MATEMATIKA

2018

VARIANTLAR

XORAZM ILM ZIYO - 2019

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Usbbu variantlar to'plami 2018-yil test imtihonlarida berilgan savollar asosida tuzilgan. Unda 30 talikdan bir-birini takrorlamaydigan 36 ta variant mavjud bo'lib, 1080 ta umumiy test bazasini o'z ichiga olgan. Mazkur variantlar to'plami maktab, Akademik litsey, kasb – hunar kollejlari o'quvchilari va abiturentlar uchun mo'ljallangan.

Yechimlarini telegram kanalimizda kuzatib borishingiz mumkin.

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Variant-1

1. 6 xonali son berilgan. Uning birinchi raqami 1 ga teng. Shu sonning birinchi raqamini uning oxiriga ko'chirsak, berilgan sondan uch marta katta son hosil bo'lsa, shu sonni toping.
A) 272875 B) 142857
C) 142785 D) 277954

2. Ifodaning qiymati 40 dan qancha kam?

$$\left(2^{-3}+\left(\frac{3}{4}\right)^{-1}\cdot\left(\frac{1}{2}\right)^{2}\right):\left(\left(\frac{1}{6}\right)^{0}-12\cdot 3^{-3}\right)\cdot 18-9\frac{3}{20}$$

A) -20,5 B) 20,5 C) 19,5 D) 60,5

3. Ifodani soddalashtiring:

$$\frac{b^2-a^2+2b+1}{1+b-a}-b.$$

A) $a-b$ B) $a+1$
C) $a-2b$ D) $2a-b$

4. $a\cdot b\cdot c=5$ bo'lsa

$$\left(\frac{2}{a}-b\cdot c\right)\left(\frac{3}{b}-a\cdot c\right)\left(\frac{4}{c}-a\cdot b\right)$$

ko'paytmaning qiymatini toping.
A) $-\frac{6}{5}$ B) $\frac{2}{3}$ C) 1 D) $-\frac{5}{3}$

5. $\sqrt{2^{20}+2^{11}+1}-\sqrt{2^{20}-2^{12}+4}$ ni hisoblang.
A) 1 B) 2 C) 3 D) 4

6. 210 gramm suvga 40 gramm tuz aralashtirildi. Hosil bo'lgan aralashmaning necha foizi suvdan iborat bo'ladi?
A) 88 B) 84 C) 86 D) 82

7. Tenglamani yeching:

$$\frac{1}{x-2}+\frac{1}{x+7}=\frac{1}{x-1}+\frac{1}{x+1}$$

A) 0,5; 5 B) 5; -5
C) 0,2; -0,2 D) 0,2; 5

8. $x^2-4|x|-a+3=0$ tenglamaning $a\geq 3$ bo'lgandagi ildizlari yig'indisini toping.
A) -4 B) 4 C) -3 D) 0

9. Tengsizlikni yeching:

$$2-3x+x^2\geq 2\left(x^2-4x+4\right)$$

A) $[-3;-2]$ B) $[2;3]$
C) $[-3;2]$ D) $[-2;3]$

10. Agar $\begin{cases}2\leq x\leq 3\\-2\leq y\leq 3\end{cases}$ bo'lsa, $\frac{x}{y}$ qanday oraliqqa tegishli bo'ladi?
A) $\left[-1;9\right]$ B) $\left[-3;3\right]$
C) $(-\infty;-1)\cup\left(\frac{2}{3};\infty\right)$
D) $(-\infty;-1]\cup\left[\frac{2}{3};\infty\right)$

11. Hisoblang:
$1\cdot 4+2\cdot 7+3\cdot 10+\ldots+8\cdot 25$
A) 720 B) 640 C) 648 D) 900

12. Arifmetik progressiya uchinchi hadi 5 ga, dastlabki 10 ta hadi yig'indisi esa 175 ga teng bo'lsa, ushbu arifmetik progressiyaning to'rtinchi va o'n ikkinchi hadlari kvadratlari yig'indisini toping.
A) 1600 B) 3600 C) 2600 D) 1000

13. Soddalashtiring: $\left(\frac{3\pi}{2}<\alpha<2\pi\right)$

$$\sin\alpha\cdot|\cos\alpha|-\cos\alpha\cdot|\sin\alpha|.$$

A) $\sin\alpha$ B) 0 C) $\cos\alpha$ D) $\sin 2\alpha$

14. Hisoblang: $\frac{\sin 10^\circ}{\cos 50^\circ-tg30^\circ\cdot\sin 50^\circ}$

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

15. Tenglamani yeching:

$$\cos^2 2x+\cos^2 3x+\cos^2 4x=\frac{3}{2}$$

A) $x=\frac{\pi}{12}+\frac{\pi n}{6},n\in Z;\ x=\pm\frac{\pi}{3}+2\pi k,k\in Z$

B) $x=\frac{\pi}{12}+\frac{\pi n}{6},n\in Z;\ x=\pm\frac{\pi}{3}+\pi k,k\in Z$

C) $x=\frac{\pi}{12}+\frac{\pi n}{6}, n\in Z;\ x=\pm\frac{2\pi}{3}+\pi k, k\in Z$

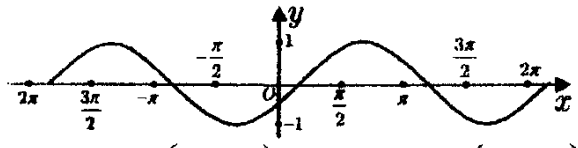
D) $x=\frac{\pi}{12}+\frac{\pi n}{3}, n\in Z;\ x=\pm\frac{\pi}{3}+2\pi k, k\in Z$

16. $y=x-2$ va $y=0,5x+1$ berilgan funksiyalarning qiymatlari 4 dan kichik bo'lmaydigan barcha x larni toping.

A) $[6;\infty)$ B) $[4;\infty)$

C) $(-\infty;6]$ D) $[1;\infty)$

17. Chizmada qaysi funksiya grafigi taqriban tasvirlangan?



A) $y=\sin\left(x+\frac{\pi}{6}\right)$ B) $y=\sin\left(x+\frac{\pi}{3}\right)$

C) $y=\sin\left(x-\frac{\pi}{6}\right)$ D) $y=\sin x$

18. Agar $x\neq 0$ bo'lsa,
$5+5^{2x+y}-5^{x+1}-5^{x+y}=0$
tenglamadagi x ni y orqali ifodalang.

A) $x=-1-y$ B) $x=1-y$

C) $x=y-1$ D) $x=y+1$

19. Hisoblang:

$$\left(2^{\frac{\log_2 5}{\log_5 2}}-5^{\frac{1}{\log_5 2}}+5^{\log_5 25}\right)^{0,5}.$$

A) 25 B) 5 C) 0,2 D) 20

20. Tenglamaning ildizlari ko'paytmasini toping:

$\log_x 3+\log_3 x=\log_{\sqrt{x}} 3+\log_3\sqrt{x}+0,5$

A) 1/3 B) 1 C) 27 D) 3

21. $y=\frac{3x^4}{6}-\frac{3x^2}{2}+2x$ funksiya hosilasining $x_0=2$ nuqtadagi qiymatini toping.

A) 10 B) 6 C) 12 D) 8

22. $\int_{-1}^{0}(bx+a)dx=10$ tenglik o'rinli bo'lsa, $b-2a$ ni qiymatini toping.

A) -10 B) -30 C) -20 D) -40

23. Noto'g'ri tenglikni ko'rsating.

1) $\log_a b\cdot\log_a c=\log_a(b+c)$,
2) $\log_a b+\log_a c=\log_a(b\cdot c)$
3) $\log_a b-\log_a c=\log_a(b:c)$,
4) $\log_a b:\log_a c=\log_a(b-c)$,
5) $\log_a b:\log_a c=\log_a(b:c)$

A) 2; 3; 4 B) 1; 2; 4

C) 1; 4; 5 D) 1; 3; 5

24. 5 ta juft raqamdan foydalanib nechta 5 xonali son hosil qilish mumkin?

A) 3500 B) 120 C) 720 D) 96

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25. To'g'ri burchakli uchburchakka ichki chizilgan aylana radiusi 3 ga, bir kateti esa 10 ga teng. Shu uchburchakka tashqi chizilgan aylana radiusini toping.

A) 7 B) 7,25 C) 7,5 D) 8

26. ABC uchburchakning A va C burchaklari 20° va 40° ga, B burchakning bissektrisasi 2 ga teng bo'lsa, $AC-AB$ ni toping.

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

27. $ABCD$ parallelogrammda $BD=6\sqrt{2}$, $\angle ADB=60^\circ$, $\angle CDB=75^\circ$ bo'lsa, AB ni toping.

A) $6\sqrt{3}$ B) $3\sqrt{3}$ C) $6\sqrt{2}$ D) $4\sqrt{2}$

28. Bir burchagi 60° bo'lgan to'g'ri burchakli uchburchakka tomoni 6 sm ga teng bo'lgan romb shunday ichki chizilganki, 60° li burchak ular uchun umumiy, rombning barcha uchlari uchburchakning tomonlarida yotadi. Uchburchakning perimetrini toping.

A) $18+9\sqrt{3}$ sm B) $27+9\sqrt{3}$ sm

C) $27+12\sqrt{3}$ sm D) $27+18\sqrt{3}$ sm

29. ABC uchburchakning tomonlari uzunliklari $AB=5$, $BC=4$ va $AC=4$

bo'lsa, $\overrightarrow{CA}\cdot\overrightarrow{CB}$ skalyar ko'paytmani toping.
A) 4 B) 5 C) 4,5 D) 3,5

30. O'lchamlari $40\times40\times5$ sm bo'lgan to'g'ri burchakli parallelepiped shaklidagi mis g'o'lasidan qalinligi 1 mm bo'lgan tunuka taxtasi tayyorlandi. Bu tunuka taxtaning yuzini toping.
A) $8\,m^2$ B) $80\,sm^2$ C) $0,8\,m^2$ D) $80\,m^2$

Variant-2

1. Agar $\overline{abc}$, $\overline{bca}$, $\overline{cab}$ uch xonali natural sonlar yig'indisi 777 ga teng bo'lsa, $a+b+c$ ni toping.
A) 7 B) 6 C) 8 D) 2

2. Ifodani qiymatini toping:
$$\frac{\left(\sqrt{5}-\sqrt{11}\right)\left(\sqrt{33}+\sqrt{15}-\sqrt{22}-\sqrt{10}\right)}{\sqrt{75}-\sqrt{50}}$$
A) 1,2 B) -1,2 C) 2,4 D) -2,4

3. Ifodani soddalashtiring:
$$\left(\frac{4a^{0.25}+b\cdot c^{1,5}}{\left(c^{1,5}+4\right)\cdot\left(a^{0,25}-b\right)}+\right.$$
$$\left.+\frac{a^{\frac{1}{4}}\cdot c^{\frac{3}{2}}-4b}{\left(4-c^{1,5}\right)\cdot\left(\sqrt[4]{a}-b\right)}\right)\cdot\frac{1}{16+c^3}.$$
A) $\frac{1}{c^3-16}$ B) $\frac{1}{16+c^3}$
C) $\frac{1}{8-c^3}$ D) $\frac{1}{16-c^3}$

4. Kasrni qisqartiring: $\frac{x+y}{\sqrt[3]{x}+\sqrt[3]{y}}$.
A) $\sqrt[3]{x^2}+\sqrt[3]{xy}+\sqrt[3]{y}$ B) $\sqrt[3]{x}+\sqrt[3]{y}$
C) $\sqrt[3]{x^2}-\sqrt[3]{xy}+\sqrt[3]{y^2}$ D) $\sqrt[3]{y}-\sqrt[3]{x}$

5. Amallarni bajaring:
$$\frac{a^{-1}-x^{-1}}{a^{-3}+x^{-3}}:\left(\frac{xa^{-2}+ax^{-2}}{x-a}\right)^{-1}$$
A) a/x B) 2 C) 1 D) x/a

6. Agar $\sqrt{4x+y-13}+\sqrt{5x-2y-13}=0$ bo'lsa, x va y sonlarning ko'paytmasini toping.
A) 3 B) 8 C) -2 D) -4

7. Ildizlari $\frac{1}{10-\sqrt{72}}$ va $\frac{1}{10+6\sqrt{2}}$ ga teng bo'lgan ratsional koeffitsentli kvadrat tenglama tuzing.
A) $7x^2-20x+1=0$ B) $7x^2-5x+1=0$
C) $28x^2-20x+\frac{1}{4}=0$ D) $28x^2-20x+1=0$

8. $(x-4)^3+(x-4)^2+(x-4)(x-3)+$
$+(x-3)^2+(x-3)^3=6$
tenglamani yeching.
A) $3-\sqrt[3]{3}$ B) $3+\sqrt{3}$
C) $\sqrt[3]{3}$ D) $3+\sqrt[3]{3}$

9. $2x^3+mx^2-13x+n=0$ tenglamaning ildizlari $x_1=2$ va $x_2=3$ bo'lsa, uning uchinchi ildizini toping.
A) 1,5 B) -2,5 C) 2,5 D) -1,5

10. $\sqrt{\frac{\sqrt{2}+\sqrt{3}-3}{x-5}}>\sqrt{3}-4$ tengsizlikni yeching.
A) (5; 10) B) $(-\infty;5)$
C) $(5;\infty)$ D) $\left(5\sqrt{2};5\sqrt{3}\right)$

11. $\left|x^2+3x+4\right|+\left|x^2-1\right|>\left|2x^2+3x+3\right|$ tengsizlikning barcha butun yechimlari yig'indisini toping.
A) -2 B) 1 C) -1 D) 0

12. Arifmetik progressiya quyidagicha berilgan: 14; 9; 4; . . . . Bu ketma-ketlikning 81-o'rnida qanday son turibdi?
A) -386 B) -391 C) -376 D) -381

13. Ifodani soddalashtiring:
$$\left(4(\sin\alpha)^{-1}+4(tg\alpha)^{-1}\right):\left(tg\frac{\alpha}{2}\right)^{-1}$$

A) $tg\frac{\alpha}{2}$ B) $tg^2\frac{\alpha}{2}$ C) 1 D) 4

14. Hisoblang.

$\sin 1^\circ + \sin 2^\circ + \sin 3^\circ + \ldots + \sin 359^\circ$

A) 1 B) -1 C) $\sin 179^\circ$ D) 0

15. $\dfrac{\sin x - \frac{1}{2}}{\cos x - \frac{\sqrt{3}}{2}} = 0$ tenglamaning $[-2\pi; 0]$ oraliqdagi ildizlari yig'indisini toping?

A) -180° B) -210°

C) -240° D) -150°

16. $y = x^2$ parabola grafigini o'ngga ikki birlik, yuqoriga uch birlik siljitish (parallel ko'chirish) natijasida hosil bo'lgan parabola tenglamasini toping.

A) $y = x^2 - 4x + 7$ B) $y = x^2 - 4x + 3$

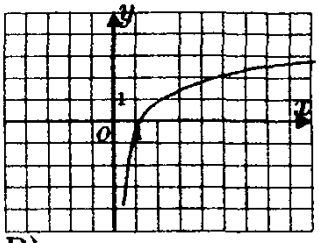
C) $y = x^2 + 4x + 7$ D) $y = 2x^2 + 3$

17. $y = \sqrt{6 - \frac{1}{3}\left|x - \frac{2}{117}\right|}$ funksiyaning barcha butun qiymatlari yig'indisini toping.

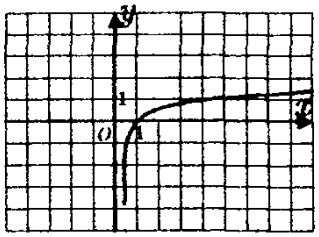
A) 6 B) 2 C) 3 D) 4

18. Qaysi chizmada $y = \log_4 x$ funksiya grafigi taqriban tasvirlangan?

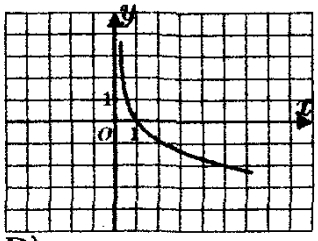
A)



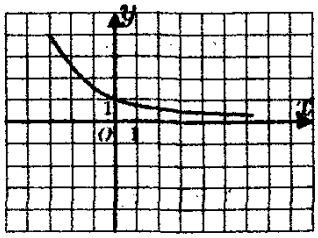
B)



C)



D)



19. $2^{\sqrt{x+1}} - 6 \geq 2^{1-\sqrt{x+1}}$ tengsizlikni qanoatlantirmaydigan barcha butun sonlar yig'indisini toping. (bunda $x \geq -1$)

A) 25 B) 26 C) 27 D) 28

20. Agar $\log_{30} 3 = a$ va $\log_{30} 5 = b$ bo'lsa, $\log_{30} 4$ ni a va b orqali ifodalang.

A) $2 + 2a - 2b$ B) $2 - 2a - 2b$

C) $1 - a - b$ D) $2a + 2ab - 2b$

21. $2\left|\lg\left|x - 1\right|\right| = x + 5$ tenglama nechta yechimga ega?

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

22. Moddiy nuqta yurgan yo'li quyidagi qonuniyat bo'yicha o'zgarmoqda:

$S(t) = \frac{t^3}{3} - 4t^2 + 7t + 2$ (t-vaqt(sek)).

Nechanchi sekund oxirida u ikkinchi marta to'xtaydi?

A) 8 B) 7 C) 5 D) 1

23. $\int \frac{3dx}{x \cdot \ln 2x}$ ni hisoblang

A) $3\ln 2x + c$ B) $6\ln(\ln 2x) + c$

C) $1{,}5\ln(\ln 2x) + c$ D) $3\ln(\ln 2x) + c$

24. Quyida keltirilgan tasdiqlardan qaysilari to'g'ri?

1) har qanday uchburchakka ichki chizilgan aylana markazi uchburchak

bissektrisalarining kesishish nuqtasida bo'ladi; 2) har qanday uchburchakka tashqi chizilgan aylana markazi, uchburchak tomonlarining o'rta nuqtalaridan tomonlariga o'tkazilgan perpendikulyarning kesishish nuqtasida bo'ladi; 3) uchburchakning o'rta chizig'i asosiga parallel bo'lmasligi ham mumkin.

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

25. Quydagi javoblardan qaysi biri bo'sh to'plam.

A) $A=\{x:\lg\left(x^2+1\right)=-4, x\in R\}$

B) $A=\{x:\lg\left(x^2-1\right)=-4, x\in R\}$

C) $A=\{x:\lg\left(1-x^2\right)=-4, x\in R\}$

D) $A=\{x:\lg\left(\sin x\right)=-4, x\in R\}$

26. Teng yonli ABC uchburchakda $AC=d$; $BA=BC=a$; AN va CM bissektrisalar. MN kesma uzunligini toping.

A) $\frac{a}{a+d}$ B) $\frac{a+d}{2}$

C) $ad+a+d$ D) $\frac{ad}{a+d}$

27. Teng yonli ABC uchburchakda $AC=4$; $BA=BC=6$; AN va CM bissektrisalar. MN kesma uzunligini toping.

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

28. Rombning tomoni diagonallari bilan 4 : 5 kabi nisbatda burchak tashkil qilsa, uning burchaklarini toping.

A) 84° va 105° B) 88° va 92°

C) 80° va 100° D) 108° va 72°

29. $ABCDEF$ muntazam oltiburchakda AC, CE, BF, FD diagonallar o'tkazilgan. AC va BF dioganallar L nuqtada, CE va FD diagonallar K nuqtada kesishadi. Agar oltiburchakning tamoni $2\sqrt{3}$ ga teng bo'lsa, $LCKF$ to'rtburchak yuzini toping.

A) $5\sqrt{3}$ B) $8\sqrt{3}$ C) $9\sqrt{3}$ D) $6\sqrt{3}$

30. Piramidaning asosi tomoni 6 ga teng bo'lgan muntazam uchburchakdan iborat. Uning ikkita yon yoqlari asos tekisligiga perpendikulyar bo'lib, ular teng yonli to'g'ri burchakli uchburchakdan iborat. Piramida yon sirtining yuzini toping.

A) $40+9\sqrt{7}$ B) $36+6\sqrt{7}$

C) $40+6\sqrt{7}$ D) $36+9\sqrt{7}$

Variant-3

1. a,b,c musbat butun sonlar uchun $x=3a+2=5b+4=7c+6$ tengliklar bajarilsa, x uch xonali sonning eng katta qiymatini toping.

A) 999 B) 944 C) 945 D) 976

2. $\frac{5}{2^2\cdot 3^2}+\frac{7}{3^2\cdot 4^2}+\frac{9}{4^2\cdot 5^2}+\ldots+\frac{39}{19^2\cdot 20^2}$ hisoblang.

A) 0,125 B) 0,3252

C) 0,2475 D) 0,5252

3. Agar $\frac{a}{b}=7-\sqrt{40}$ bo'lsa, $\frac{\sqrt{a}-\sqrt{5b}}{\sqrt{b}}$ ni qiymatini toping.

A) $\sqrt{2}$ B) $\sqrt{5}$ C) $-\sqrt{2}$ D) $-\sqrt{5}$

4. Ifodani soddalashtiring:

$$\left(a^{\frac{1}{3}}+b+\frac{4b^2-a^{\frac{2}{3}}}{\sqrt[3]{a}-b}\right):$$

$$:\left(\frac{a^{\frac{1}{3}}}{\sqrt[3]{a^2}-b^2}-\frac{2}{\sqrt[3]{a}+b}+\frac{1}{\sqrt[3]{a}-b}\right)\cdot\frac{2}{a^{\frac{1}{3}}+b}$$

A) $b\cdot\left(b-a^{\frac{1}{3}}\right)$ B) $2b\cdot\left(a^{\frac{1}{3}}+b\right)$

C) b D) $2b$

5. Uch yashikda 85,6 kg meva bor. 2-yashikdagi meva 1-yashikdagi mevaning

0,8 qismini tashkil qiladi. 3-yashikda esa 2-yashikdagining 42,5% miqdoricha meva bor. Birinchi yashikda qancha meva bor?
A) 44 kg B) 36 kg C) 40 kg D) 38 kg

6. $\left(x^2-\frac{4}{x^2}\right)\left(\frac{x}{3x+2}\right)=\frac{x^2+2}{x}$ tenglamaning ildizlari yig'indisini toping.
A) 2 B) 6 C) 4 D) 3

7. Tenglamani yeching:
$x^4-29x^2+100=0$
A) $\pm2;\pm5$ B) $\pm2;\pm10$
C) $\pm4;\pm10$ D) $\varnothing$

8. Tenglamalar sistemasini yeching:
$$\begin{cases}\frac{3b+2a}{ab}=\frac{5}{3}\\ \frac{6b+2a}{ab}=\frac{5}{2}\end{cases}$$
A) $a=\frac{13}{5};b=\frac{12}{5}$ B) $a=\frac{18}{5};b=\frac{12}{5}$
C) $a=\frac{18}{5};b=\frac{13}{5}$ D) $a=\frac{11}{5};b=\frac{13}{5}$

9. Tengsizlikni yeching:
$5\sqrt{1-\frac{1}{x}}>\frac{7x-1}{x}$
A) (2; 3) B) $\left(-\frac{1}{4};-\frac{1}{13}\right)$
C) $\left(-\frac{1}{3};-\frac{1}{8}\right)$ D) $\left(\frac{1}{3};\frac{1}{8}\right)$

10. a ning qanday eng katta butun qiymatida $4x^2-8x-1>a$ tengsizlik x ning barcha qiymatlarida o'rinli bo'ladi?
A) -7 B) -4 C) -5 D) -6

11. 1,2,2,3,3,3,4,4,4,4,5,5,5,5,5,6... kamaymaydigan sonlar ketma-ketligida har bir son o'zining qiymati necha bo'lsa, shuncha marta takrorlanadi. Bu ketma-ketlikda 2017-o'rinda turgan sonni toping.
A) 65 B) 62 C) 63 D) 64

12. Arifmetik progressiyaning barcha manfiy hadlari yig'indisini toping: -7,2; -6,9; . . .
A) -90 B) -90,3 C) -89,4 D) -89,7

13. $\frac{1}{\sin 70^\circ}-tg170^\circ\cdot tg160^\circ$ ifodani qiymatini toping.
A) 1 B) -1 C) 0 D) -2

14. Agar $8\cdot\sin3^\circ\cdot\cos3^\circ\cdot\cos6^\circ=m$ tenglik bajarilsa, $ctg78^\circ$ ni m orqali ifodalang.
A) $\frac{\sqrt{4-m^2}}{3}$ B) $\frac{m}{\sqrt{4-m^2}}$
C) $\frac{\sqrt{4-m^2}}{m}$ D) $\frac{\sqrt{16-m^2}}{9m}$

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15. Tenglamaning ildizlari yig'indisini toping. $x\in(0^\circ;720^\circ)$
$\cos2x\cdot\cos3x=-1$,
A) 540° B) 180° C) 360° D) 720°

16. $f(x)=6^x$ bo'lsa, $\left(f(-2)\cdot f\left(\frac{1}{2}\right)\right)^2$ ning qiymatini toping.
A) 216 B) 36 C) $\frac{1}{36}$ D) $\frac{1}{216}$

17. $4^x>19-1{,}5x$ tengsizlikning eng kichik natural yechimini toping.
A) 2 B) 4 C) 16 D) 3

18. a,b sonlar uchun $a^2+b^2=14ab$ tenglik o'rinli bo'lsa, $\frac{4\lg\frac{a+b}{4}}{\lg\frac{1}{a}+\lg\frac{1}{b}}$ ning qiymatini toping.
A) 1 B) -2 C) 2 D) -1

19. $\lg(2^x+x+4)=x-x\lg5$ tenglamaning ildizi x_0 bo'lsa, x_0+4 ni toping.
A) 0 B) 2 C) 1 D) 3

20. $\log_2(arctgx) > 1$ tengsizlikni yeching.

A) $(-\infty; \infty)$ B) $\varnothing$

C) $\left(-\frac{\pi}{2}; \frac{\pi}{2}\right)$ D) $\left(0; \frac{\pi}{2}\right)$

21. $M(2; -50)$ nuqtadan $f(x) = 7x^2 - 7x - 1$ funksiya grafigiga ikkita urinma o'tkazilgan. Urinish nuqtalar absissalarining yig'indisini toping.

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

22. Boshlang'ich funksiyaning umumiy ko'rinishini toping: $f(x) = \sin^2 x$

A) $\frac{2x + \sin 2x}{4} + C$ B) $\frac{2x - \sin 2x}{2} + C$

C) $\frac{x - \sin 2x}{2} + C$ D) $\frac{2x - \sin 2x}{4} + C$

23. Quyidagi tasdiqlardan qaysi biri to'g'ri:

1) uchburchakka tashqi chiziglan aylananign radiusi $R = \frac{abc}{2S}$ (a,b,c-uchburchakning tomonlari, S-uchburchakning yuzi) formula bilan hisoblanadi.

2) radiusi R ga, markaziy burchagi α ga teng doiraviy sektorning yuzi $S = \frac{\pi R^2}{360^\circ} \cdot \alpha$ formula bilan hisoblanadi.

3). Tamoni a ga teng burchagi α ga teng bo'lgan romboning yuzi $S = a^2 \sin\alpha$ formula bilan hisoblanadi.

4) diagonallari d_1 va d_2 ga, ular orasidagi burchagi α ga teng ixtiyoriy qavariq to'rtburchakning yuzi $S = d_1 \cdot d_2 \cdot \sin\alpha$ formula bilan hisoblanadi.

5) o'xshash figuralar yuzlarining nisbati ularning mos chiziqli o'lchovlari kvadratlarining nisbatiga teng.

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

24. $A = \{1;3;5;6;8;10\}$ va $B = \{5;6;7;8;10\}$ to'plamlar berilgan. $A \cup B$ to'plam elementlari sonini toping.

A) 8 B) 7 C) 11 D) 6

25. ABC, PQR va XYZ uchburchaklar teng. Agar $AB = 5\ sm$, $QR = 6\ sm$ va $ZX = 7\ sm$ ekanliklari ma'lum bo'lsa, uchburchakning qolgan tomonlarini toping.

A) $BC = 6sm$, $CA = 7sm$, $PQ = 7sm$, $RP = 6sm$, $XY = 6sm$, $YZ = 5sm$

B) $BC = 6sm$, $CA = 7sm$, $PQ = 5sm$, $RP = 7sm$, $XY = 5sm$, $YZ = 6sm$

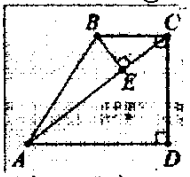
C) $BC = 7sm$, $CA = 6sm$, $PQ = 7sm$, $RP = 6sm$, $XY = 5sm$, $YZ = 6sm$

D) $BC = 7sm$, $CA = 6sm$, $PQ = 5sm$, $RP = 7sm$, $XY = 6sm$, $YZ = 5sm$

26. ABC to'g'ri burchakli uchburchakda E nuqta BC tamonni $BE : EC = 3:1$ kabi nisbatda bo'ladi, D nuqta esa AB gipotenuzada yotadi. Agar $BD = 8, AC = 12$ va $\angle BAC = 60^\circ$ bo'lsa, BDE uchburchak yuzini toping.

A) 36 B) 48 C) $18\sqrt{3}$ D) $24\sqrt{3}$

27. To'g'ri burchakli trapetsiyada $AD = 8$, $BC = 4$ va $CD = 6$ bo'lsa, BE kesmaning uzunligini toping.



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

28. Diametri AB bo'lgan, $A(2;0)$ va $B(-2;6)$ nuqtalardan o'tuvchi aylana tenglamasini toping.

A) $(x-3)^2 + y^2 = 13$

B) $(x-3)^2 + y^2 = 9$

C) $x^2 + (y-3)^2 = 13$

D) $x^2 + (y-3)^2 = 9$

29. Agar $\vec{a}(-3;2)$, $\vec{b}(2;-1)$ bo'lsa, $\vec{a}-\vec{b}$ ni toping.
A) $(-5;-3)$ B) $(-5;3)$
C) $(5;-3)$ D) $(-1;-1)$

30. Uchburchakli og'ma prizmaning yon qirralaridan biridagi ikki yoqli burchak 120° ga teng, prizmaning shu qirrasidan boshqa yon qirralarigacha masofalar 16 sm va 14 sm. Agar prizmaning yon qirrasi 20 sm bo'lsa, uning yon sirtining yuzini (sm^2) toping.
A) 1100 B) 900 C) 1000 D) 1120

Variant-4

1. $2016\cdot(2017\cdot 2018+1)$ ifoda quyidagilardan qaysi biriga teng.
A) 2017^3+1 B) 2017^2-1
C) $2017\cdot 2018$ D) 2017^3-1

2. $\frac{4}{13}$ ning kasr qismini 2016 – raqamini toping.
A) 2 B) 6 C) 7 D) 9

3. $(2a-b)^2+8b-16a$ ifodaning eng kichik qiymatini toping.
A) -16 B) 8 C) -8 D) 16

4. Ifodani qiymatini $a=22$ bo'lganda hisoblang:
$$\left(\frac{1}{a+3}-\frac{6}{9-a^2}\right):\left(\frac{a^2-6a-27}{(a^2-9)(a-3)^2}+\right.$$
$$\left.+\frac{12}{a^3-9a^2+27a-27}\right)$$
A) 14,44 B) -14,4 C) 14,4 D) -14,44

5. $a^2-b^2+a+7b-12$ ko'phadning ko'paytuvchilaridan birini toping.
A) $a+b+3$ B) $a-b+4$
C) $a-b+3$ D) $a+b+4$

6. Imtihonda belgilangan har bir to'g'ri javobga 4 ball berilib, har bir noto'g'ri javob uchun 1 ball chegiriladi. Belgilanmagan javoblar uchun ball berilmaydi ham, chegirilmaydi ham. Agar 50 ta savolli testdan o'quvchi 153 ball to'plagan bo'lsa, u nechta savolga javob belgilamagan?
A) 3 ta yoki 8 ta B) 5 ta yoki 8 ta
C) 5 ta yoki 9 ta D) 5 ta yoki 3 ta

7. x,y natural sonlar $\frac{1}{x+y-14}-\frac{1}{x-y-6}=1$ tenglamaning ildizi bo'lsa, $x-y$ ni toping.
A) 1 B) 10 C) 6 D) 4

8. $(x^2-6)x=a$ tenglama a ning qanday qiymatlarida 1 ta haqiqiy ildizga ega bo'ladi?
A) $\pm 4\sqrt{2}$ B) $\pm\sqrt{2}$ C) $\left(-4\sqrt{2};4\sqrt{2}\right)$
D) $\left(-\infty;-4\sqrt{2}\right)\cup\left(4\sqrt{2};\infty\right)$

9. Agar $\frac{1}{4}<\frac{3}{b}<\frac{1}{2}$ va $\frac{1}{6}<\frac{2}{a}<\frac{1}{3}$ tengsizliklar o'rinli bo'lsa, $a+b$ ning eng katta butun qiymatini toping.
A) 24 B) 25 C) 22 D) 23

10. $(x^2-3x-2)\cdot(x^2-3x+1)>10$ tengsizlik ni qanoatlantirmaydigan eng katta va eng kichik butun sonlar yig'indisini toping.
A) 5 B) 3 C) 2 D) 4

11. $a=1\cdot 2+2\cdot 3+3\cdot 4+\ldots+42\cdot 43$,
$b=5\cdot 4+10\cdot 6+15\cdot 8+\ldots+210\cdot 86$
bo'lsa, $\frac{b}{a}$ ning qiymatini toping.
A) 10 B) 6 C) 12 D) 8

12. Arifmetik progressiya uchun $a_8=24$, $a_3=15$ bo'lsa, a_1+a_{10} ni toping.
A) 29 B) 35 C) 39 D) 44

13. Hisoblang: $\frac{1}{\sin 200^\circ}+\frac{\sqrt{3}}{3\cos 20^\circ}$.

A) $-\frac{2}{\sqrt{3}}$ B) $-\frac{4}{\sqrt{3}}$ C) -1 D) $-\sqrt{3}$

14. Agar $m = a\cos x + b\sin x$ va $n = -\sqrt{a^2+b^2}$ bo'lsa, quyidagi tengsizliklardan qaysi biri x ning istalgan qiymatlari uchun o'rinli bo'ladi.
A) $m > n$ B) $m \geq n$
C) $m < n$ D) $m \leq n$

15. $\sin\left(\pi - x\right) - \cos\left(\frac{\pi}{2} + x\right) = \sqrt{3}$ tenglamaning $[-2\pi;\ 2\pi]$ oraliqqa tegishli ildizlari soni nechta?
A) 2 B) 1 C) 3 D) 4

16. $y = 3x - 3$ va $y = -0,5x - a$ funksiyalarning grafiklari a ning qanday qiymatlarida koordinatalar tekisligining IV choragida kesishadi?
A) $\left(\frac{1}{2};\ 3\right)$ B) $\left(-\frac{1}{2};\ 3\right)$
C) $\left(-3;\ \frac{1}{2}\right)$ D) $\left(-3;\ -\frac{1}{2}\right)$

17. Agar $f\left(2x-3\right) = 3x + 5$ bo'lsa, $f\left(f\left(1\right)\right)$ ni toping.
A) 11 B) 38 C) 26 D) 16

18. $\frac{13^{x^2+3x+2} - 11^{x^2+3x+2}}{x+1} = 0$ tenglamaning ildizi 8 dan qancha kam?
A) 14 B) 4 C) 8 D) 10

19. $y = \log_x 7 + \log_7 x$ funksiyaning qiymatlar to'plamini toping. $(x > 1)$
A) $(1;\ \infty)$ B) $[2;\ \infty)$ C) $[2;\ 7]$ D) $[7;\ \infty)$

20. Tenglamani yeching:
$\lg\left(x^2 - 3x + 1\right) \cdot \lg\left(x - 1\right) = 0$
A) 3 B) 2 C) 12 D) 10

21. $y = x^2 - \left|2x - 4\right|$ funksiya grafigiga $x = 3$ va $x = -3$ nuqtalarda o'tkazilgan urinmalarning orasidagi burchakni toping.
A) $arctg\frac{8}{15}$ B) $arctg\frac{12}{5}$
C) $arctg\frac{4}{3}$ D) $\frac{\pi}{4}$

22. $\int f'(x)dx = 2x^3 - 6x^2 + C, \quad (C \in R)$ tenglik berilgan. $f(x)$ funksiyaning minimum nuqtasi absissasini toping.
A) -2 B) -17 C) 2 D) 17

23. Quyida keltirilgan tasdiqlardan qaysilari to'g'ri?
1) Agar uchburchakning uchta tomoni boshqa uchburchakning uchta tomoniga proporsional bo'lsa, bunday uchburchaklar o'xshashdir; 2) Trapetsiyaning yuzi balandligining yarmi va asoslari ayirmasi ko'paytmasiga teng; 3) Romb bo'lmagan kvadrat mavjud; 4) Trapetsiyaning yuzi uning o'rta chizig'i va balandligi ko'paytmasiga tengdir.
A) 1; 3 B) 2; 4 C) 2; 3 D) 1; 4

24. $A = \{1;3;5;6;8;10\}$ va $B = \{5;6;7;8;10\}$ to'plamlar berilgan. $A \cap B$ to'plam elementlari sonini toping.
A) 3 B) 4 C) 5 D) 6

25. Ikkita katetdan teng uzoqlikda joylashgan hamda gipotenuzada yotgan nuqta gipotenuzani 20 va 30 sm uzunlikdagi kesmalarga ajratadi. Uchburchakning katta katetini toping.
A) $\frac{75}{\sqrt{26}}sm$ B) $\frac{150}{\sqrt{13}}sm$
C) $\frac{150}{\sqrt{26}}sm$ D) $\frac{75}{\sqrt{13}}sm$

26. Perimetri $32\,sm$ bo'lgan parallelogramda diagonallar o'tkazilgan. Ikkita qo'shni uchburchaklar perimetrlari orasidagi ayirma $8\,sm$ ga teng. Parallelogramm katta tomonining uzunligini (sm) toping.
A) 4 B) 8 C) 12 D) 24

27. Aylana tashqarisidagi A nuqtadan aylanaga ikkita kesuvchi o'tkazildi. Birinchi kesuvchi B va C nuqtalarda, ikkinchi kesuvchi D va E nuqtalarda kesib o'tadi (bunda B nuqta A va C nuqtalar orasida, D nuqta A va E nuqtalar orasida yotadi). Agar $D\breve{E} = E\breve{C} = C\breve{B} = 3D\breve{B}$ munosabat o'rinli bo'lsa, kesuvchilar orasidagi burchak necha gradus?

A) 24° B) 54° C) 36° D) 48°

28. $A(0;1)$ va $B(5;-3)$ nuqtalar berilgan. Agar B nuqta AC kesmaning o'rtasi bo'lsa, C nuqta koordinatalarini yig'indisini toping.

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

29. $ABCDA_1B_1C_1D_1$ to'g'ri burchakli parallelepiped $\overrightarrow{AA_1}=\vec{a}$, $\overrightarrow{AB}=\vec{b}$ va $\overrightarrow{AD}=\vec{c}$ uchun $\overrightarrow{AC_1}$ ni $\vec{a},\vec{b}$ va $\vec{c}$ vektorlar orqali ifodalang.

A) $\vec{a}+\vec{b}+\vec{c}$ B) $\vec{a}+\vec{b}-\vec{c}$
C) $\vec{a}-\vec{b}+\vec{c}$ D) $\vec{b}+\vec{c}-\vec{a}$

30. Asosi $5\sqrt{3}$ ga uchidagi burchagi 120° ga teng bo'lgan teng yonli uchburchak o'zining asosi atrofida aylantirishdan hosil bo'lgan jismning to'la sirtini toping.

A) 25π B) 32π C) 16π D) $48\sqrt{3}\pi$

Variant-5

1. Agar $47,8\cdot 10^n = 0,0000478$ bo'lsa, n ni toping.

A) -6 B) -7 C) -5 D) -4

2. Ifodaning qiymatini toping:

$$\sqrt[3]{\frac{400\sqrt{23^2-17^2}}{\sqrt{0,6}}}$$

A) 18 B) 21 C) 19 D) 20

3. Ifodani soddalashtiring:

$$\frac{a^{\frac{1}{3}}\cdot c^2 - 3b^{\frac{1}{2}}}{\left(c^2+3\right)\cdot\left(a^{\frac{1}{3}}+\sqrt{b}\right)} + \frac{3a^{\frac{1}{3}}+b^{\frac{1}{2}}\cdot c^2}{\left(c^2-3\right)\cdot\left(a^{\frac{1}{3}}+\sqrt{b}\right)} - 1$$

A) 0 B) 1 C) $\frac{18}{c^4-9}$ D) $\frac{9}{c^4-9}$

4. Agar $a<0,\ b<0,\ c>0$ bo'lsa, $\sqrt{b^2}+|b-c|+|c-a|+b$ ifodani soddalashtiring.

A) $a-2b$ B) $a-2b+c$
C) $-a-b+2c$ D) $a-b$

5. Agar $x<-2$ bo'lsa, $\sqrt{x^2+5x+2+\sqrt{4-4x+x^2}}$ ifodani soddalashtiring.

A) $2+x$ B) $2-x$ C) $-2x$ D) $-2-x$

6. Turistik firma uch kunlik avtobusda sayohat tashkil qildi. Bir kishi uchun ekskursiya narxi 3500 so'm. guruhlarga chegirmalar joriy etildi, ya'ni 3 dan 10 kishigacha – 6%, 10 kishidan ortiq bo'lsa – 10%. 6 kishidan iborat guruhga jami necha so'm chegirma qilingan?

A) 1300 B) 1260 C) 1240 D) 1280

7. x ning qanday qiymatida $3(2-x)-8=10$ tenglik o'rinli bo'ladi.

A) -4 B) -6 C) 4 D) 6

8. $\begin{cases} x+y+z=10 \\ y+z+u=6 \\ z+u+x=8 \\ u+x+y=9 \end{cases}$ tenglamalar sistemasidan $x+2y+3z+4u$ ning qiymatini toping.

A) 25 B) 21 C) 18 D) 27

9. Agar $x<-1$, $y>1$ bo'lsa, quyidagi javoblardan qaysi biri har doim o'rinli.

A) $x^4>y$ B) $y^3>x^3$
C) $x^2<y^2$ D) $y^2>x^6$

10. $\left|\frac{10-2x}{1+2x}\right| > 0$ tengsizlikni yeching.

A) $\left(-\infty;-\frac{1}{2}\right)\cup\left(-\frac{1}{2};5\right)\cup(5;\infty)$

B) $\left(-\infty;-\frac{1}{3}\right)\cup\left(-\frac{1}{3};\infty\right)$ C) $(-\infty;\infty)$

D) $\left(-\infty;-\frac{1}{3}\right)\cup\left(-\frac{1}{3};2\right)\cup(2;\infty)$

11. $\left\{2-\sqrt{2}\right\}+\left\{2+\sqrt{2}\right\}+\left\{3-\sqrt{3}\right\}+$
$+\left\{3+\sqrt{3}\right\}+\left\{4-\sqrt{4}\right\}+\left\{4+\sqrt{4}\right\}+\ldots+$
$+\left\{2017-\sqrt{2017}\right\}+\left\{2017+\sqrt{2017}\right\}$
hisoblang. Bunda $\{a\}-a$ sonining kasr qismi.
A) 2016 B) 2017 C) 1973 D) 1972

12. 110 soni 10,14,18,... arifmetik progressiyaning nechanchi hadi.
A) 26 B) 25 C) 24 D) 27

13. Hisoblang: $\frac{1}{\sin 200^\circ}-\frac{\sqrt{3}}{3\cos 200^\circ}$

A) $-\sqrt{3}$ B) $-\frac{2}{\sqrt{3}}$ C) -1 D) $-\frac{4}{\sqrt{3}}$

14. Hisoblang: $\arcsin(\sin 1)$

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

15. Tenglamani yeching:
$$\sin x+\cos x=\sqrt{2}$$

A) $x=\frac{\pi}{4}+2\pi n,\ n\in Z$

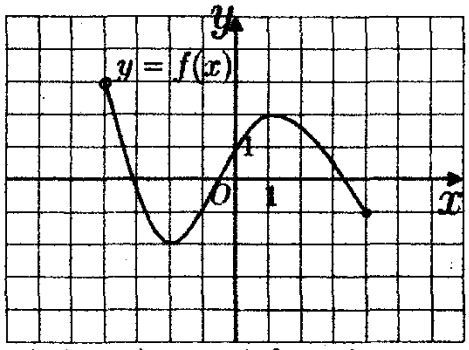
B) $x=\frac{3\pi}{4}+2\pi n,\ n\in Z$

C) $x=\frac{3\pi}{4}+\pi n,\ n\in Z$

D) $x=\frac{\pi}{4}+\pi n,\ n\in Z$

16. $x=(0,6+0,06)\cdot(0,6-0,06)+$
$+(0,8+0,08)\cdot(0,8-0,08)$ bo'lsa, eng kichik sonni aniqlang.
A) $\sqrt{x}$ B) $\sqrt[3]{x}$ C) x^2 D) x^3

17. Grafik ko'rinishda berilgan funksiyaning qiymatlar to'plamini toping.



A) (–2; 2) B) [–2; 3)
C) [–2; 2] D) (–4; 4]

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18. $2^x=x-2$ tenglama nechta haqiqiy yechimga ega?
A) 1 ta B) 2 ta C) 3 ta
D) haqiqiy yechimga ega emas

19. Ifodani soddalashtiring:
$$\frac{64-\log_a^3 b^4}{(\log_a b+\log_b a+1)\cdot\log_a\frac{a}{b}}\cdot\log_{b^{16}} a^4.$$
A) 8 B) 32 C) 64 D) 16

20. $\frac{3x^2-16x+21}{\log_{0,3}(x^2+6)}<0$ tengsizlikni yeching.

A) $\left(-\sqrt{6};\sqrt{6}\right)$ B) $\left(-\infty;\frac{7}{3}\right)\cup(3;\infty)$

C) $\left(-\sqrt{6};\frac{7}{3}\right)\cup\left(\sqrt{6};3\right)$ D) $\left(\sqrt{6};\infty\right)$

21. Funksiyaning minimum nuqtasini toping: $f(x)=x^3\cdot e^{x+7}$
A) 1 B) -3 C) 4 D) 3

22. $y=\cos 3x\cos 12x$ funktsiyaning boshlang'ich funktsiyasini toping.
A) $\frac{1}{18}\cos 9x-\frac{1}{30}\cos 15x+C$

B) $\frac{1}{18}\sin 9x - \frac{1}{30}\sin 15x + C$

C) $\frac{1}{18}\cos 9x + \frac{1}{30}\cos 15x + C$

D) $\frac{1}{18}\sin 9x + \frac{1}{30}\sin 15x + C$

23. To'g'ri qoidalarni toping.

1) $\int \frac{dx}{\sqrt{a^2-x^2}} = \arccos\frac{x}{a} + C$

2) $\int \frac{dx}{\sqrt{a^2-x^2}} = \arcsin\frac{x}{a} + C$

3) $\int \frac{dx}{a^2+x^2} = \frac{1}{a}arctg\frac{x}{a} + C$

4) $\int \frac{dx}{a^2+x^2} = -arcctg\frac{x}{a} + C$

5) $\int \frac{dx}{a^2+x^2} = -\frac{1}{a}arcctg\frac{x}{a} + C$

6) $\int \frac{dx}{\sqrt{a^2-x^2}} = -\frac{1}{a}\arccos\frac{x}{a} + C$

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

24. Voleybol jamoasi 9 ta o'yinchidan iborat. Boshlang'ich tarkibiga oltita o'yinchini necha xil usul bilan tanlab olish mumkin?

A) 120 B) 84 C) 60 D) 168

25. Teng yonli ABC uchburchakning asosidagi burchaklarining bissektrisalari yon tomonlarini mos ravishda M va N nuqtalarda kesadi. Agar ABC uchburchakning asosi 6 ga, yon tomoni 4 ga teng bo'lsa, MN kesmaning uzunligini toping.

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

26. Teng yonli trapetsiyaning pastki asosi 20 sm ga, ustki asosi esa 14 sm ga teng. Bu trapetsiyaning diagonallari o'zaro perpendikulyar. Uning yuzini toping.

A) $269\,sm^2$ B) $289\,sm^2$

C) $169\,sm^2$ D) $256\,sm^2$

27. Aylana to'g'ri burchakli uchburchakning katta katetiga urinib, shu katet qarshisidagi burchak uchidan o'tadi, markazi esa gipotenuzada yotadi. Agar katetlarining uzunliklari 5 va 12 bo'lsa, aylanani radiusini toping.

A) $\frac{65}{9}$ B) $\frac{65}{36}$ C) $\frac{55}{18}$ D) $\frac{65}{18}$

28. $3x+2y=1$; $2x+3y=2$ to'g'ri chiziqlarning kesishish nuqtasi va $M(-4;0)$ nuqtadan o'tuvchi to'g'ri chiziq tenglamasini yozing.

A) $4x-19y+16=0$ B) $4x+19y+16=0$

C) $4x-9y+16=0$ D) $4x+9y+16=0$

29. O'tkir burchagi 60° bo'lgan rombning tomonlari P tekislik bilan α burchak tashkil etib, kichik diagonali shu tekislikda yotadi. Agar $\sin\alpha = \frac{\sqrt{3}}{4}$ bo'lsa, hosil bo'lgan ikki yoqli burchakni toping.

A) 60° B) 90° C) 45° D) 30°

30. Barcha qirralari teng bo'lgan uchburchakli piramidaga ichki chizilgan shar radiusi $\frac{2\sqrt{2}}{\sqrt{3}}$ ga teng. Piramida qirrasi uzunligini toping.

A) 8 B) 4 C) 2 D) 16

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Variant-6

1. Besh xonali $\overline{x853y}$ sonini 55 ga bo'lganda natural son hosil bo'ladi. x ning barcha qiymatlari yig'indisini toping.

A) 7 B) 11 C) 3 D) 14

2. Hisoblang

$$\left(1\frac{1}{7}\right)\cdot\left(1\frac{1}{8}\right)\cdot\left(1\frac{1}{9}\right)\cdot\ldots\cdot\left(1\frac{1}{62}\right)$$

A) 9 B) $\frac{11}{7}$ C) 7 D) $\frac{10}{7}$

3. $(x+a-3)^{2018}+x-4$ ko'phadning ozod hadi 0 ga teng bo'ladigan a ning barcha qiymatlari yig'indisini toping.

A) 2018 B) 2019 C) 2000 D) 6

4. Agar $x+\frac{1}{x}=6$ bo'lsa, $x^3+\frac{1}{x^3}$ ni qiymatini toping.
A) 36 B) 216 C) 198 D) 64

5. $\frac{100-4c^2-4cd-d^2}{20c+10d-4c^2-4cd-d^2}$ kasrni qisqartiring.
A) $\frac{10+2c+d}{2c+d}$ B) $\frac{10-2c-d}{2c+d}$
D) $\frac{10+2c+d}{2c-d}$ D) $\frac{10-2c-d}{2c-d}$

6. Motorli qayiq bir to'xtash joyidan ikkinchisigacha oqim bo'yicha 3 soatda suzib boradi, sol esa shu masofani 12 soatda suzib o'tadi. Shu masofani motorli qayiq oqimga qarshi nccha soatda suzib o'tadi?
A) 6 B) 8 C) 9 D) 15

7. $\frac{x^7-4x^5+4x^2-7x-2}{x^7-4x^5+3x^2-4x-4}=1$ tenglamaning barcha ildizlari yig'indisini (agar u bitta bo'lsa, shu ildizini o'zini) toping.
A) 3 B) 1 C) -1 D) 2

8. $\left(x^2+14x+14\right)\left(x^2+x+14\right)=14x^2$ tenglamaning haqiqiy ildizlari yig'indisini toping.
A) -14 B) -15 C) -13 D) -16

9. Agar $a^2<a$ tengsizlik o'rinli bo'lsa, quyidagi sonlar orasidagi munosabatni toping. $x=a^{1947}$, $y=a^{1960}$, $z=a^{2019}$.
A) $x<y<z$ B) $y<x<z$
C) $z<y<x$ D) $z<x<y$

10. Tengsizlikni yeching:
$(2x-7)^6+\sqrt{x+1}\geq 1$
A) $[-1;\infty)$ B) $(-\infty;\infty)$
C) $[3;\infty)$ D) $[1;\infty)$

11. Agar $|a|<1$, $|b|<1$ va
$a+ab+ab^2+ab^3+\ldots=\frac{3}{4}$;
$b+ba+ba^2+ba^3+\ldots=\frac{2}{3}$ bo'lsa, $12ab$ ning qiymatini toping.
A) 12 B) 6 C) 3 D) 2

12. Musbat hadli geometrik progressiyada $S_2=3$; $S_3=7$ bo'lsa S_7 ni toping.
A) 127 B) 115 C) 121 D) 63

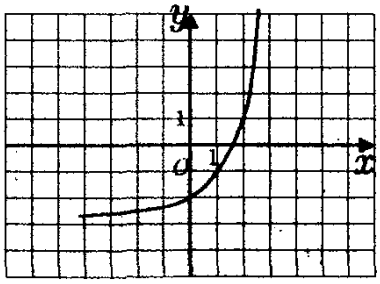
13. Agar $\sqrt{\sin\alpha-\sqrt{\sin\alpha-\sqrt{\sin\alpha-\ldots}}}=\frac{1}{2}$ bo'lsa, $\sin\alpha$ ning qiymatini toping.
A) 0,75 B) 0,8 C) 0,96 D) 0,28

14. $\left(\sin 161^\circ+\sin 41^\circ\right)\cdot\left(\sin 139^\circ+\sin 19^\circ\right)-\left(\sin 49^\circ-\sin 109^\circ\right)\cdot\left(\sin 131^\circ-\sin 71^\circ\right)$ ni soddalashtiring.
A) $\sin 22^\circ$ B) $\cos 22^\circ$ C) 1 D) 2

15. Tenglamani yeching:
$\sin^{100}x+\cos^{100}x=1$
A) $\left\{\frac{\pi n}{2};\ n\in Z\right\}$ B) $\left\{\frac{\pi n}{4};\ n\in Z\right\}$
C) $\left\{\frac{\pi n}{3};\ n\in Z\right\}$ D) $\left\{\frac{2\pi n}{3};\ n\in Z\right\}$

16. $f(x)=0,7^x$, $g(x)=0,8^x$, $h(x)=0,9^x$ bo'lsa, $f(44)$, $g(33)$, $h(22)$ larni o'sish tartibida yozing.
A) $f(44)<g(33)<h(22)$
B) $g(33)<h(22)<f(44)$
C) $g(33)<f(44)<h(22)$
D) $h(22)<f(44)<g(33)$

17. Grafik ko'rinishda berilgan funksiyani toping.



A) $y=e^x-3$ B) $y=2^{x-3}$

C) $y=\left(\frac{1}{2}\right)^x-3$ D) $y=2^x-3$

18. Tengsizlikni yeching: $(e+1)^x>\sqrt{x}$

A) $(1;\infty)$ B) $[0;\infty)$

C) $(0;1)$ D) $[1;\infty)$

19. $y=\ln\left(x^2-2x-2\right)$ funksiya musbat qiymat qabul qiladigan barcha x larni toping.

A) $(-\infty;-1)\cup(3;\infty)$ B) $(3;\infty)$

C) $\left(3;1+\sqrt{5}\right)$ D) $\left(-\sqrt{5};-1\right)$

20. $3^{\log_2(2x-3)}=\left(2x^2-10x+13\right)^{\log_2 3}$ tenglamaning barcha yechimlari yig'indisini toping.

A) 5 B) 3 C) 6 D) 7

21. $\log_{x-2}(2x-7)>1$ tengsizlikni yeching.

A) (3,5; 5) B) (3,5; ∞)

C) (5; ∞) D) $(0;3,5)\cup(5;\infty)$

22. $y=x^2-|2x-4|$ funktsiya grafigiga $x=3$ va $x=-3$ nuqtalarda o'tkazilgan urinmalarning kesishish nuqtasining abtsissasini toping.

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

23. $\int x^2\cdot\sin x\,dx$ ni hisoblang.

A) $\left(2+x^2\right)\cos x+2x\sin x+C$

B) $\left(2-x^2\right)\cos x+2x\sin x+C$

C) $\left(2+x^2\right)\cos x+2x\cos x+C$

D) $\left(2+x^2\right)\cos x-2\sin x+C$

24. Qaysi formula yordamida uchburchakning m_a medianasini a, b, c tomonlari orqali hisoblash mumkin?

A) $m_a=\frac{1}{2}\sqrt{2b^2-2c^2-a^2}$

B) $m_a=\frac{1}{2}\sqrt{2b^2+2c^2+a^2}$

C) $m_a=\sqrt{2b^2+2c^2-a^2}$

D) $m_a=\frac{1}{2}\sqrt{2b^2+2c^2-a^2}$

25. Agar $A\cap B=\{b,c,d\}$ va $A\cap C=\{b,d\}$ bo'lsa, $A\cap(B\cup C)$ to'plam elementlarini toping.

A) $\{b\}$ B) $\{c,d\}$ C) $\{c\}$ D) $\{b,c,d\}$

26. Teng yonli uchburchakning uchidagi burchagi 16° ga teng. Yon tamoni bilan asosidagi burchak bissektrissasi tashkil qilgan o'tmas burchakni toping.

A) 139° B) 141° C) 131° D) 123°

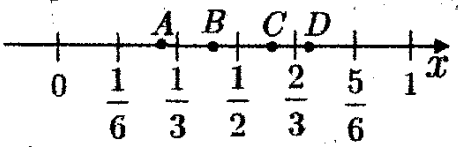
27. Tomonlari farqi 8 ga, balandliklari farqi 4 ga teng parallelogrammning o'tkir burchagini toping.

A) 60° B) 30° C) 15° D) 45°

28. $ABCD$ trapetsiyaning yuzi 36 ga teng, asoslari $DC=6$, $AB=2$. BC tamondan E nuqta olingan bo'lib, $BE=2EC$ bo'lsa, ADE uchburchakning yuzini toping.

A) 28 B) 21 C) 18 D) 36

29. Koordinata to'g'ri chizig'ida $\frac{3}{8}$ soniga mos nuqta belgilangan. Bu qaysi nuqta?



A) A B) B C) C D) D

30. Asoslarining radiuslari $2\sqrt{2}$ va $11\sqrt{2}$ ga teng bo'lgan kesik konus va unga tengdosh silindrning balandliklari o'zaro teng bo'lsa, silindr asosining radiusini toping.

A) $7\sqrt{2}$ B) $5\sqrt{2}$ C) $8\sqrt{2}$ D) $6\sqrt{2}$

Variant-7

1. Hisoblang. $\left(2^2+6^2+10^2+14^2+18^2\right)-$
$-\left(1+5^2+9^2+13^2+17^2\right)$
A) 144 B) 95 C) 104 D) 128

2. Hisoblang.
$$\frac{1\cdot2\cdot3+3\cdot6\cdot9+5\cdot10\cdot15+7\cdot14\cdot21}{2\cdot4\cdot6+6\cdot12\cdot18+10\cdot20\cdot30+14\cdot28\cdot42}$$
A) $\frac{1}{2}$ B) $\frac{1}{16}$ C) $\frac{1}{4}$ D) $\frac{1}{8}$

3. Ushbu $\left(a^2-b^2-c^2+2bc\right):\frac{a+b-c}{a+b+c}$ ifodaning $a=3,\ b=\sqrt{3},\ c=-1$ dagi qiymatini toping.
A) 1 B) 2 C) 3 D) 9

4. Ko'phadni ko'paytuvchilarga ajrating. $(a+b)^3-(a-b)^3-8b^3$
A) $2b(a-b)(a+b)$ B) $4b(a-b)(a+2b)$
C) $6b(a-b)(a+2b)$ D) $6b(a-b)(a+b)$

5. Omborga 132 tonna olma, nok va olxo'ri mevalari olib kelindi. Olma nokga qaraganda to'rt marta ko'p, olxo'ri esa nokga qaraganda 18 tonna kam. Omborga necha tonna olma olib kelingan?
A) 84 B) 96 C) 88 D) 100

6. $\frac{5x+11}{x^2-3x+2}=\frac{a}{x-1}+\frac{b}{x-2}$ tenglik ayniyat bo'lsa, $a+b$ ning qiymatini toping.
A) 2 B) 3 C) 4 D) 5

7. Tenglamani yeching:
$$x(x+3)+(x+3)\sqrt{\frac{x}{x+3}}-2=0.$$
A) -4 B) $-4;\ \frac{-3+\sqrt{13}}{2}$
C) $\frac{-3+\sqrt{13}}{2};\ \frac{-3-\sqrt{13}}{2}$ D) -4; 1

8. $x^2-2(m+1)x+1=0$ tenglama m ning qanday qiymatlarida ikkita turli musbat ildizga ega bo'ladi?
A) $(0;\infty)$ B) $(0;4)$
C) $(-1;0)$ D) $(-1;0)\cup(0;4)$

9. $\frac{(x-1)\cdot(x-4)}{\sqrt{3+5x-2x^2}}<0$ tengsizlikning yechimlari to'plamini toping.
A) $(1;3)$ B) $\left(-\frac{1}{2};3\right)$
C) $(1;4)$ D) $\left(-\frac{1}{2};4\right)$

10. $\left|x^2+2x-8\right|+\left|x^2-16\right|>2\cdot\left|x^2+x-12\right|$ tengsizlikning barcha butun yechimlari yig'indisini toping.
A) 6 B) 5 C) 3 D) 9

11. Quyida berilgan ketma-ketliklardan qaysi biri arifmetik progressiya hisoblanadi?
A) surati maxrajidan 1 ga kichik barcha to'g'ri kasrlar ketma-ketligi
B) natural sonlarning kublaridan iborat ketma-ketlik
C) 3 sonining darajalaridan iborat natural sonlar ketma-ketligi
D) 3 ga karrali bo'lgan barcha natural sonlar ketma-ketligiga

12. Ketma ket kelgan ikkita musbat toq sonlar kvadratlarining ayirmasi 152 ga teng. Ushbu sonlardan kichigini toping.
A) 37 B) 39 C) 35 D) 41

13. Soddalashtiring:
$-tg\alpha\cdot tg\beta+\left(tg\alpha-tg\beta\right)\cdot ctg(\alpha-\beta)$
A) -1 B) 1 C) 2 D) 0

14. Agar $m=a\cos x+b\sin x$ va $n=-\sqrt{a^2+b^2}$ bo'lsa, quyidagi tengsizliklardan qaysi biri x ning istalgan qiymatlari uchun o'rinli bo'ladi.

A) $-\sqrt{a^2+b^2} \le m+n \le \sqrt{a^2+b^2}$

B) $0 \le m+n \le \sqrt{a^2+b^2}$

C) $0 \le m+n \le 2\sqrt{a^2+b^2}$

D) $-2\sqrt{a^2+b^2} \le m+n \le 0$

15. Tenglamani yeching:

$$\sin x + \cos x = \sqrt{2}$$

A) $x = \frac{\pi}{4} + 2\pi n,\ n \in Z$

B) $x = \frac{3\pi}{4} + 2\pi n,\ n \in Z$

C) $x = \frac{3\pi}{4} + \pi n,\ n \in Z$

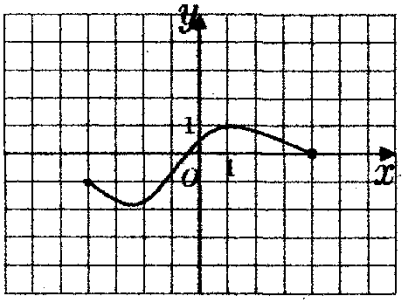
D) $x = \frac{\pi}{4} + \pi n,\ n \in Z$

16. $y = 3x - 3$ va $y = -0,5x - a$ funksiyalarning grafiklari a ning qanday qiymatlarida koordinatalar tekisligining I choragida kesishadi?

A) hech qanday qiymatlarida kesishmaydi; B) $\left(-\frac{1}{2}; \infty\right)$

C) $\left(-\infty; \frac{1}{2}\right)$ D) $\left(-\infty; -\frac{1}{2}\right)$

17. Funksiyaning aniqlanish sohasini toping.



A) $[-2; 0)$ B) $(-4; 4)$

C) $[-2; 1]$ D) $[-4; 4)$

18. Tenglamani yeching:

$3 \cdot 9^{x+1} + 2 \cdot 3^{x+1} - 1 = 0$

A) 1 B) -2 C) 3 D) 10

19.

$$\frac{\lg\left(1+\frac{1}{2}+\frac{1}{4}+\frac{1}{8}+\ldots\right)}{\lg\left(2+\frac{2}{3}+\frac{2}{9}+\ldots\right)} \cdot (\log_2 3 + \log_4 3 + \log_{16} 3 + \ldots + \log_{2^n} 3)$$

ni hisoblang.

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

20. Berilgan tengsizlikning butun ildizlari yig'indisini toping:

$\log_4(x-7) \le \log_4(20-x) - 1$

A) 10 B) 14 C) 13 D) 17

21. Agar $f(\sin^2 x) = \cos^2 x$ bo'lsa, $f'(\sin^2 x)$ ni toping.

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

22. $f(x) = A \cdot 2^x + B$, funksiya uchun $f'(1) = (\ln 2)^2$ va $\int_0^2 f(x)dx = \frac{1}{2}$ tengliklar o'rinli bo'lsa, B ni toping.

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

23. Quyida keltirilgan tasdiqlardan qaysilari noto'g'ri?

1) Har qanday ikkita teng yonli uchburchak o'xshashdir;

2) Muntazam oltiburchak oltita simmetriya o'qiga ega;

3) Agar ikkita parallel to'g'ri chiziq uchinchi to'g'ri chiziq bilan kesishganda, ichki almashinuvchi burchaklar teng;

4) Trapetsiyaning diagonallari kesishadi va kesishish nuqtasida teng ikkiga bo'linadi.

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

24. $A = \{x : |x-2| < 3, x \in N\}$ to'plamning elementlar sonini toping.

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

25. To'g'ri burchakli uchburchakning o'tkir burchagi bissektrisasi qarshisidagi katetni 2 va 3 ga teng kesmalarga

ajratadi. Uchburchakning yuzini toping.

A) 6 B) $6\sqrt{5}$ C) $4\sqrt{5}$ D) $5\sqrt{5}$

26. Tomoni 18 ga teng bo'lgan $ABCD$ kvadrat berilgan. M nuqta BC tomonni teng ikkiga, N nuqta DC tomonni $2:1$ nisbatda bo'ladi. $ABMN$ to'rtburchakning yuzini toping.

A) 144 B) 189 D) 169 D) 196

27. Aylana to'g'ri burchakli uchburchakning katta katetiga urinib, shu katet qarshisidagi burchak uchidan o'tadi, markazi esa gipotenuzada yotadi. Agar katetlarining uzunliklari 6 va 8 bo'lsa, uchburchak tekisligining shu aylana bilan chegaralangan ichki sohasini yuzini toping.

A) $14\frac{3}{16}\pi$ B) $14\frac{1}{16}\pi$

C) $15\frac{3}{16}\pi$ D) $15\frac{1}{16}\pi$

28. (2; 2) nuqtani koordinata boshi atrofida -90° burchakka burilganda qaysi nuqtaga o'tadi?

A) (2; 0) B) $(0; 2\sqrt{2})$

C) $(2; -2)$ D) (0; 2)

29. Agar $\vec{a}\cdot\vec{b}=28$ bo'lsa, $\vec{b}(2;3;-1)$ vektorga kolleniar $\vec{a}(x;y;z)$ vektorning koordinatalari yig'indisini toping.

A) 10 B) 7 C) 9 D) 8

30. Og'ma prizmaning asosida tomonlari 4 sm va 6 sm, o'tkir burchagi esa 45° bo'lgan parallelogramm yotadi. Prizmaning yon qirrasi 4 sm ga teng bo'lib, asos tekisligiga 30° li burchak ostida og'gan. Prizmaning hajmini toping.

A) $9\sqrt{2}\ sm^3$ B) $24\sqrt{2}\ sm^3$

C) $18\sqrt{2}\ sm^3$ D) $12\sqrt{2}\ sm^3$

Variant-8

1. Agar a natural sonni 64 ga bo'lganda bo'linma n, qoldiq n^3 ga teng bo'lsa, a sonining eng katta qiymatini toping.

A) 219 B) 136 C) 65 D) 262

2. Agar $a+b$ va $3a-2b$ tub sonlar bo'lib, $\frac{a+b}{3a-2b}=\frac{32}{26}$ tenglik bajarilsa a sonni toping.

A) 9 B) 7 C) 8 D) 6

3. $(x+2)(x+4)(x+6)(x+8)+16$ ifodaning eng kichik qiymatini toping.

A) 0 B) 4 C) -4 D) -6

4. Agar $\frac{5ab+7bc-2ac}{ab+3bc}=2$ bo'lsa, $\frac{b}{a}\cdot\frac{a+c}{b-c}$ ning qiymatini toping. $(b\neq c)$

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

5. a ning qanday qiymatida $\frac{4x^2-4x+1}{4}=\left(x+a\right)^2$ tenglik ayniyat bo'ladi?

A) -1/2 B) 1/2 C) 1/4 D) -1/4

6. $\left|4\sqrt{3}-7\right|-\left|5\sqrt{2}-7\right|$ nimaga teng?

A) $4\sqrt{3}-5\sqrt{2}$ B) $5\sqrt{2}-4\sqrt{3}$

C) $4\sqrt{3}+5\sqrt{2}-14$ D) $14-4\sqrt{3}-5\sqrt{2}$

7. Oybek ikkita masalani 36 minutda yechadi. U birinchi masalani yechishga ikkinchisini yechishga qaraganda 6 minut ko'p vaqt sarfladi. Oybek ikkinchi masalani necha minutda yechgan.

A) 21 B) 15 C) 18 D) 20

8. Tenglama ildizlarining to'rtinchi darajalari yig'indisini toping. $x^2-2x-2=0$.

A) 64 B) 56 C) 48 D) 54

9. $\begin{cases}2x+y=7\\|x-y|=2\end{cases}$ tenglamalar sistemasini

qanoatlantiruvchi barcha x va y lar yig'indisini toping.

A) $5\frac{1}{3}$ B) $9\frac{2}{3}$ C) 4 D) $9\frac{1}{3}$

10. $(3-x)\cdot(x+2)>0$ tengsizlikning butun yechimlari yig'indisini toping.

A) -3 B) 2 C) 0 D) 5

11. Agar $\begin{cases}1\le x\le 25\\ \frac{5}{2}\le y\le 7\end{cases}$ bo'lsa, $\frac{x}{y}$ qanday oraliqqa tegishli bo'ladi?

A) $\left[\frac{5}{2};175\right]$ B) $\left[\frac{1}{7};10\right]$

C) $\left[7;\frac{125}{2}\right]$ D) $\left[\frac{2}{5};\frac{25}{7}\right]$

12. Ayirmasi 2 ga teng bo'lgan arifmetik $(a_1<-5)$ progressiyaning ilk to'rtta toq hadlari kvadratlari yig'indisi ilk uchta juft hadlari kvadratlari yigindisidan 57 ga ko'p. Progressiyaning 7-hadini toping.

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

13. Ifodani soddalashtiring:

$$\frac{tg\left(\frac{\pi}{4}-\frac{\alpha}{2}\right)\cdot(1+\sin\alpha)}{\sin\alpha}$$

A) $\cos 2\alpha$ B) $tg\alpha$ C) $ctg\alpha$ D) $\sin 2\alpha$

14. $\frac{2018}{\pi}\cdot arcctg(\cos 2019\pi)$ ifodani qiymatini toping.

A) 1513,5 B) 1513 C) 1514 D) 1514,5

15. $tg3x\le -\sqrt{3}$ tengsizlikning $\left[-\frac{\pi}{2};\frac{\pi}{2}\right]$ oraliqqa tegishli yechimlarini toping.

A) $\left[-\frac{\pi}{6};0\right]$

B) $\left[-\frac{\pi}{2};-\frac{2\pi}{9}\right]\cup\left[-\frac{\pi}{6};-\frac{\pi}{9}\right]\cup\left[\frac{\pi}{6};\frac{2\pi}{9}\right]$

C) $\left(-\frac{\pi}{2};-\frac{4\pi}{9}\right]\cup\left(-\frac{\pi}{6};-\frac{\pi}{9}\right]\cup\left(\frac{\pi}{6};\frac{2\pi}{9}\right]$

D) $\left(-\frac{\pi}{6};0\right]\cup\left(\frac{\pi}{6};\frac{2\pi}{9}\right]$

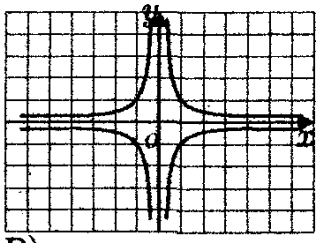
16. $y=\frac{|x-2|}{x-2}+3$ funksiya grafigi qaysi choraklardan o'tadi?

A) I, III, IV B) I, III

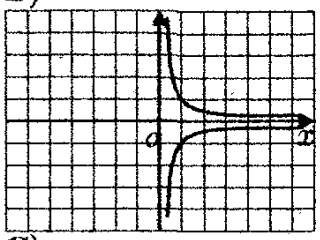
C) I, II D) I, II, III

17. Quyidagi munosabatlardan funksiyani tanlang.

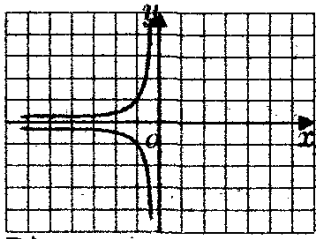
A)



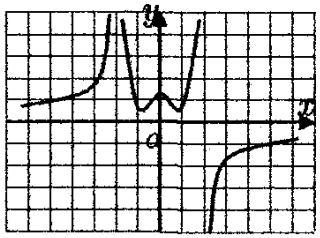
B)



C)



D)



18. Tengsizlikni yeching: $2^x>\sqrt{x}$

A) $[0;\infty)$ B) $(0;\infty)$ C) $[0;4]$ D) $[1;\infty)$

19. $\log_3 7 + \log_7 3$ yig'indi yotgan oraliqni aniqlang.

A) $(1; 2)$ B) $(2; \infty)$

C) $(-\infty; 2)$ D) $(0; 2)$

20. $\left(\log_2(x+2)-3\right)\left(\log_2(x+2)+4\right) > 0$ tengsizlikni yeching.

A) $\left(-\frac{31}{16}; 6\right)$ B) $\left(-2; 6\right)$

C) $\left(-2; 0\right) \cup \left(6; \infty\right)$

D) $\left(-2; -\frac{31}{16}\right) \cup \left(6; \infty\right)$

21. $y = x^4 - 4\ln x$ funksiyaning maksimum nuqtasini toping.

A) $x = 2$ B) $x = 1$

C) mavjud emas D) $x = 0$

22. $\int x \cdot f^{-1}(x+2)dx = 2x^2 - 3x + C,\ C \in R$ tenglikni qanoatlantiruvchi $f(x)$ funksiya quyidagilardan qaysi biri bo'la oladi? Bu yerda $f^{-1}(x)$ funksiya $f(x)$ ga teskari funksiya.

A) $\frac{4x-11}{x-2}$ B) $\frac{x+4}{2x-11}$

C) $\frac{2x-11}{x-4}$ D) $\frac{2x+1}{x-4}$

23. To'g'ri berilgan integrallash formulalarini tanlang:

1) $\int \sin(g(x)) \cdot g'(x)dx = -\cos(g(x)) + C$

2) $\int \cos(g(x)) \cdot g'(x)dx = \sin(g(x)) + C$

3) $\int ctg(g(x)) \cdot g'(x)dx = \ln\left|\cos(g(x))\right| + C$

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

24. Ifodani soddalashtiring: $\frac{1}{(n+4)!} - \frac{1}{(n+5)!}$

A) $\frac{1}{(n+4)!(n+5)!}$ B) $\frac{n+4}{(n+5)!}$

C) 0 D) $\frac{(n+4)!}{(n+5)!}$

25. ABC uchburchakda D va E nuqtalar BC tomonni uchta teng qismlarga bo'ladi $\left(BD = DE = EC\right)$, F va G nuqtalar esa AD kesmani uchta teng qismlarga bo'ladi $\left(AF = FG = GD\right)$. AFE uchburchak yuzining ABC uchburchak uchburchak yuziga nisbatini toping.

A) $\frac{1}{12}$ B) $\frac{1}{4}$ C) $\frac{1}{3}$ D) $\frac{1}{9}$

26. Teng yonli uchburchakning asosidagi burchagi 45° ga teng bo'lsa, bu uchburchakka ichki va tashqi chizilgan aylanalarning radiuslari nisbatini toping.

A) $\frac{\sqrt{2}}{2}$ B) $\sqrt{2}+1$ C) $\sqrt{2}-1$ D) $1-\frac{\sqrt{2}}{2}$

27. Muntazam ko'pburchakning tamoni unga tashqi chizilgan aylananing 36°li yoyini tortib turadi. Muntazam ko'pburchakning tamonlari sonini toping.

A) 12 B) 10 C) 6 D) 8

28. $M(-4; 1)$ nuqtadan $\frac{x}{5} - \frac{y}{6} = 1$ to'g'ri chiziqqa perpendikulyar bo'lib o'tuvchi to'g'ri chiziqning tenglamasini tuzing.

A) $x - 7y + 11 = 0$ B) $10x + 12y - 7 = 0$

C) $x + 7y + 11 = 0$ D) $5x + 6y + 14 = 0$

29. Parallelogrammning bir tomoni ikkinchi tomonidan ikki marta katta, o'tkir burchagi 60° ga teng. Parallelogrammning kichik tomonlaridan biri P tekislikda yotadi va katta diagonali ushbu tekislik bilan α burchak tashkil etadi. Agar $\cos\alpha = \sqrt{\frac{67}{112}}$ bo'lsa, parallelogrammning kichik diagonali va P tekislik orasidagi burchakning kosinusini toping.

A) 0,5 B) 0,2 C) 0,25 D) 0,7

30. Piramidaning asosi tomonlari 12, 20, 16 sm ga teng bo'lgan uchburchakdan iborat. Piramidaning barcha ikki yoqli burchaklari 30° ga teng bo'lsa, uning hajmini (sm^3) toping.

A) $\frac{128\sqrt{3}}{3}$ B) $\frac{256\sqrt{3}}{3}$ C) 320 D) 960

Variant-9

1. a $(a>1)$ shunday eng kichik natural sonki, uni 2017 ga bo'lganda ham, 2018 ga bo'lganda ham 1 qoldiq qoladi. U holda a ni 15 ga bo'lgandagi qoldiqni toping.
A) 9 B) 8 C) 11 D) 12

2. $3{,}2 = x + \frac{y}{5}$ tenglikda x va y sonlar 5 dan kichik natural sonlar bo'lsa, y ning qiymatini toping.
A) 1 B) 4 C) 3 D) 2

3. Ifodani soddalashtiring.
$$\frac{\frac{1}{a}+\frac{1}{b+c}}{\frac{1}{a}-\frac{1}{b+c}}\cdot\left(1+\frac{b^2+c^2-a^2}{2bc}\right):\frac{(a+b+c)^2}{bc}$$
A) 1 B) 0,5 C) $b+c-a$ D) $a+b+c$

4. Agar $a-b=|3x|^{-1}$ bo'lsa, a va b lar uchun to'g'ri munosabatni aniqlang.
A) $a<b$ B) $a\le b$
C) $a>b$ D) $a=b+1$

5. Axmad bir kun, Arslon ikki kun ishlaganda bir ishning $\frac{3}{8}$ qismini bajarishadi. Agar Axmad uch kun, Arslon ikki kun ishlasa, aynan shu ishning $\frac{5}{8}$ qismini bajarishadi. Axmad bir o'zi ushbu ishni necha kunda tamomlaydi?
A) 4 B) 10 C) 8 D) 9

6. Tenglamani yeching.
$$5\cdot\sqrt{1-\frac{1}{x}}=\frac{7x-1}{x}.$$
A) $\frac{1}{8};\frac{1}{3}$ B) $-\frac{1}{8};-\frac{1}{3}$
C) $-\frac{1}{8};\frac{1}{3}$ D) $\frac{1}{8};-\frac{1}{3}$

7. $|x+2|+\frac{1}{2}|x-4|=6$ tenglamaning barcha natural yechimlar ko'paytmasini toping.
A) 8 B) 5 C) 2 D) 4

8. Tenglamalar sistemasini yeching:
$$\begin{cases}\left(x+xy^2+y^2\right)\left(x+y^2\right)^2=225\\ \left(x-xy^2+y^2\right)\left(x+y^2\right)^2=25\end{cases}$$
A) (4; 1), (4; −1)
B) (−4; 1), (4; −1), (1; 2), (1; −2)
C) (4; 1), (4; −1), (1; 2), (1; −2)
D) (1; 2); (1; −2)

9. Agar a,b,c manfiy butun sonlar bo'lib, $\frac{1}{a}>\frac{1}{b}>\frac{1}{c}$ tengsizliklar bajarilsa, $|a+b|-|b-c|+|a-c|$ ifodani soddalashtiring.
A) $-2a$ B) $-2a-2c$ C) 0 D) $b-a$

10. Ushbu
$$(x^2+3x+1)\cdot(x^2+3x+3)\le 35$$
tengsizlikni qanoatlantiruvchi eng katta va eng kichik butun sonlar ayirmasini toping.
A) 6 B) 3 C) 5 D) 4

11. 1 dan boshlab ketma-ket natural sonlarning eng kamida nechtasini yig'indisi 465 dan katta bo'ladi?
A) 30 B) 31 C) 32 D) 29

12. 4 va 324 sonlari orasidan shunday 3 ta son topingki, ular barchasi goemetrik progressiyani tashkil etsin.

A) 12, 36, 108 B) 14, 42, 126
C) 10, 30, 90 D) 11, 33, 99

13. Ifodani soddalashtiring:
$\sin^2(30^\circ-\alpha)+\sin 15^\circ\cdot\cos(15^\circ+2\alpha)-$
$-\sin^2(45^\circ+\alpha)$.
A) $-\sin 2\alpha$ B) $-\cos 2\alpha$
C) $\sin\left(\frac{\pi}{4}+\alpha\right)$ D) $\sin\left(\frac{\pi}{4}-\alpha\right)$

14. $\sin 14^\circ$ dan oshmaydigan eng katta butun sonni toping.
A) 1 B) -1 C) 0 D) 2

15. $6\sin^2 x+5\sin x\cdot\cos x+3\cos^2 x=2$ tenglamaning $[-\pi;\ \pi]$ kesmada nechta ildizi bor?
A) 1 B) 2 C) 4 D) 3

16. $A(0;\ 2)$ nuqtadan
$y=\sqrt{x^2+4x+18}+2$ egri chiziqqacha bo'lgan eng qisqa masofani toping.
A) $3\sqrt{2}$ B) 4 C) $\sqrt{14}$ D) 2

17. $y=\sin^2\left(\frac{x}{3}-\frac{\pi}{4}\right)+2tgx$ funksiyaning eng kichik musbat davrini toping.
A) 6π B) 3π C) 2π D) davriy emas

18. $\frac{2^{3n-4}\cdot 2^{5+6n}}{2^{1+3n}}$ ni soddalashtiring.
A) 2^{6n+1} B) 4^{3n} C) 4^{3n-1} D) 2^{3n}

19. Agar $\log_a b=29$ bo'lsa, $\log_a \sqrt[6]{ab}$ ning qiymatini toping.
A) 2 B) 3 C) 4 D) 5

20. Tengsizlikni yeching.
$$\frac{\arccos\left(-\frac{3}{\pi}\right)\cdot\log_{\frac{3}{\pi}}\frac{\pi}{4}}{1-2\log_{\log_2 x}2}\geq 0$$
A) $x\in(2;3)\cup(16;\infty)$ B) $x\in(1;2)\cup(18;\infty)$
C) $x\in(1;2)\cup(16;\infty)$ D) $x\in(1;2)\cup(15;\infty)$

21. $f(x)=0,5x^4-x$ funksiya grafigiga $y=-\frac{3}{4}x-\frac{3}{32}$ o'tkazilgan. Urinish nuqtasi absissasini toping.
A) 0,5 B) -0,5 C) 0,75 D) -0,75

22. $\int\limits_{\frac{\pi}{6}}^{\frac{\pi}{3}}\frac{\sin^3 x+1}{\sin^2 x}dx$ integralni hisoblang.
A) $\frac{7\sqrt{3}-3}{3}$ B) $\frac{7\sqrt{3}+3}{6}$
C) $\frac{7\sqrt{3}+3}{3}$ D) $\frac{7\sqrt{3}-3}{6}$

23. Quyida keltirilgan tasdiqlardan qaysilari to'g'ri?
1) Rombning barcha burchaklari tengdir; 2) To'g'ri burchakli uchburchakning yuzi, uning katetlari ko'paytmasining yarmiga teng; 3) Berilgan to'g'ri chiziqda yotmagan nuqta orqali, shu to'g'ri chiziqqa yagona perpendikulyar to'g'ri chiziq o'tkazish mumkin; 4) ixtiyoriy ikkita to'g'ri chiziq kamida bitta umumiy nuqtaga ega.
A) 2; 4 B) 1; 4 C) 2; 3 D) 1; 3

24. Agar $A\cap B=\{b,\ c,\ d\}$ va $A\cap C=\{a,\ b\}$ bo'lsa, $A\cap(B\cup C)$ to'plam elementlarini toping.
A) $\{b\}$ B) $\{a,\ c,\ d\}$
C) $\{a,\ b,\ c,\ d\}$ D) $\{c,\ d\}$

25. Teng yonli ABC uchburchakning asosidagi burchaklarining bissektrisalari yon tomonlarini mos ravishda M va N nuqtalarda kesadi. Agar ABC uchburchakning asosi 2 ga, yon tomoni 3 ga teng bo'lsa, MN kesmaning uzunligini toping.
A) 1 B) 1,2 C) 1,5 D) 1,1

26. Radiuslari 7 va 14 sm bo'lgan kesishuvchi ikkita aylananing kesishish nuqtalaridagi urinmalar o'zaro

perpendikulyar. O_1ABO_2 shaklning yuzini toping. AB- aylanalarga umumiy urinma, O_1 va O_2 esa ularning markazlari.

A) 110 sm^2 B) 147 sm^2

C) 109 sm^2 D) 238 sm^2

27. To'g'ri burchakli uchburchakka ichki va tashki chizilgan aylanalar radiuslari uzunliklari yig'indisi 4 ga, gipotenuza esa 6 ga teng. Uchburchakning perimetrini toping.

A) 20 B) 12 C) 18 D) 14

28. $A(-2;3), B(3;1), C(a;2)$ nuqtalar berilgan. Agar AB va BC tog'ri chiziqlar o'zaro perpendikulyar bo'lsa, a ning qiymatini toping.

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

29. Asosi 18 m va yon tomoni 15 m bo'lgan teng yonli uchburchak berilgan. Ichki chizilgan doiraning markazidan uchburchak tekisligiga uzunligi 6 m bo'lgan perpendikulyar chiqarilgan. Bu perpendikulyarning oxiridan uchburchakning tomonlarigacha bo'lgan masofani toping.

A) 5,5 m B) 8 m C) 6 m D) 7,5 m

30. $ABCDA_1B_1C_1D_1$ to'g'ri burchakli parallelepiped berilgan. $AB=8$, $BC=2$ va $BB_1=6$ bo'lsa, $ABCDB_1C_1$ ko'pyoqni to'la sirtini toping.

A) 76 B) 96

C) $76+4\sqrt{10}$ D) $76+9\sqrt{10}$

Variant – 10

1. Agar $n+5$ har doim juft son bo'lsa, quyidagilardan qaysi biri har doim toq bo'ladi?

A) n^4-5 B) 2^n+n^2

C) 3^n+n^2 D) 3^n+n^3+2018

2. Agar $a,b,c,d>0$ bo'lsa, $\left(\frac{1}{a}+\frac{1}{b}+\frac{1}{c}+\frac{1}{d}\right)\cdot\left(a+b+c+d\right)$ ning eng kichik butun qiymatini toping.

A) 4 B) 8 C) 16 D) 24

3. Agar $\frac{4ab+7bc-ac}{ab+2bc}=4$ bo'lsa, $\frac{4ab+7bc-ac}{3ab+5bc-ac}$ ning qiymatini toping.

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

4. Ifodani soddalashtiring:

$$\frac{x^3+27}{2x-2}\cdot\frac{x^2-1}{x^2+4x+3}\cdot\frac{6x+12}{3x^2-9x+27}+1.$$

A) $x+3$ B) $x+2$

C) $2x+2$ D) $\frac{x+3}{2}$

5. $\sqrt{4^{10}+6^{11}+9^{11}}+\sqrt{4^{10}-6^{11}+9^{11}}$ ifodani soddalashtiring.

A) 2^{11} B) 4^{10} C) $2\cdot3^{11}$ D) $2\cdot9^{10}$

6. Toq sonning o'zidan keyin keluvchi uchta juft son bilan yig'indisi 70 dan katta. Ushbu shartni qanoatlantiruvchi toq sonlardan eng kichigini toping

A) 17 B) 15 C) 19 D) 13

7. Tenglamaning ildizlari yig'indisini toping: $\sqrt{1-\sqrt{1+x}}=x$

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

8. Tenglamaning ildizlari ko'paytmasini toping:

$$4\left(x-3\right)\left(x+3\right)-\left(x-3\right)\left(x^2+3x+9\right)=0$$

A) -6 B) -9 C) 4 D) 8

9. $\frac{2x-7}{x^2+2x-8}>1$ tengsizlikning butun yechimlari yig'indisini toping.

A) -2 B) -1 C) -5 D) -3

10. $x^2-6ax-(2-3a)(2+3a)<0$ tengsizlikni yeching.

A) $(2-3a;\ 2+3a)$

B) $(-\infty;\ 3a-2)\cup(3a+2;\ \infty)$

C) $(-\infty;\ 2-3a)\cup(2+3a;\ \infty)$

D) $(3a-2;\ 3a+2)$

11. $\left(x^2+x\right)+\left(x^2+2x\right)+\ldots+\left(x^2+19x\right)=1425$ tenglamani qanoatlantiruvchi x natural soni toping.

A) 6 B) 10 C) 5 D) 8

12. 1;8;27;64;125;....ketma-ketlikning 10-hadini toping.

A) 1331 B) 512 C) 729 D) 1000

13. Ifodani ko'paytma shaklida ifoda - lang: $\sin 2\alpha-\sin 3\alpha-\sin 4\alpha+\sin 5\alpha$

A) $-4\cos\frac{7\alpha}{2}\sin 2\alpha\sin\alpha$

B) $-4\sin\frac{7\alpha}{2}\sin\frac{\alpha}{2}\sin\alpha$

C) $-4\sin\frac{7\alpha}{2}\cos 2\alpha\sin\alpha$

D) $-4\sin\frac{7\alpha}{2}\sin\alpha\cos\frac{\alpha}{2}$

14. $tg200^\circ-4\cos 250^\circ$ ifodani qiymatini toping.

A) $-\sqrt{3}$ B) $\sqrt{3}$ C) $\frac{\sqrt{3}}{3}$ D) $-\frac{\sqrt{3}}{3}$

15. $\sin 200x\cdot\cos 199x-\cos 200x\cdot\sin 199x=0$ tenglamaning $[0;\ 4\pi]$ oraliqqa tegishli ildizlari soni nechta?

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

16. $y=\sqrt{3x-7}+\frac{\sqrt{4-x}}{x-3}$ funksiyaning aniqlanish sohasini toping.

A) $\left(-\infty;\ \frac{7}{3}\right]\cup\left[43;\ \infty\right)$ B) $\left[\frac{7}{3};\ 4\right]$

C) $\left[\frac{7}{3};\ 3\right)\cup\left(3;\ 4\right]$ D) $\left(\frac{7}{3};\ 3\right)\cup(3;\ 4)$

17. Agar $f(x)=(a+b-4)\cdot x^3+2\cdot x^2+(b-2)\cdot x$ juft funksiya berilgan bo'lsa, $f(a)$ ning qiymatini toping.

A) 8 B) 14 C) 7 D) 20

18. Agar $\sqrt[n+1]{n-\sqrt{81}}=\sqrt[4]{9}$ bo'lsa, n^2+1 ning qiymatini toping.

A) 26 B) 5 C) 17 D) 10

19. Tenglamaning ildizlari yig'indisini toping: $64^x-15\cdot 8^x-16=0$

A) $1\frac{2}{3}$ B) $2\frac{1}{3}$ C) 15 D) $\frac{4}{3}$

20. Agar $a=2$ bo'lsa, ifodani soddalashtiring:

$$\frac{\left(25^{\frac{1}{2\log_{19}25}}+2\log_2\log_2\log_2 a^{2\log_a 4}\right)\cdot 4^{\frac{2}{\log_3 4}}-a^2}{1-a}$$

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

21. $\left(\log_2(x+2)-3\right)\left(\log_2(x+2)+4\right)<0$ tengsizlikni yeching.

A) $\left(-\frac{31}{16};\ 6\right)$ B) $\left(-2;\ 6\right)$

C) $\left(-2;\ 0\right)\cup\left(6;\ \infty\right)$ D) $\left(-2;\ -\frac{31}{16}\right)\cup\left(6;\ \infty\right)$

22. Moddiy nuqta yurgan yo'li S (metrlarda) quyidagi qonuniyat bo'yicha o'zgarmoqda: $S(t)=t^3-t^2+5t+1$ (t-vaqt(sek)). Harakat boshlangandan so'ng 3 sekunddan so'ng uning oniy tezligi necha m/s bo'ladi?

A) 24 B) 26 C) 30 D) 16

23. $\int_{-5}^{3}|x-1|dx$ aniq integralni qiymatini toping.

A) -4,5 B) 20 C) 16 D) 18

24. To'g'ri berilgan integrallash formulalarini tanlang:

1) $\int \sin(g(x)) \cdot g'(x)dx = -\cos(g(x)) + C$

2) $\int \cos(g(x)) \cdot g'(x)dx = -\sin(g(x)) + C$

3) $\int tg(g(x)) \cdot g'(x)dx = -\ln\left|\cos(g(x))\right| + C$

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

25. Beshburchak uchlarini K, A, B, C, D harflar bilan nechta xil usul yordamida belgilash mumkin?

A) 48 B) 120 C) 24 D) 60

26. ABC uchburchak balandliklari kesishish nuqtasi H, ichki chizilgan aylana markazi esa I. Agar $\angle A = 40^\circ$, $\angle B = 75^\circ$ ga teng bo'lsa, IAH burchakni toping.

A) 10° B) 15° C) 5° D) 12°

27. Asoslari a va b, dioganallari m va n bo'lgan trapetsiya uchun $m^2 + n^2 = \left(a + b\right)^2$ bo'lsa, trapetsiyaning dioganallari orasidagi burchakni toping.

A) 60° B) 45° C) 30° D) 90°

28. Teng yonli uchburchakning asosi 8 sm ga, yon tomoni esa 5 sm ga teng. Bu uchburchakka tashqi chizilgan aylananing radiusini (sm) toping.

A) $\frac{25}{8}$ B) $\frac{25}{3}$ C) $\frac{25}{4}$ D) $\frac{25}{6}$

29. Uchlari $A(-4; 2)$, $B(6; 5)$ va $C(1; -4)$ nuqtalarda bo'lgan uchburchak berilgan. C uchidan tushirilgan balandlik yotuvchi to'g'ri chiziq tenglamasini tuzing.

A) $10x + 3y - 12 = 0$ B) $10x + 3y + 2 = 0$
C) $3x - y - 7 = 0$ D) $3x + 2y + 5 = 0$

30. $ABCDA_1B_1C_1D_1$ kub berilgan bo'lib, K, L, M - nuqtalar mos ravishda BB_1, A_1D_1 va CD qirralarning o'rtalari. Kubning KLM tekislik bilan kesimi ... bo'ladi.

A) Oltiburchak B) uchburchak C) beshburchak D) to'rtburchak

Variant-11

1. 29 ga bo'lganda qoldiq 12 qoladigan eng katta va eng kichik ikki xonali sonlarning yig'indisini toping.

A) 101 B) 111 C) 96 D) 109

2. $\frac{7}{1 + \frac{3}{x-2}}$ kasr ma'noga ega bo'lmaydigan barcha x lar yig'indisini toping.

A) 2 B) -1 C) 1 D) -2

3. Agar $xy^2 - 2y + 2y^2 - xy$ ifodani ko'paytuvchilarga ajratish mumkin bo'lsa, eng ko'pi bilan nechta ko'paytuvchilarga ajratish mumkin.

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

4. Soddalashtiring:

$$\frac{\left(\sqrt[3]{(a^2+4)\cdot\sqrt{1+\frac{4}{a^2}}} - \sqrt[3]{(a^2-4)\cdot\sqrt{1-\frac{4}{a^2}}}\right)^2}{\sqrt{a^4-16}-a^2} - \frac{\sqrt[3]{a}}{a}.$$

A) $\frac{\sqrt[3]{a}}{a}$ B) $\frac{4\sqrt[3]{a}}{a}$ C) $-\frac{3\sqrt[3]{a}}{a}$ D) $-\frac{2\sqrt[3]{a}}{a}$

5. $\sqrt{6+\sqrt{6+\sqrt{6+\ldots}}} = a$ bo'lsa, $\sqrt{a\cdot\sqrt{a\cdot\sqrt{a\cdot\ldots}}}$ ning qiymatini toping.

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

6. Birinchi quvurdan ikkinchi quvurga qaraganda ikki barobar ko'p suv oqadi. Ikkalasi birgalikda bo'sh hovuzni 18 soatda to'ldiradi. Ikkinchi quvur hovuzning uchdan ikki qismini necha soatda to'ldiradi?

A) 36 B) 16 C) 18 D) 9

7. Ushbu $x^4-2x^3+x^2-9=0$ tenglamaning ildizlari yig'indisi a va ildizlari soni b bo'lsa $a+b$ ni toping. $(x\in R)$

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

8. k ning qanday eng kichik natural qiymatida $x^2+(k+2)^2x+2k-4=0$ tenglamaning ildizlari 2 dan kichik bo'ladi.

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

9. $x^7\left|x^2+8x+7\right|<0$ tengsizlik $[-8;1]$ kesmada nechta butun yechimga ega.

A) 6 B) 8 C) 5 D) 7

10. Agar $\begin{cases}2\le x\le 18\\-2\le y\le 3\end{cases}$ bo'lsa, $\frac{x}{y}$ qanday oraliqqa tegishli bo'ladi?

A) $[-1;6]$ B) $[-18;18]$

C) $(-\infty;-1)\cup\left(\frac{2}{3};\infty\right)$

D) $(-\infty;-1]\cup\left[\frac{2}{3};\infty\right)$

11. 3 ga bo'lganda 1 qoldiq qoladigan dastlabki o'n oltita toq natural sonlar yig'indisini toping.

A) 832 B) 735 C) 916 D) 736

12. Alpinist birinchi kuni 800 m balandlikka ko'tarildi. Qolgan kunlari oldingi kunga qaraganda 25 m kam balandlikka ko'tarildi. U necha kunda 6300 m balandlikga ko'tarilgan?

A) 8 B) 9 C) 7 D) 10

13. $\frac{1}{\cos 20^\circ}-4\cdot\cos 40^\circ$ ifodani qiymatini toping.

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

14. Hisoblang:

$tg20^\circ+tg40^\circ+tg60^\circ+\ldots+tg160^\circ$

A) 0 B) -1 C) 89° D) 1

15. Tenglamani yeching: $\cos\left(x-\frac{\pi}{2}\right)=0$

A) $\pi+2\pi k,\ k\in Z$ B) $\frac{1}{2}\pi+\pi k,\ k\in Z$

C) $\pi k,\ k\in Z$ D) $2\pi k,\ k\in Z$

16. Agar $f(4x)=4x+7$ bo'lsa, $f(f(1))$ ni toping.

A) 15 B) 11 C) 26 D) 16

17. Agar $5^x-5^y=3,\ x+y=3$ bo'lsa, $5^{2x}+5^{2y}+25^x\cdot 5^y-5^x\cdot 25^y$ ning qiymatini toping.

A) 625 B) 5625 C) 125 D) 634

18. Hisoblang: $\lg 2019{,}9-\lg 0{,}00020199$

A) 9 B) 6 C) 5 D) 7

19. Tenglama ildizlari yig'indisini toping.

$4^{\log_4^2(x+2)}+2\cdot(x+2)^{\log_4\sqrt{x+2}}=8$.

A) 3/4 B) 5/4 C) 1/4 D) 15/4

20. $y=\sqrt{\sin\sqrt{x}}-6x+\ln 2$ funksiya uchun $y'\left(\frac{\pi^2}{4}\right)$ ni toping.

A) -6 B) 0 C) -5,5 D) -4

21. $f(x)$ musbat qiymatli kamayuvchi funksiya va $g(x)$ manfiy qiymatli o'suvchi funksiya bo'lsa, $h(x)=f(x)\cdot g(x)$ uchun quyidagilardan qaysi biri to'g'ri?

A) manfiy qiymatli o'suvchi
B) manfiy qiymatli kamayuvchi
C) musbat qiymatli o'suvchi
D) musbat qiymatli kamayuvchi

22. $\int(6-x^2f(x))dx=x^2-5mx+C$ integral berilgan. $f(-2)=4$ tenglikni qanoatlantiruvchi m ni qiymatini toping. $C\in R$

A) -4 B) 1,25 C) 1,2 D) -0,8

23. To'g'ri javobni toping.

1) agar $a>0$ bo'lsa, $a+\frac{1}{a}>2$ bo'ladi; 2) agar a va b bir xil ishorali bo'lsa, $\frac{a}{b}+\frac{b}{a}\geq 2$ bo'ladi; 3) agar a va b har xil ishorali bo'lsa, $\frac{a}{b}+\frac{b}{a}\leq -2$ bo'ladi.

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

24. 1, 2, 3, 4, 5, 6 raqamlardan foydalangan holda, har xil raqamli nechta turli uch xonali sonlar hosil qilish mumkin?

A) 60 B) 120 C) 144 D) 24

25. ABC uchburchakda $AB=4,$, $BC=5$, $AC=6$ va $BN:NC=3:2$ bo'lsa, AN kesmaning uzunligini toping.

A) $\sqrt{23}$ B) $\sqrt{19}$ C) $\sqrt{17}$ D) $\sqrt{22}$

26. R radiusli aylanaga trapetsiya ichki chizilgan. Trapetsiyaning pastki asosi qolgan tomonlaridan ikki marta katta bo'lsa, trapetsiyaning yuzini toping.

A) $4\sqrt{3}R^2$ B) $\sqrt{3}R^2$

C) $\frac{3\sqrt{3}}{4}R^2$ D) $\frac{3\sqrt{3}}{2}R^2$

27. Teng yonli uchburchakning asosi 16 sm ga, yon tomoni esa 10 sm ga teng. Bu uchburchakka tashqi chizilgan aylananing radiusini (sm) toping.

A) $\frac{4}{3}$ B) $\frac{25}{3}$ C) $\frac{8}{3}$ D) $\frac{50}{3}$

28. Koordinatalar boshidan o'tuvchi va Ox o'qini (2; 0) nuqtada, Oy o'qini (0; -6) nuqtada kesib o'tuvchi to'g'ri chiziqqa perpendikuliyar bo'lgan to'g'ri chiziqning tenglamasini tuzing.

A) $x+3y-1=0$ B) $3x+y=0$

C) $x+3y=0$ D) $x-3y=0$

29. $ABCD$ parallelogrammning diagogallari O nuqtada kesishadi. $\overrightarrow{AC}=k\cdot\overrightarrow{AO}$ tenglik bajariladigan k sonning qiymatini toping.

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

30. Oltiburchakli muntazam piramidaning apofemasi 2 ga teng. Asosidagi ikki yoqli burchak 60° ga teng. Piramidaning to'la sirtini toping.

A) $3\sqrt{3}$ B) $4\sqrt{3}$ C) $6\sqrt{3}$ D) $\frac{3\sqrt{3}}{2}$

Variant-12

1. a va b natural sonlar bo'lib ularning, eng katta umumiy bo'luvchisi 6 ga teng. Agar $4a=3b$ tenglik bajarilsa, $a+b$ yig'indini hisoblang.

A) 42 B) 36 C) 24 D) 72

2. $x;y;z$ butun sonlar bo'lib, $y<0$ va $\frac{2}{3x}=-\frac{3}{4y}=\frac{4}{5z}$ bo'lsa, $x;y;z$ sonlarini o'sish tartibida joylashtiring.

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

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

3. $a^2-b^2+8a-2b+15$ ko'phadning ko'paytuvchilaridan birini toping.

A) $a+b+5$ B) $a+b-5$

C) $a+b-3$ D) $a+b+3$

4. Agar a va b butun sonlar uchun $\sqrt{5}a-3b=2a-\sqrt{5}b-15$ tenglik o'rinli bo'lsa, a ning qiymatini toping.

A) -15 B) 15 C) 10 D) -10

5. a natural soni uchun $a^2-1=8^{17}\cdot(2^{49}+1)$ bo'lsa, $\frac{a-1}{16^{12}}$ ni toping.

A) 16 B) 4 C) 32 D) 8

6. Velosipedchi 5 km masofani 15 minutda bosib o'tadi. Odam 3 km masofani 55 minutda bosib o'tsa, odamning tezligi velosiped tezligining necha foizini tashkil etadi?

A) $16\frac{4}{11}$ B) $18\frac{7}{11}$ C) $14\frac{4}{15}$ D) $21\frac{7}{15}$

7. Agar $x\sqrt{x}-8\sqrt{x}=7$ bo'lsa, $x-\sqrt{x}$ ning qiymatini toping.
A) 3 B) 6 C) 7 D) 8

8. n ning nechta natural qiymatida $n(13x-1)=17n-n^2$ tenglamaning ildizlari musbat bo'ladi?
A) 22 B) 17 C) 14 D) 1

9. $\left||x|-2\right|\le 1$ tengsizlikning barcha butun yechimlari yig'indisini toping.
A) 4 B) 6 C) -9 D) 0

10. Arifmetik progressiyaning dastlabki 5 ta hadi yig'indisi 100 ga teng bo'lib, barcha hadlari natural sonlardan iborat. Bu progressiyaning eng kichik hadining eng katta qiymati nechaga teng bo'lishi mumkin?
A) 22 B) 16 C) 18 D) 15

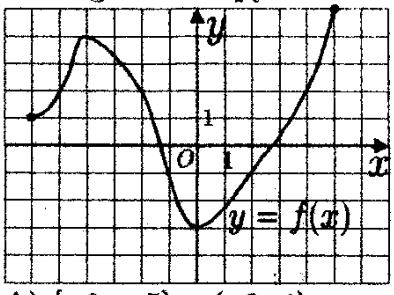
11. Ifodani soddalashtiring:
$$\frac{(\sin^2\alpha+tg^2\alpha+1)\cdot(\cos^2\alpha-ctg^2\alpha+1)}{(\cos^2\alpha+ctg^2\alpha+1)\cdot(\sin^2\alpha+tg^2\alpha-1)}$$
A) 0 B) 1 C) $1+\cos^2\alpha$ D) $1+\sin^2\alpha$

12. Agar $\sin x+\cos x=1{,}04$ bo'lsa, u holda, x soni qaysi chorakda yotadi?
A) IV B) I C) II D) III

13. Ushbu $\sin 2x+2\sin x=\cos x+1$ tenglamaning $[-\pi;\pi]$ oraliqqa tegishli ildizlari soni nechta?
A) 1 B) 2 C) 3 D) 4

14. $y=\dfrac{3x^2}{\left(1+x^2\right)\cdot\left(4x^2+1\right)}$ funksiyaning eng katta qiymatini toping.
A) 1 B) 0,3 C) 0,(3) D) 0,5

15. Chizmada $[-6;5]$ kesmada berilgan $y=f(x)$ funksiya grafigi tasvirlangan. $f(x)<2$ tengsizlikni qanoatlantiradigan x ning barcha qiymatlarini toping.



A) $[-6;-5)\cup(-2;4)$
B) $[-6;-5)\cup(-2;4]$
C) $[-4;5]$ D) $[-6;-5]\cup[-2;4)$

16. $3^{-x}=a$, $2^x=b$ bo'lsa, 216^{-x} ni a va b orqali ifodalang.
A) $2ab^3$ B) $2a^2b^3$ C) $\frac{a^3}{b}$ D) $\left(\frac{a}{b}\right)^3$

17. Hisoblang:
$$\sqrt{\left(\log_{16}24-\log_{16}6\right)\cdot\log_{16}4}\,.$$
A) 4 B) 2 C) 1 D) 0,5

18. $y=\ln\left(x^2-2x-3\right)$ funksiya manfiy qiymat qabul qiladigan barcha x larni toping.
A) $(-\infty;-1)\cup(3;\infty)$ B) $(3;\infty)$
C) $\left(1-\sqrt{5};-1\right)\cup\left(3;1+\sqrt{5}\right)$ D) $\left(-\sqrt{5};-1\right)$

19. $\ln(x+1)\ge 2$ tengsizlikning eng kichik butun qiymatini toping.
A) 3 B) 4 C) 7 D) 8

20. Funksiyani hosilasini toping:
$y=e^{-x}-2x^7$
A) $y'=-e^{-x}-14x^6$ B) $y'=e^{-x}-14x^6$
C) $y'=-e^{-x}-2x^6$ D) $y'=-e^{-x}-\frac{x^8}{4}$

21. a ning qanday eng katta qiymatida $f(x)=\frac{2}{3}x^3-ax^2+7ax+5$ funksiya monoton o'sadi?
A) 11 B) 14 C) 4 D) 13

22. a ning qanday musbat qiymatida $\int_1^a (2x+1)dx = 4$ tenglik o'rinli bo'ladi?

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

23. To'g'ri berilgan integrallash formulalarini tanlang:

1) $\int \sin(g(x)) \cdot g'(x)dx = \frac{1}{x}\cos(g(x)) + C$

2) $\int \cos(g(x)) \cdot g'(x)dx = \sin(g(x)) + C$

3) $\int tg(g(x)) \cdot g'(x)dx = -\ln|\cos(g(x))| + C$

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

24. Tekislikda 22 ta nuqta joylashgan, ulardan hech qaysi uchtasi bir to'g'ri chiziqda yotmaydi. Uchlari shu nuqtalarda bo'lgan nechta uchburchak mavjud?

A) 1540 B) 3024 C) 3080 D) 1512

25. Katetlari 24 sm va 18 sm bo'lgan to'g'ri burchakli uchburchak o'tkir burchaklarining bissektrisalarini toping.

A) $8\sqrt{5}$ *sm*; $10\sqrt{5}$ *sm*

B) $9\sqrt{10}$ *sm*; $8\sqrt{5}$ *sm*

C) $9\sqrt{10}$ *sm*; $8\sqrt{10}$ *sm*

D) $9\sqrt{5}$ *sm*; $8\sqrt{10}$ *sm*

26. $ABCD$ parallelogrammda B o'tmas burchak uchidan AD tomonga o'tkazilgan balandlik, shu tomonni D uchidan hisoblaganda $7:3$ nisbatda bo'ladi. Agar $AD:AB=2$ bo'lsa, $AC:BD$ nisbatni toping.

A) $\sqrt{37}:\sqrt{17}$ B) $\sqrt{31}:\sqrt{13}$

C) $\sqrt{39}:\sqrt{13}$ D) $\sqrt{37}:\sqrt{13}$

27. $ABCD$ to'rtburchak aylanaga ichki chizilgan. Agar $\angle ABC = 105^\circ$, $\angle CAD = 35^\circ$ bo'lsa, $\angle ABD$ ni toping.

A) 75° B) 60° C) 70° D) 80°

28. $A(8;-4)$ nuqta uchun $y=x-4$ funksiyaga nisbatan simmetrik bo'lgan nuqtani toping.

A) (0; 4) B) (12; 3)

C) (12; 8) D) (12; −8)

29. $ABCDA_1B_1C_1D_1$ to'g'ri burchakli parallelepipedda $\overrightarrow{AD}=\vec{a}$, $\overrightarrow{AB}=\vec{b}$ va $\overrightarrow{AA_1}=\vec{c}$ bo'lsa, $\overrightarrow{DB_1}$ vektorni $\vec{a}$, $\vec{b}$ va $\vec{c}$ vektorlar orqali ifodalang.

A) $\vec{b}-\vec{a}-\vec{c}$ D) $\vec{b}+\vec{a}+\vec{c}$

C) $\vec{b}-\vec{a}+\vec{c}$ D) $\vec{b}+\vec{a}-\vec{c}$

30. Muntazam uchburchakli prizmaning balandligi 4 ga teng. Agar prizmaning yuqori asosi markazi bilan quyi asosining tomoni o'rtasini tutashtiruvchi kesma asos tekislikgi bilan 45 burchak tashkil qilsa, prizmaning yon sirtini toping.

A) 96 B) $96\sqrt{3}$ C) $106\sqrt{3}$ D) $96\sqrt{2}$

Variant-13

1. $93m07n$ soni 8 ga bo'linadi. Agar bu son 6 ga ham bo'linsa, u holda m ning o'rniga qo'yilishi mumkin bo'lgan barcha raqamlar yig'indisini toping.

A) 15 B) 16 C) 18 D) 12

2. $3<a<7$ va $3<b<10$ bo'lsa, a va b butun sonlar uchun $\dfrac{1+\frac{a}{b}}{1+\frac{b}{a}}$ karsning eng katta qiymatini toping.

A) $\frac{3}{2}$ B) $\frac{21}{10}$ C) 6 D) 3

3. Agar $x^2+\frac{2}{x}=3$ va $x\neq 1$ bo'lsa, x^2+x ni qiymatini toping.

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

4. Agar $|a|\neq|b|\neq|c|$ va $\frac{a}{b+c}+\frac{b}{c+a}+\frac{c}{a+b}=-2$ bo'lsa,

$\left(\frac{a^2}{b+c}+\frac{b^2}{c+a}+\frac{c^2}{a+b}\right):(a+b+c)$ ning qiymatini toping.
A) 2 B) -3 C) -1 D) 0

5. Agar $\sqrt{30+\sqrt{30+\sqrt{30+\ldots}}}=a$ bo'lsa, $\sqrt{a+\sqrt{a+\sqrt{a+\ldots}}}$ ning qiymatini toping.
A) 3 B) 5 C) 4 D) 2

6. Uch yashikda 42,8 kg meva bor. 2-yashikdagi meva 1-yashikdagi mevaning 0,8 qismini tashkil qiladi, 3-yashikda esa 2-yashikdagining 42,5% miqdoricha meva bor. Uchinchi yashikda qancha meva bor?
A) 6,4 kg B) 8,6 kg C)7 kg D) 6,8 kg

7. Tenglamaning natural yechimlari sonini toping: $\sqrt{x+16}-\sqrt{x+8}=2$
A) 1 B) 0 C) 2 D) 3

8. a va b sonlari $x^2-6x+3=0$ tenglamaning ildizlari bo'lsa, $\frac{a^3b^2-a^2b^3}{a^2-b^2}$ ning qiymatini toping.
A) 1 B) 1,5 C) -1,5 D) 2,5

9. $\begin{cases}(x-3)^4\cdot(y-5)=1\\(x-3)^5\cdot(y-5)^4=1\end{cases}$ tenglamalar sistemasining haqiqiy ildizlari $(x;y)$ lar uchun $\frac{x-5}{y-3}$ ni qiymatini toping.

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

10. $\left|\frac{4-2x}{1+3x}\right|>0$ tengsizlikni yeching.

A) $\left(-\infty;-\frac{1}{3}\right)\cup(2;\infty)$

B) $\left(-\infty;-\frac{1}{3}\right)\cup\left(-\frac{1}{3};\infty\right)$

C) $\left(-\infty;-\frac{1}{3}\right)\cup\left(-\frac{1}{3};2\right)\cup(2;\infty)$ D) $(-\infty;\infty)$

11. Arifmetik progressiya quyidagicha shart bo'yicha berilgan: $a_1=-3,1$; $a_{n+1}=a_n+0,9$. Uning dastlabki 19 ta hadi yig'indisini toping.
A) 92 B) 95 C) 99 D) 91

12. Soddalashtiring: $tg3x-tg2x-tgx$.
A) $tg3x\cdot tg2x\cdot tgx$ B) $ctg3x\cdot tg2x\cdot tgx$
C) $tg3x\cdot ctg2x\cdot tgx$ D) $tg3x\cdot tg2x\cdot ctgx$

13. Ifodani soddalashtiring:
$\left(\left(\cos\alpha-\cos\beta\right)^2+\left(\sin\alpha-\sin\beta\right)^2\right):$
$:\left(4\sin^2\frac{\alpha-\beta}{2}\right)-3$

A) 2 B) $\sin^2\frac{\alpha-\beta}{2}-3$
C) -2 D) $\sin^2\frac{\alpha-\beta}{2}$

14. Hisoblang:
$2\arcsin\left(-\frac{\sqrt{3}}{2}\right)+arcctg(-1)+$
$+\arccos\frac{1}{\sqrt{2}}+\frac{1}{2}\arccos(-1)$

A) $\frac{\pi}{2}$ B) $\frac{3\pi}{2}$ C) $\frac{5\pi}{6}$ D) π

15. $\sqrt{4-x^2}\cdot(\sin^7x-\cos^7x)=0$ tenglama nechta butun son bo'lmagan ildizga ega?
A) 1 B) 2 C) 3 D) 4

16. $f(\varphi(x))=\frac{x+2}{x-3}$, $\varphi(x)=2x-1$ bo'lsa, $f(x)=?$

A) $f(x)=\frac{x+5}{2x-5}$ B) $f(x)=\frac{x-5}{x+5}$
C) $f(x)=\frac{x+5}{x-5}$ D) $f(x)=\frac{2x+5}{x-5}$

17. Agar $2^x=152$ bo'lsa, $|x-8|+|x-6|$ ifodani soddalashtiring.
A) 2 B) $14-2x$ C) $2x-14$ D) -2

18. Agar $\log_{30} 3 = a$ va $\log_{30} 5 = b$ bo'lsa, $\log_{30} 64$ ni a va b orqali ifodalang.
A) $8 + 8a - 8b$ B) $4 - 4a - 4b$
C) $6 - 6a - 6b$ D) $6a + 6ab - 6b$

19. Berilgan tengsizlik nechta butun ildizga ega?
$\log_{0,5}(2x - 7) \le \log_{0,5}(10 - x) + 1$
A) 2 ta B) 10 ta C) 5 ta D) 4 ta

20. $f(3x + 2) = 2x^2 - 5x + 8$ bo'lsa, $f'(x)$ ni toping.
A) $\frac{4}{9}x - \frac{13}{9}$ B) $\frac{8}{9}x - \frac{23}{9}$
C) $\frac{4}{9}x - \frac{23}{9}$ D) $\frac{4}{9}x + \frac{13}{9}$

21. $g(x) = 2x - 3$, $f(g(x)) = 3x^2 - 8x + 18$ funksiya berilgan bo'lsa, $f'(g(x))$ ni toping.
A) x B) $3x - 4$ C) $3x$ D) $3x - 2$

22. $\int (x^2 - 5x) f(x) dx = x^2 - 10x + C$ tenglik o'rinli bo'lsa, $f(x)$ quyidagilardan qaysi biri bo'ladi?
A) $\frac{x}{2}$ B) $\frac{2}{x}$ C) $-\frac{2}{x}$ D) $2x$

23. Quyida keltirilgan tasdiqlardan qaysilari to'g'ri?
1) Agar aylanaga ichki chizilgan burchak 30° ga teng bo'lsa, shu burchak tiralgan yoy 60° ga teng; 2) Trapetsiyaning yuzi asoslari yig'indisining balandligiga ko'paytmasiga teng; 3) Agar burchak 108° ga teng bo'lsa, u holda unga vertikal burchak ham 108° ga tengdir; 4) Tekislikda ikki to'g'ri chiziq uchinchi to'g'ri chiziqqa perpendikulyar bo'lsa, u holda bu ikki to'g'ri chiziq perpendikulyardir.
A) 1; 3 B) 2; 4 C) 2; 3 D) 1; 4

24. $A = \{1;3;5;6;8;9;10;11\}$ va $B = \{5;6;7;8;10;11\}$ to'plamlar berilgan. $A \cup B$ to'plam elementlar sonini toping.
A) 9 B) 5 C) 8 D) 11

25. Teng yonli ABC uchburchakda AC asos, $AB = 20$, $\cos A = \frac{2\sqrt{6}}{5}$ bo'lsa, asosga o'tkazilgan balandlikni toping.
A) 1 B) 4 C) $\frac{\sqrt{6}}{5}$ D) 2

26. Perimetri 40 sm bo'lgan parallelogrammda diagonallar o'tkazilgan. Hosil bo'lgan ikkita qo'shni uchburchaklar perimetrlari ayirmasi 10 sm ga teng. Parallelogrammning katta tomonining uzunligini toping.
A) 10 sm B) 20 sm
C) 15 sm D) 12 sm

27. Bir nuqtadan aylanaga ikkita urinma o'tkazilgan. Har bir urinmaning uzunligi 15 sm, urinish nuqtalari orasidagi masofa 24 sm. Aylananing radiusini toping.
A) 24 sm B) 20 sm
C) 15 sm D) 10 sm

28. Uchburchak uchlarining koordinatalari $A(-4;2)$, $B(6;5)$ va $C(1;-4)$ berilgan. A uchidan tushirilgan balandligi orqali o'tuvchi to'g'ri chiziq tenglamasini tuzing.
A) $9x - 5y - 29 = 0$ B) $9x + 5y - 29 = 0$
C) $5x + 9y + 2 = 0$ D) $5x - 9y + 2 = 0$

29. $\vec{a}(2; -1; 1)$ vektorning yOz tekisligidagi orthogonal proyeksiyasining uzunligini toping.
A) 1 B) 2 C) $\sqrt{2}$ D) $\sqrt{3}$

30. Konusning hajmi V ga teng, balandligi to'rtta teng qismga bo'lingan va bo'linish nuqtalaridan konus asosiga parallel tekisliklar o'tkazilgan. Hosil

bo'lgan eng kichik kesik konusning hajmini toping.

A) $\frac{7}{64}V$ B) $\frac{37}{64}V$ C) $\frac{63}{64}V$ D) $\frac{19}{64}V$

Variant-14

1. a va b juft 6 ga bo'linmaydigan sonlar, a va b ni 6 ga bo'lganda qoldiq har xil bo'lsa, $a+b$ ni 6 ga bo'lgandagi qoldiqni toping.
A) 0 B) 2 C) 4 D) 3

2. Hisoblang:
$\left(\frac{\sqrt{7}+\sqrt{5}}{\sqrt{3}+1}\cdot\frac{\sqrt{7}-\sqrt{5}}{\sqrt{3}-1}\right):\left(\frac{1}{\sqrt{3}}-\frac{\sqrt{3}}{9}+\frac{1}{\sqrt{27}}\right)$
A) $\frac{\sqrt{3}}{3}$ B) $3\sqrt{3}$ C) $\sqrt{3}$ D) 1

3. $3^{18}=x+1$ tenglik o'rinli bo'lsa, x quyidagilardan qaysi biriga qoldiqsiz bo'linadi?
A) 14; 15 B) 13; 14
C) 25; 26 D) 25; 28

4. $a=\sqrt{2}-1$ va $b=\sqrt{2}+1$ bo'lsa, a^3+b^3 ning qiymatini toping.
A) 2 B) $3\sqrt{3}$ C) 8 D) $10\sqrt{2}$

5. Ifodani soddalashtiring:
$$\frac{256m^4-1}{256m^4-128m^3+32m^2-8m+1}$$
A) $\frac{16m+1}{16m-1}$ B) $\frac{4m+1}{4m-1}$
C) $\frac{16m-1}{16m+1}$ D) $\frac{4m-1}{4m+1}$

6. Birinchi omborda 37 tonna, ikkinchi omborda esa 11 tonna ko'mir bor. Har kuni ikkala omborga ham 1,5 tonnadan ko'mir tushiriladi. Necha kundan so'ng birinchi ombordagi ko'mir miqdori ikkinchiga qaraganda ikki marta ko'p bo'ladi?
A) 12 B) 9 C) 10 D) 8

7. $\frac{2}{x^2-4}+\frac{x-4}{x^2+2x}=\frac{1}{x^2-2x}$
tenglamaning barcha ildizlari yig'indisini (agar u bitta bo'lsa, shu ildizini o'zini) toping.
A) 3 B) 4 C) -5 D) 5

8. Tenglamaning ildizlari yig'indisini toping: $\sqrt{21-\sqrt{21+x}}=x$
A) 4 B) -1 C) 0 D) -4

9. $\begin{cases}2ax=x^{1-2b^3}+9\\3cx=x^{2b^3-1}-5\end{cases}$ bo'lsa, c ni a va x orqali ifodalang.
A) $\frac{46-10ax}{3x(2ax-9)}$ B) $\frac{46-10ax}{x(2ax-9)}$
C) $\frac{10ax-46}{3x(2ax-9)}$ D) $\frac{10ax-46}{x(2ax-9)}$

10. Ushbu $\frac{5}{|x+2|+2}<|x+2|-2$ tengsizlikni qanoatlantirmaydigan butun sonlar nechta?
A) 6 ta B) 5 ta C) 4 ta D) 7 ta

11. Arifmetik progressiyada $a_6+a_{10}=18$ va $a_9+a_{11}=38$ bo'lsa, S_{15} ni toping.
A) 146 B) 138 C) 142 D) 135

12. Cheksiz kamayuvchi geometrik progressiyaning hadlari yig'indisi 3 ga, hadlari kublarining yig'indisi esa 81 ga teng bo'lsa, progressiyaning maxrajini toping.
A) -0,5 B) -2 C) -0,75 D) -2; -0,5

13. Soddalashtiring:
$2+tg\alpha\cdot tg\beta+\left(tg\alpha+tg\beta\right)\cdot ctg(\alpha+\beta)$
A) 3 B) 1 C) 2 D) 4

14. Agar $\sin x=\frac{1}{2}$ bo'lsa, $6{,}8+2\cos^2 x$ ifodaning qiymatini toping.
A) 6,8 B) 7,8 C) 8,3 D) 9,3

15. k ning qanday qiymatlarida $\cos(x+\pi k)=\cos x$ tenglik o'rinli bo'ladi?
A) $2n, n\in N$ B) $2n, n\in Z$
C) $2n+1, n\in Z$ D) $n+2, n\in N$

16. $f(x)=\dfrac{7\cdot 2^{2x}+5\cdot 2^{-2x}}{2}$ va $g(x)=\dfrac{7\cdot 2^{2x}-5\cdot 2^{-2x}}{2}$ bo'lsa, $f^2(x)-g^2(x)$ ni toping.
A) 32 B) 35 C) 25 D) 10

17. $6^x-6^{-x}=6$ bo'lsa, $\left(6^x-6\right)\cdot 6^x$ ni hisoblang.
A) 1 B) 2 C) 6 D) 36

18. Tengsizlikni yeching: $4^x\le 5-x$.
A) $(-\infty;1]$ B) $(-\infty;1]\cup(5;\infty)$
C) $(-\infty;1)$ D) $(-\infty;4)$

19. Agar $a=\dfrac{1}{6}\cdot\left(\log_2^3 3-\log_2^3 6-\log_2^3 12+\log_2^3 24\right)$ bo'lsa, 2^a ni toping.
A) 78 B) 72 C) 75 D) 60

20. Tenglamaning ildizlarining to'rtinchi darajalari ko'paytmasini toping. $3^{\log_3^2 x}+x^{\log_3 x}=162$.
A) 27 B) 9 C) 81 D) 1

21. $\log_{100}x^2+\lg^2 x<6$ tengsizlikning barcha butun yechimlari yig'indisini toping.
A) 4500 B) 4550 C) 4950 D) 4965

22. $f^2(x)$ va $\dfrac{1}{f(x)}$ funksiyalarning $x=10$ nuqtadagi hosilalari mos ravishda 4 va -2 ga teng bo'lsa, $f'(10)$ ni toping.
A) 1 B) 2 C) 3 D) 4

23. $f(x)=\dfrac{x^2}{x^3+1}$ funksiyaning $\left(\sqrt[3]{e-1};2\right)$ nuqtadan o'tuvchi boshlang'ich funksiyasini toping.
A) $F(x)=\dfrac{1}{3}\ln\left(x^3+1\right)+\dfrac{5}{3}$
B) $F(x)=\dfrac{1}{3}\ln\left(x^3+1\right)-\dfrac{5}{3}$
C) $F(x)=\dfrac{1}{3}\ln\left(x^3+1\right)-2$
D) $F(x)=\dfrac{1}{3}\ln\left(x^3+1\right)+2$

24. Birhad va ko'phadlar uchun quyidagi tasdiqlarning qaysi biri noto'g'ri?
A) ko'phadning darajasi deb, shu ko'bhad tarkibidagi birhadlarning eng katta darajasiga aytiladi;
B) agar ko'phad tarkibida faqat 2 ta harf ishtirok etsa, ikki noma'lumli ko'phad deyiladi;
C) birhadning darajasi deb, uning tarkibidagi barcha harflar darajalarinng yig'indisiga aytiladi;
D) ko'phadning darajasi deb, shu ko'bhad tarkibidagi birhadlarning darajalari yig'indisiga aytiladi;

25. Quyidagi javoblardan qaysi biri bo'sh to'plam?
A) $A=\{x: x^2\le 0, x\in R\}$
B) $A=\{x: 3x+5=0, x\in R\}$
C) $A=\{x: x^2\le x, x\in R\}$
D) $A=\{x: |2x-3|=-4, x\in R\}$

26. Teng yonli to'g'ri burchakli ABC uchburchakning AB gipotenuzasida yotuvchi M va N nuqtalar uchun $AM=AC$ va $BN=BC$ bo'lsa, $\angle MCN$ ni toping.
A) 30° B) 40° C) 60° D) 45°

27. $ABCD$ trapetsiyaning yuzi 48 ga teng, asoslari $DC=6, AB=2$. BC tamondan E nuqta olingan bo'lib, $BE=2EC$ bo'lsa, ADE uchburchakning yuzini toping.
A) 32 B) 18 C) 24 D) 28

28. $A(3;0)$ va $B(-1;2)$ nuqtalardan o'tuvchi hamda markazi $y=x+2$ to'g'ri chiziqda yotgan aylana tenglamasini toping.
A) $(x-3)^2+(y-5)^2=25$
B) $(x-4)^2+(y-5)^2=25$
C) $(x-3)^2+(y-4)^2=25$
D) $(x-5)^2+(y-3)^2=25$

29. $2x+5y=3$; $3x+4y=2$ to'g'ri chiziqlarning kesishish nuqtasi va $M(0;4)$ nuqtadan o'tuvchi to'g'ri chiziq tenglamasini yozing.
A) $23x-2y+8=0$ B) $23x-4y+16=0$
C) $23x-3y+12=0$ D) $23x-y+4=0$

30. Muntazam uchburchakli prizmaga silindr ichki chizilgan. Agar prizmaning asosining tomoni $2\sqrt{3}$, balandligi 4 ga teng bo'lsa, silindr to'la sirtini toping.
A) 8π B) 9π
C) 10π D) $8\sqrt{3}\pi$

Variant-15

1. 36 ga bo'linadigan $\overline{72x5y}$ ko'rinishidagi barcha besh xonali sonlar orasida, x ning eng katta qiymatini toping.
A) 7 B) 6 C) 5 D) 8

2. Soddalashtiring:
$$\frac{a^2-ac^2+2c^2-4}{a^2+2a+2c^2-c^4}-\frac{a^2-4a+4}{a^2+ac^2-2a-2c^2}.$$
A) 0 B) 1 C) $a+c$ D) $a-c$

3. $\frac{a}{b}=\frac{c}{d}=\frac{e}{f}=\frac{3}{4}$ bo'lsa, $\frac{a\cdot c\cdot e}{b\cdot d\cdot f}$ ning qiymatini toping.
A) $\frac{8}{27}$ B) $\frac{27}{64}$ C) $\frac{8}{81}$ D) $1\frac{27}{64}$

4. Ifodani soddalashtiring:
$\sqrt[5]{b^5}-\sqrt[4]{b^4}+\sqrt[6]{b^6}-\sqrt[7]{b^7}$, bu yerda $b<0$.
A) $0;\ 4b$ B) 0 C) $0;\ -4b$ D) $4b$

5. Agar $\sqrt{a+\sqrt{a+\sqrt{a+\ldots}}}=2$ bo'lsa, $\sqrt{a\cdot\sqrt{a\cdot\sqrt{a\cdot\ldots}}}$ ning qiymatini toping.
A) 2 B) 1 C) 4 D) 3

6. Hovuzdagi suv bo'shatila boshlaganidan bir soat o'tgach, unda $300\,m^3$ suv qoldi va yana uch soat vaqt o'tgach esa $150\,m^3$ suv qoldi. Dastlab hovuzda qancha (m^3) suv bo'lgan?
A) 425 B) 400 C) 350 D) 375

7. $2x^2-\left(2\sqrt{3}+3\sqrt{2}\right)x+\sqrt{6}+2=0$ tenglamaning kichik ildizini toping.
A) $\frac{\sqrt{2}}{2}$ B) $-\frac{\sqrt{2}}{2}$
C) $\sqrt{3}-\sqrt{2}$ D) $\sqrt{3}+\sqrt{2}$

8. k ning qanday qiymatlarida tenglama manfiy yechimlarga ega? $\frac{1}{x+1}=1-k$
A) $0<k<1$ B) $k<0;\ k>1$
C) $k<0$ D) $k>1$

9. Agar $\frac{1}{4}<\frac{3}{b}<\frac{1}{2}$ va $\frac{1}{6}<\frac{2}{a}<\frac{1}{3}$ tengsizliklar o'rinli bo'lsa, $a-b$ ning eng kichik butun qiymatini toping.
A) -5 B) 5 C) -4 D) -6

10. a ning qanday eng katta butun qiymatida $2x^2+4x-4>a$ tengsizlik x

ning barcha qiymatlarida o'rinli bo'ladi?
A) -7 B) -4 C) -8 D) -6

11. Ayirmasi noldan farqli arifmetik progressiyada to'rtinchi hadidan o'n to'rtinchi hadigacha bo'lgan hadlari yig'indisi 99 ga teng. Arifmetik progressiyaning nechanchi hadi 9 ga teng bo'ladi?
A) 10 B) 9 C) 11 D) 12

12. Ifodani soddalashtiring:

$7\sin^2 x - 1 + 7\cos^2 x$
A) 6 B) 7 B) 5 D) 0

13. $\cos 15\alpha + \cos 13\alpha + \cos 11\alpha + \cos 9\alpha$ ifodani soddalashtiring.
A) $4\cos^2 4\alpha \sin^2 4\alpha$
B) $4\cos 12\alpha \cos 2\alpha \cos \alpha$
C) $2\sin \alpha \sin 2\alpha \cos 6\alpha$
D) $8\cos 12\alpha \cos 2\alpha \cos \alpha$

14. Agar $ctg\alpha = \frac{1}{5}$ bo'lsa, $tg3\alpha$ ning qiymatini toping.
A) 55/37 B) 57/35
C) 65/37 D) 37/55

15. Tenglamani yeching:

$$2\cos\left(2x + \frac{\pi}{9}\right) + \sqrt{3} = 0.$$

A) $x = -\frac{17\pi}{36} + \pi n,\ n \in Z;\ x = \frac{13\pi}{36} + \pi k,\ k \in Z;$
B) $x = -\frac{17\pi}{36} + 2\pi n,\ n \in Z;\ x = \frac{13\pi}{36} + 2\pi k,\ k \in Z;$
C) $x = -\frac{17\pi}{18} + \pi n,\ n \in Z;\ x = \frac{13\pi}{36} + \pi k,\ k \in Z;$
D) $x = \frac{17\pi}{36} + \pi n,\ n \in Z;\ x = -\frac{13\pi}{36} + \pi k,\ k \in Z;$

16. $y = 50x + 79$ to'g'ri chiziqqa parallel bo'lgan, $y = kx - 4,7$ to'g'ri chiziqqa tegishli nuqtani toping.
A) (0,3; 0,1) B) (0,1; 0,3)
C) (1; 3) D) (0,125; 2,2)

17. $y = \frac{\sin x \cdot (ctgx + 1) + \cos x \cdot (tgx + 1)}{2}$ funksiyaning qiymatlari sohasini toping.
A) $\left[-\sqrt{2}; \sqrt{2}\right]$
B) $\left[-\sqrt{2}; -1\right) \cup \left(-1; 0\right) \cup \left(0; 1\right) \cup \left(1; \sqrt{2}\right)$
C) $\left[-\sqrt{2}; -1\right) \cup \left(-1; 1\right) \cup \left(1; \sqrt{2}\right]$
D) $\left[-\sqrt{2}; 0\right) \cup \left(0; \sqrt{2}\right)$

18. $\frac{0,04^{x+y}}{0,008^x} > 0,0016^{x-y}$ tengsizlik uchun quyidagilarning qaysi biri o'rinli?
A) $x - y < 0$ B) $x + y > 3$
C) $7x + 4y > 0$ D) $5x - 6y > 0$

19. $y = \ln\left(x^2 - 2x - 3\right)$ funksiyaning manfiy qiymatlar qabul qiladigan butun x lar sonini toping.
A) 1 B) 2 C) 0 D) 3

20. $\log_{x+8}(64 - x^2) - \frac{1}{16}\log^2_{x+8}(x-8)^2 \geq 2$ tengsizlik nechta haqiqiy yechimga ega?
A) yechimga ega emas B) 1
C) 2 D) cheksiz ko'p

21. x ning qanday qiymatlarida $f(x) = \frac{|x^2 - 2x - 8|}{3} - \frac{2x^2}{x^2 - 16}$ funksiyaning hosilasi mavjud emas?
A) -4; -2; 8 B) -2; 2; 4
C) -4; 2; 4 D) -4; -2; 4

22. $\int_0^1 x^9 \cdot \left(x^5 - 1\right)^{2n} \cdot \left(x^5 + 1\right)^{2n} dx = a$ bo'lsa, $\frac{1}{a}$ ni toping.
A) $20n + 10$ B) $10n + 10$
C) $20n - 10$ D) $10n - 10$

23. To'g'ri javobni toping.

1) agar $a < 0$ bo'lsa, $a + \frac{1}{a} \leq -2$ bo'ladi;
2) agar a va b har xil ishorali bo'lsa,

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$\frac{a}{b}+\frac{b}{a}\geq 2$ bo'ladi;
3) agar a va b har xil ishorali bo'lsa, $\frac{a}{b}+\frac{b}{a}\leq -2$ bo'ladi.
A) 2; 3 B) 1; 2; 3 C) 1; 3 D) 1; 2

24. Konsertga boshlovchilikka 4 ta o'g'il va 2 ta qiz bola nomzodi ko'rsatilgan. Boshlovchilikka 1 ta o'g'il va 1 ta qiz ni nechta xil usulda tanlash mumkin?
A) 6 B) 8 C) 24 D) 16

25. ABC uchburchakning BC asosidagi M nuqtadan uchburchakning AB va AC tomonlariga parallel qilib MN va MK kesmalar o'tkazildi, bunda K va N nuqtalar uchburchakning AB va AC tomonlarida yotadi. Agar BKM va CMN uchburchaklar yuzlari mos ravishda 3 va 12 ga teng bo'lsa, ABC uchburchak yuzini toping.
A) 36 B) 27 C) 30 D) 24

26. $ABCD$ trapetsiyada AB yon tomonning o'rtasidan CD tomonga parallel qilib to'g'ri chiziq o'tkazilgan bo'lib, AD katta asosni G nuqtada kesib o'tadi. Agar $AG=5$ dm va $GD=2,5$ m bo'lsa, trapetsiyaning asoslarini toping.
A) 3 m; 1 m B) 4 m; 1 m
C) 2 m; 1 m D) 3 m; 2 m

27. Ikkita konsentrik aylanalardan kattasining uzunligi 40 sm ga teng bo'lgan vatari kichigiga urinadi. Agar halqaning kengligi 10 sm bo'lsa, katta aylananing radiusini toping.
A) 23 D) 30 C) 25 D) 26

28. $(-3;-4)$ nuqtadan koordinatalar boshigacha masofani toping.
A) 3 B) 6 C) 4 D) 5

29. $ABCD$ parallelogrammning diagonallari O nuqtada kesishadi, $\overrightarrow{BO}=k\cdot\overrightarrow{BD}$ tenglik bajariladigan k sonining qiymatini toping.
A) 0,5 B) 0,2 C) 1 D) 0,75

30. Asosi $4\sqrt{3}$ ga uchidagi burchagi 120° ga teng bo'lgan teng yonli uchburchak o'zining asosi atrofida aylantirishdan hosil bo'lgan jismning to'la sirtini toping.
A) 36π B) 12π C) 16π D) $14\sqrt{3}\pi$

Variant-16

1. $20-15-13-1$ ifodaga qavslar qo'yilganda nechta turli xil natijalar olish mumkin?
A) 4 B) 5 C) 2 D) 7

2. Hisoblang:
$\left(\frac{\sqrt{10}+\sqrt{7}}{\sqrt{5}+1}\cdot\frac{\sqrt{10}-\sqrt{7}}{\sqrt{5}-1}\right):\left(\frac{1}{\sqrt{3}}-\frac{\sqrt{3}}{9}+\frac{1}{\sqrt{27}}\right)$
A) $\frac{3\sqrt{3}}{4}$ B) $3\sqrt{3}$ C) $\sqrt{3}$ D) 1

3. $(x+a-1)^{2018}-x^{30}-1$ ko'phadning ozod hadi 0 ga teng bo'ladigan a ning barcha qiymatlari yig'indisini toping.
A) 2018 B) 2019 C) 2000 D) 2

4. $a^2-b^2+8a-2b+15$ ko'phadning ko'paytuvchilaridan birini toping.
A) $a-b+5$ B) $a+b-5$
C) $a+b-3$ D) $a-b+3$

5. Agar biror oyda 5 ta payshanba bo'lsa, shu oyda . . . bo'la olmaydi.
A) 5 ta shanba B) 5 ta yakshanba
C) 5 ta seshanba D) 5 ta juma

6. $\frac{\sqrt{6+x^2}}{6+x}=6-x$ tenglamaning ildizlari kvadratlari yig'indisini toping.
A) 86 B) 30 C) 60 D) 146

7. Agar $x^2-3x+1=0$ bo'lsa, $x^2+\frac{1}{x^2}$ ning son qiymatini toping.
A) 7 B) 8 C) 5 D) 6

8. $(x^2-6)x=a$ tenglama a ning qanday qiymatlarida 3 ta haqiqiy ildizga ega bo'ladi?

A) $\pm 4\sqrt{2}$ B) $\pm\sqrt{2}$ C) $\left(-4\sqrt{2};4\sqrt{2}\right)$

D) $\left(-\infty;-4\sqrt{2}\right)\cup\left(4\sqrt{2};\infty\right)$

9. Tengsizlikni yeching:

$(x-3)^{16}+\sqrt{x+1}\geq 1$

A) $[-1;\infty)$ B) $(-\infty;\infty)$

C) $[3;\infty)$ D) $[1;\infty)$

10. Agar $\begin{cases}2\leq x\leq 28\\ \frac{7}{3}\leq y\leq 7\end{cases}$ bo'lsa, $\frac{x+3y}{y}$ qanday oraliqqa tegishli bo'ladi?

A) $\left[\frac{14}{3};196\right]$ B) $\left[3\frac{2}{7};15\right]$

C) $\left[7;\frac{125}{2}\right]$ D) $\left[3\frac{6}{7};7\right]$

11. Ayirmasi noldan farqli arifmetik progressiyada to'rtinchi hadidan o'n to'rtinchi hadigacha bo'lgan hadlari yig'indisi 55 ga teng. Arifmetik progressiyaning nechanchi hadi 5 ga teng bo'ladi?

A) 10 B) 9 C) 11 D) 12

12. Ifodani soddalashtiring:

$((\sin\alpha)^{-1}+(tg\alpha)^{-1}):\left(tg\frac{\alpha}{2}\right)^{-1}$

A) $tg^2\frac{\alpha}{2}$ B) $tg\frac{\alpha}{2}$ C) 1 D) 2

13. Soddalashtiring:

$\left(\sin 115^\circ+\sin 25^\circ\right)\cdot\left(\sin 65^\circ+\sin 155^\circ\right)+$

$+\left(\sin 25^\circ-\sin 115^\circ\right)\cdot\left(\sin 155^\circ-\sin 65^\circ\right)$

A) $\sin 50^\circ$ B) $\sin 40^\circ$ C) 0 D) 2

14. Agar $0<\alpha,\beta<\frac{\pi}{2}$, $tg\alpha=\frac{\sqrt{3-\sqrt{3}}\cdot\sqrt{3}}{4-\sqrt{3-\sqrt{3}}}$ va $tg\beta=\frac{\sqrt{3-\sqrt{3}}-1}{\sqrt{3}}$ bo'lsa, $\alpha-\beta$ ni toping.

A) $\frac{\pi}{3}$ B) $\frac{\pi}{12}$ C) $\frac{\pi}{4}$ D) $\frac{\pi}{6}$

15. $\cos^2 4x+tg2x\cdot\sin 4x=\cos 4x$ tenglamaning $(0;\pi]$ oraliqqa tegishli ildizlari sonini toping.

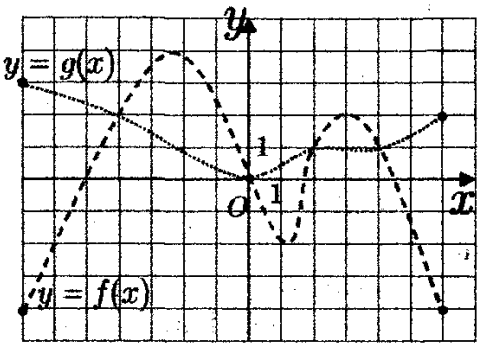
A) 1 B) 2 C) 3 D) 4

16. $\begin{cases}f(x)=ax+b\\ g(x)=cx+d\end{cases}$ agar $\frac{b}{d}=5$ va $f(g(x))=g(f(x))$ ayniyat bo'lsa, $\frac{c-1}{a-1}$ ni toping. $(a\neq 1)$

A) $\frac{1}{5}$ B) 1 C) 0 D) 5

17. Chizmada $[-7;6]$ kesmada berilgan $y=f(x)$ va $y=g(x)$ funksiyalarning grafiklari tasvirlangan. $g(x)>f(x)$ tengsizlikni qanoatlantiradigan x ning barcha qiymatlarini toping.

_____ $y=f(x)$; ..... $y=g(x)$



A) $(-4;4)$ B) $[-4;0]\cup[2;4]$

C) $(-4;0)\cup(2;4)$

D) $[-7;-4)\cup(0;2)\cup(4;6]$

18. $\frac{2^a+4\cdot 2^b}{2^a-2\cdot 2^b}=5$ bo'lsa, 2^{a-b+1} ning qiymatini toping.
A) 5 B) 7,5 C) 2 D) 7

19. Hisoblang:
$(\log_5 4+\log_4 5+2)\cdot(\log_5 4-\log_{20} 4)\cdot$
$\cdot\log_4 5-\log_5 4.$
A) 1 B) 2 C) 3 D) 4

20. $y=\log_x e+\ln x$ funksiyaning qiymatlar to'plamini toping. $(x>1)$
A) $(1;\infty)$ B) $[2;\infty)$
C) $[2;e]$ D) $[e;\infty)$

21. Agar $-3<\log_{0,5} a<-2$ va $2<\log_{0,5} b<4$ bo'lsa, $a\cdot b$ ning qabul qilishi mumkin bo'lgan barcha qiymatlarini toping.
A) (0,25; 2) B) (2; 4)
C) (1; 3) D) (0,25; 4)

22. $y=f(x)$ funksiyaning $(-2;10)$ nuqtasidan o'tkazilgan urinma koordinatalar boshidan o'tadi. Shu funksiyaning $x_0=-2$ nuqtadagi hosilasini toping.
A) 5 B) -5 C) 20 D) -20

23. Hisoblang:
$\int\left[\left(1+tg(20^\circ+x)\right)\cdot\left(1+tg(25^\circ-x)\right)\right]dx$
A) $2x^2+C$ B) x^2+C
C) $2x+C$ D) $x+C$

24. Quyida keltirilgan tasdiqlardan qaysilari noto'g'ri?
1) Agar ikkita aylanalar radiuslari 5 va 7, ularning markazlari orasidagi masofa 3 ga teng bo'lsa, u holda aylanalar umumiy nuqtaga ega emas; 2) Agar parallelogrammning diagonallari teng va perpendikulyar bo'lsa, u holda bu parallelogramm kvadratdir; 3) Vertikal burchaklar teng emas, bunda ularning yig'indisi 180° ga teng, faqat agar ular to'g'ri burchak bo'lsa; 4) Kvadratning diagonallari uning burchaklarini teng ikkiga bo'ladi.
A) 1; 3 B) 2; 4 C) 2; 3 D) 1; 4

25. Madina olma, nok va mandarin yemoqchi, ammo bu ishni qanday ketma-ketlikda amalgam oshirish yuzasidan hech qanday qarorga kelmadi. Madina bunday ketma-ketlikni nechta usul bilan tanlashi mumkin.
A) 9 B) 3 C) 1 D) 6

26. ABC uchburchakda $AB=13$, $BC=15$, $AC=14$ va $BN:NC=2:1$ bo'lsa, AN kesmaning uzunligini toping.
A) 13,5 B) 12 C) $\sqrt{127}$ D) $\sqrt{137}$

27. $ABCD$ parallelogrammda BH perpendikulyar o'tkazilgan bo'lib, H nuqta AD kesmada yotadi. Agar $AH=6$, $HD=10$, $\angle ABH=30^\circ$ ekanligi ma'lum bo'lsa, parallelogrammning yuzini toping.
A) $96\sqrt{2}$ B) $96\sqrt{6}$ C) $48\sqrt{3}$ D) $96\sqrt{3}$

28. Teng yonli $ABCD$ trapetsiyada AC dioganal CD tomonga perpendikulyar. Agar $AD=4$, $|AB|^2+|BC|^2=11$ bo'lsa, $|AB|$ ni toping.
A) 3 B) $\sqrt{2}$ C) 2 D) 1,5

29. $y=x-4$ funksiya uchun $A(8;-4)$ nuqtaga nisbatan simmetrik bo'lgan funksiyani toping.
A) $y=-x-20$ B) $y=-x+4$
C) $y=-x-4$ D) $y=x-20$

30. Radiusi $4\sqrt{2}$ ga teng bo'lgan sharga konus ichki chizilgan. Konusning yasovchisi asos tekisligi bilan 60° li burchak tashkil etadi. Konusni yon sirtini toping.
A) 54π B) 24π C) 48π D) 32π

Variant-17

1. a va b sonlar natural sonlar bo'lib, ularning eng katta umumiy bo'luvchisi 9 ga teng. Agar $4a = 5b$ tenglik bajarilsa, $a + b$ yig'indini hisoblang.
A) 81 B) 63 C) 54 D) 72

2. Ifodaning qiymatini toping:
$$\sqrt[3]{\frac{12}{25}\sqrt{\frac{244}{15\cdot(38^2-23^2)}}}$$
A) 0,8 B) 0,5 C) 0,2 D) 0,4

3. $a = 3$ va $b = 8$ bo'lsa, $\dfrac{5ab}{5ab - 8a^2}$ ifodaning qiymatini toping.
A) 3,5 B) 0,5 C) 2,5 D) 1,5

4. Ifoda qiymatini $a = 16$ bo'lganda hisoblang:
$$\frac{\sqrt[3]{a^2} + \sqrt[3]{32a} + \sqrt[3]{16}}{\left(\sqrt[3]{a} + \sqrt[3]{4}\right)^3\left(\sqrt[3]{a^2} - \sqrt[3]{4a} + \sqrt[3]{16}\right)}$$
A) 0,05 B) -0,5 C) -0,05 D) 0,5

5. Agar $x = \sqrt{42 - \sqrt{42 - \sqrt{42 - \ldots}}}$,
$y = \sqrt{x + \sqrt{x + \sqrt{x + \ldots}}}$,
$z = \sqrt{y \cdot \sqrt{y \cdot \sqrt{y \cdot \ldots}}}$ bo'lsa, $x + y + z$ ning qiymatini toping.
A) 11 B) 14 C) 10 D) 12

6. 480 gramm suvga 20 gramm tuz aralashtirildi. Hosil bo'lgan aralashmaning necha foizi tuzdan iborat bo'ladi?
A) 4 B) 5 C) 30 D) 22

7. Tenglamaning ildizlari yig'indisini toping: $\dfrac{x+1}{x-1} = 5 - x$
A) -1 B) 6 C) -4 D) 5

8. Tenglamaning ildizlari yig'indisini toping: $\sqrt{x+8} - \sqrt{x+4} = 2$
A) 1 B) 4 C) 2 D) -4

9. $(a^2 - 2a + 1)x = a^2 + 2a - 3$ tenglama a ning qanday qiymatlarida yagona yechimga ega bo'ladi?
A) $a = -3$ B) $a = 1,\ a = -3$
C) $a = 1$ D) $a \neq 1$

10. $\dfrac{19x - 2}{x^2 + 5x + 4} > 2$ tengsizlikni qanoatlantiruvchi butun sonlar soni x_0 bo'lsa, $x_0 + 2$ ni toping.
A) 2 B) 3 C) 4 D) 5

11. Ushbu $(x^2 - 3x)\cdot(x^2 - 3x + 2) \geq 24$ tengsizlikni qanoatlantirmaydigan eng katta va eng kichik butun sonlar ayirmasini toping.
A) 2 B) 3 C) 5 D) 4

12. Agar geometrik progressiyada $b_5 - b_1 = 18$ va $b_3 - b_1 = 12$ bo'lsa, b_{11} ni toping.
A) -16/27 B) -4/94 C) -3/4 D) -3/8

13. Ifodani soddalashtiring:
$\cos^4\alpha + \sin^2\alpha \cdot \cos^2\alpha$.
A) $\cos 2\alpha$ B) $2\sin^2\alpha$
C) $\cos^4\alpha$ D) $\cos^2\alpha$

14. Hisoblang. $\dfrac{arctg\frac{8}{15} - arctg\frac{1}{4}}{arcctg4}$
A) 0,5 B) 0 C) 2 D) 1

15. k ning qanday qiymatlarida $\cos(\alpha + \pi k) = -\cos\alpha$ tenglik o'rinli bo'ladi?
A) $2n, n \in N$ B) $n, n \in Z$
C) $2n+1, n \in Z$ D) $n+2, n \in N$

16. $y = 4x - x^2$ va $y = x^2 - 6x + k$ funksiyalarga o'tkazilgan umumiy urinma $M(1; 3)$ nuqtadan o'tsa, k ning qiymatini toping.
A) 7 B) 9 C) 17 D) 19

17. $f(x)=\begin{cases}-x+2, x<0\\ \dfrac{x-1}{2}, x\ge 2\end{cases}$ funksiya berilgan. $f\left(f\left(-1\right)\right)$ ni toping.

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

18. Agar $81^x=16$ bo'lsa, 9^x ning qiymatini toping.

A) 4 B) 4/3 C) -4 va 4 D) 4/9

19. $y=\sqrt{\log_{\frac{1}{3}}\left(x^2-2x\right)+1}$ funksiyaning aniqlanish sohasini toping.

A) $\left[-1;\,3\right]$ B) $\left(-\infty;\,0\right)\cup\left(2;\,\infty\right)$

C) $\left(-\infty;\,-1\right]\cup\left[3;\,\infty\right)$

D) $\left[-1;\,0\right)\cup\left(2;\,3\right]$

20. $2^{\log_{0,4}(x)\cdot\log_{0,4}(2,5x)}>1$ tengsizlikning eng kichik natural yechimini toping.

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

21. Funksiya qiymatlar to'plamini toping: $y=5-2\ln x$.

A) (0; 5) B) $(-\infty;+\infty)$

C) [−2; 5] D) $[5;+\infty)$

22. $\int\limits_{-1}^{1}\sqrt{|x|+x}\,dx$ aniq integralni qiymatini toping.

A) $2\sqrt{2}$ B) $\dfrac{2\sqrt{2}}{3}$ C) $\dfrac{\sqrt{2}}{2}$ D) $\sqrt{2}$

23. To'g'ri berilgan integrallash formulalarini tanlang:

1) $\int\dfrac{1}{g(x)}\cdot g'(x)dx=\ln\left|g(x)\right|+C$

2) $\int a^{g(x)}\cdot g'(x)dx=\dfrac{a^{g(x)}}{a\ln|a|}+C$

3) $\int e^{g(x)}\cdot g'(x)dx=e^{g(x)}+C$

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

24. Javonda 11 ta kitob bor. Diyora javondan 6 ta kitobni necha xil usul bilan olishi mumkin?

A) 792 B) 924 C) 396 D) 462

25. Agar ABC uchburchakning AB va AC tomonlarida M va N nuqtalar olinib, ular tomonlarni mos ravishda $AM:BM=2:5$ va $AN:CN=4:5$ kabi nisbatda bo'lsa, CM to'g'ri chiziq BN kesmani qanday nisbatda bo'ladi?

A) 6 : 5 B) 9 : 5 C) 9 : 2 D) 12 : 7

26. $ABCD$ to'g'ri to'rtburchakda $AB=2$, $AD=\sqrt{3}$. AB tomonda E nuqta olingan, bunda $\angle CED=\angle AED$. $\angle AED$ ni toping.

A) 67,5° B) 75° C) 30° D) 60°

27. $ABCD$ trapetsiyaning asoslari $AD=30$ va $BC=24$ hamda $AB=12$, $\angle A=60^\circ$. Diagonallari O nuqtada kesishadi. COD uchburchakning yuzini toping.

A) $40\sqrt{3}$ B) $50\sqrt{3}$

C) $30\sqrt{3}$ D) $45\sqrt{3}$

28. $A\left(0;\,1\right)$ nuqta uchun $y=2x+6$ funksiyaga nisbatan simmetrik bo'lgan nuqtani toping.

A) (−4; 3) B) (0; 3)

C) (0; 2) D) (2; 0)

29. $\vec{a}$ va $\vec{b}$ birlik vektorlarga qurilgan parallelogrammning dioganallari orasidagi burchakni toping.

A) 60° B) 90° C) 80° D) 45°

30. Tekislikdan 4 m masofada yotgan nuqtadan ikkita teng og'ma o'tkazilgan. Agar og'malar o'zaro perpendikulyar va tekislikka o'tkazilgan perpendikulyar bilan 60° ga teng burchaklar tashkil etishi ma'lum bo'lsa, og'malarning asoslari orasidagi masofani toping.

A) $8\sqrt{2}\,m$ B) $6\sqrt{2}\,m$

C) $12\sqrt{2}\,m$ D) $4\sqrt{2}\,m$

Variant-18

1. Quyida berilgan sonlardan qaysilari 6, 8 va 12 larning umumiy karralisi bo'la oladi?
a) 140; b) 96; c) 24; d) 16; e) 192
A) d B) b, c, e C) a D) a, c

2. Ifodani soddalashtiring: $\frac{\sqrt[3]{40}}{\sqrt[3]{625}}$
A) 0,8 B) 0,2 C) 0,5 D) 0,4

3. $(x+1)(x+3)(x+5)(x+7)+10$ ifodaning eng kichik qiymatini toping.
A) 0 B) 4 C) -4 D) -6

4. M natural sonni 3 ga bo'lganda qoldiqda $\frac{(3a+1)^{40}+1}{(3a+1)^{20}}$ qoladi. a ning eng kichik qiymati nimaga teng?
A) 0 B) 1 C) -2/3 D) -1/2

5. $a+b+c=3$ va $ab+ac+bc=2$ bo'lsa, $a^3+b^3+c^3-3abc$ ifodaning qiymatini toping.
A) 8 B) 9 C) -9 D) -8

6. Agar x ratsional son bo'lsa, $\sqrt[4]{4+x}+\sqrt{-x-4}-\sqrt{40+x}$ ifodani soddalashtiring.
A) -5 B) 3 C) 6 D) -6

7. Xitoy aholisining soni $1{,}3\cdot10^9$ kishini, Italiyaniki esa $5{,}6\cdot10^7$ kishini tashkil etadi. Xitoy aholisining soni Italiya aholisining sonidan necha marta ko'p?
A) taxminan 21 marta
B) taxminan 22 marta
C) taxminan 23 marta
D) taxminan 24 marta

8. $-2\cdot(5-3x)=7x+3$ tenglamani yeching.
A) -13 B) -1 C) 13 D) 1

9. $x^2+2ax+a(a-1)=0$ tenglamaning ikkita turli ildizlari ko'paytmasi 12 dan kichik bo'ladigan a parametrning barcha qiymatlarini toping.
A) (-3; 4) B) (0; 3)
C) (0; 4) D) (-4; 3)

10. Agar $\frac{1}{4}<\frac{3}{b}<\frac{1}{2}$ va $\frac{1}{6}<\frac{2}{a}<\frac{1}{3}$ tengsizliklar o'rinli bo'lsa, $a-b$ ning eng katta butun qiymatini toping.
A) 5 B) 0 C) 6 D) 3

11. m ning nechta natural qiymatida $(2-m)x^2+3(m+1)x+2>0$ tengsizlik x ning istalgan qiymatida o'rinli bo'ladi?
A) bunday qiymat mavjud emas
B) cheksiz ko'p qiymatida C) 4 D) 1

12. Arifmetik progressiyada $a_{15}=7a_9$ bo'lsa, uning dastlabki o'n beshta hadi yig'indisini toping.
A) 0 B) 30 C) 4 D) 15

13. Hisoblang: $\cos40^\circ+\cos80^\circ-\cos20^\circ$
A) 1 B) 0 C) $\cos10^\circ$ D) $\sin20^\circ$

14. Hisoblang:
$\arcsin(\cos10)+\arccos(\sin10)$
A) $\frac{\pi}{2}$ B) 20 C) $2\cdot(10-3\pi)$ D) 10

15. Ushbu $3\cos4x+1=0$ tenglamaning $\left[-\frac{\pi}{2};\frac{\pi}{2}\right]$ oraliqqa tegishli ildizlari soni nechta?
A) 2 B) 10 C) 3 D) 4

16. $f(x)=6\sqrt{2-x}+8\sqrt{x}$ funksiyaning eng katta qiymatini toping.
A) 15 B) 14 C) 10 D) $10\sqrt{2}$

17. $\frac{2^a+4\cdot2^b}{2^a-2\cdot2^b}=-7$ bo'lsa, 2^{a-b} ning qiymatini toping.
A) 1 B) 1,5 C) 2 D) 1,25

18. Agar $a=6$ bo'lsa, ifodani soddalashtiring:

$$\frac{\left(25^{\frac{1}{2\log_{49}25}}+2\log_2\log_2\log_2 a^{2\log_a 4}\right)\cdot 4^{\frac{2}{\log_3 4}}-a^2}{1-a}$$

A) 5 B) 6 C) 7 D) 8

19. $\log_{\frac{1}{3}}|1-3x|<-1$ tengsizlikning eng katta butun manfiy yechimini toping.
A) -1 B) -5 C) -2 D) -3

20. $y=5\sin 9x+3\sin 15x$ funksiyaning hosilasini toping.
A) $90\cos 3x\cos 12x$
B) $-90\cos 3x\cos 12x$
C) $90\sin 3x\sin 12x$
D) $-90\sin 3x\sin 12x$

21. Moddiy nuqta tezligi quyidagi qonuniyat bo'yicha o'zgarmoqda: $\vartheta(t)=t^2-3t+1$ (m/s). Harakat boshlangandan so'ng 6-sekund oxirida uning tezlanishi necha m/s^2 bo'ladi?
A) 8 B) 9 C) 10 D) 11

22. $\int_0^1 x(x+3)(2x-1)dx$ integralni hisoblang.

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

23. Quyida keltirilgan tasdiqlardan qaysilari to'g'ri?
1) trapetsiyaning o'rta chizig'i uning diagonallarini teng ikkiga bo'ladi; 2) agar teng yonli trapetsiyaning diagonali uning katta asosidagi burchagi bissektrisasi bo'lsa, u holda katta asos yon tomonga teng bo'ladi; 3) agar teng yonli trapetsiyaning diagonali uning kichik asosidagi burchagi bissektrisasi bo'lsa, u holda katta asos yon tomonga teng bo'ladi.
A) 1; 2; 3 B) 2; 3 C) 1; 2 D) 1; 3

24. $A=\{1;3;5;6;7;8;9;10\}$ va $B=\{1;5;6;7;8;10;11\}$ to'plamlar berilgan. $A\cap B$ to'plamning qism to'plamlari sonini toping.
A) 64 B) 16 C) 32 D) 128

25. Muntazam uchburchakning tomoni 2 ga teng. Uning balandligiga teng yangi muntazam uchburchak chizilgan, bu uchburchakning ham balandligiga teng yana muntazam uchburchak chizilgan va h. k. Hosil bo'lgan keyingi barcha uchburchaklar yuzlari yig'indisini toping.
A) $2\sqrt{3}$ B) $4\sqrt{3}$ C) $3\sqrt{3}$ D) $12\sqrt{3}$

26. Parallelogrammning perimetri 120 ga, o'tkir burchagi 60° ga teng. Diagonali o'tmas burchagini $3:1$ nisbatda bo'lsa, uning yuzini toping.
A) 450 B) $450\sqrt{3}$
C) $400\sqrt{3}$ D) $350\sqrt{3}$

27. $\angle A=120^\circ$ bo'lgan teng yonli ABC uchburchakda AC va AB tomonlari o'rtasidan hamda B, C uchlaridan o'tuvchi aylananing radiusi $\sqrt[4]{3}$ bo'lsa, uchburchakning yuzini toping.
A) 3/7 B) 3 C) 1 D) 2

28. Agar ABC uchburchakning uchlari $A(a;4)$, $B(-3;0)$ va $C(7;0)$ nuqtalarda va $\angle BAC=90^\circ$ bo'lsa, a ning qiymatini toping.
A) 5; 1 B) 5; -1 C) -5; 1 D) -5; -1

29. To'g'ri burchakli uchburchakning katetlari 6 va 8 ga teng. Uchburchakning gipotenuzasi orqali o'tuvchi tekislik uchburchakning tekisligi bilan 30 burchak tashkil qiladi. Uchburchakning to'g'ri burchagi uchi bilan tekislik orasidagi masofani toping.
A) 2,4 B) 2 C) 2,5 D) 3

30. Uchburchakli og'ma prizmaning asosi tomoni 2 m ga teng bo'lgan muntazam uchburchakdan iborat. Agar prizmaning yon qirrasi asos tomoniga teng bo'lib, asos tekisligi bilan 60° li burchak hosil qilsa, uning hajmini toping.

A) $\frac{3}{8}m^3$ B) $3m^3$ C) $\frac{3}{2}m^3$ D) $6m^3$

Variant-19

1. O'quvchi noma'lum sonni 29 bo'lish o'rniga 37 ga bo'lib, 1827 sonini hosil qildi. Dastlabki bo'linmani toping.
A) 1331 B) 2441 C) 2321 D) 2331

2. $x;y;z$ butun sonlar bo'lib, $y<0$ va $\frac{4}{7x}=-\frac{3}{4y}=\frac{5}{8z}$ bo'lsa, $x;y;z$ sonlarini o'sish tartibida joylashtiring.
A) $x<y<z$ B) $z<y<x$
C) $y<x<z$ D) $y<z<x$

3. a^4+4b^4 soni tub son hamda a, b natural son bo'lsa, barcha a va b lar yig'indisini toping.
A) bunday sonlar ko'p
B) 56 C) 2 D) 27

4. Ifodani soddalashtiring:
$$\frac{x^3+27}{2x-2}\cdot\frac{x^2-1}{x^2+4x+3}\cdot\frac{6x+12}{3x^2-9x+27}:(x+2)$$
A) 2 B) 1 C) $2x-1$ D) $\frac{x+2}{2}$

5. Ikkita son o'rta proporsionali shu sonlardan kichigidan 6 ga ko'p, o'rta arifmetigi esa kattasidan 7 ga kam bo'lsa, shu sonlardan kichikini toping.
A) 18 B) 20 C) 24 D) 30

6. $(x-3)^6+(x^2-2x-1)^3=0$ tenglamaning barcha ildizlari yig'indisini (agar u bitta bo'lsa, shu ildizini o'zini) toping.
A) 3 B) 4 C) 1 D) 2

7. $|x^2-25|+|3x+15|=0$ tenglamaning ildizlari yig'indisini toping.
A) 0 B) 5 C) 10 D) -5

8. k ning qanday eng katta butun manfiy qiymatida $x^2+(k+2)^2x+2k-4=0$ tenglamaning ildizlari 2 dan kichik bo'ladi.
A) -2 B) -4 C) -1 D) -5

9. $\frac{(8-x)^2}{x-3}>0$ tengsizlikning $[-1;9]$ oraliqda yotuvchi butun yechimlari yig'indisini toping.
A) 42 B) 17 C) 31 D) 39

10. $|x^2+7x+10|+|x^2-4|>|2x^2+7x+6|$ tengsizlikning barcha butun yechimlari yig'indisini toping.
A) -6 B) -10 C) -7 D) -9

11. O'suvchi geometrik progressiyaninng birinchi va to'rtinchi hadlarining yig'indisi 27 ga, ikkinchi va uchinchi hadlari ko'paytmasi 72 ga teng bo'lsa uning dastlabki to'rtta hadi yig'indisini toping.
A) 40 B) 45 C) 50 D) 32

12. Hisoblang
$\cos1^\circ+\cos2^\circ+\cos3^\circ+...+\cos179^\circ$
A) 1 B) –1 C) 0 D) $\cos89^\circ$

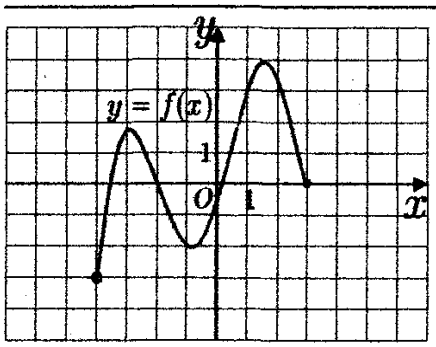
13. Hisoblang: $\arccos(\cos3)$
A) 3 B) $\pi-3$ C) $\frac{\pi}{2}-3$ D) $\varnothing$

14. Agar $\begin{cases}tg\alpha+tg\beta=4\\ctg\alpha+ctg\beta=2\end{cases}$ bo'lsa, $tg(\alpha+\beta)$ ni toping.
A) 4 B) -4 C) 2 D) -2

15. $y=|3x+2|+|2x-3|$ funksiyaning eng kichik qiymatini toping.
A) 4,(3) B) 4 C) 4,(1) D) 5

16. $y=6\cos x\cdot tgx$ funksiyaning eng katta butun qiymatini toping.
A) 6 B) -5 C) -6 D) 5

17. Grafik ko'rinishda berilgan funksiyaning qiymatlar to'plamini toping.



A) $(-3; 0)$ B) $(-2; 5]$

C) $(-4; 3]$ D) $(-3; 4]$

18. Agar $2^a = 81$, $3^b = 8$ bo'lsa, $a \cdot b$ qiymatini toping.

A) 14 B) 12 C) 15 D) 18

19. Berilgan tengsizlikning eng katta butun ildizini toping:

$3^{1+x} \cdot 2^{1-x} + 3^x \cdot 2^{-x} < 10{,}5.$

A) -2 B) 0 C) -4 D) 1

20. Agar $\log_{\sqrt{10}+3}\left(\sqrt{7}-\sqrt{6}\right) = a$ bo'lsa, $\log_{\sqrt{7}+\sqrt{6}}\left(\sqrt{10}-3\right)$ ni a orqali ifodalang.

A) $\frac{1}{a}$ B) a C) $-\frac{1}{a}$ D) $\frac{1}{a^2}$

21. $\sin x \cdot \log_3 x \cdot \sqrt{3-x} = 0$ tenglamaning ildizlari yig'indisini toping.

A) 10 B) 6 C) 3 D) 4

22. k ning qanday eng katta butun qiymatida, $y = x^3 - kx^2 + 4kx + 5$ funksiya ekstremumga ega emas?

A) 11 B) 12 C) 13 D) 14

23. $\int_1^2 \left(x + \frac{1}{x}\right)^2 dx$ integralni toping.

A) $\frac{29}{6}$ B) $\frac{29}{3}$ C) $\frac{25}{3}$ D) $\frac{25}{6}$

24. Quyidagilardan qaysilari to'g'ri?

1) agar $b > 0$, $a > c > 0$ bo'lsa, u holda $\frac{a}{b} > \frac{c}{b}$ bo'ladi;

2) agar $a > 0$, $0 < b < c$ bo'lsa, u holda $\frac{a}{b} > \frac{a}{c}$ bo'ladi;

3) agar $c > 0$, $a > b > 0$ bo'lsa, u holda $\frac{a}{b} < \frac{a+c}{b+c}$ bo'ladi;

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

25. Qutida "kombinatorika" so'zini hosil qiladigan harflar bor. Tavakkal tanlanganda "i" harfining chiqish ehtimolligini toping.

A) $\frac{1}{13}$ B) 13 C) $\frac{2}{13}$ D) $\frac{1}{26}$

★ **26.** Teng yonli ABC uchburchakda $AC = 5$; $BA = BC = 7$; AN va CM bissektrisalar. MN kesma uzunligini toping.

A) $2\frac{5}{6}$ B) $2\frac{11}{12}$ C) $2\frac{1}{6}$ D) $2\frac{7}{12}$

★ **27.** Rombning diagonallari a va $a\sqrt{3}$ bo'lsa, uning burchaklarini toping.

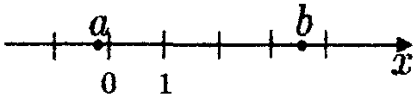
A) 45°;135° B) 30°;150°

C) 60°;120° D) 80°;100°

28. Aylana to'g'ri burchakli uchburchakning katta katetiga urinib, shu katet qarshisidagi burchak uchidan o'tadi, markazi esa gipotenuzada yotadi. Agar katetlarining uzunliklari 9 va 12 bo'lsa, aylanani radiusini toping.

A) $\frac{45}{8}$ B) $\frac{55}{8}$ C) $\frac{45}{16}$ D) $\frac{45}{4}$

29. Koordinata to'g'ri chizig'ida a va b sonlar belgilangan. Quyidagi keltirilgan tengsizliklardan qaysi biri noto'g'ri?



A) $a > -b$ B) $\frac{1}{a} < \frac{1}{b}$

C) $a+2 < b$ D) $\frac{1}{a+b} < 0$

30. Muntazam uchburchakli prizmaga silindr ichki chizilgan. Agar prizmaning asosining tomoni $2\sqrt{3}$, balandligi 3 ga teng bo'lsa, silindr to'la sirtini toping.

A) 8π B) 9π

C) 10π D) $8\sqrt{3}\pi$

Variant-20

1. Agar $\overline{abc}$, $\overline{bca}$, $\overline{cab}$ uch xonali natural sonlar yig'indisi 666 ga teng bo'lsa, $a+b+c$ ni toping.
A) 6 B) 7 C) 8 D) 2

2. Hisoblang:
$\frac{1}{16}+\frac{2}{18}+\frac{3}{16}+\ldots+\frac{15}{16}+\frac{16}{18}$
A) 8 B) 7 C) 9 D) 10

3. Agar $\frac{a+b}{a-b}=\sqrt{7}$ bo'lsa, $\frac{a}{b}+\frac{b}{a}$ ni hisoblang.

A) $\frac{15}{7}$ B) $\frac{13}{6}$ C) $\frac{8}{3}$ D) $\frac{16}{7}$

4. Ifodani qiymatini $a=18\sqrt{2}$ bo'lganda hisoblang:

$$\left(\left(\sqrt{a^3 3^{-3}}-\sqrt{27a^{-3}}\right):\left(\frac{a^2+9}{3a}+1\right)\right)\cdot\frac{(a-3)^{-1}}{\left(6a^3\right)^{-\frac{1}{2}}}-6$$

A) 30 B) 42 C) 36 D) -42

5. Kasrni qisqartiring: $\frac{\sqrt[4]{x}+\sqrt[4]{y}}{\sqrt{x}-\sqrt{y}}$.

A) $\frac{1}{\sqrt[4]{x}-\sqrt[4]{y}}$ B) $\sqrt{x}-\sqrt{y}$

C) $\sqrt[4]{x}+\sqrt[4]{y}$ D) $\frac{1}{\sqrt[4]{x}+\sqrt[4]{y}}$

6. Ahmad ikki kun, Arslon ikki kun ishlaganda bir ishning $\frac{5}{8}$ qismini bajarishadi. Agar Ahmad uch kun, Arslon ikki kun ishlasa, aynan o'sha ishning $\frac{7}{8}$ qismini bajarishardi. Ahmad bir o'zi ushbu ishni necha kunda tamomlaydi?
A) 4 B) 10 C) 8 D) 9

7. Tenglamani yeching:
$5x^3-10x^2+x-2=0$.
A) 1 B) -3 C) 0 D) 2

8. $\begin{cases} y^2 = x^2-6x+9 \\ x^2+2y=2 \end{cases}$ tenglamalar sistemasi nechta haqiqiy ildizga ega?
A) 3 ta B) 2 ta C) 4 ta D) $\varnothing$

9. $\sqrt{25-x^2} \le \frac{12}{x}$ tengsizlikni qanoatlantiradigan butun sonlar yig'indisini toping.
A) 12 B) 14 C) 10 D) 15

10. a ning qanday eng kichik butun qiymatida $-3x^2+9x+0{,}25 < a$ tengsizlik x ning barcha qiymatlarida o'rinli bo'ladi?
A) 7 B) 9 C) 8 D) 6

11. Arifmetik progressiyaning dastlabki 5 ta hadi yig'indisi 100 ga teng bo'lib, barcha hadlari natural sonlardan iborat. Bu progressiyaning eng katta hadining eng katta qiymati nechaga teng bo'lishi mumkin?
A) 22 B) 37 C) 38 D) 50

12. Ifodani soddalashtiring:
$\left(\cos^{-1}3\alpha+ctg\left(\frac{5}{2}\pi+3\alpha\right)\right)\cdot ctg\left(\frac{5}{4}\pi-\frac{3\alpha}{2}\right)$.

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

13. Ifodani soddalashtiring:
$\left(tg5^\circ + tg3^\circ\right)\cdot ctg8^\circ + \left(tg5^\circ - tg3^\circ\right)\cdot ctg2^\circ$.

A) 1 B) $\sin 2^\circ$ C) $\cos 2^\circ$ D) 2

14. Hisoblang: $\arcsin(\sin 10)$

A) $3\pi - 10$ B) 10 C) $10 - 3\pi$ D) $\varnothing$

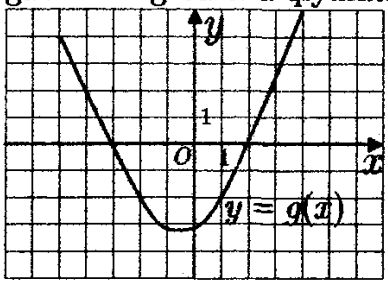
15. $tgx = 2$ tenglamaning $\left(-\frac{\pi}{2};\frac{\pi}{2}\right)$ oraliqqa tegishli ildizlari soni nechta?

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

16. $f(x) = 7^{-x}$, $g(x) = 8^{-x}$, $h(x) = 9^{-x}$ bo'lsa, $f(44)$, $g(33)$, $h(22)$ larni o'sish tartibida yozing.

A) $f(44) < g(33) < h(22)$
B) $g(33) < h(22) < f(44)$
C) $g(33) < f(44) < h(22)$
D) $h(22) < f(44) < g(33)$

17. Chizmada $[-5; 4]$ kesmada berilgan $y = g(x)$ funksiya grafigi tasvirlangan. $g(x) \le -2$ tengsizlikni qanoatlantiradigan x ning barcha qiymatlarini toping.



A) $[-3,5; 0]$ B) $[-2; 1]$

C) $[-5; -3]\cup[2; 4]$ D) $[-5; -2]\cup[1; 4]$

18. Tenglamalar sistemasini yeching:
$\begin{cases} x^{13} = 12^y \\ x^2 - 11x - 12 = 0 \end{cases}$

A) (12; 13) B) (12; 13); (13; 12)

C) (12; 13); (−12; −13) D) (−12; −13)

19. Musbat sonni toping.

A) $\log_{\frac{\pi}{3}} \frac{\pi}{4}$ B) $\log_{\frac{\pi}{3}} \cos 17^\circ$

C) $\log_{\frac{\pi}{3}} tg46^\circ$ D) $\log_{\sqrt{1,0001}} tg40^\circ$

20. Agar $-2 < \log_{0,5} a < -1$ va $1 < \log_{0,5} b < 3$ bo'lsa, $a\cdot b$ ning qabul qilishi mumkin bo'lgan barcha qiymatlarini toping.

A) (0,25; 2) B) $(2; 3\sqrt{3})$

C) $(1; \sqrt{3})$ D) $(0,25; \sqrt{3})$

21. Agar $f(x) = g(3x + 2)$ shartni qanoatlantiruvchi $f(x)$ va $g(x)$ funksiyalar uchun $g'(11) = -12$ bo'lsa, $f'(3)$ ni toping.

A) -36 B) 36 C) 25 D) -25

22. a ning qanday qiymatlarida $\int_3^a (3x-1)dx = 4$ tenglik o'rinli bo'ladi?

A) $\frac{1 \pm 2\sqrt{22}}{3}$ B) $\frac{2 \pm \sqrt{22}}{3}$

C) ± 3 D) ± 5

23. To'g'ri berilgan integrallash formulalarini tanlang:

1) $\int x^p dx = \frac{x^{p+1}}{p+1} + C,\ p \ne -1$

2) $\int (b - kx)^p dx = \frac{(b-kx)^{p+1}}{k\cdot(p+1)} + C,\ p \ne -1$

3) $\int g^p(x)\cdot g'(x)dx = \frac{g^{p+1}(x)}{p+1} + C,\ p \ne -1$

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

24. 1, 2, 3, 4, 5, 6, 7, 8 raqamlardan foydalangan holda, nechta turli ikki xonali har xil raqamlardan iborat sonlar hosil qilish mumkin?

A) 336 B) 56 C) 42 D) 28

25. Teng yonli uchburchakning asosiga tushirilgan balandligi 6 ga, yon

tomoniga tushirilgan balandligi 8 ga teng. Uchburchakning yuzini toping.

A) $12,5\sqrt{5}$ B) $14\sqrt{5}$

C) $14,4\sqrt{5}$ D) $12\sqrt{5}$

26. Agar to'g'ri to'rtburchakning perimetri 14 ga teng bo'lsa, uning yuzasini eng katta qiymatini toping.

A) 14 B) 12,25 C) 12 D) 12,75

27. Uchburchakning katta katetiga diametri shu katet bo'lgan yarim aylana yasalgan. Agar kichik katetning uzunligi 30 sm ga, to'g'ri burchak uchini gipotenuza va yarim aylana kesishadigan nuqta bilan tutashtiruvchi vatar 24 sm ga teng bo'lsa, yarim aylananing radiusini toping.

A) 30 sm B) 15 sm

C) 20 sm D) 25 sm

28. $M(2;\ 3)$ nuqtadan $5x-4y-20=0$ to'g'ri chiziqqa perpendikuliyar bo'lib o'tuvchi to'g'ri chiziqning tenglamasini tuzing.

A) $2x-3y+5=0$ B) $x-3y+7=0$

C) $8x-10y-23=0$ D) $4x+5y-23=0$

29. Parallelogramning bir tomoni orqali unga qarama–qarshi tomonidan a masofada yotuvchi tekislik otkazilgan. Parallelogramning diagonallari kesishish nuqtasidan berilgan tekislikgacha bo'lgan masofani toping.

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

30. O'lchamlari $60\times40\times5$ sm bo'lgan to'g'ri burchakli parallelepiped shaklidagi mis g'o'lasidan qalinligi 1 mm bo'lgan tunuka taxtasi tayyorlandi. Bu tunuka taxtaning yuzini toping.

A) $1,2\,m^2$ B) $120\,sm^2$

C) $120\,m^2$ D) $12\,m^2$

Variant-21

1. Hisoblang:

$$\left(2^2+6^2+10^2+14^2+18^2\right)-$$
$$-\left(1+5^2+9^2+13^2+17^2+18^2\right)$$

A) 95 B) 104 C) 128 D) 144

2. $a=2-\sqrt{3}$ va $b=2+\sqrt{3}$ bo'lsa, a^3+b^3 ning qiymatini toping.

A) 24 B) 14 C) 48 D) 52

3. $\frac{x}{ax-2a^2}-\frac{2}{x^2+x-2ax-2a}\cdot\left(1+\frac{3x+x^2}{3+x}\right)$ ifodaning $a=0,25$ dagi qiymatini toping.

A) 1/16 B) 4 C) 1/4 D) 16

4. $a+b+c=2$ va $ab+ac+bc=4$ bo'lsa, $a^3+b^3+c^3-3abc$ ifodaning qiymatini toping.

A) 16 B) -16 C) 24 D) -24

5. $\sqrt{4^8+2\cdot6^8+9^8}-\sqrt{4^7+6^8+9^8}$ ni hisoblang.

A) 256 B) 512 C) 64 D) 128

6. Uchta sonning uchinchisi ikkinchisidan nechta ortiq bo'lsa, ikkinchisi birinchisidan shuncha ortiq. Bu sonlardan ikkita kichigining ko'paytmasi 165, ikkita kattasining ko'paytmasi 285 ekanligi ma'lum. Shu uchta sondan uchinchisini toping.

A) 13 B) 15 C) 19 D) 17

7. Tenglama nechta butun ildizlarga ega? $\left|x^2-2x-15\right|=2x-x^2+15$

A) 6 B) 8 C) 9 D) 7

8. Tenglamaning ildizlari yig'indisini toping: $\sqrt{7-\sqrt{7+x}}=x$

A) 2 B) -1 C) -6 D) $\varnothing$

9. Tengsizlikni yeching:

$$(5-2x)^{10}<(-x^2-4x-7)^5$$

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A) $(-\infty; 2,5)$ B) $(1; 2,5)$

C) $(1; 2,5) \cup (2,5; 3)$ D) $\varnothing$

10. m ning nechta natural qiymatida $(m-4)x^2 - 2x + m + 1 > 0$ tengsizlik x ning istalgan qiymatida o'rinli bo'ladi?

A) 2 B) cheksiz ko'p qiymatida

C) 4 D) 1

11. Agar geometrik progressiyada $b_5 - b_1 = 18$ va $b_3 - b_1 = 12$ bo'lsa b_{11} ni toping.

A) $-\frac{4}{94}$ B) $-\frac{3}{8}$ C) $-\frac{16}{27}$ D) $-\frac{3}{4}$

12. Ifodani soddalashtiring:

$$(2(\sin\alpha)^{-1} + 2(tg\alpha)^{-1}) \cdot \left(tg\frac{\alpha}{2}\right)^{-1}$$

A) $ctg^2\frac{\alpha}{2}$ B) $2ctg^2\frac{\alpha}{2}$

C) $2tg^2\frac{\alpha}{2}$ D) $tg^2\frac{\alpha}{2}$

13. Hisoblang: $\cos 40^\circ + \cos 80^\circ - \cos 20^\circ$

A) $\sin 20^\circ$ B) $\cos 20^\circ$ C) 1 D) 0

14. $\sqrt{3}\sin x + \frac{3}{2} = 0$ tenglamaning 2 ga yaqin ildizini toping.

A) $\frac{\pi}{3}$ B) $-\frac{2\pi}{3}$ C) $\frac{4\pi}{3}$ D) $-\frac{\pi}{3}$

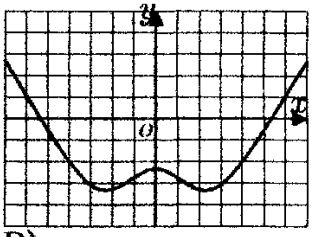
15. $f(x) = \left(\frac{1}{3}\right)^{x^2-6x+11}$ funksiyaning qiymatlari sohasini toping.

A) $[-9; \infty)$ B) $\left(0; \frac{1}{9}\right]$

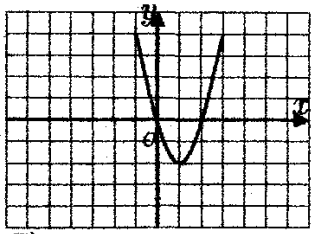
C) $(0; 9]$ D) $[9; \infty)$

16. Toq ham, juft ham bo'lmagan funksiyani ko'rsating.

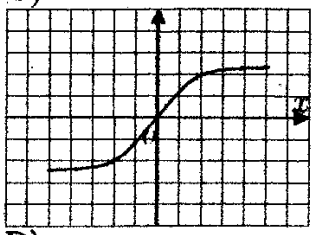
A)



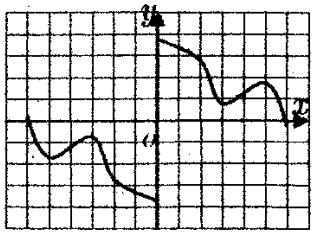
B)



C)



D)



17. Tenglamalar sistemasini yeching:

$$\begin{cases} 11^x + 8^y = 75 \\ 3 \cdot 11^x + 8^y = 97 \end{cases}$$

A) (1; 2); (2; 1) B) (1; 2)

C) (1; – 2) D) (1; 2); (–1; – 2)

18. Agar $\log_a b = -11$ bo'lsa, $\log_a \sqrt[3]{\frac{a}{b}}$ ning qiymatini toping.

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

19. $y = \ln(3x^2 - 12x + 15)$ funksiyaning qiymatlar to'plamini toping.

A) $(1; \infty)$ B) $[1; \infty)$

C) $[1; \ln 3]$ D) $[\ln 3; \infty)$

20. $\log^2_{0,2}(x+1) < 4$ tengsizlikni yeching.

A) $(0;1) \cup (24;\infty)$ B) $(-0,96;1) \cup (24;\infty)$

C) $(-0,96;24)$ D) $(1;24)$

21. $y = f(x)$ funksiyaning $(-2;10)$ nuqtasidan o'tkazilgan urinma $(1;10)$ nuqtadan o'tadi. Shu funksiyaning $x_0 = -2$ nuqtadagi hosilasini toping.

A) 10 B) -10 C) 20 D) 0

22. $\int_0^1 \frac{4}{3x+2}dx$ integralni hisoblang.

A) $0,3 \cdot \ln 25$ B) $1,3 \cdot \ln 2,5$

C) $\frac{4}{3} \cdot \ln 2,5$ D) $0,(3) \cdot \ln 2,5$

23. Quyida keltirilgan tasdiqlardan qaysilari to'g'ri?

1) To'g'ri to'rtburchakning diagonallari tengdir; 2) Teng yonli uchburchakning ixtiyoriy bissektrisasi uning medianasi bo'ladi; 3) ixtiyoriy uchburchakka tashqi aylana chizish mumkin; 4) ixtiyoriy uchta to'g'ri chiziq kamida bitta umumiy nuqtaga ega.

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

24. Do'konda 7 xil pidjak, 5 xil shim va 4 xil galstuk sotilmoqda. Pidjak, shim va galstukdan iborat komplektni nechta usul bilan sotib olsa bo'ladi?

A) 146 B) 140 C) 148 D) 155

25. Ikkita katetdan teng uzoqlikda joylashgan hamda gipotenuzada yotgan nuqta gipotenuzani $\frac{50}{3}$ va $\frac{100}{3}$ sm uzunlikdagi kesmalarga ajratadi. Uchburchakning yuzini toping.

A) $100\,sm^2$ B) $500\,sm^2$

C) $50\,sm^2$ D) $1000\,sm^2$

26. Yon tomoni 41 *sm*, balandligi 40 *sm* va o'rta chizig'i 45 *sm* bo'lgan teng yonli trapetsiyaning asoslarini toping.

A) 38 *sm*, 52 *sm* B) 24 *sm*, 66 *sm*

C) 42 *sm*, 48 *sm* D) 36 *sm*, 54 *sm*

27. ABC uchburchakda $AB = 5$, $BC = 6$ va $CA = 7$ bo'lsin. Unga ichki chizilgan aylanaga AC tomonga parallel qilib o'tkazilgan urinma ABC uchburchakdan BMN uchburchak ajratadi. BMN uchburchakka ichki chizilgan aylana radiusining ABC uchburchakka ichki chizilgan aylana radiusiga nisbatini toping.

A) $\frac{2}{9}$ B) $\frac{5}{18}$ C) $\frac{1}{3}$ D) $\frac{7}{18}$

28. Agar $A(-2;1)$ va $B(a;-6)$ nuqtalar Oy o'qiga parallel ravishda o'tuvchi bir to'g'ri chiziqqa tegishli bo'lsa, a ning qiymatini toping.

A) 2 B) -1 C) -2 D) 1

29. Teng yonli trapetsiyaning balandligi kichik asosga teng va katta asosdan uch marta kichik. Trapetsiyaning diagonallari uning katta asosidan o'tuvchi P tekislik bilan α burchak tashkil etadi. Agar $\cos\alpha = \sqrt{0,818}$ bo'lsa, trapetsiya tekisligi va P tekislik orasidagi ikki yoqli burchakning kosinusini toping.

A) 0,3 B) 0,9 C) 0,7 D) 0,5

30. Piramidaning asosi yon tomonlari 12 va ular orasidagi burchak 60 ga teng bo'lgan teng yonli uchburchakdan iborat. Agar piramidaning barcha yon qirralari asos tekisligi bilan 60 burchak tashkil qilsa, uning hajmini toping.

A) $72\sqrt{3}$ B) $144\sqrt{3}$

C) $100\sqrt{3}$ D) $125\sqrt{3}$

Variant-22

1. 6 ga karrali bo'lmagan a va b juft sonlarini 6 ga bo'lganda har xil qoldiq qoladi. $a+b$ sonini 6 ga bo'lganda qoldiq nechaga teng bo'ladi?

A) 2 B) 3 C) 0 D) 4

2. $\frac{3}{7}$ ning kasr qismini 2018 – raqamini toping.
A) 2 B) 4 C) 5 D) 8

3. Ifodani soddalashtiring.
$$\frac{a^4-10a^2+169}{a^2+6a+13}$$
A) $a^2-5a+13$ B) a^2+13
C) $a^2-6a+13$ D) $a^2-3a+13$

4. Agar $a-b=\sqrt{x}+3$ bo'lsa, a va b lar uchun to'g'ri munosabatni aniqlang.
A) $a>b$ B) $a\le b$
C) $a<b$ D) $a=b+1$

5. Hovuzdagi suv bo'shatila boshlaganidan bir soat o'tgach, unda $400\,m^3$ suv qoldi va yana uch soat vaqt o'tgach esa $250\,m^3$ suv qoldi. Dastlab hovuzda qancha (m^3) suv bo'lgan?
A) 525 B) 450 C) 600 D) 475

6. $\left(\frac{x^2}{9}+\frac{16}{x^2}\right)-2\cdot\left(\frac{x}{3}-\frac{4}{x}\right)-\frac{19}{9}=0$ tenglamaning ildizlari ko'paytmasini toping.
A) 144 B) 12 C) -12 D) 10

7. Tenglamani yeching:
$$\sqrt{x+\sqrt{4x+\sqrt{16x+\ldots+\sqrt{4^{10}\cdot x+3}}}}=$$
$$=\sqrt{x}+1.$$
A) 2^{20} B) 2^{-20} C) 4^{20} D) 4^{-20}

8. Agar $x^2-6x+3=0$ bo'lsa, $x^2+\frac{9}{x^2}$ ning son qiymatini toping.
A) 30 B) 23 C) 15 D) 18

9. Agar $x<-1$, $y>1$ bo'lsa, quyidagi javoblardan qaysi biri doim o'rinli?
A) $y^5>x^3$ B) $x^4>y$
C) $x^2<y^2$ D) $x^6<y^2$

10. $x+4<\sqrt{x+46}$ tengsizlikni yeching.
A) $[-46;\,0)$ B) $[-46;\,3)$
C) $[-46;\,1)$ D) $[-46;\,49)$

11. $\left\{2-\sqrt{2}\right\}+\left\{2+\sqrt{2}\right\}+\left\{4-\sqrt{4}\right\}+$
$+\left\{4+\sqrt{4}\right\}+\left\{6-\sqrt{6}\right\}+\left\{6+\sqrt{6}\right\}+\ldots$
$+\left\{2018-\sqrt{2018}\right\}+\left\{2018+\sqrt{2018}\right\}$
hisoblang. Bunda $\{a\}-a$ sonining kasr qismi.
A) 2018 B) 2017 C) 1009 D) 987

12. Arifmetik progressiyada $a_{17}=8a_{10}$ bo'lsa, uning dastlabki o'n yettita hadi yig'indisini toping.
A) 0 B) 34 C) 4 D) 17

13. Hisoblang: $\frac{\sin 60^\circ}{\sin 20^\circ}-2\cdot\cos 40^\circ$
A) $\sqrt{3}$ B) 2 C) 1 D) $\frac{\sqrt{3}}{2}$

14. $\frac{\left|\log_{0,5}\left(tg\frac{\pi}{3}\right)\right|}{\log_{0,5}\left(tg\frac{\pi}{3}\right)}+\frac{3\cdot\left|3\sqrt{3}-2\sqrt{7}\right|}{3\sqrt{3}-2\sqrt{7}}+$
$+\frac{9\cdot\left|\arccos(-0,5)-\frac{\pi}{2}\right|}{\arccos(-0,5)-\frac{\pi}{2}}$ ifodani qiymatini toping.
A) 6 B) 4 C) 5 D) 10

15. Tenglamani yeching:
$$ctg\left(\frac{\pi}{2}x-\pi\right)=1$$
A) $\frac{1}{2}+2k,\ k\in Z$ B) $\frac{1}{2}+k,\ k\in Z$
C) $\frac{\pi}{2}+\pi k,\ k\in Z$ D) $\frac{\pi}{2}+2\pi k,\ k\in Z$

16. $y=(x+3)^{\frac{6}{7}}$ funksiyaning aniqlanish sohasini toping.

A) $(-\infty;\infty)$ B) $(-\infty;-3)\cup(3;\infty)$

C) $(-3;\infty)$ D) $(-\infty;-3)\cup(-3;\infty)$

17. Tenglamalar sistemasini yeching:

$$\begin{cases} x\cdot 2^x - y\cdot 4^y = x\cdot 4^y - y\cdot 2^x \\ 3^x\cdot 9^y = 81 \end{cases}$$

A) $(4;-4);(-2;-1)$ B) $(-4;-4);(2;1)$

C) $(-4;4);(2;1)$ D) $(-4;4);(-2;1)$

18. Ifodani soddalashtiring:

$$\frac{1-\log_a^3 b}{(\log_a b+\log_b a+1)\cdot\log_a\frac{a}{b}}\cdot\log_{b^2} a.$$

A) -2 B) $\frac{1}{2}$ C) 1 D) 0

19. $\left|\lg|x+1|\right| = x-3$ tenglama nechta yechimga ega?

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

20. $f(x)=\left|x^2-2x-3\right|-\left|x+2\right|$ funksiyaning $x=0$ nuqtadagi hosilasini toping.

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

21. $y=4x^5-15x^4-5$ funksiyaning $(-1;1)$ oraliqdagi eng katta qiymatini toping.

A) -2 B) -25 C) -5 D) -3

22. $\int\limits_{\frac{\pi}{4}}^{\pi}\cos\left(3x-\frac{\pi}{4}\right)dx$ integralni hisoblang.

A) $\frac{2}{3}\left(\frac{\sqrt{2}}{2}+1\right)$ B) $\frac{1}{3}\left(\frac{\sqrt{2}}{2}+1\right)$

C) $\frac{2}{3}\left(\frac{\sqrt{2}}{2}-1\right)$ D) $\frac{1}{3}\left(\frac{\sqrt{2}}{2}-1\right)$

23. Bir noma'lumli chiziqli tenglama nechta ildizga ega bo'lishi mumkin?

1) bitta ildizga; 2) cheksiz ko'p ildizga; 3) ildizi yo'q

A) faqat 2 va 3 B) faqat 1 va 3

C) faqat 1 D) 1; 2; 3

24. Tennis turnirida 9 ta sportchi ishtiroq etmoqda. Tennischilar necha xil usul bilan oltin, kumush va bronza medallarini yutishi mumkin?

A) 360 B) 504 C) 990 D) 720

25. To'g'ri burchakli uchburchakning yuzi 9 ga va o'tkir burchagi 15° ga teng. Uchburchakning medianalar kesishish nuqtasidan gipotenuzagacha bo'lgan masofani toping.

A) $\frac{\sqrt{2}}{4}$ B) $\frac{\sqrt{3}}{2}$ C) $2\sqrt{2}$ D) $\frac{\sqrt{2}}{2}$

26. Yon tomoni 17 ga teng bo'lgan teng yonli trapetsiyaga diametri 15 ga teng bo'lgan aylana ichki chizilgan bo'lsa, trapetsiyaning asoslarini toping.

A) 12; 25 B) 9; 25 C) 20; 25 D) 19; 25

27. ABC uchburchakka tashqi chizilgan aylananing A nuqtani o'z ichiga olmagan BC yoyi o'rtasi M nuqta bo'lsin. AM kesma BC tomonni N nuqtada kesadi. Agar $AB=8$, $BC=9$ va $CA=7$ bo'lsa, $BN-NC$ ni hisoblang.

A) 0,8 B) 0,6 C) 0,5 D) 1

28. Uchlari $A(4;2)$, $B(6;-5)$ va $C(-5;4)$ nuqtalarda bo'lgan uchburchak berilgan. B uchidan tushirilgan balandlik yotuvchi to'g'ri chiziq tenglamasini tuzing.

A) $x+y-1=0$ B) $2x+9y+33=0$

C) $9x-2y-64=0$ D) $3x+y-22=0$

29. Ox o'qida $A(2;3;5)$, $B(-1;3;4)$ nuqtalardan baravar uzoqlashgan $C(x;0;0)$ nuqtani toping.

A) $C(-3;0;0)$ B) $C(2;0;0)$

C) $C(-4;0;0)$ D) $C(-2;0;0)$

30. Qirrasi 50 sm ga teng kubning ichini qirrasi 5 sm ga teng kubchalardan nechtasi bilan to'ldirish mumkin?
A) 100 B) 1000 C) 200 D) 2000

Variant-23

1. Ikki son yig'indisi 242 ga, bu sonlardan kattasini kichigiga bo'lganda bo'linma 4 ga, qoldiq esa 22 ga teng. Sonlardan kichigini toping.
A) 52 B) 44 C) 42 D) 56

2. $\dfrac{7}{1+\dfrac{2}{x-1}}$ kasr ma'noga ega bo'lmaydigan barcha x lar yig'indisini toping.
A) 0 B) -1 C) 1 D) -2

3. Ifoda qiymatini $x=\dfrac{10}{3}$ bo'lganda hisoblang:
$(x-5)^3+3(x-5)^2+3(x-5)+1.$
A) $\dfrac{8}{27}$ B) $-\dfrac{8}{27}$ C) $\dfrac{1000}{27}$ D) $-\dfrac{64}{27}$

4. Agar $a\ge 0,\ b>0,\ \sqrt{a}\le b$ bo'lsa,
$f(a;b)=\sqrt{\dfrac{a+b^2}{b}+2\sqrt{a}}-\sqrt{\dfrac{a+b^2}{b}-2\sqrt{a}}$
ifodani soddalashtiring.
A) 1 B) $2\sqrt{b}$ C) $\dfrac{2\sqrt{ab}}{b}$ D) $2\sqrt{ab}$

5. Ifodani soddalashtiring:
$\dfrac{x^3+27}{2x-2}\cdot\dfrac{x^2-1}{x^2+4x+3}\cdot\dfrac{6x+12}{3x^2-9x+27}.$
A) $x+2$ C) $2x+1$
B) $\dfrac{x+2}{x-1}$ D) $\dfrac{x+2}{2}$

6. Mobil telefon to'liq quvvatlantirilganda 4 soat suhbatlashish yoki 12 soat kutish holatiga yetadigan quvvat oladi. Yo'lovchi poyezdga chiqishdan oldin mobil telefonni to'liq quvvatlab oldi va yurgan vaqtning yarmida suhbatlashib ketdi. Agar mobil telefondagi quvvat to'liq yo'lga ketgan va poyezddan tushayotgan payt tugagan bo'lsa, yo'lovchi poyezdda qancha vaqt yurgan.
A) 5 yarim soat B) 8 soat
C) 4 yarim soat D) 6 soat

7. Tenglamani yeching:
$\sqrt{15-x}+\sqrt{3-x}=6.$
A) -2 B) 1 C) -3 D) -1

8. $\begin{cases} ax=x^{1-b}+2 \\ cx=x^{b-1}-1 \end{cases}$ bo'lsa, c ni a va x orqali ifodalang.
A) $\dfrac{3-ax}{x(ax-2)}$ B) $\dfrac{ax-3}{x(ax-2)}$
C) $\dfrac{3-ax}{ax-2}$ D) $ax-2$

9. Ushbu $(x^2+3x+1)\cdot(x^2+3x+3)\le 35$ tengsizlikni qanoatlantiruvchi butun sonlar nechta?
A) 6 ta B) 7 ta C) 5 ta D) 4 ta

10. $\left|\dfrac{6-2x}{1+3x}\right|>0$ tengsizlikni yeching.
A) $\left(-\infty;-\dfrac{1}{3}\right)\cup\left(-\dfrac{1}{3};3\right)\cup(3;\infty)$
B) $\left(-\infty;-\dfrac{1}{3}\right)\cup\left(-\dfrac{1}{3};\infty\right)$ C) $(-\infty;\infty)$
D) $\left(-\infty;-\dfrac{1}{3}\right)\cup\left(-\dfrac{1}{3};2\right)\cup(2;\infty)$

11. Maxraji musbat bo'lgan geometrik progressiyaning uchinchi hadi 9 ga, birinchi va ikkinchi hadlari yig'indisi 4 ga teng bo'lsa, ushbu progressiyaning beshinchi hadini toping.
A) 80 B) 91 C) 81 D) 78

12. $\dfrac{1}{\cos 200^\circ}-tg170^\circ\cdot tg20^\circ$ ifodani qiymatini toping.

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

13. Hisoblang.

$ctg15^\circ + ctg30^\circ + ctg45^\circ + ... + ctg165^\circ$

A) 0 B) $ctg89^\circ$ C) -1 D) 1

14. Hisoblang: $\arccos(\cos 4)$

A) $2\pi - 4$ B) 3 C) $\frac{\pi}{2} - 3$ D) $\varnothing$

15. $6\sin^2 x + 5\sin x \cdot \cos x + 3\cos^2 x = 2$ tenglamaning $[-\pi; 0]$ kesmada nechta ildizi bor?

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

16. Agar

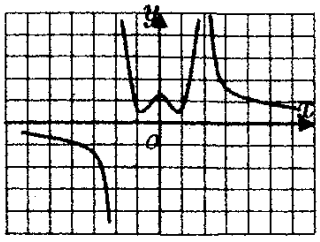
$f(x) = (a + b - 4) \cdot x^3 + 2x^2 + (b - 1) \cdot x$

juft funktsiya berilgan bo'lsa, $f(a)$ ning qiymatini toping.

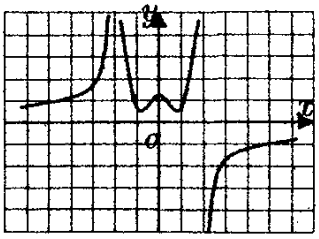
A) 12 B) 14 C) 20 D) 18

17. Juft funksiyani tanlang.

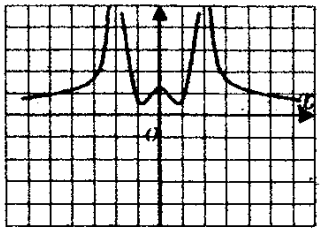
A)



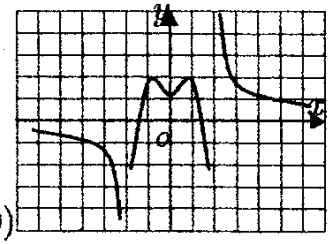
B)



C)



D)



18. $2^{x-1} = x + 2$ tenglama nechta haqiqiy yechimga ega?

A) 1 ta B) 2 ta C) 3 ta

D) haqiqiy yechimga ega emas

19. $\left\{\frac{\{\lg 200\}}{\{\lg 50\}}\right\} + \{\log_5 12{,}5\}$ ni hisoblang.

Bunda $\{a\} - a$ soninng kasr qismi.

A) 0,5 B) 1 C) $\log_5 2$ D) $\log_5 4$

20. $\log_{x-1} x^2 = \log_{x-1}(6x - 8)$ tenglamaning ildizlari soni x_0 bo'lsa, $x_0 + 5$ ni toping.

A) 6 B) 7 C) 8 D) 9

21. $\left|\lg|x - 1|\right| = x + 1$ tenglama nechta yechimga ega?

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

22. Agar $f(x) = 6 + 5tg^2 2x$ bo'lsa, $f'(\pi)$ ni toping.

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

23. $\int_{-1}^{0} (x + 1)(x^2 - 2)dx$ integralni hisoblang.

A) 13/12 B) -11/12

C) -13/12 D) 11/12

24. Quyida keltirilgan tasdiqlardan qaysilari to'g'ri?

1) Kub – barcha yoqlari kvadratlardan iborat ko'pyoqdir; 2) Parallelepiped – barcha qirralari trapetsiyadan iborat ko'pyoqdir; 3) Prizma - asoslari deb ataladigan ikki yog'i parallel tekisliklarda yotuvchi, qolgan yoqlari parallelogrammlardan iborat ko'pyoqdir;

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

25. 10 ta o'quv fanidan bir kunlik o'quv jadvaliga 6 ta har xil darslarni necha xil usul bilan joylashtirish mumkin?

A) 60480 B) 6048 C) 30240 D) 151200

26. To'g'ri burchakli uchburchakning yuzi 9 ga va o'tkir burchagi 75° ga teng. Uchburchakning medianalar kesishish

nuqtasidan gipotenuzagacha bo'lgan masofani toping.

A) $\frac{\sqrt{2}}{4}$ B) $\frac{\sqrt{3}}{2}$ C) $2\sqrt{2}$ D) $\frac{\sqrt{2}}{2}$

27. Ikkita bir xil r radiusli aylanalar tashqi ravishda urinadi. Radiusi 5 ga teng bo'lgan uchinchi aylana bu aylanalarga tashqi ravishda A va B nuqtalarda urinadi. Agar $AB=6$ bo'lsa, r ni toping.

A) $\frac{15}{4}$ B) $\frac{11}{8}$ C) $\frac{15}{2}$ D) $\frac{30}{11}$

28. ABC uchburchakka ichki chizilgan aylana markazidan AB tomonga parallel to'g'ri chiziq o'tkazilgan. Bu to'g'ri chiziq BC tomonni M nuqtada, AC tomonni esa N nuqtada kesib o'tadi. Agar $AB=8$, $MN=5$ bo'lsa, $ABMN$ to'rtburchakning perimetrini toping?

A) 20 B) 22 C) 18 D) 21

29. Markazi $O(0;3)$ nuqtada va $A(2;0)$ va $B(-2;6)$ nuqtalardan o'tuvchi aylana tenglamasini tuzing.

A) $x^2+(y-3)^2=13$

B) $(x-3)^2+(y-3)^2=13$

C) $x^2+(y-3)^2=\sqrt{13}$

D) $x^2+(y-3)^2=169$

30. Barcha qirralari $\sqrt{1,5}$ ga teng bo'lgan uchburchakli piramidaga ichki chizilgan shar radiusini toping.

A) 2,5 B) 1 C) 0,25 D) 0,5

Variant-24

1. $83m07n$ soni 8 ga bo'linadi. Agar bu son 6 ga ham bo'linsa, u holda m ning o'rniga qo'yilishi mumkin bo'lgan barcha raqamlar yig'indisini toping.

A) 15 B) 10 C) 18 D) 12

2. Hisoblang

$$\left(\frac{\sqrt{6}+\sqrt{5}}{\sqrt{2}+1}\cdot\frac{\sqrt{6}-\sqrt{5}}{\sqrt{2}-1}\right):\left(\frac{1}{\sqrt{3}}-\frac{\sqrt{3}}{9}+\frac{1}{\sqrt{27}}\right)$$

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

3. Ifodani soddalashtiring:

$$\frac{x}{2}\cdot\sqrt[3]{\frac{y^5}{x^2}}:\sqrt[3]{\frac{xy^4}{8}}.$$

A) $y^{\frac{1}{6}}+4$ B) $y^{\frac{1}{6}}$ C) y D) $y^{\frac{1}{3}}$

4. a natural soni uchun $a^2-1=8^{27}\cdot(2^{79}+1)$ bo'lsa, $\frac{a-1}{16^{19}}$ ni toping.

A) 16 B) 4 C) 32 D) 8

5. Agar $\sqrt[3]{a+\sqrt[3]{a+\sqrt[3]{a+\ldots}}}=2$ bo'lsa, $\sqrt{a-\sqrt{a-\sqrt{a-\ldots}}}$ ning qiymatini toping.

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

6. Birinchi quvurdan ikkinchi quvurga qaraganda ikki barobar ko'p suv oqadi. Ikkalasi birgalikda bo'sh hovuzni 12 soatda to'ldirsa, birinchi quvur hovuzning uchdan bir qismini necha soatda to'ldiradi.

A) 12 B) 4 C) 6 D) 9

7. x va y butun sonlar uchun $xy+x=3y+6$ tenglik bajarilsa, barcha x butun sonlarning yig'indisini toping.

A) 14 B) 10 C) 12 D) 8

8. $x^2-(k-2)\cdot x+3k+4=0$ tenglamaning ikkala ildizi ham 2 dan kichik bo'ladigan k ning barcha manfiy butun qiymatlarini yig'indisini toping.

A) -78 B) -55 C) -66 D) -44

9. $(x^2-x)\cdot(x^2-x-2)<120$ tengsizlikni qanoatlantiruvchi butun sonlar nechta?

A) 9 ta B) 8 ta C) 6 ta D) 7 ta

10.

$$6\cdot\left(\sqrt{8+x}-\sqrt{5-x}\right)\le\sqrt{(8+x)(5-x)}$$

tengsizlikni qanoatlantiradigan butun ildizlari ko'paytmasini toping.
A) 560 B) 360 C) 120 D) 0

11. Arifmetik progressiya uchun $a_6 = 3$, $a_2 + a_5 = 16$ bo'lsa, a_1 ni toping.
A) 11 B) 15 C) 17 D) 13

12. Soddalashtiring: $\left(\pi < \alpha < \frac{3\pi}{2}\right)$
$\sin\alpha \cdot |\cos\alpha| - \cos\alpha \cdot |\sin\alpha|$.
A) $\sin\alpha$ B) 0 C) $\cos\alpha$ D) $\sin 2\alpha$

13. $tg10^\circ \cdot tg20^\circ + 1$ ifodani soddalashtiring.
A) $\frac{1}{\cos 20^\circ}$ B) $-\frac{1}{\cos 10^\circ}$
C) $\frac{1}{\cos 100^\circ}$ D) $-\frac{1}{\sin 20^\circ}$

14. Agar $\sin x + \cos x = -1{,}02$ bo'lsa, u holda, x soni qaysi chorakda yotadi?
A) IV B) I C) II D) III

15. $tgx = 2$ tenglamaning $\left[0; \frac{\pi}{2}\right)$ oraliqqa tegishli ildizlari soni nechta?
A) 2 B) 1 C) 3 D) 4

16. $y = \sqrt{27 - \frac{1}{3}\left|x - \frac{2}{117}\right|}$ funksiyaning barcha butun qiymatlari yig'indisini toping.
A) 27 B) 25 C) 15 D) 14

17. $2^x = 101$ bo'lsa, $|x-8| + |x-6|$ ifodani soddalashtiring.
A) $2x - 14$ B) 2 C) $14 - 2x$ D) -2

18. Hisoblang:
$\sqrt{\log_{16} 4 + \log_{16} 24 - \log_{16} 6}$.
A) 4 B) 2 C) 16 D) 1

19. $\log_4^2 x - \log_4 \sqrt{x} - 1{,}5 = 0$ tenglamaning eng katta va eng kichik ildizlari nisbatini toping.
A) 16 B) 64 C) 32 D) 2

20. $g(x) = x - 3$, $f(g(x)) = 3x^2 - 7x + 3$ funksiya berilgan bo'lsa, $f'(0)$ ning qiymatini toping.
A) 13 B) 11 C) 4 D) 10

21. $y = 4x^5 - 15x^4 - 3$ funksiyaning $(-1; 1)$ oraliqdagi eng katta qiymatini toping.
A) -3 B) -1 C) -115 D) -2

22. To'g'ri berilgan integrallash formulalarini tanlang:
1) $\int \cos^2 x dx = \frac{1}{2}x + \frac{1}{4}\sin 2x + C$
2) $\int ctg^2 x dx = ctgx + x + C$
3) $\int tg^2 x dx = tgx - x + C$
A) 1; 2; 3 B) 2; 3 C) 1; 2 D) 1; 3

23. Surat va maxraji 40 dan katta bo'lmagan turli tub sonlardan iborat bo'lgan nechta oddiy kasr mavjud?
A) 110 B) 66 C) 132 D) 55

24. Uchburchakning 10 ga teng bo'lgan balandligi uning asosini 10 va 4 ga teng kesmalarga ajratadi. Uchburchakning qolgan ikki tamonidan kichigiga o'tkazilgan mediana uzunligini toping.
A) 11 B) 14 C) 13 D) 12

25. Teng yonli trapetsiyaning qarama-qarshi burchaklari ayirmasi 40° bo'lsa, uning burchaklarini toping.
A) 80° va 120° B) 70° va 110°
C) 75° va 105° D) 80° va 100°

26. N nuqta teng yonli $ABCD$ trapetsiya AB yon tomonining o'rtasi. Agar $AN = 4$, $\angle CND = 90^\circ$ bo'lsa, trapetsiya perimetrini toping.
A) 24 B) 30 C) 32 D) 28

27. Muntazam uchburchakka tomoni m ga teng bo'lgan kvadrat ichki chizilgan.

Uchburchakning yuzini toping.

A) $\frac{m^2(11\sqrt{3}+12)}{12}$ B) $\frac{m^2(7\sqrt{3}+12)}{12}$

C) $\frac{m^2(7\sqrt{3}+12)}{6}$ D) $\frac{m^2(7\sqrt{3}+2)}{12}$

28. $(1;2)$ va $(-3;2)$ nuqtalar orasidagi masofani toping.

A) 5 B) 2 C) 4 D) 6

29. Tekislikdan 4 m masofada yotgan nuqtadan ikkita teng og'ma o'tkazilgan. Agar og'malar o'zaro perpendikulyar va tekislikka o'tkazilgan perpendikulyar bilan 30° ga teng burchaklar tashkil etishi ma'lum bo'lsa, og'malarning asoslari orasidagi masofani toping.

A) $\frac{4\sqrt{6}}{3}m$ B) $\frac{8\sqrt{3}}{3}m$

C) $\frac{4\sqrt{3}}{3}m$ D) $\frac{8\sqrt{6}}{3}m$

30. Uchburchakli og'ma prizmaning asosi tomoni 3 m ga teng bo'lgan muntazam uchburchakdan iborat. Agar prizmaning yon qirrasi asos tomoniga teng bo'lib, asos tekisligi bilan 60° li burchak hosil qilsa, uning hajmini toping.

A) $\frac{81}{8}m^3$ B) $\frac{9}{8}m^3$

C) $\frac{27}{8}m^3$ D) $\frac{27}{4}m^3$

Variant-25

1. a $(a>1)$ shunday eng kichik natural sonki, uni 2017 ga bo'lganda ham, 2018 ga bo'lganda ham 1 qoldiq qoladi. U holda a ni 5 ga bo'lgandagi qoldiqni toping.

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

2. $2<a<6$ va $2<b<10$ bo'lsa, a va b butun sonlar uchun $\frac{1+\frac{a}{b}}{1+\frac{b}{a}}$ kasrning eng katta qiymatini toping.

A) $\frac{7}{3}$ B) $\frac{5}{3}$ C) 7 D) 5

3. Agar $a\in(-1;1)$ bo'lsa, ifodani soddalashtiring:

$$\sqrt[4]{(1-2a+a^2)(a^2-1)(a-1)}:\frac{a^2+2a-3}{\sqrt[4]{a+1}}$$

A) $\frac{\sqrt{a+1}}{\sqrt{a+3}}$ B) $-\frac{\sqrt{a+1}}{\sqrt{a+3}}$

C) $-\frac{\sqrt{a+1}}{a+3}$ D) $\frac{\sqrt{a+1}}{a+3}$

4. Ifodani soddalashtiring: $\sqrt[4]{256a^4b^8c^{12}}$, agar $a<0, c<0$.

A) $2ab^2c^3$ B) $-4ab^2c^3$

C) $4ab^2c^3$ D) $16ab^2c^3$

5. Agar $a<0, b>0$ bo'lsa, $a\sqrt{b^2}+b\sqrt{a^2}-|a-b|$ ifodani soddalashtiring.

A) $b-a$ B) a C) $b-2ab+a$ D) $a-b$

6. Quyidagi

$$\sqrt{x+1-4\sqrt{x-3}}+\sqrt{x+1+4\sqrt{x-3}}$$

ifodani $(3;7)$ oraliqda soddalashtiring.

A) 2 B) $2\sqrt{x+1}$ C) 4 D) $-2\sqrt{x+1}$

7. $\frac{3x+2}{x^2-x-12}=\frac{a}{x-4}+\frac{b}{x+3}$ tenglik ayniyat bo'lsa, $a\cdot b$ ning qiymatini toping.

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

8. a va b sonlari $x^2-6x+3=0$ tenglamaning ildizlari bo'lsa, $\frac{ab^3-a^3b}{a-b}$ ning qiymatini toping.

A) 18 B) -18 C) 20 D) 36

9. x_1, x_2 sonlari $x^2 - kx - k + 6 = 0$ tenglamaning ildizlari va $\sqrt{x_1 \cdot x_2} = 1$ bo'lsa, $\frac{x_1 + x_2}{2}$ ni qiymatini toping.

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

10. $x^5\left|x^2 - 7x - 8\right| < 0$ tengsizlik $\left[-8;1\right]$ kesmada nechta butun yechimga ega.

A) 7 B) 8 C) 5 D) 6

11. 1,2,2,3,3,3,4,4,4,4,5,5,5,5,5,6... kamaymaydigan sonlar ketma-ketligida har bir son o'zining qiymati necha bo'lsa, shuncha marta takrorlanadi. Bu ketma-ketlikda 2018-o'rinda turgan sonni toping.

A) 65 B) 62 C) 63 D) 64

12. Ikki son yig'indisi 242 ga, bu sonlardan kattasini kichigiga bo'lganda bo'linma 4 ga, qoldiq esa 22 ga teng sonlardan kichigini toping.

A) 44 B) 52 C) 42 D) 56

13. Hisoblang:

$\cos 10^\circ - 2\cos 50^\circ - \cos 70^\circ$

A) $-\cos 50^\circ$ B) $\sin 40^\circ$

C) $-\sin 50^\circ$ D) $\cos 50^\circ$

14. Agar $tg258^\circ = a$ bo'lsa, $\cos 24^\circ \cdot \left(\frac{a-1}{a+1} + \frac{a+1}{a-1}\right)$ ning qiymatini toping.

A) 1 B) –1 C) 2 D) -2

15. $\sin\left(\pi - x\right) + \cos\left(\frac{\pi}{2} + x\right) = \sqrt{3}$ tenglamaning $[-\pi;2\pi]$ oraliqqa tegishli ildizlari soni nechta?

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

16. $y = x^2 - 4x + 7$ funksiya grafigining $(-1; 1)$ nuqtaga nisbatan simmetrik bo'lgan tenglamasini tuzing.

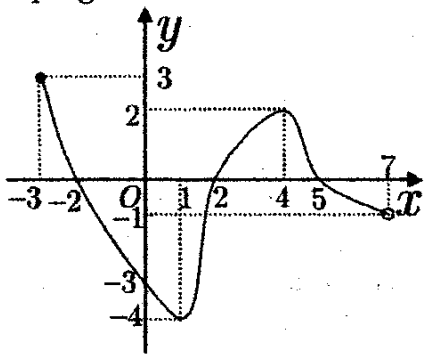
A) $y = -x^2 + 4x - 7$

B) $y = -x^2 - 8x - 17$

C) $y = -x^2 + 8x - 10$

D) $y = x^2 - 8x - 17$

17. Grafik ko'rinishda berilgan funksiyaning qiymatlar to'plamini toping.



A) $[-4; -1) \cup (-1; 3]$ B) $[-3; -2] \cup [2; 5]$

C) $[-3; 7)$ D) $[-4; 3]$

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18. a ning qanday qiymatlarida $9^x - (2a-1)\cdot 3^x + a^2 - 4a = 0$ tenglama ikkita haqiqiy ildizga ega bo'ladi?

A) $\left(-\frac{1}{12};\infty\right)$ B) $\left(4;\infty\right)$

C) $\left(0;\frac{1}{2}\right) \cup \left(4;\infty\right)$ D) $\left(-\frac{1}{12};\frac{1}{2}\right) \cup \left(4;\infty\right)$

19. Hisoblang:

$$\left(3^{2+\frac{\log_3 4}{\log_4 3}} - 9\cdot 4^{\frac{1}{\log_4 3}} + 4^{1+\log_4 25}\right)^{0,5}.$$

A) 100 B) 10 C) 10000 D) 1

20. $(x^2 - 5x + 4)\cdot \ln(5 - x^2) = 0$ tenglamaning ildizlari ko'paytmasini toping.

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

21. $f(x)$ manfiy qiymatli kamayuvchi funksiya va $g(x)$ musbat qiymatli o'suvchi funksiya bo'lsa, $h(x) = f(x)\cdot g(x)$ uchun quyidagilardan qaysi biri to'g'ri?

A) manfiy qiymatli o'suvchi
B) manfiy qiymatli kamayuvchi
C) musbat qiymatli o'suvchi
D) musbat qiymatli kamayuvchi

22. Integralni hisoblang: $\int_1^2 \frac{3x-1}{\sqrt{x}}dx$

A) $3\sqrt{2}$ B) $\sqrt{2}$ C) $2\sqrt{2}$ D) $4\sqrt{2}$

23. Quyida keltirilgan tasdiqlardan qaysilari to'g'ri?
1) Tomonlari $AB=3$, $BC=4$, $AC=5$ bo'lgan ABC uchburchak o'tkir burchakli uchburchakdir; 2) Agar qavariq to'rtburchakning uchta burchagining yig'indisi 200° ga teng bo'lsa, u holda uning to'rtinchi burchagi 160° ga teng bo'ladi; 3) Agar aylana radiusi 3 ga teng bo'lsa, u holda vatari har doim 6 dan kichik bo'ladi; 4) To'g'ri to'rtburchak diagonallari kesishish nuqtasi uning simmetriya markazidir.
A) 2; 4 B) 1; 4 C) 1;3 D) 2; 3

24. Do'konda 5 xil konvert va 4 xil marka sotilmoqda. Konvert bilan markani nechta usulda sotib olish mumkin?
A) 20 B) 18 C) 16 D) 15

25. ABC to'g'ri burchakli uchburchakning katetlari $AB=4$, $AC=6$ va AN bissektrisa bo'lsa, ABN uchburchak yuzini toping.
A) 3 B) 4,8 C) 4 D) 4,2

26. To'gri burchakli $ABCD$ trapetsiyaning B va C burchaklari to'gri, $AB=8$, $BC=6$ va $DC=4$. Trapetsiyaning D uchidan AC diagonaligacha bo'lgan masofani toping.
A) 3,6 B) 3 C) 2,4 D) 2

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) 12

28. $y=2x+6$ funksiya uchun $A(0;1)$ nuqtaga nisbatan simmetrik bo'lgan funksiyani toping.
A) $y=2x+4$ B) $y=2x-5$
C) $y=2x-6$ D) $y=2x-4$

29. $ABCDA_1B_1C_1D_1$ to'g'ri burchakli parallelepipedda $\overrightarrow{AD}=\vec{a}$, $\overrightarrow{AB}=\vec{b}$ va $\overrightarrow{AA_1}=\vec{c}$ bo'lsa, $\overrightarrow{B_1D}$ vektorni $\vec{a}$, $\vec{b}$ va $\vec{c}$ vektorlar orqali ifodalang.
A) $\vec{a}-\vec{b}-\vec{c}$ B) $\vec{a}+\vec{b}-\vec{c}$
C) $\vec{a}-\vec{b}+\vec{c}$ D) $\vec{a}+\vec{b}+\vec{c}$

30. Muntazam oltiburchakli prizmaning balandligi 8 ga, yon yog'ining diagonali 13 ga teng. Prizmaga tashqi chizilgan shar radiusini toping.
A) 12 B) 11 C) $\sqrt{153}$ D) $\sqrt{105}$

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Variant-26

1. a va b sonlar o'zaro tub sonlardir. Bu sonlarning eng kichik umumiy karralisi 500 ga teng bo'lsa, $a+b$ ni toping.
A) 125 B) 129 C) 100 D) 14

2. Ifodani soddalashtiring: $\frac{a^4+a^2+169}{a^2+5a+13}$
A) $a^2-5a+13$ B) a^2+13
C) $a^2-6a+13$ D) $a^2-3a+13$

3. Agar $a-b=\sqrt{x}+4$ bo'lsa, a va b lar uchun to'g'ri munosabatni aniqlang.
A) $a>b$ B) $a\le b$
C) $a<b$ D) $a=b+1$

4. Agar x ratsional son bo'lsa, $\sqrt[4]{5+x}+\sqrt{-x-5}-\sqrt{30+x}$ ifodani soddalashtiring.
A) -5 B) 4 C) 6 D) -4

5. a dan b 20% ko'p bo'lsa, b dan a necha % kam bo'ladi?
A) 15 B) 49/3 C) 50/3 D) 20

6. Agar x_1 va x_2 sonlar $x^2-5x+1=0$ tenglama ildizlari bo'lsa, $\frac{1}{x_1+3}+\frac{1}{x_2+3}$ ni hisoblang.
A) $\frac{13}{25}$ B) $\frac{11}{25}$ C) $-\frac{13}{25}$ D) $-\frac{11}{25}$

7. n ning nechta natural qiymatida $n(x-1)=12-n^2$ tenglamaning ildizlari musbat bo'ladi?
A) 2 B) 3 C) 4 D) 1

8. Tenglamalar sistemasini yeching:
$\begin{cases} x+y+xy=0 \\ x^3+y^3+x^3y^3=12 \end{cases}$
A) $\left(1+\sqrt{3};1-\sqrt{3}\right),\left(1-\sqrt{3};1+\sqrt{3}\right)$
B) $\left(1;\sqrt{3}\right),\left(\sqrt{3};1\right)$
C) $\left(1-\sqrt{3};1+\sqrt{3}\right)$
D) $\left(1+\sqrt{3};1+\sqrt{3}\right),\left(1-\sqrt{3};1-\sqrt{3}\right)$

9. $(x^2-3x-2)\cdot(x^2-3x+1)<10$ tengsizlikni qanoatlantiruvchi butun sonlar nechta?
A) 5 ta B) 3 ta C) 6 ta D) 4 ta

10. Nechta natural son $100<\sqrt{n}<101$ tengsizlikni qanoatlantiradi?
A) 201 ta B) 200 ta
C) 199 ta D) 202 ta

11. Agar $|a|<1, |b|<1$ va
$a+ab+ab^2+ab^3+\ldots=\frac{5}{16}$,
$b+ba+ba^2+ba^3+\ldots=\frac{4}{15}$ bo'lsa,
$80ab$ ni qiymatini toping.
A) 12 B) 6 C) 32 D) 4

12. Arifmetik progressiya quyidagicha berilgan: -4; -2 ; 0; ... . Bu progressiyaning dastlabki 10 ta hadi yig'indisini toping.
A) 60 B) 30 C) 50 D) 40

13. Hisoblang: $\frac{\sin 20^\circ}{\cos 80^\circ - tg30^\circ\cdot\sin 80^\circ}$
A) $\frac{\sqrt{3}}{2}$ B) $\frac{1}{2}$ C) $-\frac{1}{2}$ D) $-\frac{\sqrt{3}}{2}$

14. Agar $12\cdot\sin 4^\circ\cdot\cos 4^\circ\cdot\cos 8^\circ=m$ tenglik bajarilsa, $tg74^\circ$ ni m orqali ifodalang.
A) $\frac{\sqrt{9-m^2}}{3}$ B) $\frac{\sqrt{9-m^2}}{m}$
C) $\frac{\sqrt{3-m^2}}{m}$ D) $\frac{\sqrt{9-m^2}}{9m}$

15. Tenglamani yeching:
$6\sin^2 x+13\sin x+5=0$
A) $x=-\frac{\pi}{6}+2\pi n,\ n\in Z;\ x=\frac{7\pi}{6}+2\pi k,\ k\in Z;$
B) $x=-\frac{\pi}{6}+\frac{\pi n}{2},\ n\in Z;\ x=\frac{7\pi}{6}+\pi k,\ k\in Z;$
C) $x=-\frac{\pi}{6}+\pi n,\ n\in Z;\ x=\frac{\pi}{6}+2\pi k,\ k\in Z;$
D) $x=-\frac{\pi}{3}+2\pi n,\ n\in Z;\ x=\frac{7\pi}{5}+2\pi k,\ k\in Z;$

16.
$y=\sin\left(\pi\left(2x-x^2+\frac{9}{2}\right)\right)-x^2+4x-5$
funksiyaning noli qaysi oraliqqa tegishli?
A) $\left(-\frac{\pi}{2};\pi\right)$ B) $\left(-\frac{\pi}{2};\frac{\pi}{2}\right)$
C) $(0;1)$ D) $(1;2)$

17. Agar $5^a=36$, $6^b=625$ bo'lsa $a\cdot b$ ning qiymatini toping.
A) 8 B) 11 C) 13 D) 10

18. Tengsizlikni yeching: $2^x\le 3-x$.
A) $\left(-\infty;1\right]$ B) $\left(-\infty;1\right]\cup\left(3;\infty\right)$

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C) $(-\infty; 1)$ D) $(-\infty; 2)$

19. Hisoblang:

$$2^{\frac{1}{2\log_5 2}} \cdot 5^{\log_5^2 2} - \sqrt{5} \cdot 2^{\log_5 2} - \left(\frac{1}{3}\right)^{\log_3 25}$$

A) -0,04 B) 0,4 C) 0,04 D) -0,4

20. Tenglamaning ildizlari yig'indisini toping:

$\log_{\frac{1}{3}}(2+x) + \log_{\frac{1}{3}}(5+4x) = 0.$

A) -1,25 B) -1 C) 1 D) -3,25

21. Agar $f(x) = \frac{2e^x}{\ln x}$ bo'lsa, $f'(e)$ ni toping.

A) $\frac{2e^{e-1} \cdot (e-1)}{e}$ B) $2e^e$

C) $2e^{e-1} \cdot (e-1)$ D) $2e$

22. Agar $f(x) = g(3x+4)$ shartni qanoatlantiruvchi $f(x)$ va $g(x)$ funksiyalar uchun $g'(10) = -5$ bo'lsa, $f'(2)$ ni toping.

A) -15 B) 15 C) 10 D) -10

23. $x=1$, $y=e^x$ va $y=e^{-x}$ funktsiyalar bilan chegaralangan soha yuzini toping.

A) $\frac{(e-1)^2}{e}$ B) $e-1$

C) $\frac{e-1}{e}$ D) $\frac{(e-2)^2}{e}$

24. To'g'ri berilgan integrallash formulalarini tanlang:

1) $\int \frac{1}{g(x)} \cdot g'(x)dx = \ln|g(x)| + C$

2) $\int a^{g(x)} \cdot g'(x)dx = \frac{a^{g(x)}}{\ln|a|} + C$

3) $\int e^{g(x)} \cdot g'(x)dx = g(x) \cdot e^{g(x)} + C$

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

25. A shahardan B shaharga 6 xil usulda borish mumkin, B shahardan C shaharga esa 4 xil usul bilan borish mumkin. Agar A dan D ga 2 xil usul bilan, D dan B ga ham 2 xil usul bilan borish mumkin bo'lsa, A dan C ga necha xil usul bilan borish mumkin?

A) 44 B) 40 C) 36 D) 56

26. Agar ABC uchburchakning AB va AC tomonlarida M va N nuqtalar olinib, ular tomonlarni mos ravishda $AM : BM = 3:5$ va $AN : CN = 4:5$ kabi nisbatda bo'lsa, CM to'g'ri chiziq BN kesmani qanday nisbatda bo'ladi?

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

27. Rombning bir uchidan chiqqan balandliklar orasidagi burchak 72° ga teng bo'lsa, uning o'tkir burchagini toping.

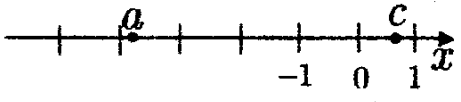
A) 18° B) 36° C) 54° D) 72°

28. Bir burchagi 60° bo'lgan to'g'ri burchakli uchburchakka tomoni 6 sm ga teng bo'lgan romb shunday ichki chizilganki, 60° li burchak ular uchun umumiy, rombning barcha uchlari uchburchakning tomonlarida yotadi. Uchburchakning o'rtacha tomoni uzunligini toping.

A) $9\sqrt{3}$ sm B) $7\sqrt{3}$ sm

C) $18\sqrt{3}$ sm D) $6\sqrt{3}$ sm

29. Koordinata to'g'ri chizig'ida a va c sonlar belgilangan. Quyidagi keltirilgan tengsizliklardan qaysi biri noto'g'ri?



A) $\frac{a}{c} < 0$ B) $-3 < a+1 < -2$

C) $a - c > 0$ D) $-c > -1$

30. Tomoni 2 ga teng bo'lgan kubning biror uchidan unga ichki chizilgan shargacha bo'lgan masofani toping.

A) $\sqrt{3}$ B) $\sqrt{3}-1$ C) $2\sqrt{3}-1$ D) $\sqrt{3}+1$

Variant-27

1. a,b,c musbat butun sonlar uchun $x = 3a+2 = 5b+4 = 7c+6$ tengliklar bajarilsa, x uch xonali sonning eng kichik qiymatini toping.
A) 104 B) 106 C) 945 D) 976

2. Ifodani qiymatini toping:
$$\frac{\left(\frac{1}{24}\right)^3 \cdot \left(\frac{1}{12}\right)^{-9} \cdot 27^{-2} - 80}{0,75^{-2}}$$
A) 243 B) 81 C) 27 D) 729

3. Soddalashtiring:
$$\left(\frac{x^2}{y^3}+\frac{1}{x}\right) : \left(\frac{x}{y^2}-\frac{1}{y}+\frac{1}{x}\right) : \frac{x^2+y^2+2xy}{1+yx^{-1}}$$
A) xy B) 1 C) $\frac{x}{y}$ D) $\frac{1}{xy}$

4. a manfiy bo'lsa, ifodani soddalashtiring: $\sqrt[3]{54a^{2\frac{1}{3}}} \cdot \sqrt[3]{24a^{\frac{2}{3}}}$.
A) $12a^{\frac{2}{3}}$ B) $12a$ C) $6a^{\frac{2}{3}}$ D) $6a\sqrt[3]{6}$

5. Soddalashtiring:
$$2a + \frac{a^3+21a^2+147a+343}{(a+7)^2} - 7$$
A) a B) $2a$ C) $3a$ D) $-2a$

6. Ahmad besh kun, Arslon bir kun ishlaganda bir ishning $\frac{5}{8}$ qismini bajarishadi. Agar Ahmad va Arslon bir kundan ishlasa, aynan o'sha ishning $\frac{3}{8}$ qismini bajarishardi. Ahmad bir o'zi ushbu ishni necha kunda tamomlaydi?
A) 16 B) 10 C) 4 D) 9

7. Tenglamani yeching:
$$\frac{x-1}{1+\sqrt{x}} = 4 - \frac{1-\sqrt{x}}{2}$$
A) 49 B) 81 C) 64 D) 25

8. $\left(a^2-10a+25\right)x = a^2-4a-5$ tenglama a ning qanday qiymatida cheksiz ko'p yechimga ega?
A) $a=5$ B) $a=-1$
C) $a=-1;\ a=5$ D) $a\neq -1$

9. Agar a,b,c manfiy butun sonlar bo'lib, $\frac{1}{a} > \frac{1}{b} > \frac{1}{c}$ tengsizliklar bajarilsa, $|a+b|+|b-c|-|a-c|$ ifodani soddalashtiring.
A) $-2b$ B) $-2a-2c$ C) 0 D) $b-a$

10. $(m-2)(x^2-8x+3) > -2$ tengsizlik m ning qanday qiymatlarida har doim o'rinli bo'ladi.
A) $\left[2;\frac{28}{13}\right)$ B) $\left[1;\frac{28}{13}\right)$
C) $\left[2;3\right)$ D) $\left[2;+\infty\right)$

11. Maxraji 2 ga, $b_1 = -\frac{3}{4}$ ga teng bo'lgan (b_n) geometrik progressiya berilgan. Uning dastlabki 6 ta hadi yig'indisini toping.
A) -45,25 B) -48,25
C) -46,25 D) -47,25

12. $\sin 0,8\alpha - \sin 1,4\alpha - \sin 0,4\alpha + \sin 1,8\alpha$ ifodani soddalashtiring.
A) $8\sin 1,1\alpha \cdot \sin 0,5\alpha \cdot \sin 0,2\alpha$
B) $4\cos 1,1\alpha \cdot \cos 0,5\alpha \cdot \sin 0,2\alpha$
C) $4\sin 1,1\alpha \cdot \sin 0,5\alpha \cdot \cos 0,2\alpha$
D) $8\cos 1,1\alpha \cdot \cos 0,5\alpha \cdot \cos 0,2\alpha$

13. Hisoblang: $\frac{1}{\cos 50^\circ} + \frac{tg30^\circ}{\cos 40^\circ}$
A) 1 B) $\frac{2}{\sqrt{3}}$ C) $\sqrt{3}$ D) $\frac{4}{\sqrt{3}}$

14. Hisoblang. $\arcsin\left(\sin 3\right)$
A) $\frac{\pi}{2}-3$ B) $\pi-3$ C) 3 D) $\varnothing$

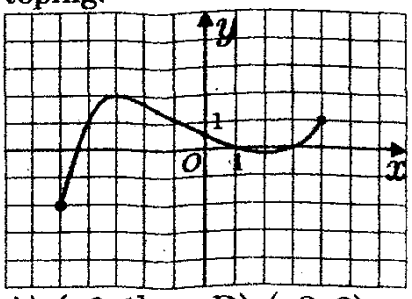
15. $\sqrt{3}ctgx + 3 = 0$ tenglamaning eng kichik musbat yechimini toping.

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

16. $y = (1 + tgx)(1 + ctgx)$ funksiyaning qiymatlar sohasiga tegishli butun sonlar ko'paytmasini toping?

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

17. Grafik ko'rinishda berilgan funksiyaning qiymatlar to'plamini toping.



A) $(-2; 1]$ B) $(-2; 2)$

C) $(-4; 4]$ D) $(-2; 2]$

18. $\frac{(4^x - 2^5)\cdot(3^x - 9^7)}{(2x-5)\cdot(9x-7)} = 0$ tenglamaning ildizi 42 dan necha marta kam?

A) 14 B) 4 C) 7 D) 3

19. Hisoblang:

$(\log_4 6 + \log_6 4 + 2)\cdot(\log_4 6 - \log_{11} 11)\cdot$

$\cdot\log_6 4 - \log_4 6.$

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

20. Tenglamaning ildizlari yig'indisini toping: $\log_2(2 - x) - \log_2(2 \sqrt{\ }) =$

$= \log_2\sqrt{2 - x} - 0{,}5.$

A) 16/9 B) 13/4

C) 80/45 D) 29/45

21. $y = f(x)$ funksiyaning $(2; 10)$ nuqtasidan o'tkazilgan urinma $(-1; 0)$ nuqtadan o'tadi. Shu funksiyaning $x_0 = -2$ nuqtadagi hosilasini toping.

A) 10 B) -10 C) 20 D) 30

22. Integralni hisoblang: $\int_0^{27}(4\sqrt[3]{x} + 2x)dx$

A) 1002 B) 729 C) 739 D) 972

23. Nuqtalar o'rniga to'g'ri javobni tanlang.

To'g'ri burchakli uchburchak α o'tkir burchagi ... deb shu burchak qarshisidagi katetning gipotenuzaga nisbatiga aytiladi.

A) tangensi B) kotangensi

C) kosinusi D) sinusi

24. Hech bir uchtasi bir to'g'ri chiziqda yotmaydigan 25 ta nuqtadan nechta uchburchak yasash mumkin?

A) 2300 B) 2304 C) 2200 D) 2100

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★25. ABC uchburchakning BC tamonida D nuqta olingan. Agar $BD = 16$, $DC = 4$ va $AB = AD = 10$ bo'lsa, $S_{\Delta ADC}$ ni toping.

A) 12 B) 14 C) 10 D) 16

26. Agar to'g'ri to'rtburchakning perimetri 10 ga teng bo'lsa, uning yuzasini eng katta qiymatini toping.

A) 8 B) 6,25 C) 6 D) 6,75

27. Trapetsiyaning asoslari 24 va 30 ga, asosidagi burchaklaridan biri 60° ga teng. Yon tomonlari davom ettirilganda 60° burchak ostida kesishsa, trapetsiyaning yuzini toping.

A) $81\sqrt{3}$ B) $27\sqrt{3}$

C) $13{,}5\sqrt{3}$ D) $40{,}5\sqrt{3}$

28. Bir nuqtadan aylanaga ikkita urinma o'tkazilgan. Har bir urinmaning uzunligi 12 sm, urinish nuqtalari orasidagi masofa 14,4 sm. Aylananing radiusini toping.

A) 6 sm B) 8 sm C) 9 sm D) 10 sm

29. To'g'ri burchakli uchburchakning katetlari 7 va 24 ga teng. Uchburchakning gipotenuzasi orqali o'tuvchi tekislik uchburchakning tekisligibilan 30 burchak tashkil qiladi.

Uchburchakning to'g'ri burchagi uchi bilan tekislik orasidagi masofani toping.
A) 5 B) 4 C) 3,36 D) 3,5

30. Muntazam uchburchakli prizmaning balandligi 5 ga teng. Agar prizmaning yuqori asosi markazi bilan quyi asosining tomoni o'rtasini tutashtiruvchi kesma asos tekislikgi bilan 30 burchak tashkil qilsa, prizmaning yon sirtini toping.
A) 400 B) 500 C) 450 D) 350

Variant-28

1. 72 ga bo'linadigan a sonining natural bo'luvchilari soni 20 ta bo'lsa, a sonining eng katta va eng kichik qiymatlarining farqini toping.
A) 144 B) 72 C) 216 D) 432

2. Hisoblang:
$\left(1\frac{1}{7}\right)\cdot\left(1\frac{1}{8}\right)\cdot\left(1\frac{1}{9}\right)\cdot\ldots\cdot\left(1\frac{1}{76}\right)$
A) 11 B) 11/7 C) 7 D) 76/7

3. Ifodani soddalashtiring:
$\sqrt[5]{b^5}+\sqrt[4]{b^4}-\sqrt[6]{b^6}-\sqrt[7]{b^7}$, bu yerda $b<0$.
A) $0;\ 4b$ B) 0 C) $0;\ -4b$ D) $4b$

4. $a\cdot b\cdot c=7$ bo'lsa
$\left(\frac{4}{a}-b\cdot c\right)\left(\frac{5}{b}-a\cdot c\right)\left(\frac{6}{c}-a\cdot b\right)$
ko'paytmaning qiymatini toping.
A) $-\frac{6}{7}$ B) $\frac{2}{3}$ C) 1 D) $-\frac{5}{3}$

5. Juft sonning o'zidan keyin keluvchi juft sonning uchlangani bilan yig'indisi 70 dan kichik. Ushbu shartni qanoatlantiruvchi juft sonlardan eng kattasini toping.
A) 12 B) 16 C) 14 D) 8

6. Tenglamaning ildizlari yig'indisini toping:
$4(x-3)(x+3)-(x-3)(x^2+3x+9)=0$
A) -6 B) -9 C) 4 D) 8

7. $(x^2-6)x=a$ tenglama a ning qanday qiymatlarida 2 ta haqiqiy ildizga ega bo'ladi?
A) $\pm4\sqrt{2}$ B) $\pm\sqrt{2}$ C) $\left(-4\sqrt{2};4\sqrt{2}\right)$
D) $\left(-\infty;-4\sqrt{2}\right)\cup\left(4\sqrt{2};\infty\right)$

8. $(x^2-3x-2)\cdot(x^2-3x+1)<10$ tengsizlikni qanoatlantiruvchi eng katta va eng kichik butun sonlar yig'indisini toping.
A) 5 B) 3 C) 2 D) 4

9. $(x^3-4x)\cdot\sqrt{x+1}>0$ tengsizlikning eng katta butun manfiy yechimini toping.
A) bunday qiymat mavjud emas
B) -1 C) -2 D) -3

10. Ketma-ket kelgan ikkita musbat juft sonlar kvadratlarining ayirmasi 116 ga teng. Ushbu sonlardan kichigini toping.
A) 26 B) 30 C) 28 D) 32

11. Ifodani soddalashtiring:
$\sin\alpha+\sin\left(\alpha+\frac{2\pi}{3}\right)+\sin\left(\alpha+\frac{4\pi}{3}\right)$
A) 1 B) 0 C) $1+\sin\alpha$ D) $\sin\alpha$

12. Agar $\sqrt{tg\alpha-\sqrt{tg\alpha-\sqrt{tg\alpha-\ldots}}}=1$ bo'lsa, $\cos2\alpha$ ning qiymatini toping.
A) -0,6 B) -0,8 C) 0,96 D) 0,28

13. $\cos97^\circ$ dan oshmaydigan eng katta butun sonni toping.
A) 1 B) -1 C) 0 D) -2

14. $\frac{\sin x-\frac{1}{2}}{\cos x-\frac{\sqrt{3}}{2}}=0$ tenglamaning $[-2\pi;\ 2\pi]$ oraliqdagi ildizlari yig'indisini toping?
A) -180° B) -60° C) -120° D) -150°

15. $f(2x-1)=\frac{18-x}{7}$ va $g(3x-1)=x^2-1$ bo'lsa, $f(g(2))$ ni hisoblang.

A) 2,5 B) 2 C) 3 D) $\frac{16}{7}$

16. $(x;\ y)$- juftlik

$$\begin{cases} 9^x-3^x(y+1)+y=0, \\ \dfrac{y^2-y-6}{x}=0. \end{cases}$$ tenglamalar sistemasining ildizi bo'lsa, $y-x$ ni toping.

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

17. Hisoblang: $\lg 2018,4-\lg 0,0020184$

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

18. $x^{\lg 2}+2^{\lg x}=4$ tenglama nechta yechimga ega?

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

19. $2^{\log_{0,2}(x)\cdot\log_{0,2}(5x)}>1$ tengsizlikni yeching.

A) $(0,2;\ 1)$ B) $(1;\ \infty)$

C) $(0;\ 0,2)\cup(5;\ \infty)$ D) $(0;\ 0,2)\cup(1;\ \infty)$

20. Agar $f(x)=\frac{e^x}{\ln x}+\sqrt{\lg 2}$ bo'lsa, $f'(e)$ ni toping.

A) $\frac{e^{e-1}\cdot(e-1)}{e}$ B) e^e

C) $e^{e-1}\cdot(e-1)$ D) e

21. $y=x^4-4\ln x$ funktsiyaning minimum nuqtasini toping.

A) $x=2$ B) $x=1$

C) mavjud emas D) $x=0$

22. Quyidagi chiziqlar bilan chegaralangan shaklni yuzini hisoblang: $y=2e^x,\ y=2e,\ x=0$.

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

23. To'g'ri berilgan integrallash formulalarini tanlang:

1) $\int\frac{1}{kx+b}dx=\frac{1}{k}\cdot\ln|kx+b|+C$

2) $\int a^{b-kx}dx=-\frac{a^{kx-b}}{k\cdot\ln|a|}+C$

3) $\int e^{b-kx}dx=-\frac{1}{k}\cdot e^{b-kx}+C$

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

24. 9 ta xatni 9 xil joyga 2 ta pochta hodimi necha xil usul bilan tarqatishi mumkin?

A) 162 B) 512 C) 1024 D) 81

25. Teng yonli trapetsiyaning pastki asosi 50 sm ga, ustki asosi esa 36 sm ga teng. Bu trapetsiyaning diagonallari o'zaro perpendikulyar. Uning yuzini toping.

A) $1600\,sm^2$ B) $1849\,sm^2$

C) $2036\,sm^2$ D) $1681\,sm^2$

26. Ikkita bir xil r radiusli aylanalar tashqi ravishda urinadi. Radiusi 8 ga teng bo'lgan uchinchi aylana bu aylanalarga tashqi ravishda A va B nuqtalarda urinadi. Agar $AB=9$ bo'lsa, r ni toping.

A) $\frac{36}{5}$ B) $\frac{48}{7}$ C) $\frac{72}{7}$ D) $\frac{72}{25}$

27. ABC uchburchakda AD, BE va CF balandliklar o'tkazildi. Agar $AB=BC=10$ va $CA=12$ bo'lsa, BFD uchburchakka ichki chizilgan aylana radiusini toping.

A) $\frac{18}{25}$ B) $\frac{21}{25}$ C) $\frac{4}{5}$ D) $\frac{3}{5}$

28. Balandligi 2,5 bo'lgan 120° yoyli segmentga $ABCD$ to'g'ri to'rtburchak shunday ichki chizilganki, bunda $AB:BC=1:4$ va BC tomon segment vatarida yotadi. To'g'ri to'rtburchak yuzini toping.

A) 9 B) 15 C) 12 D) 13,5

29. Uzunliklari o'zaro teng bo'lgan $\vec{a}(2;-2;5)$ va $\vec{b}(-3;-4;2x)$ vektorlar berilgan bo'lsa, x ning absolut qiymatini toping.

A) 2 B) $\sqrt{2}$ C) $2\sqrt{2}$ D) $\sqrt{3}$

30. Konus ichidan o'tkazilgan tekislik uning asosini 9 ga teng bo'lgan vatar orqali kesib o'tadi. Ushbu vatar konus asosida 90 li yoyni tortib turadi. Konus yasovchilari orasidagi eng katta burchak 60 ga teng bo'lsa, konusning yon sirti yuzini toping.

A) 36π B) 64π C) 81π D) $64\sqrt{3}\pi$

Variant-29

1. $9*950$ yozuvda yulduzchani shunday raqam bilan almashtiringki, hosil bo'lgan son 45 ga qoldiqsiz bo'linsin.

A) 6 B) 4 C) 2 D) 5

2. $\frac{9}{4^2\cdot 5^2}+\frac{11}{5^2\cdot 6^2}+\frac{13}{6^2\cdot 7^2}+\ldots+\frac{39}{19^2\cdot 20^2}$ hisoblang.

A) 0,125 B) 0,005 C) 0,06 D) 0,5

3. Agar $\frac{a}{b}=5+\sqrt{24}$ bo'lsa, $\frac{\sqrt{a}-\sqrt{2b}}{\sqrt{b}}$ ni qiymatini toping.

A) $-\sqrt{3}$ B) $\sqrt{5}$ C) $\sqrt{3}$ D) $-\sqrt{5}$

4. Agar $\sqrt{\frac{2}{\sqrt{7}+\sqrt{5}}-\frac{3}{\sqrt{7}-2}+a+1}$ ifodani qiymati 0 ga teng bo'lsa, a ni toping.

A) $\sqrt{5}-1$ B) $\sqrt{1+\sqrt{5}}$

C) $1+\sqrt{5}$ D) $1-\sqrt{5}$

5. Ifodani soddalashtiring:

$$\frac{x+y}{x-y}:\left(\frac{3\sqrt{x}}{\sqrt{x}-\sqrt{y}}-\frac{3\sqrt{y}}{\sqrt{x}+\sqrt{y}}\right).$$

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

6. $\sqrt{4^{19}+6^{20}+9^{20}}+\sqrt{4^{19}-6^{20}+9^{20}}$ ifodani soddalashtiring.

A) 2^{21} B) 4^{10} C) $2\cdot 3^{20}$ D) $2\cdot 3^{19}$

7. Juft sonning o'zidan keyin keluvchi uchta juft son bilan yig'indisi 70 dan katta. Ushbu shartni qanoatlantiruvchi juft sonlardan eng kichigini toping

A) 16 B) 18 C) 14 D) 12

8. Agar $\sqrt{2x+y-15}+\sqrt{3x-y-10}=0$ tenglik o'rinli bo'lsa, xy ning qiymatini toping.

A) 20 B) 30 C) 22 D) 25

9. $(5x-1)(2x-5)^2=(4x^2-25)(x-0,2)$ tenglama ildizlari yig'indisini toping.

A) $6\frac{1}{4}$ B) $2\frac{7}{10}$ C) $6\frac{9}{20}$ D) $6\frac{1}{2}$

10. $|5-2x|+|3x-4|\geq 2x+3$ tengsizlikning eng kichik natural yechimini toping.

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

11. n-hadining formulasi $a_n=\frac{13-n}{6}$ bo'lgan arifmetik progressiyaning ayirmasini toping.

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

12. Ifodani ko'paytma shaklida ifodalang:

$\cos 8\alpha-\cos 7\alpha-\cos 3\alpha+\cos 2\alpha$

A) $-4\cos\frac{\alpha}{2}\cos 5\alpha\cos\frac{5\alpha}{2}$

B) $-4\sin\frac{\alpha}{2}\cos 5\alpha\cos\frac{5\alpha}{2}$

C) $-4\cos 5\alpha\sin\frac{\alpha}{2}\sin\frac{5\alpha}{2}$

D) $-4\sin\frac{\alpha}{2}\sin 5\alpha\cos\frac{5\alpha}{2}$

13. Hisoblang: $tg20^\circ+4\sin 20^\circ+1$

A) $\sqrt{3}-1$ B) $\sqrt{3}+1$

C) $\frac{\sqrt{3}+3}{3}$ D) $\sqrt{3}$

14. Agar $m = a\cos x + b\sin x$ va $n = -\sqrt{a^2+b^2}$ bo'lsa, quyidagi tengsizliklardan qaysi biri x ning istalgan qiymatlari uchun o'rinli bo'ladi.

A) $-\sqrt{a^2+b^2} \le m-n \le \sqrt{a^2+b^2}$

B) $0 \le m-n \le \sqrt{a^2+b^2}$

C) $0 \le m-n \le 2\sqrt{a^2+b^2}$

D) $-2\sqrt{a^2+b^2} \le m-n \le 0$

15. Tenglamani yeching:

$4\cos^2 x - 2\sin^2 x - 5\cos x - 4 = 0$

A) $x = \pm\arccos\frac{2}{3} + \pi n,\ n \in Z$

B) $x = \arccos\left(-\frac{2}{3}\right) + \pi n,\ n \in Z$

C) $x = \pm\arccos\left(-\frac{2}{3}\right) + 2\pi n,\ n \in Z$

D) $x = \pm\arccos\left(-\frac{2}{3}\right) + \pi n,\ n \in Z$

16. $y = (1+tgx)(1+ctgx)$ funksiyaning qiymatlar sohasini toping?

A) $(-\infty;\infty)$ B) $(-\infty;-1)\cup(1;\infty)$

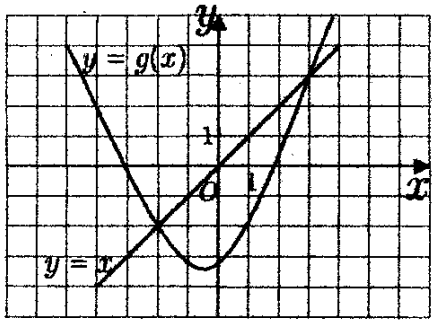
C) $(-\infty;0]\cup[4;\infty)$ D) $(-1;1)$

17. Chizmada $[-5;4]$ kesmada berilgan $y = g(x)$ funksiya grafigi tasvirlangan. $g(x) \ge x$ tengsizlikni qanoatlantiradigan x ning barcha qiymatlarini toping.

A) $[-4;-2]\cup[3;4]$

B) $[-5;-2]\cup[3;4]$

C) $[-5;-3]\cup[2;4]$ D) $[-2;3]$



18. Tenglamalar sistemasini yeching:

$$\begin{cases} 11^x + 8^y = 75 \\ 3\cdot 11^x + 8^y = 97 \end{cases}$$

A) $(1;2);\ (\log_2 7;\ 2\log_{11} 2)$

B) $(1;2)$ C) $(-2;1)$ D) $(1;-2)$

19. Hisoblang: $\log_{\frac{1}{4}}(\log_2 3 \cdot \log_3 4)$.

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

20. Ifodani soddalashtiring:

$$\frac{27 - \log_a^3 b^3}{(\log_a b + \log_b a + 1)\cdot \log_a \frac{a}{b}} \cdot \log_{b^9} a.$$

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

21. a, b musbat sonlar uchun $\lg(a-b)$, $\lg 2 \cdot \sqrt{ab+b^2}$ va $\lg(a+b)$ sonlari ko'rsatilgan tartibda arifmetik progressiyaning ketma-ket hadlari bo'lsa, $\log_b a^2 - \log_b 25$ ifodaning qiymatini toping.

A) 2 B) 1 C) -2 D) -1

22. $y = x^2 - |2x-4|$ funksiya grafigiga $x = 3$ va $x = -3$ nuqtalarda o'tkazilgan urinmalarning orasidagi burchak α bo'lsa, $\cos\alpha$ ni toping.

A) $\frac{15}{17}$ B) $\frac{5}{13}$ C) $\frac{3}{5}$ D) $\frac{\pi}{6}$

23. Hisoblang: $\int_1^2 \left(e^x + \frac{1}{x} + 1\right) dx$

A) $e^2-e+\ln 2$ B) $e^2-e+3+\ln 2$
C) $e^2+e-\ln 2$ D) $e^2-e+\ln 2+1$

24. Quyida keltirilgan tasdiqlardan qaysilari to'g'ri?
1) muntazam uchburchakka ichki chizilgan aylananing radiusi, uning balandligining to'rtdan uch qismiga teng; 2) muntazam uchburchakka tashqi chizilgan aylananing radiusi, uning balandligining uchdan ikki qismiga teng; 3) muntazam uchburchakka tashqi chizilgan aylananing markazi, uning bissektrisasida yotadi.
A) 1; 3 B) 1; 2; 3 C) 2; 3 D) 1; 2

25. 6 ta katakni 2 ta qizil, 1 ta oq, 1 ta ko'k, 1 ta qora, 1 ta yashilga necha xil usul bilan bo'yash mumkin?

A) 120 B) 720 C) 360 D) 96

26. $ABCD$ rombning AB va AD tomonlarida M va N nuqtalar mos ravishda shunday olinganki, bunda MC va NC to'g'ri chiziqlar rombni uchta tengdosh qismga ajratadi. Agar $BD=18$ bo'lsa, MN ni toping.
A) 3 B) 4 C) 4,5 D) 6

27. Markaziy burchagi 72° bo'lgan sektorning yuzi 15 ga teng. Sektor radiusini toping.
A) $\sqrt{\frac{75}{\pi}}$ B) $\sqrt{\frac{45}{\pi}}$ C) $\sqrt{\frac{15}{\pi}}$ D) $\sqrt{\frac{25}{\pi}}$

28. ABC teng yonli uchburchakka tashqi chizilgan aylananing AD vatari uning BC asosini E nuqtada kesib o'tadi. Agar $AE=2\sqrt{3}$, $DE=\sqrt{3}$ bo'lsa, AB ni toping.
A) $3\sqrt{6}$ B) 6 C) $3\sqrt{3}$ D) $3\sqrt{2}$

29. ABC uchburchak uchlarining koordinatalari berilgan. $A(8;12)$, $B(-8;0)$ va $C(-2;8)$. Uchburchakning CM medianasi yotgan to'g'ri chiziq tenglamasini tuzing.
A) $x+2y+3=0$ B) $x+y+6=0$
C) $x+y=6$ D) $x-y-6=0$

30. To'la sirti 48 bo'lgan to'g'ri burchakli parallelepipedning o'lchovlari a,b,c bo'lib $\frac{1}{a}+\frac{1}{b}+\frac{1}{c}=\frac{1}{4}$ tenglik o'rinli. Parallelepipedning hajmini toping.
A) 48 B) 64 C) 72 D) 96

Variant-30

1. 7 ga karrali sonni 5 ga bo'lgandagi qoldiq 4 bo'ladi, Shu sonni 35 ga bo'lgandagi qoldiqni toping.
A) 3 B) 14 C) 25 D) 21

2. $b=\sqrt{0,3}$ bo'lsa, $(b-2)^2-4b(2b-1)$ ifodani qiymatini toping.
A) 0,09 B) 1,09 C) 0,9 D) 1,9

3. Agar $|a|\neq|b|\neq|c|$ va $\frac{a}{b+c}+\frac{b}{c+a}+\frac{c}{a+b}=2$ bo'lsa, $\left(\frac{a^2}{b+c}+\frac{b^2}{c+a}+\frac{c^2}{a+b}\right):(a+b+c)$ ning qiymatini toping.
A) 2 B) 0,5 C) 1 D) 0

4. Agar $x<-2$ bo'lsa, $\sqrt{x^2+6x+1+\sqrt{9-12x+4x^2}}$ ifodani soddalashtiring.
A) $2-x$ B) $2+x$ C) $-2-x$ D) $-2x$

5. Toq sonning o'zidan keyin keluvchi uchta toq son bilan yig'indisi 49 dan katta. Ushbu shartni qanoatlantiruvchi toq sonlardan eng kichigini toping.
A) 9 B) 15 C) 11 D) 13

6. $|5x-3|+|3x-5|=9x-10$ tenglamaning ildizi 9 dan qancha kam?
A) 5 B) 6 C) 7 D) 8

7. $(x+2)^2=(x-4)^2$ tenglamani yeching.
A) -1 B) 1 C) 2 D) 4

8. $6x^3-18x^2+ax+a+28=0$ tenglamaning uchta haqiqiy ildizining ikkitasi qarama-qarshi sonlar bo'lsa, a^2-2 ning qiymatini toping.
A) 34 B) 47 C) 23 D) 62

9. Tengsizlikni yeching:
$(2x-5)^{10}<(x^2-4x+3)^5$
A) $(-\infty;\ 2,5)$ B) $(1;\ 2,5)$
C) $(1;\ 2,5)\cup(2,5;\ 3)$ D) $\varnothing$

10. $\dfrac{|x-2|}{x^2+3x-10}\geq 2$ tengsizlikni qanoatlantiruvchi eng kichik ratsional sonni toping.
A) -5,5 B) -6,2 C) -4,5 D) -5

11. $a=1\cdot 2+2\cdot 3+3\cdot 4+\ldots+40\cdot 41$,
$b=5\cdot 4+10\cdot 6+15\cdot 8+\ldots+200\cdot 82$
bo'lsa, $\dfrac{a}{b}$ ning qiymatini toping.
A) 1/10 B) 1/6 C) 1/12 D) 1/8

12. Ifodani soddalashtiring:
$\cos\left(\dfrac{\pi}{6}-\dfrac{\alpha}{4}\right)\cdot\sin\left(\dfrac{\pi}{3}-\dfrac{\alpha}{4}\right)\cdot\sin\dfrac{\alpha}{4}$
A) $\dfrac{1}{4}\sin\dfrac{3\alpha}{4}$ B) $\dfrac{1}{2}\sin\dfrac{\alpha}{2}$
C) $\dfrac{1}{4}\sin\dfrac{\alpha}{4}$ D) $\dfrac{1}{2}\sin\dfrac{3\alpha}{4}$

13. Hisoblang: $\dfrac{1}{\cos 20^\circ}-tg10^\circ\cdot tg20^\circ$
A) 2 B) $\dfrac{\sqrt{3}}{2}$ C) 1 D) $\sqrt{3}$

14. Hisoblang. $tg\left(arctg2-arctg\dfrac{1}{2}\right)$
A) $\dfrac{3}{4}$ B) $\dfrac{3}{2}$ C) $\dfrac{4}{3}$ D) $\dfrac{2}{3}$

15. Tenglamani yeching:
$2^{\sin^2 x}+2^{\cos^2 x}=3$
A) $\dfrac{\pi n}{2};\ n\in Z$ B) $\pi n;\ n\in Z$
C) $\dfrac{\pi n}{4};\ n\in Z$ D) $\dfrac{\pi n}{3};\ n\in Z$

16. $y=\arcsin\left(\left|x-\dfrac{1}{2}\right|+|x|\right)$ funksiyaning qiymatlari sohasini toping.
A) $\left[\dfrac{\pi}{6};\dfrac{\pi}{2}\right]$ B) $\left[0;\dfrac{\pi}{2}\right]$
C) $\left[-\dfrac{\pi}{2};\dfrac{\pi}{2}\right]$ D) $\left[-\dfrac{\pi}{2};\dfrac{\pi}{6}\right]$

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17. $3^{-x}=a$, $2^{2x}=b$ bo'lsa, 144^{-x} ni a va b orqali ifodalang.
A) $2ab$ B) $2a^2b$ C) $\dfrac{a^2}{b}$ D) $\left(\dfrac{a}{b}\right)^2$

18. $\log_5 7+\log_7 5$ yig'indi yotgan oraliqni aniqlang.
A) (1; 2) B) (2; ∞)
C) (−∞; 2) D) (0; 2)

19. Tenglamaning ildizlari yig'indisini toping. $\sqrt{2\log_8(-x)}-\log_8\sqrt{x^2}=0$
A) -7 B) -3 C) -65 D) -69

20. $y=\cos 2x+4x$ funksiya hosilasining $x_0=\dfrac{\pi}{2}$ nuqtadagi qiymatini toping.
A) 4 B) 0 C) -2 D) 2

21. Moddiy nuqta yurgan yo'li quyidagi qonuniyat bo'yicha o'zgarmoqda: $S(t)=\dfrac{t^4}{4}-\dfrac{t^3}{3}+t^2+1$ (m). Harakat boshlangandan so'ng 4 - sekund oxirida uning oniy tezligi necha m/s bo'ladi?
A) 48 B) 54 C) 52 D) 56

22. $x=1$, $y=2^x$ va $y=2^{-x}$ funksiyalar bilan chegaralangan soha yuzini toping.
A) $\log_4 e$ B) $\log_2 2e$
C) $\log_2 \sqrt{e}$ D) $-\log_4 e$

23. Quyidagilardan qaysilari to'g'ri?
1) agar $b>0$, $a>c>0$ bo'lsa, u holda $\frac{a}{b}>\frac{c}{b}$ bo'ladi;
2) agar $a>0$, $b>c>0$ bo'lsa, u holda $\frac{a}{b}<\frac{a}{c}$ bo'ladi;
3) agar $c>0$, $0<a<b$ bo'lsa, u holda $\frac{a}{b}>\frac{a+c}{b+c}$ bo'ladi;
A) 1; 2; 3 B) 2; 3 C) 1; 2 D) 1; 3

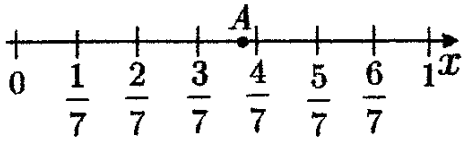
24. Bir kunlik o'quv jadvalida 4 ta har xil darslarni necha xil usul bilan tuzish mumkin?
A) 6 B) 48 C) 12 D) 24

25. $ABCD$ parallelogrammning A burchak bissektrisasi BC tomonni E nuqtada kesadi. $AB=9$, $AD=15$ bo'lsa, BE va EC ni toping.
A) 8; 7 B) 9; 6 C) 10; 5 D) 12; 3

26. Teng yonli uchburchakning asosi 8 sm ga, yon tomoni esa 5 sm ga teng. Bu uchburchakka ichki va tashqi chizilgan aylanalarning markazlari orasidagi masofani (sm) toping.
A) 3/8 B)5/2 C) 5/6 D) 7/6

27. Agar qo'shni burchaklarning ayirmasi 40° ga teng bo'lsa, shu burchaklarni toping.
A) 70°; 110° B) 75°; 115°
C) 75°; 105° D) 80°; 120°

28. Koordinata to'g'ri chizig'ida A nuqta bilan $\frac{5}{6}$, $\frac{5}{7}$, $\frac{5}{9}$, $\frac{5}{12}$ sonlaridan biri belgilangan. Ushbu nuqtani toping.



A) $\frac{5}{6}$ B) $\frac{5}{9}$ C) $\frac{5}{7}$ D) $\frac{5}{12}$

29. Agar $\vec{a}\cdot\vec{b}=42$ bo'lsa, $\vec{b}(2;3;-1)$ vektorlarga kollinear $\vec{a}(x;y;z)$ vektorning koordinatalari yig'indisini toping.
A) 10 B) 14 C) 9 D) 12

30. Rombning bir tomoni P tekislikda yotadi. Rombning o'tkir burchagi 60° ga teng, katta diagonali esa ushbu tekislik bilan α burchak tashkil etadi. Agar $\cos\alpha=\frac{\sqrt{19}}{5}$ bo'lsa, romb tekisligi bilan P tekislik orasidagi ikki yoqli burchakning kosinusini toping.
A) 0,5 B) 0,2 C) 0,25 D) 0,7

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Variant-31

1. 24 ga bo'lganda qoldiq 15 qoladigan eng katta va eng kichik ikki xonali sonlarning yig'indisini toping.
A) 100 B) 102 C) 96 D) 109

2. $4{,}8=x+\frac{y}{5}$ tenglikda x va y sonlar 5 dan kichik natural sonlar bo'lsa, y ning qiymatini toping.
A) 1 B) 3 C) 4 D) 0

3. $\frac{a}{b}=\frac{c}{d}=\frac{e}{f}=\frac{4}{5}$ bo'lsa, $\frac{a\cdot c\cdot e}{b\cdot d\cdot f}$ ning qiymatini toping.
A) $\frac{32}{243}$ B) $\frac{64}{125}$ C) $\frac{32}{81}$ D) $1\frac{64}{125}$

4. $x+2y=4$ tenglik o'rinli bo'lsin. y ning qanday qiymatlarida

$(x-y)^2+(x-2y)^2$ ifoda o'zining eng kichik qiymatiga erishadi?
A) 1 B) 1,04 C) 1,08 D) 1,12

5. Agar biror oyda 5 ta dushanba bo'lsa, shu oyda . . . bo'la olmaydi.
A) 5 ta shanba B) 5 ta chorshanba
C) 5 ta seshanba D) 5 ta payshanba

6. Tenglamani yeching.
$7\cdot\sqrt{1-\frac{1}{x}}=\frac{13x-1}{x}$.
A) $\frac{1}{8};\frac{1}{15}$ B) $-\frac{1}{8};-\frac{1}{15}$
C) $-\frac{1}{8};\frac{1}{15}$ D) $\frac{1}{8};-\frac{1}{15}$

7. Agar $x^2-5x+2=0$ bo'lsa, $x^2+\frac{4}{x^2}$ ning son qiymatini toping.
A) 15 B) 23 C) 21 D) 18

8. Agar $a>0,\ b>0,\ c<0$ va $b^2-4ac>0$ bo'lsa, $ax^4+bx^2+c=0$ bikvadrat tenglama nechta haqiqiy ildizga ega bo'ladi?
A) 2 B) 4 C) 1 D) 3

9. Nechta butun son $(x^2+6x)^2\le 49$ tengsizlikning yechimi bo'la oladi?
A) 9 ta B) 6 ta C) 7 ta D) 8 ta

10. $\sqrt{(x^3-8)^2}>x-2$ tengsizlikni yeching.
A) $x\in R$ B) $\{2\}$ C) $x\in Z$
D) $(-\infty;2)\cup(2;+\infty)$

11. 1, 4, 9, 16, 25,... Ketma –ketlikning 9 – hadini toping.
A) 81 B) 49 C) 729 D) 243

12. Ifodani soddalashtiring:
$\sin^2(45^\circ+\alpha)-\sin^2(30^\circ-\alpha)-$
$-\sin 15^\circ\cdot\cos(15^\circ+2\alpha)$.
A) $\sin 2\alpha$ B) $\cos 2\alpha$
C) $\sin\left(\frac{\pi}{4}+\alpha\right)$ D) $\sin\left(\frac{\pi}{4}-\alpha\right)$

13. Agar $2tgx-\sin x+3\cos x=6$ bo'lsa, $\cos 2x$ ni toping.
A) $-\frac{4}{5}$ B) $-\frac{4}{5}$ C) $\frac{4}{3}$ D) $-\frac{4}{3}$

14. Soddashtiring: $\frac{\sin\alpha+\cos(2\beta-\alpha)}{\cos\alpha-\sin(2\beta-\alpha)}$
A) 1 B) $ctg\left(\frac{\pi}{4}-\beta\right)$
C) $ctg\left(\frac{\pi}{4}-\alpha\right)$ D) $tg\left(\frac{\pi}{4}-\beta\right)$

15. $tgx=3$ tenglamaning $\left[-\frac{\pi}{2};\frac{\pi}{2}\right)$ oraliqqa tegishli ildizlari soni nechta?
A) 2 B) 1 C) 3 D) 4

16. $y=\sqrt{3}x+\sqrt{3}ctgx-\frac{\pi\sqrt{3}}{3}$ funksiyaning $\left[\frac{\pi}{3};\frac{\pi}{2}\right]$ kesmadagi eng katta qiymatini toping.
A) 1 B) 3 C) $-\frac{\sqrt{3}}{3}$ D) $\sqrt{3}$

17. Tenglamalar sistemasini yeching:
$\begin{cases}2^x\cdot 7^y=28\\2^x+7^y=11\end{cases}$
A) $(2;1);\ (\log_2 7;2\log_7 2)$
B) $(2;1);\ (\log_2 7;2\log_2 7)$
C) $(-2;1);\ (\log_2 7;2\log_7 2)$
D) $(2;2);\ (\log_2 7;2\log_7 2)$

18. Agar $a=\log_{108}2$ bo'lsa, $\log_{108}3$ ni a orqali ifodalang.

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A) $\frac{1-2a}{3}$ B) $\frac{1-3a}{3}$

C) $\frac{1-2a}{4}$ D) $\frac{1+2a}{3}$

19. Agar $-2 < \log_{0,5} a < -1$ va $0 < \log_3 b < 0,5$ bo'lsa, $a \cdot b$ ning qabul qilishi mumkin bo'lgan barcha qiymatlarini toping.

A) (1; 2) B) $(2; 3\sqrt{3})$

C) $(2; 4\sqrt{3})$ D) $(2; 4\sqrt{2})$

20. $f(x) = 6x + \frac{6}{x}$ funksiyaning $(0; +\infty)$ oraliqdagi eng kichik qiymatini toping.

A) 11 B) 13 C) 12 D) 14

21. $f(x) = x^3 - x^4 + 17x + 8$ funksiya grafigiga $x_0 = -3$ nuqtada o'tkazilgan urinmaning burchak koeffitsiyentini toping.

A) -64 B) 152 C) -152 D) 52

22. $\int_0^{\frac{\pi}{2}} \frac{\cos x}{1+\sin^2 x} dx$ integralni hisoblang.

A) 0 B) 1 C) $\frac{\pi}{2}$ D) $\frac{\pi}{4}$

23. To'g'ri berilgan integrallash formulalarini tanlang:

1) $\int \cos^2 x dx = \frac{1}{2}x + \frac{1}{4}\sin 2x + C$

2) $\int ctg^2 x dx = -ctgx + x + C$

3) $\int tg^2 x dx = tgx - x + C$

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

24. Qutida "informatika" so'zini hosil qiladigan harflar bor. Tavakkal tanlanganda "f" harfining chiqish ehtimolligini toping.

A) $\frac{1}{22}$ B) $\frac{1}{11}$ C) 11 D) $\frac{2}{11}$

25. $ABCDE$ qavariq beshburchak tomonlari uzunliklari (soat strelkasi yo'nalishida) 7 sm dan. Chumoli A nuqtadan boshlab soat strelkasi yo'nalishida beshburchak perimetri bo'ylab harakatlanmoqda. Agar u 34 m 51 sm yo'l yursa, qaysi nuqtaga keladi?

A) A B) B C) C D) D

26. Agar to'g'ri burchakli uchburchak katetlarining gipotenuzaga tushirilgan proyeksiyalari 9 va 16 sm ga teng bo'lsa, unga ichki chizilgan doiraning yuzini toping.

A) $25\pi\ sm^2$ B) $50\pi\ sm^2$

C) $75\pi\ sm^2$ D) $12,5\pi\ sm^2$

27. Uchlari $A(3;2), B(1;-4)$ va $C(-2;5)$ nuqtalarda bo'lgan uchburchakning yuzini toping.

A) 16 B) 18 C) 20 D) 21

28. Tenglamasi $3x - 7y + 21 = 0$ bo'lgan to'g'ri chiziqning koordinata o'qlari orasida joylashgan kesmasining o'rtasidan perpendikulyar bo'lib o'tuvchi to'g'ri chiziq tenglamasini tuzing.

A) $x - 3y + 8 = 0$ B) $x + 3y - 1 = 0$

C) $7x + 3y - 12 = 0$ D) $7x + 3y + 20 = 0$

29. Parallelogramning bir tomoni orqali unga qarama-qarshi tomonidan 14 sm masofada yotuvchi tekislik otkazilgan. Parallelogramning diagonallari kesishish nuqtasidan berilgan tekislikgacha bo'lgan masofani toping.

A) 5 B) 6,5 C) 3,5 D) 7

30. O'n burchakli muntazam prizmaning asosiga perpendikulyar nechta diagonal kesimi mavjud?

A) 50 B) 35 C) 55 D) 45

Variant-32

1. Sonni 6, 9 va 14 ga bo'lganda, mos holda 4, 7 va 12 qoldiq qolgan bo'lsa, bunday sonlarning eng kichigining

raqamlari yig'indisini toping.
A) 7 B) 15 C) 10 D) 12

2. Agar $a+b$ va $12a-b$ tub sonlar bo'lib, $\frac{a+b}{12a-b}=\frac{21}{57}$ tenglik bajarilsa, a soni toping.
A) 2 B) 4 C) 5 D) 3

3. $a=\sqrt{3}$ bo'lsa, $30a-5(a+3)^2$ ifodaning qiymatini toping.
A) -30 B) -60 C) -50 D) -40

4. Ifodani soddalashtiring:
$$\frac{x^3+27}{2x-2}\cdot\frac{x^2-1}{x^2+4x+3}\cdot\frac{6x+12}{3x^2-9x+27}.$$
A) $2x+1$ B) $\frac{x+2}{2}$
C) $\frac{x+2}{x-1}$ D) $x+2$

5. Agar $a+b-c=7$ va $ab-ac-bc=5$ bo'lsa, $a^2+b^2+c^2$ ni qiymatini toping.
A) 64 B) 36 C) 39 D) 25

6. a haqiqiy soni uchun $\sqrt{12-a}-\sqrt{5-a}=2$ bo'lsa, $\sqrt{12-a}+\sqrt{5-a}$ ifodaning qiymatini toping.
A) 3,5 B) 4 C) 3 D) 2,5

7. $\frac{\sqrt{3+x^2}}{3+x}=3-x$ tenglamaning ildizlari kvadratlari yig'indisini toping.
A) 19 B) 38 C) 12 D) 13

8. $(12-x^2)(27-x^2)\sqrt{x+3}=0$ tenglama ildizlarining ko'paytmasini toping.
A) -54 B) -972 C) $108\sqrt{3}$ D) $-108\sqrt{3}$

9. $(1-x)\cdot(x+3)>0$ tengsizlikning butun yechimlari yig'indisini toping.
A) -3 B) 2 C) 0 D) -5

10. Tengsizlikni yeching: $||x|-2|\le 1$
A) [1; 3] B) [3; +∞)
C) (−∞; 3]∪[−1; 1] D) [−3; −1]∪[1; 3]

11. Arifmetik progressiyada $a_7+a_{13}=34$ va $a_5+a_7=18$ bo'lsa, a_{19} ni toping.
A) 39 B) 37 C) 33 D) 35

12. Ifodani soddalashtiring:
$$(\sin\alpha)^{-1}+(tg\alpha)^{-1}-\left(tg\frac{\alpha}{2}\right)^{-1}$$
A) $ctg\frac{\alpha}{2}$ B) $tg\frac{\alpha}{2}$ C) 1 D) 0

13. $ctg70^\circ+4\cos 70^\circ$ ifodani qiymatini toping.
A) $-\sqrt{3}$ B) $\sqrt{3}$ C) $\frac{\sqrt{3}}{3}$ D) $-\frac{\sqrt{3}}{3}$

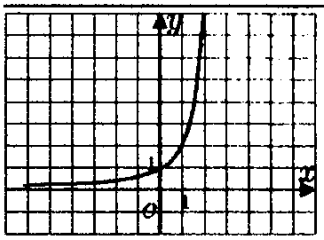
14. $\sin 54^\circ\cdot\sin 18^\circ$ ifodani qiymatini toping.
A) 0,5 B) 0,25 C) 0,125 D) 0,625

15. Tenglamaning ildizlari yig'indisini toping. $x\in(0^\circ; 720^\circ)$
$$\cos 2x\cdot\cos 8x=-1,$$
A) 810° B) 1440° C) 1350° D) 720°

16. $y=(1+ctg^2x)\cdot\sin^2 x+\frac{2\sin 2x}{\cos x}$ funksiyaning qiymatlari sohasini toping.
A) [−1; 3] B) [−1; 1)∪(1; 3]
C) [−3; 5] D) (−3; 1)∪(1; 5)

17. Qaysi son $y=3\cos x-4$ funksiya qiymati bo'la oladi?
A) 7 B) -6 C) 1 D) 0

18. Grafik ko'rinishda berilgan funksiyani toping.
A) $y=e^x$ B) $y=\log_2 x$
C) $y=\left(\frac{1}{2}\right)^x$ D) $y=2^x$



19. Agar $x \neq 0$ bo'lsa, $7 + 7^{2x+y} = 7^{x+1} + 7^{x+y}$ tenglamadagi x ni y orqali ifodalang.
A) $x = -1 - y$ B) $x = 1 - y$
C) $x = y - 1$ D) $x = y + 1$

20. Hisoblang:

$$\frac{\left(3^{\log^2_{\sqrt{3}} 2} - 4^{\log_{\sqrt{3}} 2}\right)^2 - 1}{2}.$$

A) -2 B) -0,25 C) -1 D) -0,5

21. $\log^2_{0,2}(x+1) > 4$ tengsizlikni yeching.
A) $(0;1) \cup (24; \infty)$
B) $(-1; -0,96) \cup (24; \infty)$
C) $(-0,96; 24)$ D) $(1; 24)$

22. $y = x^2 - 5|x| + 6$ funksiyaning $[0; 3]$ oraliqdagi eng katta qiymatini toping.
A) 0 B) 0,25 C) 5 D) 6

23. Quyidagi chiziqlar bilan chegaralangan shaklni yuzini hisoblang: $y = 3x^2$, $y = 0$, $x = 2$.

A) 8 B) 16 C) 4 D) $2\frac{1}{12}$

24. Quyidagilardan qaysilari to'g'ri?
1) agar $b > 0$, $a > c > 0$ bo'lsa, u holda $\frac{a}{b} > \frac{c}{b}$ bo'ladi;
2) agar $a > 0$, $b > c > 0$ bo'lsa, u holda $\frac{a}{b} > \frac{a}{c}$ bo'ladi;
3) agar $c > 0$, $a > b > 0$ bo'lsa, u holda $\frac{a}{b} > \frac{a+c}{b+c}$ bo'ladi;
A) 1; 2; 3 B) 2; 3 C) 1; 2 D) 1; 3

25. $A = \{x : |x-2| < 3, x \in Z\}$ to'plamning elementlar sonini aniqlang.
A) 5 B) 3 C) 6 D) 4

26. Asoslari 4 va 6 ga teng trapetsiyaning diagonallari kesishgan nuqtasidan asoslariga parallel to'g'ri chiziq o'tkazilgan. Bu to'g'ri chiziqning trapetsiya ichidagi kesmasi uzunligini toping.
A) 4,5 B) 5,4 C) 4,8 D) 5

27. Radiuslari 2 va 6 bo'lgan aylanalar tashqi ravishda B nuqtada urinadi. B nuqtadan o'tuvchi to'g'ri chiziq kichik aylanani A nuqtada, katta aylanani C nuqtada kesib o'tadi. Agar $BC - AB = 5$ bo'lsa, AB kesma uzunligini toping.
A) $\sqrt{5}$ B) 2,5 C) $\frac{5}{3}$ D) 3

28. Aylanaga ichki chizilgan trapetsiya diagonali yon tomoniga perpendikulyar hamda asosi bilan 30°li burchak tashkil etadi. Shu trapetsiya perimetrining aylana uzunligiga nisbatini toping.
A) $\frac{3}{2\pi}$ B) $\frac{5}{2\pi}$ C) $\frac{2}{\pi}$ D) $\frac{4}{\pi}$

29. $x = -3$ to'g'ri chiziqqa nisbatan $A(2; 3)$ nuqtaga simmetrik bo'lgan nuqtaning koordinatalarini toping.
A) $(-8; 3)$ B) $(-10; 3)$
C) $(-6; 3)$ D) $(-4; 3)$

30. Parallelogrammning diagonallaridan biri uning yon tomoniga perpendikulyar va unga teng. Parallelogrammning katta diagonali P tekislik bilan α burchak tashkil etadi. Agar $\cos\alpha = \sqrt{0,936}$ bo'lsa, parallelogram tekisligi va P tekislik orasidagi ikki yoqli burchakning

kosinusini toping.
A) 0,2 B) 0,8 C) 0,5 D) 0,6

Variant-33

1. n -toq son bo'lsa, quyidagilardan qaysi biri juft son?
A) $4^n - 3^n$ B) $4^n + 3^n$
C) $4^n + n^3$ D) $4^n \cdot n^3$

2. Hisoblang.
$\frac{1}{2}+\frac{2}{3}+\frac{3}{2}+\frac{4}{3}+...+\frac{15}{2}+\frac{16}{3}$.
A) 72 B) 24 C) 65 D) 56

3. $(4a-b)^2+2b-8a$ ifodaning eng kichik qiymatini toping.
A) -1 B) 2 C) -2 D) 1

4. $x=18$ va $y=7,5$ bo'lsa, $\frac{xy+y^2}{15x}\cdot\frac{3x}{x+y}$ ifodaning qiymatini toping.
A) 3,5 B) 0,5 C) 2,5 D) 1,5

5. Kasrni qisqartiring:
$\frac{x^4+4a^2x^2+16a^4}{x^3+8a^3}$.
A) $\frac{x^2+2ax+4a^2}{x^2-2ax+4a^2}$ B) $\frac{x^2+2ax+4a^2}{x+2a}$
C) $\frac{x^3-2ax^2+2a}{x^2-2ax+4a^2}$ D) $\frac{x^2-2ax+4a^2}{x+2a}$

6. Qotishma tarkibida temir, xrom va nikel 5 : 2 : 1 kabi nisbatda. Tarkibida 4 t xrom bo'lgan qotishmaning massasini (t) toping.
A) 10 B) 12 C) 15 D) 16

7. $x^2-63x+k=0$ tenglamaning ikkala ildizi ham tub son bo'ladigan k natural sonlar nechta?
A) 1 B) 2 C) 3
D) k bunday natural qiymati ega emas

8. $\begin{cases}4x+y=7\\|x-y|=3\end{cases}$ tenglamalar sistemasini qanoatlantiruvchi barcha x va y lar yig'indisini toping.
A) 9 B) 10 C) 5,6 D) 8,6

9. $x^2+5x+3\le 0$ tengsizlikning barcha butun yechimlari yig'indisini toping.
A) -10 B) -14 C) -13 D) -15

10. $(x^3-9x)\cdot\sqrt{x+1}>0$ tengsizlikning eng kichik natural yechimini toping.
A) 4 B) 1 C) 5 D) 6

11. Cheksiz kamayuvchi geometrik progressiya birinchi hadi 8 ga, yig'indisi 16 ga teng bo'lsa, ushbu progressiyaning uchinchi va to'rtinchi hadlari yig'indisini toping.
A) 12 B) 10 C) 3 D) 5

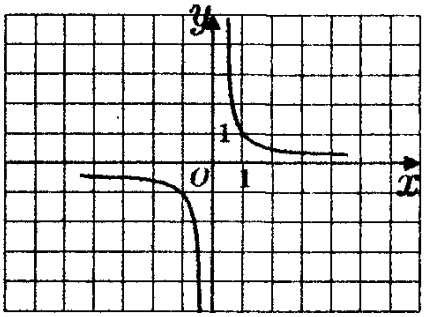
12. Soddalashtiring:
$\left(\frac{1}{\sin^2\alpha}-1\right)\left(\frac{1}{\cos^2\alpha}-1\right)$
A) 1 B) -1 C) 2 D) 0

13. Hisoblang: $tg20^\circ+4\sin 20^\circ+1$
A) $\sqrt{3}+1$ B) $\frac{\sqrt{3}+3}{3}$
C) $\sqrt{3}$ D) $\sqrt{3}-1$

14. Tenglamani yeching.
$\sin\frac{\pi(x+1)}{2}+2\cdot 2^{(x^2-6x+8)^2}=1$.
A) 4 B) 2 C) 4; 2 C) 0

15. $y=\arcsin\left(|x-0,5|+|x|\right)$ funksiyaning aniqlanish sohasini toping.
A) $\left[-\frac{1}{4};\frac{3}{4}\right]$ B) $\left[0;\frac{3}{4}\right]$
C) $\left[-\frac{\pi}{2};\frac{\pi}{2}\right]$ D) $\left[-1;\frac{3}{4}\right]$

16. Chizmada qaysi funksiya grafigi taqriban tasvirlangan?
A) $y=x^{-4}$ B) $y=x^{-3}$
C) $y=x^{-2}$ D) $y=x^3$



17. Tenglamalar sistemasini yeching:

$$\begin{cases} 2^x - 3^y = 1 \\ 2^{x+2} - 3^{y+1} = 7 \end{cases}$$

A) (2; 1) B) (2; 1); (1; 2)
C) (2; 1); (−2; −1) D) (2; −1)

18. Agar $\log_5 a = b$ va $\log_a 125 = 6$ bo'lsa, $\log_{\frac{5}{4}}(a \cdot b)$ ning qiymatini toping.
A) 0,25 B) 0,5 C) 0,6 D) 1

19. Tenglamani yeching:

$$\log_6 \log_{\frac{1}{3}}\left(-\frac{1}{9x}\right) = 1$$

A) -81 B) -3 C) -9 D) -27

20. $\log^2_{0,2}(x-1) > 4$ tengsizlikni yeching.
A) $(0;1,04) \cup (5;\infty)$ B) $(1;1,04) \cup (26;\infty)$
C) $(26;\infty)$ D) $(1;26)$

21. Agar $y = \ln(3x-4)$ funksiyaga o'tkazilgan urinma $y = 3x - 4 + a$ bo'lsa, a ning qiymatini toping.
A) 1 B) 2 C) -1 D) 2

22. $f'(x)$ funksiya $f(x)$ funksiyaning hosilasi bo'lib, $\int f'(x)dx = 3x^2 - 7x + C$, $(C \in R)$ va $f(1) = 8$ tengliklar o'rinli bo'lsa, $f(-1)$ ni toping.
A) 19 B) -6 C) -4 D) 22

23. Nuqtalar o'rniga to'g'ri javobni tanlang.
To'g'ri burchakli uchburchak α o'tkir burchagi ... deb shu burchakka yopishgan katetning gipotenuzaga nisbatiga aytiladi.
A) tangensi B) kotangensi
C) kosinusi D) sinusi

24. 1, 2, 3, 4, 5, 6, 7 raqamlardan foydalangan holda, nechta turli ikki xonali har xil raqamlardan iborat sonlar hosil qilish mumkin?
A) 84 B) 210 C) 42 D) 24

25. ABC to'g'ri burchakli uchburchakning katetlari $AB = 10$, $AC = 15$ va AN bissektrisa bo'lsa, ACN uchburchakning yuzini toping.
A) 50 B) 30 C) 48 D) 45

26. Aylanada A, B, C nuqtalar berilgan. Agar $\angle ABC = 30^\circ$ va aylana diametri $BC = 10\,sm$ bo'lsa, AC vatarni toping.
A) 5 sm B) 3 sm C) 2 sm D) 4 sm

27. Balandligi $\frac{\sqrt{5}}{3}$ bo'lgan 120° yoyli segmentga $ABCD$ to'g'ri to'rtburchak shunday ichki chizilganki, bunda $AB : BC = 1 : 4$ va BC tomon segment vatarida yotadi. To'g'ri to'rtburchakni yuzini toping.
A) 0,6 B) 1 C) 0,8 D) 1,2

28. Agar qo'shni burchaklardan biri ikkinchisidan 30° ga katta bo'lsa, shu burchaklarni toping.
A) 135°; 75° B) 75°; 115°
C) 75°; 105° D) 90°; 60°

29. $ABCDA_1B_1C_1D_1$ to'g'ri burchakli parallelepipedda $\overrightarrow{AD} = \vec{a}$, $\overrightarrow{AB} = \vec{b}$ va $\overrightarrow{AA_1} = \vec{c}$ bo'lsa, $\overrightarrow{OA}$ vektorni $\vec{a}, \vec{b}$ va $\vec{c}$ vektorlar orqali ifodalang. O nuqta parallelepiped diagonallarining kesishish nuqtasi.

A) $\frac{\vec{a}+\vec{b}+\vec{c}}{2}$ B) $\frac{\vec{a}-\vec{b}+\vec{c}}{2}$

C) $\frac{\vec{a}+\vec{b}-\vec{c}}{2}$ D) $-\frac{\vec{a}+\vec{b}+\vec{c}}{2}$

30. Konus ichidan o'tkazilgan tekislik uning asosini 8 ga teng bo'lgan vatar orqali kesib o'tadi. Ushbu vatar konus asosida 90 li yoyni tortib turadi. Konus yasovchilari orasidagi eng katta burchak 60 ga teng bo'lsa, konusning yon sirti yuzini toping.

A) 36π B) 48π C) 64π D) $64\sqrt{3}\pi$

Variant-34

1. a-raqamlari yig'indisi 12 ga teng 6 xonali son bo'lsa, $999999-a$ sonining raqamlari yig'indisini toping.
A) 36 B) 42 C) 48 D) 24

2. $\frac{x^2y^2+2xy-3}{x^2y^2-1}$ kasrni qisqartiring.

A) $\frac{xy+3}{xy-1}$ B) $\frac{xy-3}{xy+1}$ C) $\frac{xy+3}{xy+1}$ D) $\frac{xy-3}{xy-1}$

3. $a^2-b^2+a+7b-12$ ko'phadning ko'paytuvchilaridan birini toping.
A) $a+b+3$ B) $a+b-4$
C) $a+b-3$ D) $a+b+4$

4. Agar $a<0,\ b<0,\ c>0$ bo'lsa, $\sqrt{b^2}-|b-c|+|c-a|+b$ ifodani soda-lashtiring.
A) $a-2b$ B) $a-2b+c$ C) $-a$ D) $b-a$

5. 180 gramm suvga 70 gramm tuz aralashtirildi. Hosil bo'lgan aralashmaning necha foizi tuzdan iborat bo'ladi?
A) 28 B) 25 C) 30 D) 22

6. $\frac{3x-2}{4}-\frac{x}{3}=2$ tenglamani yeching.
A) 4 B) 8 C) 6 D) 2

7. Tenglama haqiqiy ildizlarining yig'indisini toping: $144x^4=(x^3+35x)^2$.
A) -2 B) 4 C) 2 D) 0

8. $x^4-6x^3+8x^2+6x-9=0$ tenglama nechta turli haqiqiy yechimga ega?
A) 2 B) 3 C) 4 D) 1

9. Agar $\frac{1}{4}<\frac{3}{b}<\frac{1}{2}$ va $\frac{1}{6}<\frac{2}{a}<\frac{1}{3}$ tengsizliklar o'rinli bo'lsa, $a+b$ ning eng kichik butun qiymatini toping.
A) 12 B) 15 C) 24 D) 13

10. Tengsizlikni yeching:
$5+4x-x^2\ge 2(x^2+3{,}5x-0{,}5)$
A)$[-1;\ 1]$ B)$[-2;\ 2]$ C)$[1;\ 2]$ D)$[-2;\ 1]$

11. 1, 4, 9, 16, 25,... Ketma –ketlikning 10 hadini toping.
A) 100 B) 1000 C) 10000 D) 100000

12. Ifodani soddalashtiring:
$\frac{2\cdot tg\left(\frac{\pi}{4}-\frac{\alpha}{2}\right)\cdot(1+\sin\alpha)}{\sin\alpha}$
A) $\cos 2\alpha$ B) $2tg\alpha$ C) $2ctg\alpha$ D) $\sin 2\alpha$

13. Ifodani soddalashtiring:
$\frac{1-\sin^2\alpha}{1-\cos^2\alpha}+tg\alpha\cdot ctg\alpha$
A) $\sin^2\alpha$ B) $\cos^2\alpha$ C) $\frac{1}{\cos^2\alpha}$ D) $\frac{1}{\sin^2\alpha}$

14. Hisoblang. $\sin 10^\circ+2\sin 50^\circ-\sin 70^\circ$
A) $-\cos 50^\circ$ B) $\sin 40^\circ$ C) $\sin 50^\circ$ D) $\cos 50^\circ$

15. $\sin x+\sqrt{3}\cos x=1$ tenglamaning $(-\pi;\ \pi)$ intervalga tegishli ildizlari yig'indisini toping.
A) 120° B) 60° C) 135° D) 90°

16. $f(x)=ax+b$ funksiya uchun $f(1)\le f(2)$, $f(4)\le f(3)$ bo'lsa, $f(4)-f(2)$ ni toping.
A) 2 B) 0 C) 4 D) 3

17. $y=\frac{\sin 2x}{\sin x}$ funksiyaning eng kichik

butun qiymatini toping.
A) -2 B) 1 C) 2 D) -1

18. Berilgan tengsizlik nechta butun ildizga ega: $7\cdot 5^{x-1}-5^{x-2}\le 170$ agar $x\ge 3$.
A) 1 B) 2 C) 4 D) 10

19. Funksiyalar grafiklari kesishish nuqtasining absissasini toping. $y_1=\log_7(6x+11)$; $y_2=1+\log_7(2x-3)$.
A) -2 B) 2 C) -4 D) 4

20. $\log^2_{\frac{1}{7}}(7-x^2)-8\log_{\frac{1}{7}}(7-x^2)-9=0$ tenglama nechta ildizga ega?
A) 3 B) 1 C) 2 D) 4

21. Funksiyaning maksimumini toping: $y=\frac{2x^3}{3}-\frac{3x^2}{2}-2x+1\frac{11}{24}$.
A) 3 B) 4 C) 2 D) 1

22. Agar $f(\cos^2 x)=-2\sin^2 x$ bo'lsa, $f'(\cos^2 x)$ ni toping.
A) 2 B) -1 C) -2 D) 1

23. $\int\limits_{-2}^{1}\left|x^2-x\right|dx$ aniq integralni qiymatini toping.
A) $4\frac{5}{6}$ B) $5\frac{2}{3}$ C) $5\frac{1}{6}$ D) $4\frac{1}{6}$

24. To'g'ri berilgan integrallash formulalarini tanlang:

1) $\int\sin(b-kx)dx=\frac{1}{k}\cdot\cos(b-kx)+C$

2) $\int\cos(b-kx)dx=-\frac{1}{k}\cdot\sin(b-kx)+C$

3) $\int tg^2 x dx=tgx-x+C$

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

25. A={1;3;5;6;8;10} va B={5;6;7;8;10} to'plamlar berilan. $A\cap B$ to'plamning qism to'plamlar sonini toping.
A) 16 B) 32 C) 11 D) 6

26. $ABCD$ parallelogrammning diagonallari kesishish nuqtasi orqali BC va AD tomonlarini mos ravishda E va F nuqtalarda kesib o'tuvchi to'g'ri chiziq o'tkazilgan. Agar $BE=2$ va $AF=2,8$ bo'lsa, BC va AD tomonlarini toping.
A) $BC=AD=5,7$ B) $BC=AD=3,8$
C) $BC=AD=4,8$ D) $BC=AD=4,2$

27. Trapetsiyaning parallel tomonlari 16 sm va 44 sm, parallel bo'lmagan tomonlari 17 sm va 25 sm. Shu trapetsiyaning yuzini toping.
A) 750 B) $225\sqrt{2}$ C) $450\sqrt{2}$ D) 450

28. $x^2+y^2=4$ va $(x-3)^2+(y+4)^2=a$ aylanalar urinadigan barcha a larning yig'indisini toping.
A) 9 B) 49 C) 58 D) 10

29. Trapetsiyaga ichki chizilgan aylana uning yon tomonini urinish nuqtasida uzunligi 3 va 12 bo'lgan kesmalarga ajratadi. Agar trapetsiyaning ikkinchi yon tomoni 17 ga teng bo'lsa, trapetsiya yuzini toping.
A) 198 B) 132 C) 192 D) 66

30. Piramidaning asosi yon tomonlari 6 va ular orasidagi burchak 60° ga teng bo'lgan teng yonli uchburchakdan iborat. Agar piramidaning barcha yon qirralari asos tekisligi bilan 30° burchak tashkil qilsa, uning hajmini toping.
A) $4\sqrt{3}$ B) $3\sqrt{3}$ C) $2\sqrt{3}$ D) $6\sqrt{3}$

Variant-35

1. $2015\cdot(2017\cdot 2016+1)$ ifoda quyidagilarning qaysi biriga teng.
A) 2016^3-1 B) 2016^2-1
C) $2017\cdot 2016$ D) 2017^3-1

2. Agar a natural sonni 36 ga bo'lganda bo'linma n, qoldiq n^2 ga teng bo'lsa, a sonning eng katta qiymatini toping.
A) 160 B) 432 C) 205 D) 117

3. Ifodani qiymatini toping:

$$\left(\left(\frac{1}{18}\right)^5 \cdot 64 \cdot \left(\frac{1}{27}\right)^{-4} + \left(\frac{1}{6}\right)^{-2}\right) : \left(\frac{2}{3}\right)^{-2}$$

A) 18 B) 48 C) 24 D) 12

4. $3a+2b+2c=0$ bo'lsa, $\frac{a}{b+c} + \frac{b}{3a+2c} + \frac{c}{3a+2b}$ ni soddalashtiring.

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

5. Agar $a-b=|x|+3$ bo'lsa, a va b lar uchun to'g'ri munosabatni aniqlang.

A) $a>b$ B) $a=b+1$ C) $a\le b$ D) $a<b$

6. Agar $\sqrt{3x+2y-13}+\sqrt{4x-y-10}=0$ bo'lsa, x va y sonlarining ko'paytmasini toping.

A) 8 B) -2 C) -4 D) 6

7. Turistik firma uch kunlik avtobusda sayohat tashkil qildi. Bir kishi uchun ekskursiya narxi 3500 so'm. guruhlarga chegirmalar joriy etildi, ya'ni 3 dan 10 kishigacha 5%, 10 kishidan ortiq bo'lsa – 10%. 6 kishidan iborat guruhga jami necha so'm chegirma qilingan?

A) 1055 B) 1550 C) 1505 D) 1050

8. Tenglamani yeching:

$$9-8\cdot\sqrt[6]{x}-\sqrt[3]{x}=0.$$

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

9. $x^2-4x-y^2+4y=7$ tenglamaning butun sonlardan iborat yechimlar jufti nechta?

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

10. $6x^3-7x^2-16x+m=0$ tenglama ildizlaridan biri 2 ga teng bo'lsa, qolgan ildizlari ko'paytmasini toping.

A) -1 B) 2 C) 1 D) -2

11. $x^2+5x+3\le 0$ tengsizlikning barcha butun yechimlari yig'indisini toping.

A) –10 B) –14 C) –13 D) –15

12. Agar geometrik progressiyada $b_n=-\frac{3}{8}$, $b_5-b_1=18$ va $b_3-b_1=12$ bo'lsa, n ni toping.

A) 19 B) 15 C) 13 D) 17

13. Ifodani soddalashtiring:

$\cos^2 x+tg^2x\cos^2 x$

A) 0,7 B) 4 C) 2 D) 1

14. Hisoblang: $tg10^\circ\cdot tg160^\circ-1$.

A) $\frac{1}{\cos 200^\circ}$ B) $-\frac{1}{\cos 10^\circ}$

C) $\frac{1}{\cos 100^\circ}$ D) $-\frac{1}{\sin 20^\circ}$

15. Agar $ctg\alpha=-\frac{1}{3}$ bo'lsa, $tg3\alpha$ ning qiymatini toping.

A) $-\frac{9}{13}$ B) $-\frac{1}{11}$ C) $-\frac{2}{11}$ D) 5

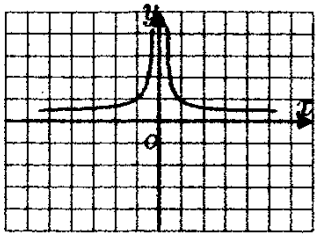
16. $\sin(x+2018\pi)=0$ tenglamaning $[0;2\pi]$ oraliqdagi ildizlari yig'indisini toping.

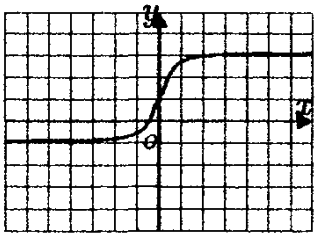
A) 3π B) $3{,}5\pi$ C) 2π D) $2{,}5\pi$

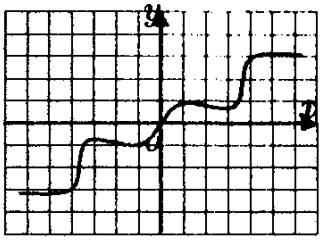
17. $y=\frac{1+\sin x+1+\cos x}{2}$ funksiyaning qiymatlar sohasiga tegishli butun sonlar nechta?

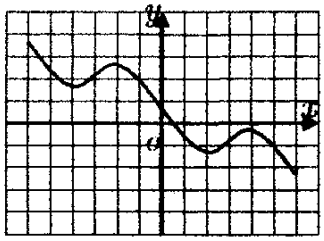
A) 1 B) 3 C) 2 D) 0

18. Toq funksiyani tanlang.

A) 

B) 

C) 

D) 

19. Tenglamani yeching:

$3\cdot 16^x + 2\cdot 81^x = 5\cdot 36^x$

A) 2 B) 4 C) 1/2 D) 0; 1/2

20. $y = \ln(2x^2 - 3x + 10)$ funksiyaning qiymatlar to'plamini toping.

A) $(1;\infty)$ B) $\left[\ln\frac{3}{4};\infty\right)$

C) $\left[\ln\frac{3}{4};\ln\frac{71}{8}\right]$ D) $\left[\ln\frac{71}{8};\infty\right)$

21. Tenglamani yeching:

$\lg\left(x(x+9)\right) + \lg\frac{x+9}{x} = 0$

A) -10 B) 18 C) 10 D) 4,8

22. $f(x) = x + e^{-3x}$ funksiya grafigiga o'tkazilgan urinma $y(x) = 1 - 2x$ to'g'ri chiziqqa parallel. Urinish nuqtasi absissasini toping.

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

23. $x = 1$, $y = 3^x$ va $y = 3^{-x}$ funksiyalar bilan chegaralangan sohaning yuzini toping.

A) $\log_3 e^{\frac{2}{3}}$ B) $\log_3 2e$

C) $\log_3 e^{\frac{4}{3}}$ D) $-\log_3 e^{\frac{4}{3}}$

24. Quyida keltirilgan tasdiqlardan qaysilari noto'g'ri?

1) Uchburchak istalgan tomonining kvadrati qolgan ikki tomon kvadratlari yig'indisidan, shu ikki tomon bilan ular orasidagi burchak sinusining ikkilangan ko'paytmasini ayirish natijasiga teng; 2) Agar qavariq to'rtburchakning uchta burchagi yig'indisi 200° ga teng bo'lsa, u holda uning to'rtinchi burchagi 160° ga teng bo'ladi; 3) Agar figuralarning yuzalari teng bo'lsa, u holda bu figuralarning o'zlari ham tengdir; 4) Ixtiyoriy muntazam ko'pburchakka tashqi aylana chizish mumkin.

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

25. Surat va maxraji 42 dan katta bo'lmagan turli tub sonlardan iborat bo'lgan nechta oddiy kasr mavjud?

A) 132 B) 156 C) 52 D) 66

26. Teng yonli uchburchakning asosiga tushirilgan balandligi 5 ga, yon tomoniga tushirilgan balandligi 6 ga teng. Uchburchakning yuzini toping.

A) 18,75 B) 50 C) 25 D) 37,5

27. $ABCD$ rombning AB va AD tomonlarida M va N nuqtalar mos ravishda shunday olinganki, bunda MC va NC to'g'ri chiziqlar rombni uchta tengdosh qismga ajratadi. Agar $BD = 24$ bo'lsa, MN ni toping.

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

28. Teng yonli uchburchakning asosidagi burchagi 30° ga teng bo'lsa, bu uchburchakka ichki va tashqi chizilgan aylanalarning radiuslari nisbatini toping.

A) $\frac{\sqrt{3}}{2}$ B) $\frac{\sqrt{3}-1}{2}$

C) $\frac{2\sqrt{3}-3}{2}$ D) $\frac{3\sqrt{3}-5}{2}$

29. $A(-5;4)$ va $B(3;6)$ nuqtalarning o'rtasi hamda $M(1;2)$ nuqtadan o'tuvchi to'g'ri chiziq tenglamasini yozing.

A) $x + y - 3 = 0$ B) $3x + 2y - 7 = 0$

C) $x + 2y - 5 = 0$ D) $2x + y - 4 = 0$

30. To'g'ri burchakli uchburchakning katetlari 15 va 20 ga teng. Uchburchakning gipotenuzasi orqali o'tuvchi tekislik uchburchakning tekisligi bilan 30° burchak tashkil qiladi. Uchburchakning to'g'ri burchagi uchi bilan tekislik orasidagi masofani toping.
A) 6 B) 7 C) 8 D) 5

Variant-36

1. Agar $38,4 \cdot 10^n = 0,0000384$ bo'lsa, n ni toping.
A) -6 B) -7 C) -5 D) -4

2. $\frac{2}{7}$ ning kasr qismini 2017 – raqamini toping.
A) 2 B) 7 C) 5 D) 8

3. Ifodani soddalshtiring:
$$\frac{x^{1,8}-x^{1,5}}{x^{-0,2}-x^{-0,5}} - (0,09)^{-0,5} - \frac{2}{3}\cdot(x+3)^0.$$
A) x^2-2 B) $x+2$ C) $x-4$ D) x^2-4

4. $a=-\frac{1}{2}$ bo'lsa, $(a-3)^2 - a(5a-6)$ ifodani qiymatini toping.
A) 9 B) 8 C) 4 D) 6

5. $a=-\frac{1}{2}$ bo'lsa, $a^{12}(a^{-4})^4$ ifodani qiymatini toping.
A) 64 B) 16 C) 8 D) 32

6. $\sqrt{9+\sqrt{77}}+\sqrt{9-\sqrt{77}}$ ni soddalashtiring.
A) $2\sqrt{8}$ B) $2\sqrt{11}$ C) $\sqrt{22}$ D) $\sqrt{18}$

7. Tenglamani yeching:
$a^2b^2x^1 = b^4x^2 - a^2b^2 + a^4x^2$
A) $\varnothing$ B) $\pm\frac{a}{b};\pm\frac{b}{a}$
C) $\pm\frac{1}{a};\pm\frac{1}{b}$ D) $\pm a;\pm b$

8. a ning qanday qiymatlarida $x^2+(1-2a)x+a^2-a-2=0$ tenglamaning ildizlari $(-3;3)$ oraliqga tegishli bo'ladi?
A)$(-4;5)$ B)$(-1;2)$ C)$(-1;5)$ D)$(-4;2)$

9. $(x^2-x)\cdot(x^2-x-2)<120$ tengsizlikni qanoatlantiruvchi eng katta va eng kichik butun sonlar yig'indisini toping.
A) 2 B) 1 C) 5 D) 4

10. $\sqrt{25-x^2} \le \frac{12}{x}$ tengsizlikni yeching.
A) $(0;5]$ B) $[0;3]\cup[4;5]$
C) $(0;3]\cup[4;5]$ D) $\varnothing$

11. Arifmetik progressiyada $a_9 = 4a_6$ bo'lsa, uning dastlabki to'qqizta hadi yig'indisini toping.
A) 4 B) 18 C) 0 D) 36

12. Soddalashtiring:
$tg\alpha\cdot tg\beta + (tg\alpha + tg\beta)\cdot ctg(\alpha+\beta)$.
A) -1 B) 1 C) 2 D) 0

13. $\sqrt{3}\cdot tg110^\circ + 4\sin 70^\circ$ ifodani qiymatini toping.
A) $-\sqrt{3}$ B) $\sqrt{3}$ C) 1 D) -1

14. Soddalashtiring: $\frac{3tgx - tg^3x}{1-3tg^2x}\cdot ctg3x$
A) 1 B) -1 C) 2 D) 0

15. $\sin\pi x = 1$ tenglamaning $(1;6)$ oraliqdagi ildizlari yig'indisini toping.
A) 8 B) 7 C) 7,5 D) 6,5

16. $y = 14\sin x\cdot ctgx$ funksiyaning eng katta butun qiymatini toping.
A) 14 B) -13 C) -14 D) 13

17. $f(x)=6^x$ bo'lsa, $\left(f(2)\cdot f\left(-\frac{1}{2}\right)\right)^2$ ning qiymatini toping.
A) 216 B) 36 C) $\frac{1}{36}$ D) $\frac{1}{216}$

18. $y = \lg(8\sin\alpha - 6\cos\alpha)^4$ funksiya-

ning qiymatlar sohasini toping.
A) $(-\infty;-4)$ B) $(-\infty;4)$
C) $[4;\infty)$ D) $(-\infty;4]$

19. $(0,5)^{|4x-1|} \geq \frac{1}{8}$ tengsizlik yechimlar oralig'ining o'rtasini ko'rsating.
A) 0,5 B) -0,5 C) 0,25 D) -0,25

20. Agar $\log_{27} a = b$ bo'lsa, $\log_{\sqrt[6]{a}} \sqrt{3}$ ni toping.
A) $\frac{2}{b}$ B) $-\frac{1}{b}$ C) $\frac{1}{b}$ D) $-\frac{2}{b}$

21. Tenglamalar sistemasini yeching:
$\begin{cases} y - \log_3 x = 1 \\ x^y = 3^{12} \end{cases}$
A) $(3^{-4};3),(27;4)$ B) $(3^{-4};-3),(27;2)$
C) $(3^{-4};-3),(81;4)$ D) $(3^{-4};-3),(27;4)$

22. $y = e^x - x - 1$ funksiyaning o'sish oralig'ini toping.
A) $[e;\infty)$ B) $[1;\infty)$ C) $(0;1)$ D) $[0;\infty)$

23. Funksiyaning eng kichik qiymatini toping: $f(x) = 2x^6 - 7x^3 + 9$.
A) $-3\frac{1}{4}$ B) $4\frac{1}{2}$ C) $2\frac{7}{8}$ D) $3\frac{1}{4}$

24. $f(x)$ funksiyaning boshlang'ich funksiyasi $F(x)$ va $f(x-3)+f(x)=$, $=2x-5$ $F(2)=0$ tengliklar o'rinli bo'lsa, $F(-2)$ ni qiymatini toping.
A) 2 B) 6 C) -2 D) 4

25. Quyida keltirilgan tasdiqlardan qaysilari noto'g'ri?
1) Muntazam beshburchak beshta simmetriya o'qiga ega; 2) Agar parallelogrammning tomoniga yopishgan burchaklaridan biri 50° ga teng bo'lsa, u holda shu tomoniga yopishgan boshqa burchagi ham 50° ga tengdir; 3) Aylanada yotuvchi nuqtadan uning markazigacha bo'lgan masofa aylananing radiusiga tengdir; 4) O'tmas burchakli uchburchakning barcha burchaklari o'tmasdir.
A) 2; 4 B) 1; 4 C) 1;3 D) 2; 3

26. Tennis turnirida 12 ta sportchi ishtiroq etmoqda. Tennischilar necha xil usul bilan oltin, kumush va bronza medallarini yutishi mumkin?
A) 360 B) 1320 C) 990 D) 720

27. $ABCD$ to'g'ri to'rtburchakda $AB = 4\sqrt{2}$, $AD = 4$. AB tomonda E nuqta olingan, bunda $\angle CED = \angle AED$. $\angle AED$ ni toping.
A) 67,5° B) 75° C) 22,5° D) 60°

28. $ABCDEF$ muntazam oltiburchakning AD va CF diagonallari O nuqtada kesishadi. Agar AOC uchburchakka tashqi chizilgan aylana radiusi 4 ga teng bo'lsa, oltiburchakning perimetrini toping.
A) 24 B) $12\sqrt{3}$ C) $12\sqrt{2}$ D) 18

29. Muntazam uchburchakka tomoni 1 ga teng bo'lgan kvadrat ichki chizilgan. Uchburchakning tomonini toping.
A) $\frac{(2\sqrt{3}+3)}{3}$ B) $\frac{(2\sqrt{3}+9)}{3}$
C) $\frac{(2\sqrt{3}+3)}{6}$ D) $\frac{(2\sqrt{3}+9)}{6}$

30. Og'ma prizmaning asosida tomonlari 3 sm va 4 sm, o'tkir burchagi esa 45° bo'lgan parallelogramm yotadi. Prizmaning yon qirrasi 4 sm ga teng bo'lib, asos tekisligiga 30° li burchak ostida og'gan. Prizmaning hajmini toping.
A) $9\sqrt{2}\ sm^3$ B) $15\sqrt{2}\ sm^3$
C) $8\sqrt{2}\ sm^3$ D) $12\sqrt{2}\ sm^3$

★ XORAZM ILM ZIYO ★

VARIANTLAR JAVOBLARI

№	Variant nomerlari																	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	B	A	B	D	A	A	B	A	D	B	B	A	C	A	A	A	A	B
2	C	B	C	A	D	A	D	A	A	C	C	C	A	C	A	A	D	D
3	B	D	C	A	C	D	A	A	B	A	B	A	C	B	B	D	C	D
4	A	C	D	A	C	C	D	C	C	A	C	A	B	D	B	D	A	C
5	C	C	C	B	D	A	D	A	C	C	A	B	A	B	A	B	D	B
6	B	A	D	A	B	A	D	D	B	A	A	A	D	C	C	C	A	D
7	D	D	A	D	A	B	B	B	D	A	B	C	B	A	A	A	D	C
8	D	D	B	D	B	B	A	B	C	B	D	B	B	A	B	C	D	A
9	B	B	C	D	B	C	A	D	A	C	A	D	A	A	A	A	D	C
10	D	C	D	B	A	A	C	B	C	D	D	C	C	D	A	B	C	A
11	C	D	D	A	C	D	D	B	B	C	D	B	B	D	B	B	B	A
12	C	A	A	C	A	A	A	C	A	D	B	B	A	A	A	C	C	A
13	D	D	A	B	D	A	B	C	A	B	D	C	C	A	B	D	D	B
14	A	D	B	B	A	B	D	A	C	B	A	C	C	C	A	D	D	C
15	B	B	D	D	A	A	A	C	C	B	C	A	A	B	A	B	C	D
16	A	A	D	B	D	A	D	C	B	C	A	D	C	B	B	A	C	D
17	C	C	D	C	B	D	D	D	B	A	D	D	A	A	C	D	A	D
18	B	B	B	D	D	B	B	A	B	D	D	C	C	A	D	D	A	C
19	B	C	A	B	D	A	A	B	D	D	C	C	C	B	C	A	D	A
20	D	B	B	A	B	C	D	D	C	C	A	A	C	D	B	B	B	A
21	C	B	D	A	B	C	B	C	A	A	A	D	B	C	D	A	B	B
22	C	B	D	C	D	D	B	C	D	B	C	C	B	B	A	B	B	A
23	C	D	A	D	D	B	D	D	C	B	A	C	A	A	C	C	A	D
24	D	D	B	B	B	D	B	B	C	A	B	A	A	D	B	A	D	A
25	B	A	B	B	B	D	D	D	B	B	D	D	B	D	B	D	C	C
26	C	D	C	C	B	D	B	C	B	C	C	D	C	D	D	D	D	C
27	A	D	B	C	D	B	B	B	D	D	B	C	B	D	C	D	A	A
28	B	C	C	C	A	B	C	D	B	D	C	A	C	A	D	B	A	B
29	D	B	B	A	D	B	D	C	D	B	C	C	C	A	A	D	B	A
30	A	D	D	A	A	A	B	A	B	A	C	B	A	C	C	C	A	B
№	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	Variant nomerlari																	

№	Variant nomerlari																	
	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
1	D	A	A	C	B	D	D	B	A	C	B	B	B	A	D	B	A	A
2	C	A	D	A	A	C	B	A	A	A	C	D	C	A	D	C	C	A
3	C	C	B	C	B	D	C	A	D	B	C	C	B	B	A	C	C	D
4	B	A	B	A	C	A	C	A	D	A	C	C	D	D	D	D	B	B
5	A	A	D	B	A	B	D	C	C	B	D	C	D	C	B	A	A	B
6	D	A	C	A	D	C	C	B	A	C	C	C	B	A	D	C	D	C
7	D	D	C	B	D	C	A	B	B	A	A	B	C	C	A	D	D	B
8	D	B	A	A	A	C	B	A	A	B	D	B	A	A	C	B	D	B
9	C	D	D	A	A	C	B	D	A	A	C	D	B	A	A	D	B	B
10	C	C	B	B	A	D	A	B	A	C	B	A	D	D	A	D	A	A
11	B	C	D	D	C	D	D	D	D	B	D	A	A	D	C	A	A	C
12	C	A	B	A	B	B	A	C	B	A	C	A	A	D	A	C	C	B
13	A	D	D	C	A	A	A	D	D	B	B	C	A	B	A	D	D	D
14	B	A	C	C	A	D	C	B	B	B	C	A	B	B	B	C	A	A
15	A	B	B	A	C	B	D	A	B	A	C	A	B	B	A	B	A	B
16	D	A	B	D	D	C	B	A	D	D	C	A	A	D	B	B	A	D
17	D	B	B	C	C	B	D	A	D	D	B	D	A	B	A	D	A	A
18	B	A	C	B	B	D	A	A	D	C	B	B	A	D	B	A	C	D
19	B	C	D	D	B	C	B	A	A	D	A	C	C	B	A	D	D	C
20	A	A	C	D	A	B	B	B	A	C	A	A	C	D	B	A	D	C
21	D	A	B	C	B	A	B	C	B	B	A	D	B	B	C	C	A	D
22	B	A	C	D	C	D	C	A	D	C	A	C	D	D	D	A	C	D
23	A	A	D	D	B	C	A	A	D	D	D	C	D	A	C	A	C	C
24	C	B	B	B	D	C	A	D	A	B	C	D	B	D	C	A	A	D
25	C	C	B	D	D	B	B	B	A	B	C	B	D	A	D	A	B	A
26	B	B	D	B	D	A	C	B	B	C	D	B	A	C	A	C	A	B
27	C	C	A	B	C	B	B	D	A	B	A	A	B	B	C	D	A	A
28	A	D	C	C	C	C	D	A	C	A	D	B	D	B	C	C	C	A
29	D	C	A	B	A	D	A	C	C	B	C	D	D	A	D	C	B	A
30	A	D	B	B	C	A	B	B	C	C	D	B	B	D	C	D	A	D
№	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
	Variant nomerlari																	