

MATEMATIKA

1. Ifodaning qiymati toping:

$$\frac{(\sqrt{5} - \sqrt{11})(\sqrt{33} + \sqrt{15} - \sqrt{22} - \sqrt{10})}{\sqrt{75} - \sqrt{50}}$$

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

2. Uch yashikda 64,2 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) 36 kg B) 30 kg C) 28 kg D) 24 kg

3. Uchta sonning uchinchi ikkinchisidan nechta ortiq bo'lsa, ikkinchi birinchisidan shuncha ortiq. Bu sonlardan ikkita kichigining ko'paytmasi 85, ikkita kattasining ko'paytmasi 115 ekanligi ma'lum. Shu uchta sondan ikkinchisini toping.

- A) 10,5 B) 9,5 C) 11 D) 10

4. Tenglamani yeching: ($a \neq 1$)

$$1 + a + a^2 + a^3 + \dots + a^{x-1} + a^x = (1 + a)(1 + a^2)(1 + a^4)(1 + a^8).$$

- A) 14 B) 15 C) 16 D) 17

5. Arifmetik progressiyada $a_{19} = 9a_{11}$ bo'lsa, uning dastlabki o'n to'qqizta hadi yig'indisini toping.

- A) 4 B) 38 C) 0 D) 19

6. 1, 2, 2, 3, 3, 3, 4, 4, 4, 4, 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

7. 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

8. Agar geometrik progressiyada $b_5 - b_1 = 18$ va $b_3 - b_1 = 12$ bo'lsa, b_{11} ni toping.

- A) $-\frac{16}{27}$ B) $-\frac{4}{94}$ C) $-\frac{3}{4}$ D) $-\frac{3}{8}$

9. $\sin x + \sqrt{3} \cos x = 1$ tenglamaning $(-\pi; \pi)$ intervalga tegishli ildizlari yig'indisini toping.

- A) 90° B) 120° C) 135° D) 60°

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

- A) $\frac{5\pi}{12}$ B) $\frac{5\pi}{3}$ C) $\frac{11\pi}{12}$ D) $\frac{5\pi}{6}$

11. Hisoblang: $\sin\left(\frac{1}{2} \arcsin\left(-\frac{2\sqrt{2}}{3}\right)\right)$.

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

12. $\frac{|\log_{0,5}\left(\operatorname{tg}\frac{\pi}{3}\right)|}{\log_{0,5}\left(\operatorname{tg}\frac{\pi}{3}\right)} + \frac{3 \cdot |3\sqrt{3} - 2\sqrt{7}|}{3\sqrt{3} - 2\sqrt{7}} + \frac{9 \cdot \left|\arccos(-0,5) - \frac{\pi}{2}\right|}{\arccos(-0,5) - \frac{\pi}{2}}$ ifodaning qiymatini toping.

- A) 10 B) 4 C) 5 D) 6

13. Ifodani soddalashtiring: $\frac{1 - \sin^2 \alpha}{1 - \cos^2 \alpha} + \operatorname{tg} \alpha \cdot \operatorname{ctg} \alpha$.

- A) $\sin^2 \alpha$ B) $\cos^2 \alpha$ C) $\frac{1}{\cos^2 \alpha}$ D) $\frac{1}{\sin^2 \alpha}$

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. 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) $\cos^2 \alpha$

16. Agar $12 \cdot \sin 5^\circ \cdot \cos 5^\circ \cdot \cos 10^\circ = m$ tenglik bajarilsa, $\operatorname{tg} 70^\circ$ ni m orqali ifodalang.

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

17. 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) $\sin \alpha$

18. Ifodani soddalashtiring:

$$\left(2(\sin \alpha)^{-1} + 2(\operatorname{tg} \alpha)^{-1}\right) : \left(\operatorname{tg} \frac{\alpha}{2}\right)^{-1}$$

- A) $\operatorname{tg} \frac{\alpha}{2}$ B) 4 C) $\operatorname{ctg} \frac{\alpha}{2}$ D) 2

19. Ifodani soddalashtiring:

$$\left((\sin \alpha)^{-1} + (\operatorname{tg} \alpha)^{-1}\right) : \left(\operatorname{tg} \frac{\alpha}{2}\right)^{-1}$$

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

20. Ifodani soddalashtiring: $\frac{1}{2}(\cos \alpha - \cos \beta)^2 +$

$$\frac{1}{2}(\sin \alpha - \sin \beta)^2 - 2 \sin^2 \frac{\alpha - \beta}{2}$$

- A) $4 \sin^2 \frac{\alpha - \beta}{2}$ B) 1 C) $4 \sin \frac{\alpha - \beta}{2}$ D) 0

21. Ifodani soddalashtiring:
 $5 - \left((\cos \alpha - \cos \beta)^2 + (\sin \alpha - \sin \beta)^2 \right) :$
 $\left(2 \sin^2 \frac{\alpha - \beta}{2} \right)$
 A) $\sin^2 \frac{\alpha - \beta}{2}$ B) 3 C) $2 \sin^2 \frac{\alpha - \beta}{2}$ D) 2

22. Agar $a = 8$ 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) 10 B) 8 C) 9 D) 4,5

23. Ifodani soddalashtiring:
 $\frac{1 - \log_a^3 b}{(\log_a b + \log_b a + 1) \cdot \log_a \frac{a}{b}} \cdot \log_b a$
 A) 3 B) 0 C) 2 D) 1

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

25. $\frac{x}{ax - 2a^2} - \frac{2}{x^2 + x - 2ax - 2a} \cdot \left(1 + \frac{3x + x^2}{3 + x} \right)$
 ifodaning $a=0,25$ dagi qiymatini toping.
 A) 1/16 B) 4 C) 1/4 D) 16

26. 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) $-\frac{\sqrt{a+1}}{a+3}$ B) $-\frac{\sqrt{a+1}}{\sqrt{a+3}}$ C) $\frac{\sqrt{a+1}}{\sqrt{a+3}}$
 D) $\frac{\sqrt{a+1}}{a+3}$

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

28. $\frac{x^2 y^2 + 2xy - 3}{x^2 y^2 - 1}$ kasrni qisqartiring.
 A) $\frac{xy + 3}{xy - 1}$ B) $\frac{xy - 3}{xy + 1}$ C) $\frac{xy + 3}{xy + 1}$
 D) $\frac{xy - 3}{xy - 1}$

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

30. 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) $-\frac{2}{3}$ D) $-\frac{1}{2}$

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

32. $\sqrt{x + 3 - 4\sqrt{x - 1}} + \sqrt{x + 8 - 6\sqrt{x - 1}} = 1$
 $(5 \leq x \leq 10)$ bo'lsa, tenglamaning butun ildizlari
 yig'indisini toping.
 A) 15 B) 45 C) 20 D) 10

33. 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) $x + 2$

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

35. Agar $|a| \neq |b| \neq |c|$ va $\frac{a}{b+c} + \frac{b}{c+a} + \frac{c}{a+b} = 1$
 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) 1 B) 0,5 C) 0 D) 2

36. Tenglamani yeching: $\frac{x - 1}{1 + \sqrt{x}} = 4 - \frac{1 - \sqrt{x}}{2}$.
 A) 49 B) 81 C) 64 D) 25

37. $2x^2 - (2\sqrt{3} + 3\sqrt{2})x + \sqrt{6} + 2 = 0$ tenglamaning
 kichik ildizini toping.
 A) $\frac{\sqrt{2}}{2}$ B) $-\frac{\sqrt{2}}{2}$ C) $\sqrt{3} - \sqrt{2}$ D) $\sqrt{3} + \sqrt{2}$

38. $(x - 3)^6 + (x^2 - 2x - 1)^3 = 0$ tenglamaning
 ildizlari yig'indisini (agar u bitta bo'lsa, shu
 ildizning o'zini) toping.
 A) 4 B) 1 C) 2 D) 3

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

40. 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) $\left\{ \frac{2\pi n}{3}, n \in Z \right\}$

41. Tenglamani yeching: $6 \sin^2 x + 13 \sin x + 5 = 0$.

- A) $x = -\frac{\pi}{6} + \frac{\pi n}{2}, n \in Z; x = \frac{7\pi}{6} + \pi n, n \in Z$
 B) $x = -\frac{\pi}{6} + \pi n, n \in Z; x = \frac{\pi}{6} + 2\pi n, n \in Z$
 C) $x = -\frac{\pi}{6} + 2\pi n, n \in Z; x = \frac{7\pi}{6} + 2\pi n, n \in Z$
 D) $x = -\frac{\pi}{3} + 2\pi n, n \in Z; x = \frac{7\pi}{5} + 2\pi n, n \in Z$

42. $\frac{(5^x - 25) \cdot (7^x - 7)}{\sqrt{7 - 5x}} = 0$ tenglamani yeching. Ildizlari 5 dan qancha kam?

- A) 8 B) 6 C) 10 D) 4

43. $\frac{13^{x^2+3x+2} - 11^{x^2+3x+2}}{x+1} = 0$ tenglamani yeching. Ildizlari 8 dan qancha kam?

- A) 12 B) 8 C) 6,9 D) 10

44. $\log_2^2 x - \log_4 \sqrt{x} - 1,5 = 0$ tenglamani yeching. Eng katta va eng kichik ildizlari nisbatini toping.

- A) 16 B) 64 C) 32 D) 2

45. $\log_{x-1} x^2 = \log_{x-1} (6x - 8)$ tenglamani yeching. Ildizlari soni x_0 bo'lsa, $x_0 + 5$ ni toping.

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

46. Tenglama ildizlari yig'indisini toping: $4^{\log_4^2(x+2)} + 2(x+2)^{\log_4 \sqrt{x+2}} = 8$.

- A) $\frac{3}{4}$ B) $\frac{5}{4}$ C) $\frac{1}{4}$ D) $\frac{15}{4}$

47. Ildizlari $\frac{1}{10 - \sqrt{72}}$ va $\frac{1}{10 + 6\sqrt{2}}$ ga teng bo'lgan ratsional koeffitsiyentli kvadrat tenglamani aniqlang.

- A) $7x^2 - 20x + 1 = 0$ B) $7x^2 - 5x + 1 = 0$
 C) $28x^2 - 20x + 1 = 0$ D) $28x^2 - 20x + \frac{1}{4} = 0$

48. $x^2 - 11 + \sqrt{x^2 + 11} = 20$ tenglama ildizlari nisbatini toping.

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

49. $x^4 - 2x^3 + x^2 - 9 = 0$ tenglamani yeching. Ildizlari yig'indisi a va ildizlari soni b bo'lsa, $a + b$ ni toping.

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

50. $2x^3 + 3x^2 - 1 = 0$ tenglama katta ildizining kichik ildiziga nisbatini toping.

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

51. Tenglamani yeching: $2^{\sin^2 x} + 2^{\cos^2 x} = 3$.

- A) $\pi k, k \in Z$ B) $\frac{\pi k}{2}, k \in Z$ C) $\frac{\pi k}{4}, k \in Z$
 D) $\frac{\pi k}{3}, k \in Z$

52. 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) $(4; -4), (-2; -1)$

53. Tenglamalar sistemasini yeching:

$$\begin{cases} 2^x - 3^y = 1 \\ 2^{x+2} - 3^{y+1} = 7 \end{cases}$$

- A) $(2; -1)$ B) $(2; 1), (-2; -1)$ C) $(2; 1)$
 D) $(2; 1), (1; 2)$

54. Tenglamalar sistemasini yeching:

$$\begin{cases} x^{13} = 12^y \\ x^2 - 11x - 12 = 0 \end{cases}$$

- A) $(12; 13)$ B) $(12; 13), (-12; -13)$
 C) $(-12; -13)$ D) $(12; 13), (13; 12)$

55. $6x^3 - 7x^2 - 16x + m = 0$ tenglama ildizlaridan biri 2 ga teng bo'lsa, qolgan ildizlari ko'paytmasini toping.

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

56. $|5x - 3| + |3x - 5| = 9x - 10$ tenglamani yeching. Ildizlari soni 9 dan qancha kam?

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

57. $\frac{x^7 - 4x^5 + 4x^2 - 7x - 2}{x^7 - 4x^5 + 3x^2 - 4x - 4} = 1$ tenglamani yeching. Ildizlari yig'indisini (agar u bitta bo'lsa, shu ildizning o'zini) toping.

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

58. $\frac{2}{x^2 - 4} + \frac{x - 4}{x^2 + 2x} = \frac{1}{x^2 - 2x}$ tenglamani yeching. Ildizlari yig'indisini (agar u bitta bo'lsa, shu ildizning o'zini) toping.

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

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

60. Tenglamani yeching:

$$4 \cos^2 x - 2 \sin^2 x - 5 \cos x - 4 = 0.$$

- A) $x = \arccos\left(-\frac{2}{3}\right) + \pi n, n \in Z$
 B) $x = \pm \arccos\frac{2}{3} + \pi n, n \in Z$
 C) $x = \pm \arccos\left(-\frac{2}{3}\right) + \pi n, n \in Z$
 D) $x = \pm \arccos\left(-\frac{2}{3}\right) + 2\pi n, n \in Z$

61. Tenglamalar sistemasini yeching:

$$\begin{cases} (x + xy^2 + y^2)(x + y^2)^2 = 225 \\ (x - xy^2 + y^2)(x + y^2)^2 = 25 \end{cases}$$

- 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)

62. Tenglamalar sistemasini yeching:

$$\begin{cases} x + y + xy = 0 \\ x^3 + y^3 + x^3y^3 = 12 \end{cases}$$

- A) $(1 + \sqrt{3}; 1 - \sqrt{3}), (1 - \sqrt{3}; 1 + \sqrt{3})$
 B) $(1; \sqrt{3}), (\sqrt{3}; 1)$ C) $(1 - \sqrt{3}; 1 + \sqrt{3})$
 D) $(1 + \sqrt{3}; 1 + \sqrt{3}), (1 - \sqrt{3}; 1 - \sqrt{3})$

63. Tenglamalar sistemasini yeching:

$$\begin{cases} y - \log_3 x = 1 \\ x^y = 3^{12} \end{cases}$$

- A) $\left(\frac{1}{81}; 3\right), (27; 4)$ B) $\left(\frac{1}{81}; -3\right), (27; 2)$
 C) $\left(\frac{1}{81}; -3\right), (81; 4)$ D) $\left(\frac{1}{81}; -3\right), (27; 4)$

64. a ning qanday eng katta butun qiymatida $3x^2 - 18x - 3 > a$ tengsizlik x ning barcha qiymatlarida o'rinli bo'ladi?

- A) -29 B) -32 C) -30 D) -31

65. $\frac{(8-x)^2}{x-3} > 0$ tengsizlikning $[-1; 9]$ oraliqda yotuvchi butun yechimlari yig'indisini toping.

- A) 17 B) 31 C) 42 D) 39

66. $2^{\log_{0,4}(x)} \cdot \log_{0,4}(2,5x) > 1$ tengsizlikning eng kichik natural yechimini toping.

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

67. $\log_{0,2}^2(x-1) > 4$ tengsizlikni yeching.

- A) $(0; 1,04) \cup (5; \infty)$ B) $(26; \infty)$ C) $(1; 26)$
 D) $(1; 1,04) \cup (26; \infty)$

68. $\frac{5}{|x+2|+2} > |x+2| - 2$ tengsizlikni qanoatlantiruvchi butun sonlar nechta?

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

69. $2^{\sqrt{x+1}} - 6 < 2^{4-\sqrt{x+1}}$ tengsizlikni qanoatlantiruvchi eng katta va eng kichik butun sonlar ayirmasini toping.

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

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

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

71. $f(x) = \left(\frac{1}{3}\right)^{x^2-6x+11}$ funksiyaning qiymatlari sohasini toping.

- A) $(0; 9]$ B) $[-9; \infty)$ C) $\left(0; \frac{1}{9}\right]$ D) $[9; \infty)$

72. $y = \sqrt{\log_{\frac{1}{3}}(x^2 - 2x) + 1}$ funksiyaning aniqlanish sohasini toping.

- A) $[-1; 3]$ B) $(-\infty; 0) \cup (2; \infty)$
 C) $(-\infty; -1] \cup [3; \infty)$ D) $[-1; 0) \cup (2; 3]$

73. $y = (1 + \operatorname{ctg}^2 x) \sin^2 x + \frac{2 \sin 2x}{\cos x}$ funksiyaning qiymatlari sohasini toping.

- A) $[-1; 3]$ B) $[-1; 1) \cup (1; 3]$ C) $[-3; 5]$
 D) $(-3; 1) \cup (1; 5)$

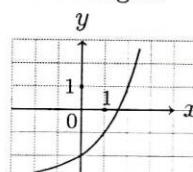
74. $y = \frac{\sin x(\operatorname{ctg} x + 1) + \cos x(\operatorname{tg} x + 1)}{2}$ funksiyaning qiymatlari sohasini toping.

- A) $[-\sqrt{2}; \sqrt{2}]$
 B) $[-\sqrt{2}; -1) \cup (-1; 0) \cup (0; 1) \cup (1; \sqrt{2})$
 C) $[-\sqrt{2}; 0) \cup (0; \sqrt{2}]$
 D) $[-\sqrt{2}; -1) \cup (-1; 1) \cup (1; \sqrt{2}]$

75. $y = \arcsin\left(\left|x - \frac{1}{2}\right| + |x|\right)$ funksiyaning qiymatlari sohasini ko'rsating.

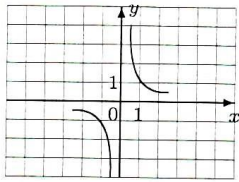
- A) $\left[\frac{\pi}{6}; \frac{\pi}{2}\right]$ B) $\left[0; \frac{\pi}{2}\right]$ C) $\left[-\frac{\pi}{2}; \frac{\pi}{2}\right]$
 D) $\left[-\frac{\pi}{2}; \frac{\pi}{6}\right]$

76. Chizmada qaysi funksiya grafigi taqriban tasvirlangan?



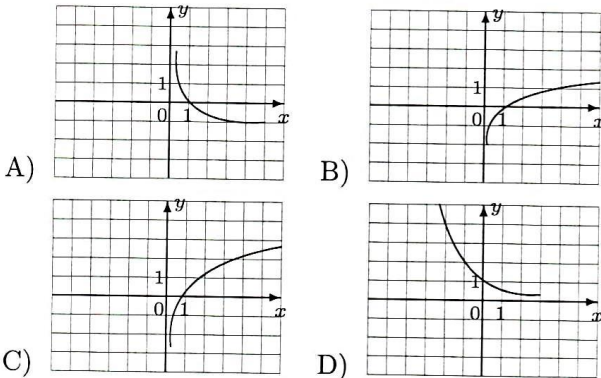
- A) $y = 2^{-x} - 2$ B) $y = 2^x - 2$ C) $y = 2^{x-1,5}$
 D) $y = 2^x - 3$

77. Chizmada qaysi funksiya grafigi taqriban tasvirlangan?

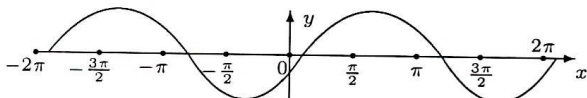


- A) $y = x^{-4}$ B) $y = x^{-3}$ C) $y = x^3$
 D) $y = x^{-2}$

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

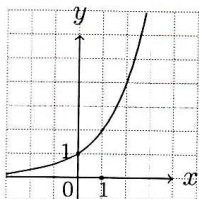


79. Chizmada qaysi funksiya grafigi taqriban tasvirlangan?



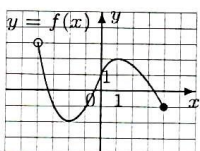
- A) $y = \sin\left(x + \frac{\pi}{6}\right)$ B) $y = \sin\left(x + \frac{\pi}{3}\right)$
 C) $y = \sin\left(x - \frac{\pi}{6}\right)$ D) $y = \sin x$

80. Grafik ko'rinishda berilgan funktsiyani toping.



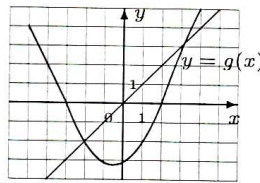
- A) $y = e^x$ B) $y = \log_2 x$ C) $y = \left(\frac{1}{2}\right)^x$
 D) $y = 2^x$

81. Grafik ko'rinishda berilgan funksiya qiymatlar to'plamini toping.



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

82. Chizmada $[-5; 4]$ kesmada berilgan $y = g(x)$ funksiyaning grafigi tasvirlangan. $g(x) \geq x$ 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) $[-2; 3]$

83. 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 C) e^e
 D) $e^{e-1} \cdot (e-1)$

84. $y = e^x - x - 1$ funksiyaning o'sish oralig'ini toping.

- A) $[0; \infty)$ B) $(0; 1)$ C) $[1; \infty)$ D) $[e; \infty)$

85. Agar $f(x) = 4 + 3 \operatorname{tg}^2 2x$ bo'lsa, $f'(\pi)$ ni toping.

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

86. $y = 4x^5 - 15x^4 - 3$ funksiyaning $(-1; 1)$ oralig'dagi eng katta qiymatini toping.

- A) -1 B) -3 C) -2 D) -115

87. $\int_{\frac{\pi}{6}}^{\frac{\pi}{3}} \frac{\sin^3 x + 1}{\sin^2 x} dx$ integralni hisoblang.

- A) $\frac{7\sqrt{3}-3}{3}$ B) $\frac{7\sqrt{3}+3}{6}$ C) $\frac{7\sqrt{3}+3}{3}$
 D) $\frac{7\sqrt{3}-3}{6}$

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

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

89. 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) ± 3 C) ± 5 D) $\frac{2 \pm \sqrt{22}}{3}$

90. $f(x) = A \cdot 2^x + B$ 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) $-\frac{1}{2}$ B) $\ln 2$ C) -1 D) -2

91. Teng yonli ABC uchburchakda AC asos, $AB=20$, $\cos A = \frac{2\sqrt{6}}{5}$ bo'lsa, asosga o'tkazilgan balandlikni toping.
A) $\frac{\sqrt{6}}{5}$ B) 4 C) 1 D) 2
92. Teng yonli trapetsiyaning katta asosi 40 sm ga, kichik asosi esa 24 sm ga teng. Bu trapetsiyaning diagonallari o'zaro perpendikulyar. Uning yuzini (sm^2) toping.
A) 2048 B) 1024 C) 512 D) 256
93. Perimetri 32 sm bo'lgan parallelogramda diagonallar o'tkazilgan. Ikkita qo'shni uchburchaklar perimetrlari orasidagi ayirma 8 sm ga teng. Parallelogram katta tomonining uzunligini (sm) toping.
A) 4 B) 8 C) 12 D) 24
94. 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) $\frac{3}{8}$ B) $\frac{5}{2}$ C) $\frac{5}{6}$ D) $\frac{7}{6}$
95. Teng yonli uchburchakning asosi $4\sqrt{2}$ sm ga, yon tomonining medianasi esa 5 sm teng. Yon tomonini (sm) toping.
A) 6 B) 5 C) $\sqrt{38}$ D) $\sqrt{34}$
96. 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, rombnig barcha uchlari uchburchakning tomonlarida yotadi. Uchburchakning katta tomoni uzunligini (sm) toping.
A) 16 B) 18 C) 12 D) 24
97. Bir nuqtadan aylanaga ikkita urinma o'tkazilgan. Har bir urinmaning uzunligi 12 sm, urinish nuqtalari orasidagi masofa 14,4 sm. Aylananing radiusini (sm) toping.
A) 6 B) 9 C) 8 D) 10
98. 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, aylananing radiusini toping.
A) $\frac{65}{9}$ B) $\frac{65}{18}$ C) $\frac{55}{18}$ D) $\frac{65}{36}$
99. Og'ma prizmaning asosi tomonlari 3 sm va 6 sm, o'tkir burchagi esa 45° bo'lgan parallelogramdan iborat. Prizmaning yon qirrasini 4 sm ga teng bo'lib, asos tekisligiga 30° burchak ostida og'gan. Prizmaning hajmini (sm^3) toping.
A) $9\sqrt{2}$ B) $12\sqrt{2}$ C) $36\sqrt{2}$ D) $18\sqrt{2}$
100. O'lchamlari $40 \times 20 \times 5$ (sm) bo'lgan to'g'ri burchakli parallelepiped shaklidagi metall dan qalinligi 1 mm bo'lgan tunuka tayyorlandi. Bu tunukaning yuzasini toping.
A) $0,4 \text{ m}^2$ B) 40 sm^2 C) 40 m^2 D) 4 m^2
101. Tekislikdan 1 m masofadagi nuqtadan tekislikka ikkita teng og'ma o'tkazilgan. Agar og'malar o'zaro perpendikulyar hamda tekislikka o'tkazilgan perpendikulyar bilan 60° li burchaklar tashkil etishi ma'lum bo'lsa, og'malarning asoslari orasidagi masofani (m) toping.
A) $\frac{\sqrt{2}}{2}$ B) $2\sqrt{2}$ C) $3\sqrt{2}$ D) $\sqrt{2}$
102. Uchlari $A(4; 2)$, $B(6; -5)$ va $C(-5; 4)$ nuqtalarda bo'lgan uchburchak berilgan. A uchidan tushirilgan balandlik quyidagi qaysi tenglama bilan berilgan to'g'ri chiziqda yotadi?
A) $x - y - 2 = 0$ B) $11x - 9y - 6 = 0$
C) $11x - 9y - 26 = 0$ D) $x - y - 6 = 0$
103. 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) $x^2 + (y - 3)^2 = 13$
C) $(x - 3)^2 + y^2 = 9$ D) $x^2 + (y - 3)^2 = 9$
104. 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) $2\sqrt{2}$ B) 2 C) $\sqrt{2}$ D) $\sqrt{3}$
105. $A = \{1; 3; 5; 6; 8; 10\}$ va $B = \{5; 6; 7; 8; 10\}$ to'plamlar berilgan. $A \cup B$ to'plam elementlari sonini toping.
A) 11 B) 8 C) 6 D) 7
106. $A = \{1; 3; 5; 6; 8; 9; 10; 11\}$ va $B = \{5; 6; 7; 8; 10; 11\}$ to'plamlar berilgan. $A \cap B$ to'plam elementlari sonini toping.
A) 4 B) 9 C) 5 D) 8
107. Do'konda 7 xil pidjak, 5 xil shim va 4 xil galstuk sotilmoqda. Pидjak, shim va galstukdan iborat komplektni nechta usul bilan sotib olsa bo'ladi?
A) 140 B) 155 C) 148 D) 146
108. 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) $\{a, b, c, d\}$ B) $\{a, c, d\}$ C) $\{c, d\}$ D) $\{b\}$

109. Birhad yoki ko'phadlar uchun quyidagi tasdiqlarning qaysi biri noto'g'ri?
- A) birhadning darajasi deb, uning tarkibidagi barcha harflar darajalarining yig'indisiga aytiladi
 B) ko'phadning darajasi deb, shu ko'phad tarkibidagi birhadlarning eng katta darajasiga aytiladi
 C) agar ko'phad tarkibida faqat 2 ta harf ishtirok etsa, ikki noma'lumli ko'phad deyiladi.
 D) ko'phadning darajasi deb, shu ko'phad tarkibidagi birhadlarning darajalari yig'indisiga aytiladi
110. 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 $0 < a < b$, $c > 0$ bo'lsa, u holda $\frac{a}{b} < \frac{a+c}{b+c}$ bo'ladi.
- A) 1; 2; 3 B) 1; 3 C) 2; 3 D) faqat 1
111. 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 1 va 3 B) faqat 1 C) faqat 2 va 3 D) 1; 2; 3
112. 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) 1; 2; 3 B) 1; 2 C) faqat 3 D) 2; 3
113. 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; 3 B) 1; 2; 3 C) 1; 2 D) faqat 3
114. To'g'ri berilgan integrallash formulalarini tanlang:
- 1) $\int \sin(kx+b) dx = -\frac{1}{k} \cdot \cos(kx+b) + C$
 2) $\int \cos(b-kx) dx = -\frac{1}{b} \cdot \sin(b-kx) + C$
 3) $\int \operatorname{tg}(kx+b) dx = -\frac{1}{k} \cdot \ln|\cos(kx+b)| + C$
- A) 1; 3 B) 1; 2; 3 C) 1; 2 D) faqat 3
115. To'g'ri berilgan integrallash formulalarini tanlang:
- 1) $\int \sin^2 x dx = \frac{1}{2}x - \frac{1}{4}\sin 2x + C$
 2) $\int \operatorname{ctg}^2 x dx = \operatorname{ctg} x + x + C$
 3) $\int \operatorname{tg}^2 x dx = \operatorname{tg} x - x + C$
- A) 1; 3 B) 1; 2; 3 C) 1; 2 D) 2; 3
116. To'g'ri berilgan integrallash formulalarini tanlang:
- 1) $\int \sin(g(x)) \cdot g'(x) dx = -\cos(g(x)) + C$
 2) $\int \cos(g(x)) \cdot g'(x) dx = \frac{1}{x} \sin(g(x)) + C$
 3) $\int \operatorname{tg}(g(x)) \cdot g'(x) dx = -\ln|\cos(g(x))| + C$
- A) 1; 3 B) 1; 2 C) 2; 3 D) 1; 2; 3
117. Nuqtalar o'rniga to'g'ri javobni tanlang.
To'g'ri burchakli uchburchak o'tkir burchagining ... deb shu burchakka yopishgan katetining qarshisidagi katetiga nisbatiga aytiladi.
- A) tangensi B) sinusi C) kosinusi
 D) kotangensi
118. Quyidagi 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 perpendikulyarlarning kesishish nuqtasida bo'ladi; 3) uchburchakning o'rta chizig'i parallel tomonidan 2 ga kam bo'ladi.
- A) 1; 2; 3 B) 1; 2 C) 2; 3 D) 1; 3
119. Quyidagi 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 kichik 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) faqat 1; 3 B) faqat 2; 3 C) faqat 1; 2
 D) 1; 2; 3
120. Quyidagi tasdiqlarning qaysilari to'g'ri?
- 1) Kub - barcha yoqlari to'rtburchaklardan iborat ko'pyoqdir;
 2) Parallelepiped - barcha yoqlari parallelogrammdan iborat ko'pyoqdir;
 3) Prizma - asoslari deb ataladigan ikki yog'i parallel tekisliklarda yotuvchi, qolgan yoqlari parallelogrammdan iborat ko'pyoqdir
- A) 1; 3 B) 1; 2; 3 C) 1; 2 D) 2; 3