(cos\left(-\frac{10p}{3}\right)\right)$$

86. Hisoblang.

$$ctg70° + 4cos70°$$

87. Tenglamaning eng kichik ildizi x_0 bo'lsa, $2x_0 + \frac{p}{4}$ ni toping.

$$ctgx - 2sin2x = 1$$

88. Tengsizlikni yeching.

$$ctgx - tgx - 2tg2x - 4tg4x < \frac{8\sqrt{3}}{3}$$

89. Trigonometrik tengsizliklar sistemasini yeching:

$$\begin{cases} sinx \le \dfrac{\sqrt{3}}{2} \\ cosx < \dfrac{\sqrt{3}}{2} \\ 0 \le x < 2\text{p} \end{cases}$$

90. $cos(2arcsin0,(66))$ ni hisoblang.

91. $sin6x \cdot cos2x < sin5x \cdot cos3x$ trigonometrik tengsizlikni yeching.

92. $cos\left(\frac{\text{p}-4x}{2}\right) = sin(x^2-1)$ tenglamaning butun sonlardan iborat ildizlari nechta?

93. Ifodani soddalashtiring:

$$sin^4\text{б} - cos^4\text{б} + sin2\text{б}$$

94. $y = 12sin\left(2x + \frac{\text{p}}{4}\right)$ funksiya nechta natural qiymatlar qabul qiladi?

95. $y = lgcosx$ funksiyaning aniqlanish sohasini toping.

96. $|sinx| - x^2 = 0$ tenglamaning nechta butun yechimi bor.

97. Agar $tg^2\text{б} = 3$ bo'lsa, $cos^2\text{б} - sin^2\text{б}$ ni hisoblang.

98. $tgx + tg\left(\frac{\text{p}}{4} + x\right) < -2$ trigonometrik tengsizlikni yeching.

99. $sin\left((-1)^n\frac{\text{p}}{2}\right)cos((-1)^n\text{p}) - (-1)^n$ ni hisoblang. $(n \in Z)$

100. $sin80° \cdot sin40° \cdot sin20°$ ni hisoblang.

101. $arctg3 + arctg2 + arctg1$ ni hisoblang.

102. $sin2x + 9cos^2x - 1 \le 0$ tengsizlik x ning qanday qiymatlarida o'rinli?($x \in [0; 2\text{p}]$)

103. $y = 28sin\left(2x + \frac{\text{p}}{4}\right)$ funksiya nechta natural qiymatlarni qabul qiladi?

104. $y = cos\left(\sqrt{4-x^2} + 2\right)$ funksiyaning qiymatlari sohasini toping.

105. $a = tg\frac{3\text{p}}{7},\ b = sin\frac{\text{p}}{6},\ c = tg\frac{5\text{p}}{7}$ sonlari uchun quyidagi munosabatlardan qaysi biri o'rinli?

106. $log_4\left(2 - \sqrt{x+3}\right) < cos\frac{5\text{p}}{3}$ tengsizlikning butun sonlardan iborat nechta yechimi bor?

107. $y = cos\frac{2x}{x^2+1}$ funksiyaning qiymatlari sohasini toping.

108. Hisoblang.

$$sin\left(2arcctg\frac{1}{3}\right)$$

109. $\sqrt{sin^2\text{б} + 4cos^2\text{б}} - \sqrt{cos^2\text{б} + 4sin^2\text{б}}$ ifodaning $\text{б} = 15°$ bo'lganda qiymatini toping.

110. $cos(2arccos0,(333))$ ni hisoblang.

111. $sin\frac{\text{p}}{2} \le \frac{tgx+tg3x}{1-tgx\cdot tg3x} \le ctg\frac{\text{p}}{6}$ tengsizlikning eng katta va eng kichik yechimlari yig'indisini toping. $\left(\frac{\text{p}}{12} \le x \le \frac{13\text{p}}{16}\right)$

112. $ctg66 \cdot \frac{sin10\text{б}+sin2\text{б}}{cos10\text{б}+cos2\text{б}}$ ni soddalashtiring.

113. Soddalashtiring.

$$tg(-3,1\text{p}) \cdot cos(-9,9\text{p}) - sin5,6\text{p} \cdot ctg4,4\text{p}$$

114. $y = cos2\text{p} + 4cos^4x - 4cos^2x$ funksiyaning eng kichik musbat davrini toping.

UCHBURCHAK

1. Asosi *a* ga, yon tomoni *b* ga teng bo'lgan teng yonli uchburchakning yon tomoniga tushirilgan medianasini toping.
A) B) C) D)

2. Asosi *a* ga, yon tomoni *b* ga teng bo'lgan teng yonli uchburchakning yon tomoniga tushirilgan bissektrissasini toping.
A) B) C) D)

3. ABC uchburchakning A ichki burchagidan o'tkazilgan bissektrissasi BC tomonni D nuqtada kesib o'tadi. Bunda AD=BD=4, AC=5 bo'lsa, uchburchakning BC tomonini toping.
A) B) C) D)

4. ABC teng yonli uchburchakka aylana ichki chizilgan$(AB = BC)$. E nuqta AB tomondagi urinish nuqtasi va $BE = 2, EA = 1$ bo'lsa, ABC uchburchak yuzini hisoblang.
A) B) C) D)

5. ABC uchburchakning BC tomoniga AD to'g'ri chiziq shunday o'tkazildiki, natijada ACD teng yonli uchburchak hosil bo'ldi. Agar ABC va ABD uchburchaklar perimetrlari mos ravishda 51 va 40 ga teng bo'lsa, AC tomon uzunligini toping.
A) B) C) D)

6. ABC to'g'ri burchakli uchburchakning AB gipotenuzasiga CH balandlik va CM to'g'ri chiziq shunday o'tkazilganki, natijada AB kesma teng uch bo'lakka bo'lingan. Agar CHM uchburchakning yuzi 3 ga teng bo'lsa, ABC uchburchak yuzini hisoblang.
A) B) C) D)

7. To'g'ri burchakli uchburchakning gipotenuzasiga tushirilgan balandlik ajratgan uchburchaklar yarim perimetrlari p_1 va p_2 bo'lsa, berilgan uchburchak perimetrini toping.
A) B) C) D)

8. Uchburchakning ikki tomoni 4 va 5 ga, ular orasidagi burchak kosinusi 0,2 ga teng. Uchburchakning uchinchi tomoniga tushirilgan balandligini hisoblang.
A) B) C) D)

9. Nechta turli yon tomoni 1 sm bo'lgan teng yonli uchburchaklarni 2 ta teng yonli uchburchakka ajratish mumkin?
A) B) C) D)

10. Teng yonli ABC uchburchakning AC asosida D nuqta shunday olinganki, AD=13, DC=15. ABD va DBC uchburchaklarga ichki chizilgan aylanalar BD to'g'ri chiziqqa mos ravishda M va N nuqtalarda urinadilar. MN kesma uzunligini toping.
A) B) C) D)

11. ABC uchburchakda E nuqta AC tomon o'rtasi, BC tomonda D nuqta shunday olinganki , 2BD=DC o'rinli. AD va BE to'g'ri chiziqlar F nuqtada kesishsin. Agar FDCE to'rtburchakning yuzi 20 ga teng bo'lsa, BDF uchburchak yuzini hisoblang.
A) B) C) D)

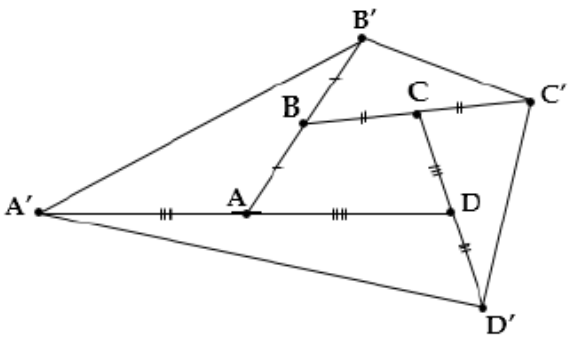
12. To'g'ri burchakli uchburchakning bir kateti 18 ga teng. Bu uchburchakning medianalari kesishgan nuqtadan ikkinchi katetgacha bo'lgan masofani toping.
A) B) C) D)

13. Teng yonli uchburchakning asosi 16 ga, yon tomoni 10 ga teng. Bu uchburchakka ichki va tashqi chizilgan aylanalarning markazlari orasidagi masofani toping.
A) B) C) D)

14. ABC uchburchakka ichki chizilgan aylana AB, BC va AC tomonlarga mos ravishda P, Q va R nuqtalarda urinadi. Agar BC=12 sm, AB=10 sm AC=5 sm bo'lsa, CQ ni toping.

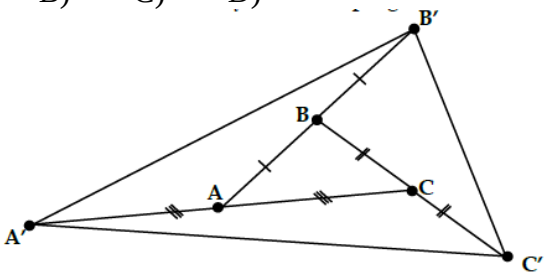
15. To'g'ri burchakli ABC uchburchak CD balandlik bilan BCD va ACD uchburchaklarga bo'lingan. Shu uchburchaklar yarim perimetrlari mos ravishda 20 va 21 ga teng bo'lsa, ABC uchburchak yarim perimetrini toping.
A) $24\sqrt{2}$ B) 26 C) 42 D) 29

16. ABCD to'rtburchakning har bir tomoni chizmada ko'rsatilgandek o'z uzunligiga teng uzoqlikda davom ettirilgan. Agar $A'B'C'D'$ to'rtburchak yuzasi 5 ga teng bo'lsa, ABCD to'rtburchak yuzasini toping.



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

17. ABC uchburchakning har bir tomoni chizmada ko'rsatilgandek o'z uzunligiga teng uzoqlikda davom ettirilgan. Agar $A'B'C'$ uchburchak yuzasi 28 ga teng bo'lsa, ABC uchburchak yuzasini toping.
A) B) C) D)



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

18. To'g'ri burchakli uchburchak tomonlariga yasalgan kvadratlar yuzalari yig'indisi 48 ga teng. Gipotenuza uzunligini toping.

19. To'g'ri burchakli ABC uchburchak CD balandlik bilan BCD va ACD uchburchaklarga bo'lingan. Shu uchburchaklarga ichki chizilgan doiralar radiuslari mos ravishda 5 va 12 ga teng. ABC uchburchakka ichki chizilgan aylana radiusini hisoblang.

20. Uchburchakning uchlari dekart koordinatalar sistemasida quyidagicha berilgan: A(0;0), B(-1;-2), C(-2;0). Uchburchak yuzini toping.

21. Uchburchakning uchlari dekart koordinatalar sistemasida quyidagicha berilgan: A(0;0), B(-0,5;10), C(-1;0). Uchburchak yuzini toping.

22. Asosi a ga, yon tomoni b gat eng bo'lgan teng yonli uchburchakning yon tomoniga tushirilgan balandligini toping.

23. Teng yonli uchburchakning yon tomoniga o'tkazilgan mediana va asosi orasidagi burchak tangensi 4 ga teng. Uchburchak asosidagi burchak tangensini toping.

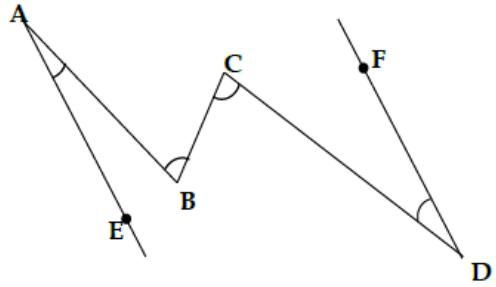
24. To'g'ri burchakli uchburchakning gipotenuzasi 9 ga, unga ichki chizilgan aylana radiusi 1 ga teng. Uchburchak perimetrini toping.

25. To'g'ri burchakli uchburchakning gipotenuzasi 32 ga, unga ichki chizilgan aylana radiusi 6 ga teng. Uchburchak perimetrini toping.

26. Teng yonli ABC uchburchakning AC asosida D nuqta shunday olinganki, AD=21, DC=23 tengliklar bajariladi. ABD va DBC uchburchaklarga ichki chizilgan aylanalar BD to'g'ri chiziqqacmos ravishda M va N nuqtalarda urinadilar. MN kesma uzunligini toping.

27. To'g'ri burchakli uchburchakning perimetri 24 dm ga, yuzi 24 dm^2 ga teng. Uchburchak katetlari uzunliklarini (dm) aniqlang.

28. Teng yonli uchburchakning yon tomoniga tushirilgan medianasi 5 ga, asosi $4\sqrt{2}$ ga teng. Uchburchak yon tomonini aniqlang.
29. Teng yonli ABC uchburchakning AC asosida D nuqta shunday olinganki, AD=13, DC=15 tengliklar bajariladi. ABD va DBC uchburchaklarga ichki chizilgan aylanalar BD to'g'ri chiziqqacmos ravishda M va N nuqtalarda urinadilar. MN kesma uzunligini toping.
30. Katerlari $3-2\sqrt{2}x+x^2=0$ tenglama ildizlariga teng bo'lgan to'g'ri burchakli uchburchakning yuzini hisoblang.
31. To'g'ri burchakli ABC uchburchakning AB gipotenuzasiga C uchdan o'tkazilgan CO mediana va CE balandliklar nisbatini BE:BO=1:5 bo'lganda aniqlang.
32. Asosi AC bo'lgan ABC teng yonli uchburchakning BC tomoniga tushirilgan AD kesma ADC teng yonli uchburchak hosil qiladi. Agar ABD va ABC uchburchaklar perimetrlari mos ravishda 27 va 39 ga teng bo'lsa, AC ni toping.
33. To'g'ri burchakli uchburchakning gipotenuzasiga tushirilgan balandligi va bissektrissasi mos ravishda h va l bo'lsa, uchburchak yuzasini aniqlang.
34. Uchburchakning bir tomonida olingan nuqta orqali uchburchakning qolgan ikki tomoniga parallel chiziqlar o'tkazilgan bo'lib, bu chiziqlar uchburchakni uch qismga-bitta parallelogram va ikkita uchburchakka ajratadi. Uchburchaklarning yuzasi 3 va 12 ga teng bo'lsa, parallelogram yuzini aniqlang.
35. ABC uchburchakka aylana ichki chizilgan va AM mediananing davomi aylanani K nuqtada kesadi. Agar AM=18, MK=8 va BK=10 bo'lsa, AC tomon uzunligini hisoblang.
36. ABC uchburchakning B uchi va AM medianasining o'rtasi orqali l to'g'ri chiziq o'tkazilgan. Bu chiziq AC tomonni F nuqtada kesib o'tadi. Agar D nuqta AM ning o'rtasi bo'lsa, BD:DF ni toping.
37. Yon tomoni a ga teng bo'lgan ikkita teng yonli to'g'ri burchakli uchburchaklar ustma-ust qo'yildi. Shundan so'ng uchburchaklardan biri to'g'ri burchagining uchi atrofida 45° ga burildi. Hosil bo'lgan shakl perimetrini toping.
38. ABC uchburchakda $\angle B=48°, \angle C=95°$, AD bissektrissa. AB tomondan E nuqta olingan, bunda AE=AC. $\angle BDE$ ni toping.
39. To'g'ri burchakli uchburchakka ichki va tashqi chizilgan aylanalar radiuslari mos ravishda 3 va 7 ga teng bo'lsa, uchburchak yuzini toping.
40. tomoni a ga teng bo'lgan ikkita muntazam uchburchaklar ustma-ust qo'yilgan. Ulardan biri ikkinchisining uchlaridan biri atrofida 30° ga burildi. Hosil bo'lgan shakl yuzini toping.
41. Teng yonli ABC(AB=AC) uchburchakda $\angle A=80°$. Uchburchak ichidan O nuqta shunday olinganki, $\angle OBC=10°, \angle OCB=30°$. $\angle AOB$ burchak qiymatini aniqlang.
42. ABC uchburchakda $\angle A=48°, \angle C=62°$. AB to'g'ri chiziqning B nuqtasidan davomida CB kesmaga teng BD kesma qo'yildi. BCD uchburchakda $\angle D$ ni aniqlang.
43. Uchburchakning balandliklari 4, 5, 6 ga teng. Unga tashqi chizilgan aylana radiusi R uchun quyidagi munosabatlardan qaysi biri to'g'ri?
44. Rasmda berilgan ma'lumotlarga ko'ra nomalum D burchak kattaligini toping. Bu yerda $AE \parallel DF, \angle A=35°, \angle B=65°, \angle C=2\cdot\angle D$



45. Uchburchakning ikkita burchagi mos ravishda 38° va 52° ga teng. Uchinchi burchak uchidan tushirilgan bissektrissa va mediana orasidagi burchakni toping.
46. Uchburchakning uchlari to'g'ri burchakli dekart koordinatalar sitemasida quyidagicha berilgan: A(0;0), B(a;0), C(0;a). Uchburchakning o'tkir burchaklari medianalari orasidagi o'tmas burchak kosinusini toping.
47. Perimetri 4 ga, o'tkir burchagi 30° ga va shu burchak qarshisidagi tomoni $\sqrt{3}$ ga teng bo'lgan uchburchakka ichki chizilgan doira yuzini toping.
48. ABC uchburchakning A ichki burchagidan o'tkazilgan bissektrissa BC tomonni D nuqtada kesib o'tadi. Bunda AD=BD, AB=12, AC=16. Uchburchakning BC tomonini toping.
49. O'tkir burchagi 60° ga, perimetri $\frac{2}{\sqrt{2-\sqrt{3}}}$ ga teng bo'lgan to'g'ri burchakli uchburchakning yuzini toping.
50. uchburchakka radiusi 1,4 bo'lgan ichki chizilgan aylana markazidan uchburchak tekisligiga perpendikulyar tushirilgan bo'lib, uning uchidan uchburchak tomonlarigacha bo'lgan masofa 5 ga teng. Perpendikulyarning uzunligini toping.

51. 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.
52. to'g'ri burchakli uchburchakda o'tkir burchaklarning medianalari $6\sqrt{5}$ va 15 ga teng. Gipotenuza uzunligini toping.
53. Ikkita teng yonli uchburchak umumiy asosga ega bo'lib, ularning tekisliklari o'zaro 60° burchak hosil qiladi. Umumiy asos 16 sm, bir uchburchakninh yon tomoni 17 sm, ikkinchisining yon tomonlari o'zaro perpendikulyar. Uchburchaklarning uchlari orasidagi masofani toping.
54. To'g'ri burchakli uchburchakning bir kateti 18 ga teng. Uning medianalari kesishgan nuqtadan ikkinchi katetgacha bo'lgan masofani aniqlang.
55. Uchburchakning uchlari A(5;-1), B(3;4), C(1;2) nuqtalarda joylashgan. Shu uchburchak medianalar kesishgan nuqtasining koordinatalarini aniqlang.

TO'RTBURCHAKLAR. PARALLELOGRAM. ROMB. TO'G'RI TO'RTBURCHAK. KVADRAT. TRAPETSIYA

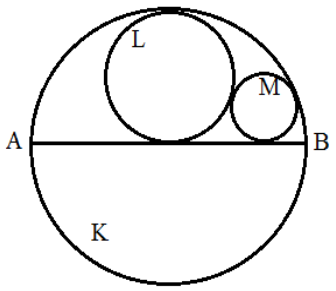
1. Trapetsiyaning 9 ga teng bo'lgan o'rta chizig'i uning yuzini 3:5 kabi nisbatda bo'ladi. Trapetsiyaning asoslarini toping.
A) B) C) D)
2. Teng yonli trapetsiyaning diagonali uning o'tkir burchagi bissektrissasidir. Trapetsiyaning asoslari uzunliklari1:2 nisbatda, perimetri esa 12 ga teng. Trapetsiyaning o'rta chizig'ini toping.
A) B) C) D)
3. Trapetsiya asoslari 5 va 11 ga teng. Asoslarga parallel bo'lib, uning yuzini teng ikkiga bo'luvchi kesma uzunligini toping. $\sqrt{73}$
A) B) C) D)
4. Trapetsiyaning diagonallari o'zaro perpendikulyar bo'lib, uning yuzi 4 ga teng bo'lsa, trapetsiya balandligini toping.
A) B) C) D)
5. Trapetsiyaning 20 ga teng bo'lgan o'rta chizig'i uning yuzini 3:5 kabi nisbatda bo'ladi. Trapetsiya asoslarini toping.
A) B) C) D)
6. Teng yonli trapetsiyaning katta asosi 2,7 m, yon tomoni 1 m, ular orasidagi burchak 60°. Kichik asosni toping.
A) B) C) D)
7. Teng yonli trapetsiyaning diagonali uning o'tmas burchagining bissektrissasidir. Trapetsiyaning asoslari uzunliklari 2:3 nisbatda, perimetri esa 12 ga teng. Trapetsiyaning o'rta chizig'ini toping.

A) B) C) D)
8. ABCD to'g'ri to'rtburchakda AB=2, BC=1. AB tomonda shunday M nuqta tanlanganki, AMD va CMD burchaklar o'zaro teng. AMD burchakni toping.
A) B) C) D)

9. Qavariq ABCDEF oltiburchakda ichki burchaklari o'zaro teng. Agar $AB = 3, BC = 4, CD = 5, EF = 2$ bo'lsa, $AF - DE$ ni toping.
A) B) C) D)

AYLANA VA DOIRA

1. Radiusi 1 ga teng, markazi O nuqtada bo'lgan aylana berilgan. Uning AB diametrida M nuqta olib, shu nuqta orqali AB bilan 45° li burchak hosil qiluvchi CD vatar o'tkazilgan. $CM^2 + DM^2$ ni toping.
A) B) C) D)
2. AB kesma K aylananing diametri bo'lsin. L aylana K aylanaga hamda AB to'g'ri chiziqqa K aylananing markazida urinadi. Agar M doira yuzasi 2 ga teng bo'lsa, K doira yuzini toping.

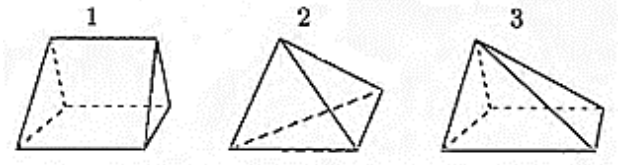


A) B) C) D)
3. Raiusi 6 ga teng doiradan, markaziy burchagi 60° ga teng doiraviy sector qirqib olindi va unga aylana ichki chizildi. Shu aylanaga ichki chizilgan muntazam uchburchak yuzi topilsin.
A) B) C) D)
4. Aylanag o'tkazilgan vatar uni 5:7 nisbatda bo'ladi. Ushbu vatarga tiralgan, aylanaga ichki chizilgan katta burchakni aniqlang.
A) B) C) D)

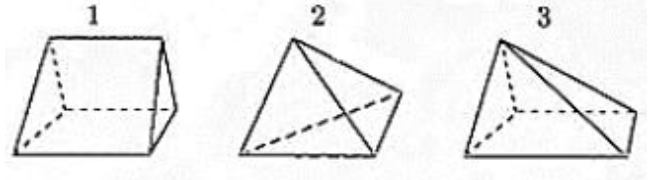
5. 60° li BAC burchakka aylana ichki chizilgan. Aylana burchak tomonlariga B va C nuqtalarda urinadi. Agar $BC = 3$ bo'lsa, $AB + AC$ ni toping.
A) B) C) D)

FAZOVIY JISMLAR

1. Ko'pyoqning bitta yoqi beshburchak bo'lsa, uning yoqlari soni eng kamida nechta bo'lishi mumkin?
A) B) C) D)
2. Parallelepipedning asoslari tomoni 2 ga teng bo'lgan kvadratlardan, barcha yon yoqlari romblardan iborat. Yuqori asosining uchlaridan biri ostki asosining uchlaridan baravar uzoqlikda joylashgan. Parallelepipedning hajmini hisoblang.
A) B) C) D)
3. Asosining radiuslari 2 va 3 ga teng bo'lgan kesik konus va unga tengdosh silindrning balandliklari bir xil. Silindr asosining radiusini toping.
A) B) C) D)
4. Qirralari 18, 16 va 14 ga teng bo'lgan parallelepiped qirrasi 1 ga teng bo'lgan kubchaklardan tashkil topgan. Parallelepipedning bir kubcha qalinlikdagi tashqi sirtini olib tashlash uchun nechta kubcha olib tashlanishi kerak?
A) B) C) D)
5. Prizmaning qirralari soni 60 ga teng. Uning yoqlari soni nechta?
A) B) C) D)
6. Qirrasi a gat eng kubning ikkita qo'shni yoqlari ayqash diagonallari orasidagi eng qisqa masofani toping.
A) B) C) D)
7. ABCD tetraedrning D uchidagi yassi burchaklari to'g'ri. Shu tetraedrga kub shunday ichki chizilganki, kubning bitta uchi D nuqtada, unga qarama-qarshi uchi esa ABC yoqda yotibdi. Agar DA=a, DB=b, DC=c bo'lsa, kub qirrasining uzunligini hisoblang.
A) B) C) D)
8. Piramidaning qirralari soni 63 ta bo'lsa, uning yoqlari sonini toping.
A) B) C) D)
9. Katetlari $2\sqrt{2}$ va 8 ga teng bo'lgan to'g'ri burchakli uchburchakni kichik tomoni atrofida aylantirishdan hosil bo'lgan jism to'la sirtini hisoblang.
A) B) C) D)
10. Katetlari $2\sqrt{2}$ va 8 ga teng bo'lgan to'g'ri burchakli uchburchakni katta tomoni atrofida aylantirishdan hosil bo'lgan jism to'la sirtini hisoblang.
A) B) C) D)
11. Silindrning balandligi H gat eng. Uning yon sirti yoyilganda balandligi bilan diagonali 60° li burchak tashkil qilsa, silindr hajmini hisoblang.
A) B) C) D)
12. Uchburchakka radiusi 1,4 ga teng bo'lgan ichki chizilgan aylananing markazidan uchburchak tekisligiga perpendikulyar chiqarilgan bo'lib, uning uchidan uchburchak tekisligigacha bo'lgan masofa 5 ga teng. Perpendikulyarning uzunligini toping.
A) B) C) D)
13. Akvariumning bo'yi 110 sm, eni 70 sm, balandligi 60 sm. Suv sathi yuqoridan 10 sm pastda bo'lishi uchun akvariumga necha litr suv quyish kerak?
A) B) C) D)
14. Tomonlari 3 va 7 ga teng bo'lgan to'g'ri to'rtburchakni kichik tomoni atrofida aylantirishdan hosil bo'lgan jismning to'la sirtini toping.
A) B) C) D)
15. Muntazam parallelepipedning diagonali yon yog'i bilan 30° li burchak tashkil etsa, uning hajmini toping. Parallelelpiped yon yog'ining diagonali $\sqrt{6}$ ga teng.
A) B) C) D)
16. A nuqtadan tekislikka o'tkazilgan og'malarning biri 8 ga, ikkinchisining uzunligi birinchi og'maning 75 % iga, A nuqtadan tekislikkacha bo'lgan masofa esa 4,8 ga teng bo'lsa, o'g'malarning tekislikdagi soyalari uzunliklarini hisoblang.
A) B) C) D)
17. Quyidagi ko'pyoqlarning qaysi birida 4 ta yoq bor?

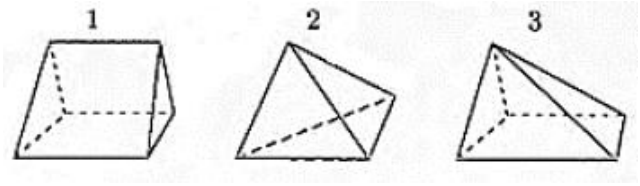


A) 1,3 B) 3 C) 1 D) 2
18. Quyidagi ko'pyoqlarning qaysi birida 5 ta yoq, 9 ta qirra bor?



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

19. Quyidagi ko'pyoqlarning qaysi birida 6 ta qirra bor?



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

OLIY MATEMATIKA
To'plam. Combinatorika elementlari. Ehtimollar nazariyasi

1. {a, b, c, d} to'plamning nechta qism to'plamlari mavjud?
A) B) C) D)
2. $\{x|x \in N, x^2 < 26\}$ to'plamning qism to'plamlari sonini toping.
A) B) C) D)
3. $\{x|x \in N, -3 < x \leq 26\}$ to'plamning qism to'plamlari sonini toping.
A) B) C) D)
4. $\{x|x \in Z, -3 \leq x \leq 26\}$ to'plamning qism to'plamlari sonini toping.
A) B) C) D)
5. Stolda 5 ta olma va 3 ta nok yotibdi. Bitta mevani necha usul bilan tanlash mumkin?
A) B) C) D)
6. 5 ta ruchka, 3 ta qalam va 4 ta flomaster bor. Ikkita xildagi predmetlardan tashkil topgan nechta to'plam tuzish mumkin?
A) B) C) D)
7. 2x2 o'lchamli kvadrat jadvalning har bir katagini qora yoki oq rangga bo'ysh mumkin. Bu jadvalni necha xil usulda bo'yasa bo'ladi?
A) B) C) D)
8. Turli 6 ta rangdagi mato bor. Uchta rangdagi gorizontal polosalibayroqni necha xil usul bilan tikib bo'ladi?
A) B) C) D)
9. Mavjud 7 ta predmetdan 4 ta predmetni nechta usul bilan tanlasa bo'ladi?
A) B) C) D)
10. Ifodani soddalashtiring: $\frac{C_{2n}^{n+1}}{C_{2n+1}^{n-1}}$.
A) B) C) D)
11. 4 xil gullardan necha xil usul bilan 7 guldan iborat guldasta tuzish mumkin?
A) B) C) D)
12. Savatda 200 ta qizil, 100 ta oq va 50 ta qora shar bor. Tavakkaliga olingan sharning oq rangda bo'lish ehtimolini toping.
A) B) C) D)
13. Savatdagi mevalarning 30% i banan, 60% i olma. Tasodifan olingan meva banan yoki olma bo'lish ehtimolini toping.
A) B) C) D)
14. 6 nafar mehmonni 6 ta stulga o'tqazish variantlari nechta?
A) B) C) D)
15. Uchta tanga tashlanmoqda. Ikkita gerb va bitta raqam tushish ehtimolini toping.
A) B) C) D)
16. Hisoblang: $C_8^6 \cdot P_2$.
A) B) C) D)