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MILLIY SERTIFIKAT MATEMATIKA 15 variant

SHAMS

Gologrammasiz kitob qalbaki hisoblanadi

Toshkent
«Spectrum Media Group»
2025

6-VARIANT

1. Hisoblang.

$$\left(\frac{3}{1-\frac{3}{4}}+\frac{\frac{3}{4}-1}{3}\right):\frac{1}{12}$$

A) *12* B) *143*
C) *20* D) *5*

2. $x = 0,27 - 0,03$ bo‘lsa, $\frac{0,9}{0,04}$ ni x oraliqni ifodalang.

A) $\frac{375}{4}x$ B) $75x$
C) $\frac{375}{8}x$ D) $\frac{375}{16}x$

3. $-3 < x < |x|$ bo‘lsa,

$|x-1|+|x-3|-\sqrt{x^2}-\sqrt[5]{x^5}$

ifodani soddalashtiring.

A) $4 - 2x$ B) $4 - 3x$
C) $3x - 2$ D) 4

4. Avaz (-2) sonidan 5 birlik uzoqlikda joylashgan sonlarni topmoqchi. Unda Avaz quyidagi tenglamalardan qaysi birini yechishi kerak?

A) $|x - 2| = 5$
B) $|x + 2| = 5$
C) $|x - 5| = 2$
D) $|x + 5| = 2$

5. $-1 < x < 0$ bo‘lsa, x, x^2, x^3 sonlarni o‘sish tartibida joylashtiring.

A) $x < x^2 < x^3$
B) $x < x^3 < x^2$
C) $x^3 < x < x^2$
D) $x^2 < x < x^3$

6. m va n musbat butun sonlar. $m = 3^{9-n}$ ifodada m tub son bo‘lsa, m + n nimaga teng?

A) *11* B) *9*
C) *8* D) *7*

7. $m = \frac{4}{1+2018^x}+\frac{4}{1+2017^{-y}}$

$n = \frac{4}{1+2017^y}+\frac{4}{1+2018^{-x}}$

Bunga ko‘ra m + n ning qiymatini toping.

A) *1*
B) *2*
C) *4*
D) *8*

8. Hisoblang.

$$\frac{\sqrt[3]{2}\cdot\sqrt[3]{4}\cdot\sqrt[3]{8}\cdot\ldots\cdot\sqrt[3]{256}}{\sqrt[4]{2}\cdot\sqrt[4]{4}\cdot\sqrt[4]{8}\cdot\ldots\cdot\sqrt[4]{256}}$$

A) *16*
B) *8*
C) *2*
D) $\frac{1}{2}$

9. $x = \sqrt{2+\sqrt{5}} + \sqrt{-2+\sqrt{5}}$ bo‘lsa, $\sqrt{6+2\sqrt{5}}$ ifoda quyidagilardan qaysi biriga teng bo‘lishi mumkin?

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

10. Tenglamani yeching:
$\sqrt{9x+27} + \sqrt{25x+75} = 12$

A) $-\frac{1}{4}$
B) $\frac{1}{4}$
C) $\frac{1}{8}$
D) $-\frac{3}{4}$

11. $a > 0$,
$$\frac{\sqrt{1+\sqrt{1-a^2}} \cdot \sqrt{1-\sqrt{1-a^2}}}{(a+1)^2 - \frac{1}{2}\left[(a+1)^2 + (a-1)^2\right]}$$
ifodani soddalashtiring.

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

12. $P(x)$ ko‘phadi uchun
$P(x+1) + (x+1)$
$P(x-2) = 2x+4$
tenglik o‘rinli bo‘lsa,
$P(2) + P(-2)$ ni toping.

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

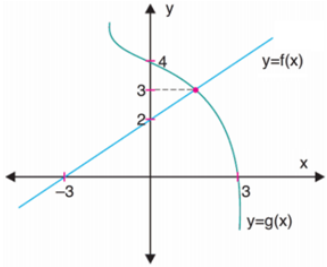
13. $c \in R, P(x) = (x+c)^6$
P(x) ko‘phadning koeffitsiyentlarining o‘rtacha arifmetik qiymati $\frac{64}{7}$ ga teng. Shunga ko‘ra, $P(-5)$ olishi mumkin bo‘lgan qiymatlari yig‘indisini toping.

A) 2^{32}
B) 2^{30}
C) 2^{28}
D) 2^{26}

14. f funksiyaning grafigi koordinata boshiga nisbatan simmetrikdir.
$4f(-x) + f(x) = 2x^3 - 7x$
Funksiya uchun o‘rinli bo‘lsa, $f(-1)$ ni toping.

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

15. Yuqorida y = f(x) chiziqli funksiya va y = g(x) funksiyaning grafigi berilgan. Shunga ko'ra, $g^{-1}(3)\cdot f(1)+g(0)$ qiymatini toping.



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

16. $f(x)=\dfrac{5}{x^2-x-6}-\dfrac{4}{x^2-4}$ bo'lsa,
$f(4)+f(5)+...+f(10)$ yig'indini hisoblang.

A) $\dfrac{7}{8}$
B) $\dfrac{9}{8}$
C) $\dfrac{8}{9}$
D) $\dfrac{15}{7}$

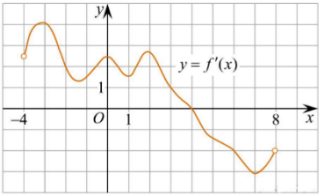
17. $x^2-x-9m+3=0$ tenglamaning ildizlari $x_1 va x_2$ bo'lsa, $x^2-mx-2m-4$ tenglamaning ildizlari esa $x_1 va x_3$. Shunga ko'ra $\dfrac{x_2}{x_3}+m$ ning qiymatini toping.

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

18. Ildizlari orasida
$x_1^2x_2+x_2^2x_1+x_1+x_2=5$
$x_1+x_2<0$
$(x_1-1)(x_2-1)=-4$
Munosabatlar o'rinli bo'lgan tenglamani toping.

A) $x^2+x-5=0$
B) $x^2+5x-5=0$
C) $x^2+x-6=0$
D) $x^2+2x-4=0$

19. Rasmda (−4; 8) oraliqda aniqlangan f(x) funksiyaning hosilasi grafigi ko'rsatilgan. [−2;6] oraliqda f(x) funksiyaning ekstremum nuqtasini toping.

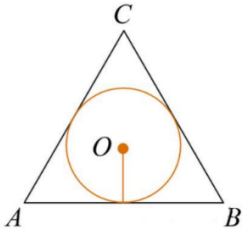


A) 1 B) 2
C) −3 D) 4

20. Birinchi ishchi 475 ta detal ishlab chiqarish uchun ikkinchi ishchi 550 ta detal ishlab chiqarishiga qaraganda 6 soat kamroq vaqt sarflaydi. Ma'lumki, birinchi ishchi bir soat ichida ikkinchisiga qaraganda 3 ta ko'proq qism yasaydi. Birinchi ishchi soatiga nechta detal ishlab chiqaradi?

A) *20* B) *25*
C) *30* D) *35*

21. Teng tomonli uchburchakning tomoni $\sqrt{3}$. Unga ichki chizilgan aylananing radiusini toping.



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

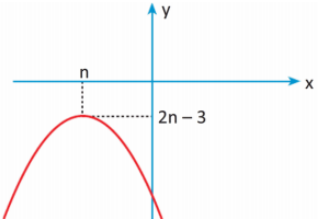
22. $\vec{a}$ *va* $\vec{b}$ vektorlarning uzunliklari mos ravishda $2\sqrt{3}$ *va* 5 ga teng. Ular orasidagi burchak 150^0. $\vec{a}$ *va* $\vec{b}$ vektorlar skalyar ko'paytmasini toping.

A) *10* B) *15*
C) *–15* D) *–10*

23. Zarik ikki marta tashlanadi. Tajribaning nechta elementar natijasi «A = ballar yig'indisi 5» hodisasini ma'qullaydi?

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

24. Yuqoridagi $y = f(x)$ funksiyaning maksimum nuqtasi $(n;2n-3)$. $y = f(-x)$ maksimum nuqtasi (3; k). Shunga ko'ra $n \cdot k$ ni toping.



A) *27*
B) *3*
C) *–27*
D) *–9*

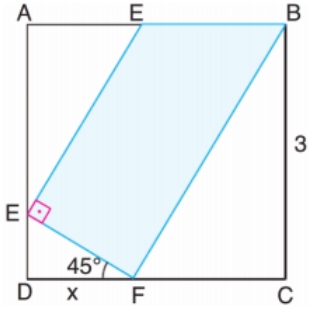
25. $y - x^2 = 3 - 2x$
$y = 5x - 7$
Tenglamalar sistemasida x ning qiymatlarining yig'indisi a va y qiymatlarining yig'indisi b bo'lsa, a + b yig'indi nimaga teng.

A) *31* B) *28*
C) *27* D) *15*

26. $\frac{(x^2+x+1)\cdot(x-2)}{x^2+1} > 0$ tengsizlikni qanoatlantiruvchi x ning eng kichik butun qiymatini toping.

A) *–2*
B) *–1*
C) *1*
D) *3*

27. ABCD kvadrat. $<DFE = 45^0$, $|BC| = 3cm$, $|DF| = x\,cm$, $|EA| \perp |EF|$ Bunga ko'ra bo'yalgan soha yuzi eng ko'pi bilan necha cm^2?



A) $\frac{81}{16}$
B) $\frac{21}{4}$
C) $\frac{27}{8}$
D) $\frac{9}{2}$

28. $\log_2(a^7 \cdot b^4 \cdot c^3) = 44$

$\log_2\left(\frac{a^2}{b\cdot c^2}\right) = 4$

Shunday bo'lsa, $\log_2 a + \log_2 b + \log_2 c$ ni toping.

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

29. Tenglamani yeching.

$5x = arcsin(cos4x)$

A) $\frac{\pi}{2}$
B) $\frac{\pi}{18}$
C) $\frac{\pi}{18}; \frac{\pi}{2}$
D) $\varnothing$

30. a_n – ketma-ketlik uchun $a_{n+1} = \frac{n}{n+1}\cdot a_n$, $a_1 = 3$ tengliklar o'rinli bo'lsa, a_{21} ni toping.

A) $\frac{1}{7}$
B) $\frac{1}{10}$
C) $\frac{2}{11}$
D) $\frac{2}{30}$

31. 4 nafar o‘g‘il va 3 nafar qiz bola yonma-yon tizilganda, ikkita qiz birga kelmaslik ehtimoli qancha?

A) $\frac{2}{5}$ B) $\frac{2}{7}$

C) $\frac{2}{7}$ D) $\frac{2}{3}$

32. Teng yonli uchburchakning yon tomonlari 20 va asosi esa 24 ga teng. Uchburchakning yon tomoniga tushirilgan balandligini toping.

A) *18* B) *16*

C) *19,2* D) *19*

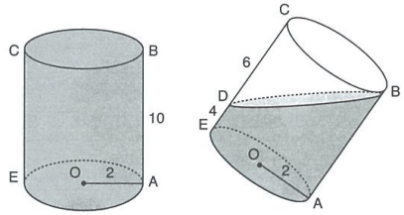
Topshiriqlar (33–35) va javob variant (A–F)larini o‘zaro to‘g‘ri moslashtiring.

$|AB| = 10\,cm, |OA| = 2\,cm$

$|DE| = 4\,cm, |DC| = 6\,cm$

Rasmda suv bilan to‘ldirilgan silindr birinchi rasmdagi holatdan ikkinchi rasmdagi holatga o‘tkazilganda suvning bir qismi to‘kiladi.

$(\pi = 3)$



33. Ikkinchi rasmdagi suvning hajmi qancha?

34. Ikkinchi silindr tekis holatga keltirilsa, suvning balandligi qanday bo‘ladi?

35. To‘kilgan suv hajmini toping.

A) *84*
B) *12*
C) *8*
D) $12\sqrt{5}$
E) *45*
F) *24*

36. Tenglamani yeching:

$$(\cos x - 1)\left(\operatorname{tg} x + \sqrt{3}\right)\sqrt{\cos x} = 0$$

A) Tenglamani yeching.

B) $\left[3\pi; \frac{9\pi}{2}\right]$ oraliqqa tegishli ildizlari yig‘indisini toping.

37. Tengsizlikni yeching.

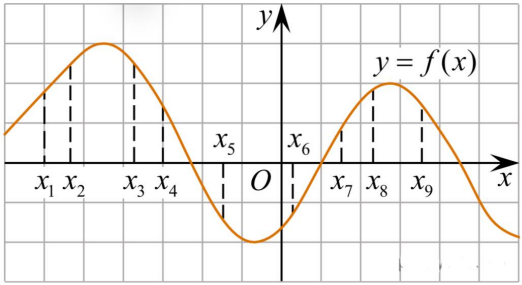
$$\left(x^2+1\right)^{\lg\left(7x^2-3x+1\right)}+$$

$$\left(7x^2-3x+1\right)^{\lg\left(x^2+1\right)}\le 2$$

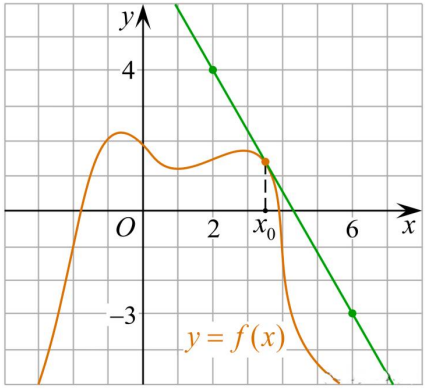
A) Tengsizlikni yeching.

B) Tengsizlikning butun yechimlari sonini toping.

38. A) Rasmda y = f(x) differentsiallanuvchi funksiyaning grafigi ko'rsatilgan. Absissa o'qida to'qqizta nuqta belgilangan: x_1 , x_2 ,..., x_9 . Bu nuqtalar orasidan y = f (x) funksiyaning hosilasi manfiy bo'lgan barcha nuqtalar sonini toping.



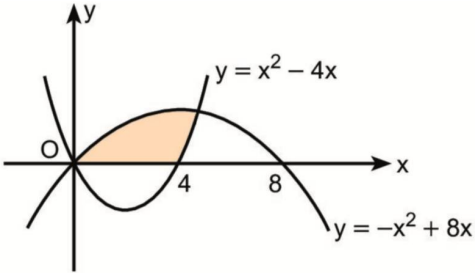
B) Rasmda y = f (x) funksiyaning grafigi va absissa x_0 nuqtada unga o'tkazilgan urinma ko'rsatilgan. f (x) funksiyaning x_0 nuqtadagi hosilasi qiymatini toping.



39. Rasmda y = f(x) va y = g(x) funksiya grafiklari keltirilgan.

$f(x) = x^2 - 4x$

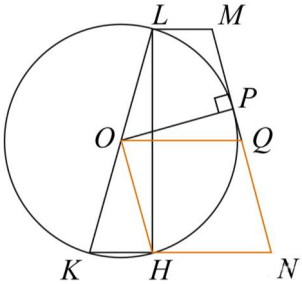
$g(x) = -x^2 + 8x$



A) Yuqoridagi rasmga ko‘ra bo‘yalgan soha yuzini toping.

B) $\int_1^3 \big(f(x)+g(x)\big)dx$ ni toping.

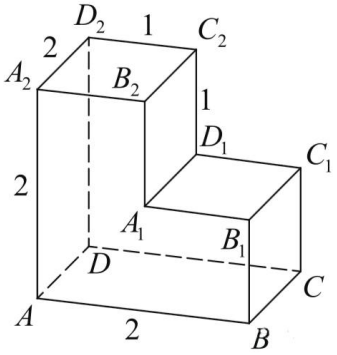
40. KN va LM asoslari bo‘lgan KLMN teng yonli trapetsiya berilgan. KL yon tomonida diametri sifatida qurilgan markazi O bo‘lgan doira MN yon tomoniga urinib, kattaroq KN asosini H nuqtada ikkinchi marta kesib o‘tadi, Q nuqta MN ning o‘rtasi. NQOH to‘rtburchak parallelogramm.



A) $\angle LKN = 75^\circ$ va $LM = 1$ bo‘lsa, KN ni toping.

B) Trapetsiya yuzini toping.

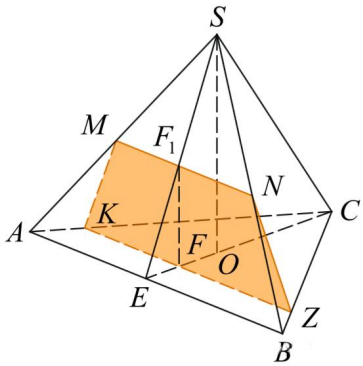
41. Ko'pburchakning barcha ikki yoqli burchaklari to'g'ri burchaklardir.



A) Rasmda ko'rsatilgan ko'pburchakning CAD_2 burchagini toping.

B) Shakl hajmini toping.

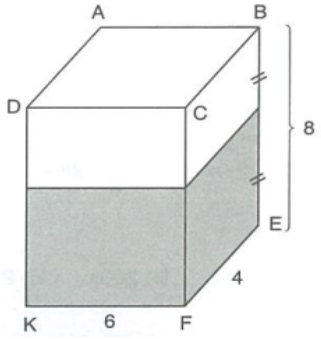
42. Muntazam uchburchakli SABC piramidasida AB tayanch tomoni 12 ga, yon qirrasi SA esa 8 ga teng. M va N nuqtalar mos ravishda SA va SB qirralarining o'rta nuqtalaridir. a tekislik MN chizig'ini o'z ichiga oladi va piramida asosining tekisligiga perpendikulyar.



A) C nuqtadan hisoblaganda, a tekislik asosning CE medianasini qanday nisbatda ajratadi?

B) cho'qqisi C nuqta, asosi esa SABC piramidasining a tekislik kesmasi bo'lgan piramidaning hajmini toping.

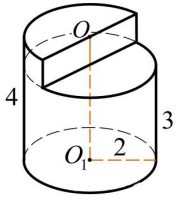
43. Qirralari 4, 6, 8 bo‘lgan to‘g‘ri to‘rtburchakli prizma yarmigacha suyuqlik bilan to‘ldirilgan.



A) Bu suyuqlik hajmini cm^3 da aniqlang.

B) Bu prizma eng katta yuzasi bilan yiqitilsa suyuqlik balandligi necha cm bo‘ladi?

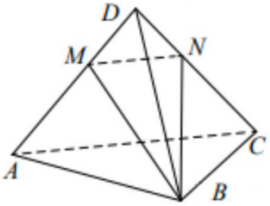
44. Rasmda silindr ko‘rsatilgan.



A) Ko‘rsatilgan silindr qismining V hajmini toping.

B) Silindr o‘q kesimi yuzini toping.

45. ABCD piramidada DA, DB va DC qirralari juftlikda perpendikulyar.



A) MN kesma uzunligini toping.

B) M va N nuqtalar DA va DC chekkalarida mos ravishda olingan. DM:MA = DN:NC = 2:3. MNB ko‘ndalang kesim yuzini toping.