

MILLIY SERTIFIKAT UCHUN MAVZULASHTIRILGAN TEST
MOCK 4

1. $2 < a < 5$ 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) 7
- B) $\frac{7}{3}$
- C) $\frac{4}{3}$
- D) 15

2. Hisoblang: $\left(1 + 4^{\frac{1}{3}} + 16^{\frac{1}{3}}\right) \left(1 - 2^{\sqrt[3]{4}} + \sqrt[3]{16}\right)^{0,5}$

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

3. Yo'lovchi tezligi 60 km/soat poyezd ichida ketayotib, qarshi kelayotgan poyezd deraza yonidan 4 sekundda o'tganini aniqladi. Agar u poyezdnning uzunligi 120 m bo'lsa, tezligini aniqlang (km/soat).

- A) 55
- B) 50
- C) 40
- D) 48

4. 190 gramm suvga 60 gramm tuz aralashtirildi. Hosil bo'lgan aralashmaning necha foizi tuzdan iborat bo'ladi?

- A) 25
- B) 30
- C) 22
- D) 24

5. Kasrni qisqartiring: $\frac{(3a+7)^2 - (3a-7)^2}{2a}$

- A) 21
- B) 42
- C) 49
- D) 84

6. Hisoblang: $\sqrt{7^{\frac{2}{\log_8 7}} + 25^{\frac{1}{\log_6 5}}}$

- A) 13
- B) 12
- C) 11
- D) 10

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7. Kasrni qisqartiring: $\frac{5\sqrt{6}+12}{3\sqrt{2}+2\sqrt{3}}$

A) $\sqrt{3} + \sqrt{2}$

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

C) $\frac{5\sqrt{3}}{3}$

D) $5\sqrt{6}$

8. Kamayuvchi arifmetik progressiyada $a_1 + a_3 + a_5 = 15$ va $a_2^2 + a_3^2 + a_4^2 = 83$ ga teng bo'lsa, bu progressiyaning o'n uchinchi hadini toping.

A) -15

B) 25

C) -17

D) 27

9. 6 ta haddan iborat geometrik progressiyaning boshidagi uchta hadi yig'indisi 26 ga, oxiridagi uchta hadi yig'indisi 702 ga teng bo'lsa, uning maxrajini toping.

A) 3

B) 6

C) 2

D) 8

10. $\begin{cases} f(x) = ax + b \\ g(x) = cx + d \end{cases}$. Agar $\frac{b}{a} = 5$ va $f(g(x)) = g(f(x))$ ayniyat bo'lsa, $\frac{c-1}{a-1}$ ni toping. ($a \neq 1$)

A) 1

B) 0

C) $\frac{1}{5}$

D) 5

11. Agar $a = 1 \cdot 2 + 2 \cdot 3 + 3 \cdot 4 + \dots + 40 \cdot 41$ va $b = 3 \cdot 4 + 6 \cdot 6 + 9 \cdot 8 + \dots + 120 \cdot 82$ bo'lsa, $\frac{b}{a}$ ning qiymatini toping.

A) 6

B) 9

C) 10

D) 8

12. 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) 16

C) 32

D) 64

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13. Agar $12 \cdot \sin 3^\circ \cdot \cos 3^\circ \cdot \cos 6^\circ = m$ bo'lsa, $\operatorname{tg} 78^\circ$ ni m orqali ifodalang.

- A) $\frac{\sqrt{3-m^2}}{m}$
- B) $\frac{\sqrt{9-m^2}}{3}$
- C) $\frac{\sqrt{9-m^2}}{9m}$
- D) $\frac{\sqrt{9-m^2}}{m}$

14. Tenglama ildizining chorak qismini toping:

$$120: \left(24: \left(18: \left(12: \left(6: (x+1) \right) \right) \right) \right) = 15$$

- A) 0,5
- B) 0,25
- C) 1
- D) 0,4

15. $x^2 + ax + 5 = 0$ va $x^2 - 5x - a = 0$ tenglamalar umumiy yechimga ega bo'lsa, a ni toping.

- A) -5 ; 6
- B) 5 ; -6
- C) -5 ; -6
- D) -5

16. $(x^2 - 4)(x + 5)(x + 9) = 60$ tenglikni qanoatlantiruvchi butun sonlar yig'indisini toping.

- A) -14
- B) 7
- C) 14
- D) -7

17. $\frac{7x+1}{x^2+4x+3} > 1$ tengsizlikni qanoatlantiruvchi butun sonlar soni x_0 bo'lsa, $x_0 + 2$ ni toping.

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

18. Tengsizlikni yeching: $\frac{|x+2|-5}{6-|2-x|} \geq 0$

- A) $(-\infty ; -7] \cup [3 ; 8)$
- B) $[-7 ; -4) \cup [3 ; 8)$
- C) $\{-7\} \cup [3 ; 8)$
- D) $(-\infty ; -7] \cup (-4 ; 3] \cup (8 ; \infty)$

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19. a ning qanday eng kichik butun qiymatida $-3x^2 + 9x + 0,25 < a$ tengsizlik x ning barcha qiymatlarida o'rinli bo'ladi?

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

20. $|x - 2| + |2x - 5| + |x - 5|$ ifodaning eng kichik qiymatini toping.

- A) 8
- B) 5
- C) 4
- D) 3

21. $f(x) = \frac{\sqrt{x-4} \cdot \sqrt[3]{x+5} \cdot \sqrt[4]{36-x^2}}{\sqrt[5]{x^2-11x+30}}$ funksiyaning aniqlanish sohasiga nechta butun son tegishli bo'ladi.

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

22. $f(3x - 1) = 2x^6 + ax^3 + 12$ funksiya uchun $f'(2) = 5$ tenglik o'rinli bo'lsa, $f'(5)$ ning qiymatini toping.

- A) 140
- B) 120
- C) 112
- D) 132

23. $\int_{-1}^2 \frac{5x-2}{\sqrt[3]{x}} dx$ integralni hisoblang.

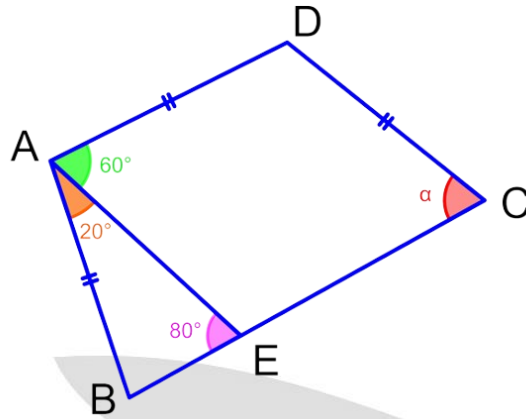
- A) $3\sqrt[3]{2} - 6$
- B) $3\sqrt{2} - 6$
- C) $3\sqrt[3]{4} + 6$
- D) $3\sqrt[3]{3} - 6$

24. $ABCD$ 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 tomonini toping.

- A) 5,7
- B) 3,8
- C) 4,2
- D) 4,8

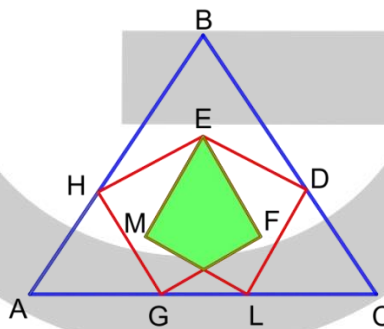
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25. Rasmda $ABCD$ to'rtburchak tasvirlangan. α burchakni toping.



- A) 20°
- B) 40°
- C) 60°
- D) 80°

26. Quyida ABC muntazam uchburchak va uning ichiga $EFGH$ va $EDLM$ kvadratlar chizilgan. Agar $AH = AG = CD = CL$ va $GL = 6\sqrt{3} - 6$ bo'lsa, bo'yalgan soha yuzini toping.



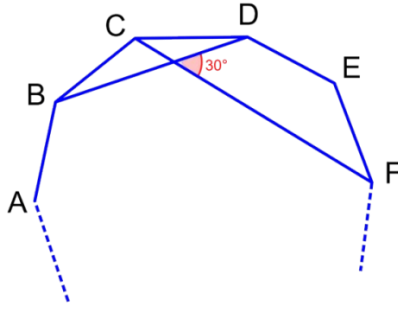
- A) $18\sqrt{3}$
- B) $12\sqrt{3}$
- C) $6\sqrt{3}$
- D) 12

27. To'g'ri burchakli uchburchakning tomonlari o'suvchi geometric progressiyani tashkil etadi. Uning kichik o'tkir burchagini toping.

- A) 45°
- B) 30°
- C) $\arcsin \frac{\sqrt{5}+1}{2}$
- D) $\arcsin \frac{\sqrt{5}-1}{2}$

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28. Rasmda berilgan muntazam ko'pburchak necha tomonli?



- A) 9
- B) 12
- C) 15
- D) 18

29. Parallelogrammning tomonlari $\vec{a}(4; 2; -2)$ va $\vec{b}(-3; 1; 4)$ vektorlardan iborat. Bu parallelogrammning diagonallari uzunliklari yig'indisini toping.

- A) $\sqrt{14} + \sqrt{86}$
- B) 7
- C) $10\sqrt{3}$
- D) $\sqrt{7} + \sqrt{21}$

30. α tekislikda yotgan $ABCDEF$ muntazam oltiburchakning tomoni 6 ga teng. PA kesma esa α tekislikka perpendikulyar bo'lib, uzunligi 6 ga teng. PE va BC ayqash to'g'ri chiziqlar orasidagi burchakni toping.

- A) $\arcsin \frac{3}{4}$
- B) $\arccos \frac{3}{4}$
- C) $\arcsin \frac{4}{5}$
- D) $\arccos \frac{4}{5}$

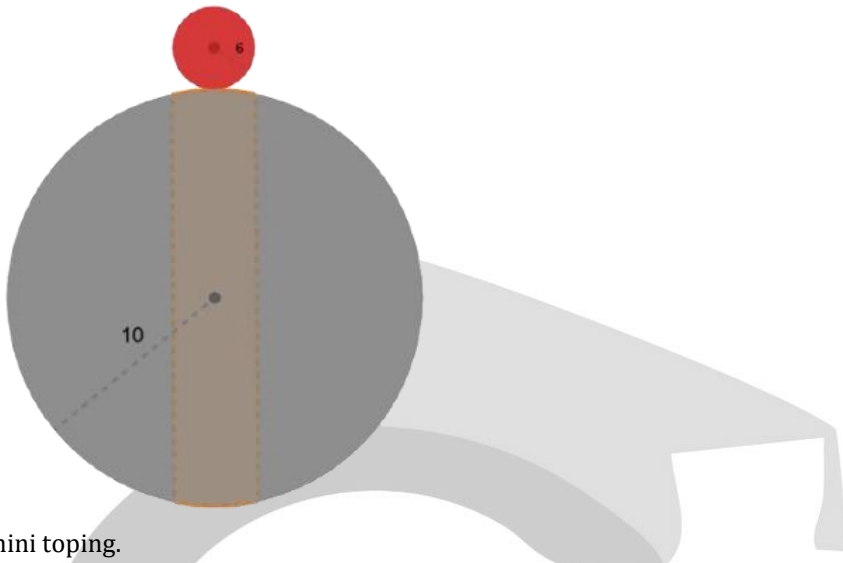
31. 10 kishi tennis musobaqasida kumush, oltin, bronza medallarini necha xil usulda olishi mumkin?

- A) 240
- B) 720
- C) 160
- D) 110

32. Guruhda 12 ta talaba bo'lib, ulardan 8 tasi a'lochi. Tavakkaliga tanlangan 9 ta talabadan 5 tasi a'lochi bo'lish ehtimolligini toping.

- A) $\frac{5}{9}$
- B) $\frac{14}{55}$
- C) $\frac{2}{55}$
- D) $\frac{1}{44}$

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Topshiriqlar (33-35) va javob variant (A-F) larni o'zaro moslashtiring.	Javoblar
Radiusi 10 sm bo'lgan shar shaklidagi metal bo'lgi bor. Uning ustiga radiusi 6 sm bo'lgan shar shaklidagi qizigan temir bo'lgi qo'yildi va to'g'ri shar markazidan o'tib uni teshib o'tdi va teshik hosil qildi ($\pi \approx 3$ deb oling).  33. Hosil bo'lgan teshik hajmini toping. 34. Sharining qolgan qismining hajmini toping. 35. Hosil bo'lgan teshik ichiga joylashtirilgan eng katta hajmli konus hajmini toping.	A) 1896 B) 1952 C) 4000 D) 2048 E) 648 F) 1944

36. Tenglamani yeching: $x^2 \log_2 x - 4x^2 - 4x \log_2 x + 16x + 3 \log_2 x - 12 = 0$

a) Tenglama nechta haqiqiy ildizga ega?

Javob: _____

b) Tenglamaning haqiqiy ildizlari kvadratlari yig'indisini toping.

Javob: _____

Gayratdin oqiw orayi

37. Tenglamani yeching: $\sin^{2024} x + \cos^{2024} 2x = 2$

a) Tenglamaning eng kichik musbat ildizini toping.

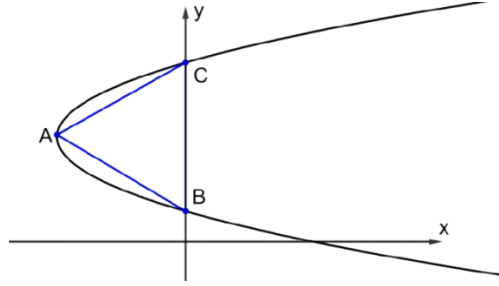
Javob: _____

b) Tenglama $[0^\circ; 2160^\circ]$ kesmada nechta haqiqiy ildizga ega?

Javob: _____

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38. Quyida $x = y^2 + 2ay + \frac{a^2}{2}$ funksiyaning grafigi berilgan. A nuqta parabola uchi va ABC muntazam uchburchak.



a) $a = ?$

Javob: _____

b) Uchburchak yuzini toping.

Javob: _____

39. Agar $f(x) = \frac{x+3}{x-1}$ bo'lsa,

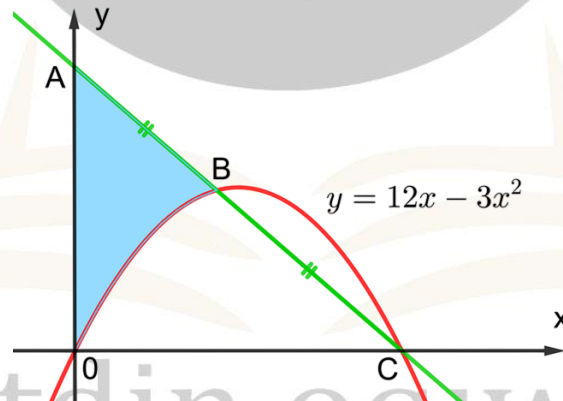
a) $f^{-1}(2)$ ni toping.

Javob: _____

b) $f(x) = f^{-1}(x)$ tenglama nechta butun ildizga ega.

Javob: _____

40. Koordinatalar sistemasida $y = 12x - 3x^2$ parabola va to'g'ri chiziq berilgan.



a) B nuqtaning koordinatalari yig'indisini toping.

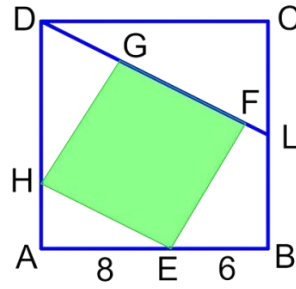
Javob: _____

b) Shtrixlangan soha yuzini toping.

Javob: _____

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41. $ABCD$ kvadratning ichki sohasida chizmadagi kabi $EFGH$ kvadrat joylashtirilgan. Bunda $AE = 6$ sm va $ED = 8$ sm.



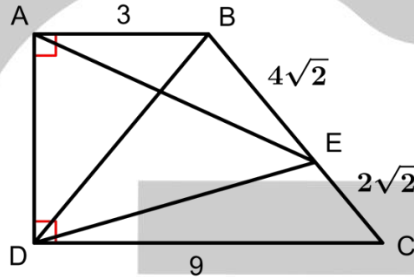
a) DH kesma uzunligini (sm) toping.

Javob: _____

b) $EFGH$ kvadratning yuzini (sm^2) toping.

Javob: _____

42. $ABCD$ to'g'ri burchakli trapetsiya berilgan.



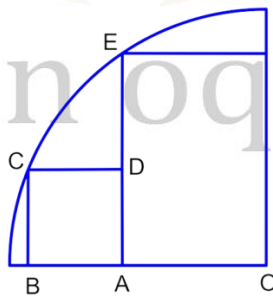
a) Trapetsiya yuzini toping.

Javob: _____

b) $\frac{AE^2}{ED^2} = ?$

Javob: _____

43. Quyidagi rasmda O markazli chorak doira ichida $OAEF$ to'g'ri to'rtburchak va $ABCD$ kvadrat tasvirlangan. Bunda $AB = 2$ sm va $FE = 7$ sm.



a) DE kesma uzunligini (dm) toping.

Javob: _____

b) $OAEF$ to'g'ri to'rtburchakning yuzini (sm^2) toping.

Javob: _____

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44. $ABCD A_1 B_1 C_1 D_1$ birlik kub berilgan. Bu yerda P va Q lar $A_1 B_1$ va BC qirralarning o'rtalari.

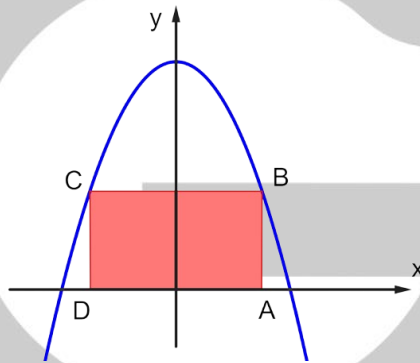
a) D_1 nuqtadan PQ to'g'ri chiziqli bo'lgan masofani toping.

Javob: _____

b) A nuqtadan PQ kesmaning o'rtasigacha bo'lgan masofani toping.

Javob: _____

45. Quyidagi rasmda $y = 9 - x^2$ funksiya grafigi va unga ichki chizilgan $ABCD$ to'g'ri to'rtburchak tasvirlangan.



a) $ABCD$ to'g'ri to'rtburchakning yuzi eng katta bo'lishi uchun B nuqtaning koordinatalari qanday bo'lishi kerak?

Javob: _____

b) $ABCD$ to'g'ri to'rtburchak yuzining eng katta qiymatini toping.

Javob: _____

Gayratdin oqiw orayi