MATEMATIKA

MILLIY SERTIFIKAT

Milliy sertifikat
Attestatsiya
BMBA imtihonlari uchun

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milliy sertifikat

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Mazkur to’plam abituriyentlar, maktab va litsey o’quvchi va o’qituvchilari, matematika bilan mustaqil shug’ullanuvchilar uchun mo’ljallangan. Ushbu kitob matematika fanidan milliy sertifikat standartlari asosida tayyorlangan. Kitob 1800 ta topshiriqdan tashkil topgan. Savollardan 900 tasi milliy sertifikatdagi har bir savoliga mos bo’lgan 20 ta takrorlash uchun misol va masalalar, qolgan 900 tasi esa 20 ta variant ko’rinishida berilgan. Misollar tartibi va mavzular Bilim va malakalarni baholash agentligi tomonidan taqdim etilgan milliy test tizimi spetsifikatsiyasi asosida tayyorlangan. Kitob so’ngidagi QR-kod orqali variantlarni Rash modeli asosida tekshirishingiz mumkin. Ushbu to’plam matematika imtihonlarida yuqori natijaga erishishingizga yordam beradi degan umiddamiz.

Taklif va mulohazalaringizni quyidagi QR kod orqali kutib qolamiz.

Mundarija

19 $y = \sqrt{4x-7}$ va $y = x - 1$ funksiyalar A va B nuqtalarda kesishadi. AB kesmaning uzunligini toping.
A) 4
B) $2\sqrt{2}$
C) 3
D) 5

20 $f(x)$ kubik funksiya Ox o'qini $-2; 0$ va 4 nuqtalarda kesib o'tadi. $f(x)$ uchun quyidagilardan qaysi biri doimo o'rinli?
A) $f(-1) \cdot f(2) > 0$
B) $f(-2) \cdot f(5) > 0$
C) $f(-4) \cdot f(3) > 0$
D) $f(-3) \cdot f(1) < 0$

21 Agar $f(x) = \dfrac{3x^4}{5x^6 + (a-2)x^3 + 4}$ funksiya juft funksiya bo'lsa, $f(1)$ ning qiymatini toping.
A) $\dfrac{1}{2}$
B) $\dfrac{1}{3}$
C) $\dfrac{1}{6}$
D) 3

22 $f(x) = x^3 + 2x - 1$ funksiya uchun $f^{-1}(2)$ ning qiymatini toping (bu yerda $f^{-1}(x) - f(x)$ funksiyaning teskari funksiyasi).
A) 1
B) 2
C) 3
D) 11

23 $f(x) = 2\sin^2 x - 4\cos x + 3$ funksiyaning qiymatlar sohasini toping.
A) $[5; 7]$
B) $[-1; 7]$
C) $[-1; 5]$
D) $[-1; 9]$

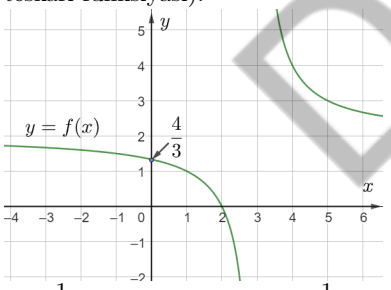
24 $f(x) = \dfrac{10x^2 + 13x - 3}{8x^2 + 14x + 3}$ funksiyaning qiymatlar sohasini toping.
A) $\left(-\infty; \dfrac{5}{4}\right)$
B) $(-\infty; 1,25) \cup (1,25; 1,7) \cup (1,7; \infty)$
C) $\left(-\infty; -\dfrac{3}{2}\right) \cup \left(-\dfrac{3}{2}; -\dfrac{1}{4}\right) \cup \left(-\dfrac{1}{4}; \infty\right)$
D) $\left(-\infty; \dfrac{5}{4}\right) \cup \left(\dfrac{5}{4}; \infty\right)$

25 $y = |x+2| + |x+a|$ funksiyaning qiymatlar sohasi $[7;\infty)$ bo'lsa, a ning musbat qiymatini toping.
A) 7
B) 9
C) 6
D) 12

26 $y = \dfrac{x+3}{x+2}$ funksiya grafigini $y = 2$ chiziqqa nisbatan simmetrik ko'chirganda qaysi funksiya hosil bo'ladi?
A) $y = \dfrac{3x+5}{x+2}$
B) $y = \dfrac{x+1}{x+2}$
C) $y = \dfrac{3x-1}{x+2}$
D) $y = \dfrac{x+2}{x+3}$

27 $y = x^2 - 2x - 4$ parabola va $y = 2x + 8$ to'g'ri chiziqlar A va B nuqtalarda kesishadi. AB kesma o'rtasidan koordinata boshigacha bo'lgan masofani toping.
A) $2\sqrt{37}$
B) 18
C) $2\sqrt{35}$
D) 14

28 Funksiya grafigidan foydalanib, $f(4) + f^{-1}(0)$ ning qiymatini toping (bu yerda $f^{-1}(x) - f(x)$ funksiyaning teskari funksiyasi).



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

29 $y = \dfrac{\sin^3 x + \cos^3 x}{\sin x + \cos x} - \dfrac{1}{2}\sin 2x$ funksiyaning qiymatlar sohasini toping.
A) $[-2;2)$
B) $[0;2)$
C) $(0;2)$
D) $[0;2]$

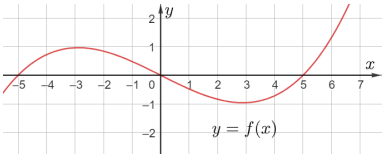
30 $y(x) = x^2 - 4x + 3a$ kvadrat funksiya Ox o'qini A va B nuqtalarda kesib o'tadi. Agar $|AB| = 8$ bo'lsa, $y(2)$ ning qiymatini toping.

A) -16
B) 16
C) -20
D) 20

31 $f(g(x)) = \dfrac{x^2+1}{x^2+2}$ va $f(x) = \dfrac{x}{x+1}$ bo'lsa, $g(x)$ funksiyaning eng kichik qiymatini toping.

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

32 $f(x)$ kubik funksiya grafigi berilgan. $f(x) = f(x-1) - 4$ tenglama nechta yechimga ega?



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

33 Agar $f(x)$ chiziqli funksiya bo'lib, $f(2x+1) + f(x-2) = 6x + 4$ bo'lsa, $f(5)$ ning qiymatini toping.

A) 17
B) 13
C) 19
D) 21

34 $y = |x+3| + 1$, $y = 1$ va Oy o'qlari bilan chegaralangan uchburchak yuzasini toping.

A) 9
B) 4,5
C) 6
D) 8

35 $f(x) \geq 0$ tengsizlikning yechimlar toplami $[-4; 2]$ bo'lsa, $f\left(\dfrac{x}{2} + 1\right) \geq 0$ tengsizlikni yeching.

A) $[-2; 1]$
B) $[-1; 2]$
C) $[-5; 1]$
D) $[-10; 2]$

36 $f(x) = \dfrac{x}{1+|x|}$ funksiyaning qiymatlar sohasini toping.
A) $(-\infty;-1)\cup(1;\infty)$
B) $(-1;0)$
C) $(-1;1)$
D) $(-\infty;0]\cup(1;\infty)$

37 $f(x) = x^2 - 4x + 3$ funksiya uchun $g(x) = f(x+a)$ funksiya juft funksiya bo'lsa, $g(4)$ ning qiymatini toping.
A) 8
B) 15
C) 13
D) 16

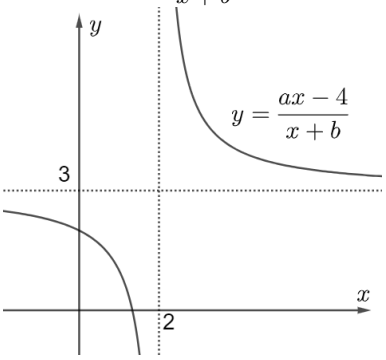
38 $f(x) = 2^x \ln(x+2)$ bo'lsa, $f(x) = 2$ tenglamaning ildizi qaysi oraliqqa tegishli?
A) $(-1;0)$
B) $(0;1)$
C) $(1;2)$
D) $(2;3)$

39 $2f(x) + f(6-x) = 3x^2 - 12x + a$ va $f(1) = 2$ bo'lsa, a ning qiymatini toping.
A) 33
B) 35
C) 36
D) 39

40 $y = x + a$ va $y = x - 3$ funksiyalar orasidagi eng qisqa masofa $2\sqrt{2}$ ga teng. a ning qabul qilishi mumkin bo'lgan barcha qiymatlari yig'indisini toping.
A) 4
B) 1
C) -1
D) -6

41 $5x - 2y + 3 = 0$ va $ax + 5y - 10 = 0$ to'g'ri chiziqlar o'zaro perpendikulyar.
a)a ning qiymatini toping.
b)Bu to'g'ri chiziqlarning kesishish nuqtasi $(x_0; y_0)$ nuqta bo'lsa, $58x_0 + 29y_0$ ning qiymatini toping.

42 Chizmada $y = \dfrac{ax-4}{x+b}$ funksiyaning grafigi tasvirlangan.

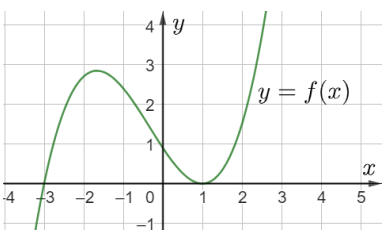


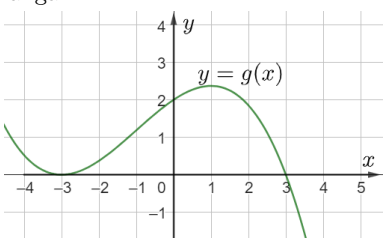
a) $a+b$ ning qiymatini toping.
b) $f^{-1}(5)$ ning qiymatini toping.

43 $f(x) = x+1$ va $g(x) = |x-1| + |x-2|$ funksiyalar berilgan.
a)Funksiyalar qaysi choraklarda kesishadi?
b) $y = f(g(x))$ funksiyaning qiymatlar sohasini toping.

44 $f(x) = x^3 - x^2 - 3x + 4$ funksiya berilgan.
a) $f(1+\sqrt{2})$ ning qiymatini toping.
b)Nechta musbat x uchun $f(x) = 1$ tenglik o'rinli bo'ladi?

45 Rasmda $f(x)$ va $g(x)$ funksiyalar grafiklari tasvirlangan.



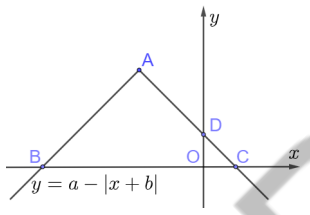


a) $g(f(1))$ ning qiymatini toping.
b) $f(x) \cdot g(x) \geq 0$ tengsizlik $(-4;4)$ oraliqda nechta butun yechimga ega?

46 $y = 2x + 4$ to'g'ri chiziqqa parallel va $(6; 2)$ nuqtadan o'tuvchi to'g'ri chiziq o'tkazilgan.
a)Bu to'g'ri chiziqning Oy o'qi bilan kesishish nuqtasi ordinatasini toping.
b)Bu to'g'ri chiziq va koordinata o'qlari bilan chegaralangan uchburchak yuzini toping.

47 $f(x) = \log_5(\log_4(\log_3(\log_2 x)))$ funksiya berilgan bo'lsin.
a)$f(x)$ ning aniqlanish sohasiga tegishli eng kichik tub sonni toping.
b)$f(x) = 0$ tenglama yechimi x_0 bo'lsa, $\log_8 x_0$ ning qiymatini toping.

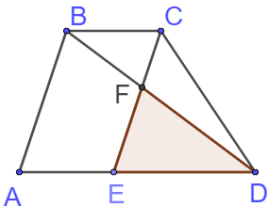
48 $y = a - |x + b|$ funksiya grafigi absissa o'qini B va C nuqtalarda, ordinata o'qini D nuqtada kesib o'tadi. Bunda $a + b = 6$ bo'lib, OCD uchburchak yuzi 2 ga teng.



a)$a - b$ ning qiymatini toping.
b)$ABOD$ to'rtburchak yuzini toping.

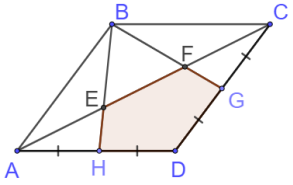
49 $2 \cdot f\left(\frac{x}{3}\right) - f\left(\frac{3}{x}\right) = \frac{x}{3} + \frac{3}{x}$ bo'lsin.
a) $f(3)$ ning qiymatini toping.
b)$f(2)$ ning qiymatini toping.

68 ABCD-trapetsiya, ABCE-parallelogramm. Agar AD:BC=3 va trapetsiyaning yuzi 54 ga teng bo'lsa, EFD uchburchak yuzini toping.



A) 9 B) 12 C) 18 D) 16

69 ABCD rombning yuzi 24 ga teg. EFGDH beshburchak yuzini toping.



A) 6 B) 8 C) 4 D) $\frac{24}{5}$

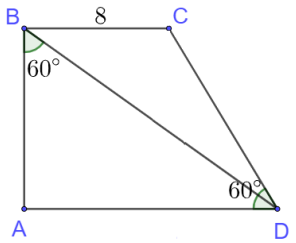
70 Trapetsiyaning diagonali uning yuzini 1:2 nisbatda bo'ladi. Trapetsiya o'rta chizig'i o'tkazildi. Hosil bo'lgan to'rtburchaklardan kichigining yuzini kattasining yuziga nisbatini toping.

A) 1 : 2
B) 2 : 5
C) 5 : 7
D) 3 : 5

71 Diagonallari soni tomonlar sonidan 3 marta ko'p bo'lgan muntazam ko'pburchakning bitta tashqi burchagini toping.

A) 30°
B) 40°
C) 45°
D) 24°

72 Agar ABCD to'g'ri burchakli trapetsiyada BC=8; $\angle ADC = 60°, \angle ABD = 60°$ bo'lsa, AD ni toping.



A) 16 B) 12 C) $8\sqrt{3}$ D) $12\sqrt{3}$

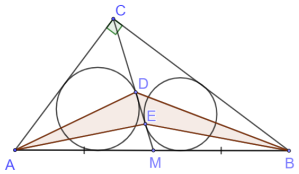
100 ABCD qavariq to'rtburchakda AB=AD=2, $\angle A = 108°, \angle C = 126°$ bo'lsa, AC ni toping.

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

101 ABC uchburchakka ichki chizilgan aylana BC tomonga E nuqtada urinadi. Agar BE=4; EC=5 va $\angle BAC = 60°$ bo'lsa, uchburchakning yuzini toping.

A) $10\sqrt{3}$
B) $20\sqrt{3}$
C) $12\sqrt{3}$
D) $15\sqrt{3}$

102 ABC to'g'ri burchakli uchburchakning gipotenuzasiga CM mediana tushirilgan. ACM va BCM uchburchaklarga ichki chizilgan aylanalar CM ga D va E nuqtalarda urinadi. AC=30 va BC=40 bo'lsa, ADBE to'rtburchak yuzini toping.

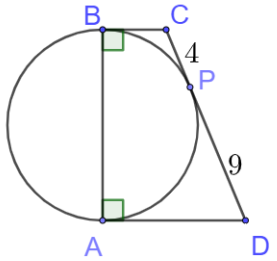


A) 225 B) 240 C) 120 D) 75

103 Yuzi 54 ga teng bo'lgan to'g'ri burchakli uchburchakka radiusi 3 ga teng bo'lgan aylana ichki chizilgan. Uchburchakning gipotenuzasi uzunligini toping.

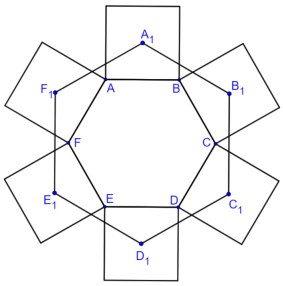
A) $10\sqrt{3}$
B) 20
C) 15
D) 13

104 ABCD trapetsiya. PC=4, PD=9. AB ni diametr qilib aylana chizilgan. Trapetsiya yuzini toping.



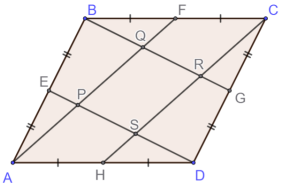
A) 82 B) 102 C) 78 D) 85

158 ABCDEF – muntazam oltiburchak tashqarisiga kvadrat chizilib markazlari tutashtirilgan. Agar $A_1B_1C_1D_1E_1F_1$ oltiburchak perimetri $12\sqrt{3}+12$ bo'lsa,



a)ABCDEF oltiburchak perimetrini toping.
b)$\dfrac{S_{A_1B_1C_1D_1E_1F_1}}{S_{ABCDEF}}$ ni toping.

159 ABCD parallelogrammning mos tomonlari o'rtalari E, F, G va H bo'lsin. AF, BG, CH va DE lar kesishib PQRS to'rtburchak hosil qiladi. ABCD parallelogramm yuzi 80 ga teng.

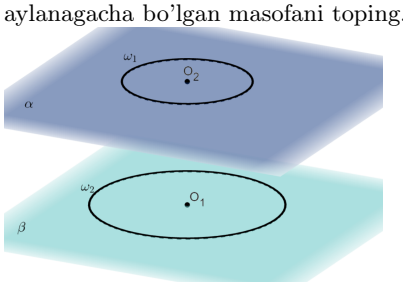


a)DP:PE nisbatni toping.
b)PQRS to'rtburchak yuzini toping.

160 Aylanada ketma-ket P,Q,R,S, nuqtalar olingan. Bunda $PQ = PS$. PR va QS kesmalar T nuqtada kesishadi. Agar $RQ = 5$, $RS = 20$, $RT = 6$ bo'lsa,
a) QT ning uzunligini toping.
b)PT ning uzunligini toping.

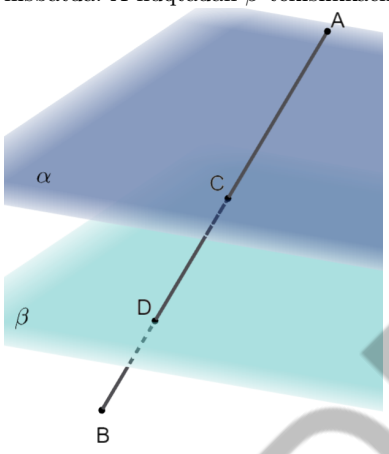
161 ABCD parallelogrammning perimetri 16 ga teng. ABC uchburchakka ichki chizilgan aylana radiusi $\dfrac{\sqrt{3}}{2}$ ga teng. Agar $\angle BAD = 60^\circ$ bo'lsa,
a)Parallelogramm katta tomoni uzunligini toping.
b)Parallelogramm diagonallari kvadratlari yig'indisini toping.

17 α va β parallelel tekisliklarda markazlari O_1 va O_2 bo'lgan ω_1 va ω_2 aylanalar olingan. O_1O_2 to'g'ri chiziq α va β tekisliklarga perpendikulyar. ω_1 aylana markazidan β tekislikdagi aylanagacha bo'lgan masofa 13 ga teng. ω_1 va ω_2 aylanalarning radiuslari mos ravishda 3 va 5 ga teng bo'lsa, ω_2 aylana markazidan α tekislikdagi aylanagacha bo'lgan masofani toping.



A) $\sqrt{135}$ B) $\sqrt{153}$ C) $\sqrt{147}$ D) $\sqrt{154}$

18 AB kesma α va β parallel tekisliklarni mos ravishda C va D nuqtalardan kesib o'tadi. BD:CD:AC=5:4:3 kabi nisbatda. A nuqtadan β tekislikkacha masofa 21 ga teng. B nuqtadan α tekislikkacha bo'lgan masofani toping.



A) 32 B) 24 C) 27 D) 18

19 AB tomoni α tekislikda bo'lgan ABCDEF oltiburchak berilgan. Oltiburchakning katta diagonallaridan biri tekislik bilan 30° burchak tashkil qiladi. Oltiburchakning AC diagonalining tekislik bilan hosil qilgan burchagi sinusini toping.

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

20 Radiusi 4 ga teng bo'lgan doira α tekislik bilan 60° burchak hosil qiladi. Doiraning tekislikdagi proyeksiyasi yuzini toping.

A) 16π
B) 8π
C) $8\sqrt{3}\pi$
D) 12π

Topshiriqlar(21-23) va javob variant (A-F) larini o‘zaro moslashtiring.
Yuzasi $36cm^2$ ga teng bo’lgan uchburchak tomonlaridan biri atrofida to’liq 360° ga aylantirildi. Aylanishdan hosil bo’lgan jismning hajmi $192\pi cm^3$ ga, to’la sirti yuzi esa $216\pi cm^2$ ga teng bo’ldi.

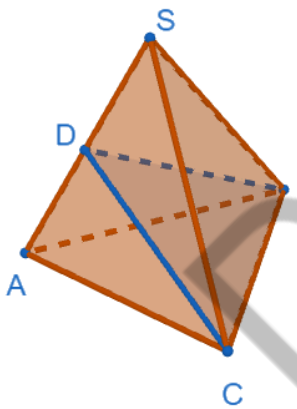
A)9
B)10
C)17
D)18
E)24
F)27

21 Hosil bo’lgan jism uchburchakning qanday uzunlikdagi (cm) tomoni atrofida aylantirilgan?

22 Shu uchburchakning eng katta tomonini(cm) toping.

23 Shu uchburchak yarim perimetrini toping.

Topshiriqlar(24-26) va javob variant (A-F) larini o‘zaro moslashtiring.
SABC muntazam uchburchakli piramidaning SA qirrasi o’rtasi D nuqta bo’lsin. D nuqta va BC tomon orqali kesim o’tkazilgan. BC=6 va $S_{BCD} = 12$ bo’lsin.



A)$2\sqrt{7}$
B)$3\sqrt{7}$
C)4
D)6
E)$3\sqrt{3}$
F)$6\sqrt{3}$

24 Piramidaning yon qirrasi uzunigini toping.

25 Piramidaning balandligini toping.

26 DABC piramida hajmini toping.

Variantlar bo'limi

1-variant

1 a, b, c turli tub sonlar uchun $EKUK(a^2b^3c, abc^4) = 10800$ bo'lsa, $a + b - c$ ning qiymatini toping.
A) 3
B) 6
C) 8
D) 10

2 $0,1 \cdot 0,2 \cdot 0,3 - 0,2 \cdot 0,3 \cdot 0,4 + 0,3 \cdot 0,4 \cdot 0,5$ ifodaning qiymatini yuzdan birlar xonasigacha yaxlitlang.
A) 0,4
B) 0,042
C) 0,03
D) 0,42

3 Abbos xarid qilgan mashinaning narxi ketma-ket ikki marta 10% dan arzonlashdi. Agar mashinaning dastlabki narxi 12000$ bo'lgan bo'lsa, ikkinchi marta arzonlashgandan keyingi narxini toping.
A) 10000$
B) 9720$
C) 10800$
D) 9600$

4 Ketma-ket kelgan bir nechta butun sonning o'rta arifmetigi 16 ga teng. Bu sonlarning eng kattasi eng kichigidan 12 ga katta. Bu ketma-ketlikdagi ikkinchi va uchinchi sonlar yig'indisini toping.
A) 11
B) 19
C) 23
D) 32

5 $2^3 \cdot 4^4 \cdot 16^4 = 2^a \cdot 4^b$ va $a + b = 19$ bo'lsa, $a \cdot b$ ning qiymatini toping.
A) 78
B) 84
C) 90
D) 88

6 $x = \frac{7}{25}$ bo'lsa, $\sqrt{1 - 2x\sqrt{1 - x^2}}$ ning qiymatini toping.
A) $\frac{24}{25}$
B) $\frac{7}{25}$
C) $\frac{17}{25}$
D) $\frac{12}{25}$

7 $\dfrac{30}{a\sqrt{a+2}+(a+2)\sqrt{a}} = (a+2)\sqrt{a} - a\sqrt{a+2}$ bo'lsa, $\dfrac{2}{a} + \dfrac{a}{9}$ ning qiymatini toping.

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

8 Agar $a = 4045; b = -2022; c = -2023$ bo'lsa, $\dfrac{a^2}{b+c} + \dfrac{b^2}{a+c} - \dfrac{c^2}{a+b}$ ni hisoblang.

A) 4050
B) -4044
C) -4046
D) 0

9 a_n, b_n ketma-ketliklar uchun $a_n = 2n^2$ va $b_n = 3n^2$ bo'lsa, $\dfrac{\sqrt{a_1}+\sqrt{a_2}+...+\sqrt{a_{10}}}{\sqrt{b_1}+\sqrt{b_2}+...+\sqrt{b_{10}}}$ ning qiymatini toping.

A) $\dfrac{\sqrt{6}}{3}$
B) $\dfrac{2}{3}$
C) $\dfrac{2\sqrt{6}}{9}$
D) $\dfrac{4}{9}$

10 Cheksiz kamayuvchi geometrik progressiyaning birinchi hadi 6 ga teng. Progressiya maxraji $\dfrac{1}{3}$ dan kichik bo'lsa, bu progressiyaning yig'indisi nechta butun qiymat qabul qilishi mumkin?

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

11 Hisoblang: $\log_2\left(\log_3 25 \cdot \log_5 27 + \dfrac{4^{\frac{1}{\log_{\sqrt{10}} 2}}}{5}\right)$

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

12 $P(1;0)$ nuqtani koordinata boshi atrofida $\frac{5\pi}{3}$ radian burchakka burish natijasida $P(x;y)$ nuqta hosil bo'ldi. $\frac{x}{y}$ ni toping.

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

13 $8\cos x\cos^2 2x\cos 4x + 2\cos 8x\cos x$ ifoda quyidagilardan qaysi biriga teng?

A) $\frac{\sin 12x}{\sin x}$
B) $\frac{\sin 10x}{\sin x}$
C) $\frac{\sin 10x}{\cos x}$
D) $\frac{\sin 12x}{\cos x}$

14 $x^2 + \frac{1}{9-x^2} - 5x + 6 - \frac{x+2}{18+9x-2x^2-x^3} = 0$ tenglama nechta haqiqiy yechimga ega?

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

15 $\sqrt{x^2+5x+3} + \sqrt{x^2-3x+3} = 4\sqrt{x}$ tenglama ildizlariga teskari sonlar yig'indisini toping.

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

16 $3^{\log_2 2x} + 9^{\log_4 16x} + 81^{\log_{16}\frac{x}{2}} = 28\frac{1}{9}$ tenglamani yeching.

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

17 $\frac{(x^7-x)-(x^6-x)}{x^4-x^3} < 27$ tengsizlik $x \in [-5;7]$ oraliqda nechta butun yechimga ega?

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

18 $|3x-6| \le |x-2|+6$ tengsizlikning barcha butun yechimlari yig'indisini toping.

A) 18
B) 16
C) 14
D) 15

19 $\begin{cases} 2^{2x} - 66 \cdot 2^x + 128 \le 0 \\ \dfrac{3^x - 27}{5^x - 625} > 0 \end{cases}$ tengsizliklar sistemasining butun sonlardan iborat yechimlari yig'indisini toping.

A) 14
B) 17
C) 21
D) 18

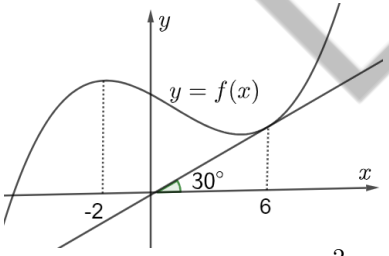
20 $f(x) = \log_2 \dfrac{4}{x}$ bo'lsa, $f(\sqrt{6}+2) + f(\sqrt{6}-2)$ ning qiymatini toping.

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

21 $f\left(\dfrac{x}{1+x^2}\right) = x-1$ bo'lsa, $f(x)$ funksiyaga teskari funksiyani toping.

A) $\dfrac{x}{x^2+x+1}$
B) $\dfrac{x}{x^2+2x+2}$
C) $\dfrac{x+1}{x^2+2x+2}$
D) $\dfrac{x+1}{x^2+x+1}$

22 Rasmda $y = f(x)$ funksiya grafigi tasvirlangan. $g(x) = f(x-4) + f(2x+2)$ bo'lsa, $g'(2)$ ning qiymatini toping.



A) 0 B) $2\sqrt{3}$ C) $\dfrac{2}{\sqrt{3}}$ D) 6

23 Hisoblang: $\int_2^4 \dfrac{27x^3}{9x^2-6x+4}dx + \int_2^4 \dfrac{8}{9x^2-6x+4}dx$

A) 26
B) 18
C) 22
D) 20

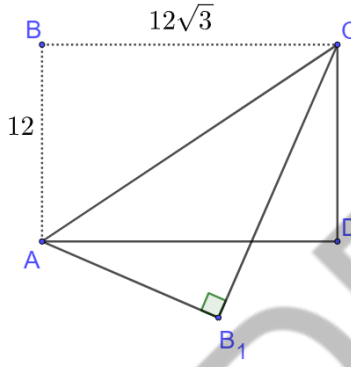
24 ABC uchburchakning AC tomonida AB=BD shartni qanoatlantiruvchi D nuqta olindi. $\angle DBC = 24°, \angle BCD = 48°$ bo'lsa, $\angle ABD$ ni toping.

A) $36°$
B) $48°$
C) $54°$
D) $72°$

25 ABC to'g'ri burchakli uchburchakning CD balandligi o'tkazildi. ADC va BDC uchburchaklarning eng kichik medianalari 4 va 5 ga teng. AB gipotenuza uzunligini toping.

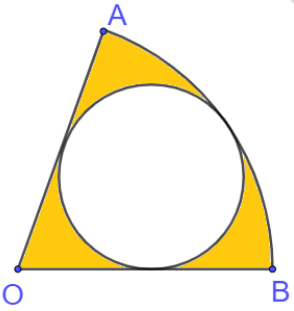
A) $2\sqrt{37}$
B) $2\sqrt{26}$
C) $2\sqrt{41}$
D) $\sqrt{41}$

26 ABCD to'g'ri to'rtburchakda $AB = 12; BC = 12\sqrt{3}$. ABC uchburchakda AC diagonal bo'yicha buklanib, ACB_1 uchburchak hosil qilindi. DB_1 kesma uzunligini toping.



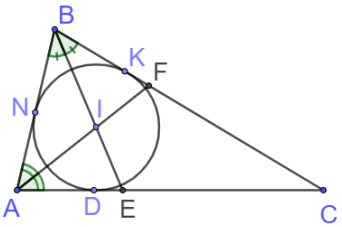
A) $6\sqrt{3}$ B) 9 C) 12 D) $8\sqrt{3}$

27 $\angle AOB = 60°$ bo'lgan sektorga ichki chizilgan aylana radiusi 2 ga teng. Bo'yalgan soha yuzini toping.



A) π B) $\frac{3\pi}{2}$ C) 2π D) 3π

28 Agar AB=5; AC=7; BC=6 bo'lsa, DE+KF ni toping.

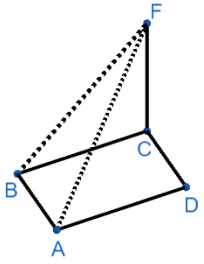


A) $\frac{21}{26}$ B) $\frac{13}{22}$ C) $\frac{23}{26}$ D) $\frac{15}{22}$

29 $(x-a)^2+(y-b)^2=R^2$ aylana koordinata o'qlari va $5x+12y-60=0$ to'g'ri chiziqqa urinadi. $a+b+R$ ni toping.

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

30 ABCD rombda $\angle BAD=60°$. Rombning C uchidan romb tekisligiga perpendikulyar chiqarilgan va unda F nuqta olingan. BF=10; AF=$2\sqrt{43}$ bo'lsa, CF ning uzunligini toping.



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

31 9 ga bo'linadigan va barcha raqamlari toq bo'lgan uch xonali sonlar nechta?

A) 6
B) 7
C) 8
D) 10

32 $n(A\cap B)=5$, $n(A)=3x-1$, $n(B)=4x-1$ va $n(A\cup B)=5x+1$ bo'lsa, $n(A\cup B)$ ni toping.

A) 19
B) 20
C) 21
D) 22

Topshiriqlar (33-35) va javob variant (A-F) larini o‘zaro moslashtiring.
ABCD trapetsiyaning tomonlari uzunliklari AB=BC=CD=6 va AD=12 bo’lsin. Trapetsiya AD tomoni atrofida 360° ga aylantirildi.

A)$54\sqrt{3}\pi$
B)$72\sqrt{3}\pi$
C)$108\sqrt{3}\pi$
D)$162\sqrt{3}$
E)216π
F)324π

33 Hosil bo’lgan jismning hajmini toping.

34 Hosil bo’lgan jisnmning to’la sirtini toping.

35 Hosil bo’lgan jismga ichki chizilgan shar hajmini toping.

36 $a \neq 0$ uchun $x^2-(2a+1)x+a^2=0$ tenglamaning ildizlari x_1 va x_2, $x^3-a^2x^2+(b+4)x+a^2=0$ tenglamaning ildizlari $x_1; x_2$ va x_3 bo’lsin.
a)a ning qiymatini toping.
b)b^2+b+1 ning qiymatini toping.

37 $4\cos^3 x + 3\sin x = 3\cos x + 4\sin^3 x$ tenglama berilgan.
a)Tenglamaning $[0; 2\pi]$ oraliqdagi eng katta va eng kichik ildizlari yig'indisini toping.
b)Tenglama $[-\pi; 0]$ oraliqda nechta ildizga ega?

38 $f(x) = (\sin x + 3\cos x)(5\cos x + \sin x)$ funksiya berilgan bo'lsin.
a)$f(x) = a + b\cos 2x + c\sin 2x$ ayniyat bo'lsa, $a + b + c$ ning qiymatini toping.
b)$f(x)$ funksiyaning eng katta va eng kichik qiymatlari ko'paytmasini toping.

39 $y = x$ to'g'ri chiziq va $y = x^2 - 3x - 10$ parabola berilgan.
a) to'g'ri chiziqning parabolaga eng yaqin nuqtasining absissasini toping.
b)to'g'ri chiziq va parabola orasidagi eng qisqa masofani toping.