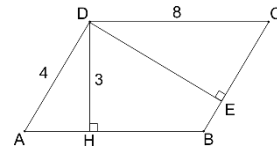


Olimpiada topshiriqlari

MATEMATIKA 10

1-qism: Har bir topshiriq 0,9 balldan baholanadi

1. $ABCD$ qavariq to'rtburchakka aylana ichki chizilgan. Agar $AB = 7$, $BC = 11$ bo'lsa, $CD - AD$ ni toping.
A) 5 B) 2 C) 3 D) 4
2. $x^2 + y^2 + \sqrt{3}y - \sqrt{5}x = 1$ tenglama bilan berilgan aylananing markazi koordinata tekisligining qaysi choragida yotadi? A) I B) II C) III D) IV
3. Supermarketda reklama aksiyasi o'tkazilmoqda: 3 ta shokolad sotib olgan xaridorga 4-shokolad sovg'a tariqasida qo'shib beriladi. Bitta shokolad narxi 28000 so'm. Xaridor 300 000 so'm evaziga eng ko'pi bilan nechta shokolad xarid qila oladi? A) 11 B) 14 C) 13 D) 12
4. Chizmada $ABCD$ –paralleloqramm. DE ni ntoping.
A) 6 B) 9 C) 5 D) 4
5. Soddashtiring: $\frac{a^2-b^2}{a+b} - \frac{a^3+b^3}{a^2-b^2} - (ab - 2a^2) \cdot (a-b)^{-1}$
A) $2b$ B) $a+b$ C) $2a$ D) $a-b$
6. Qavariq o'n ikki burchakning diagonallar sonini toping. A) 54 B) 48 C) 36 D) 40
7. k parametrning qanday musbat qiymatida $20x^2 + kx + 5 = 0$ tenglama bitta ildizga ega?
A) 40 B) 20 C) 10 D) 5
8. x_1 va x_2 sonlari $x^2 - 7x - 1 = 0$ tenglama ildizlari bo'lsa, $x_1^2 + x_2^2$ ni toping.
A) 4 B) 49 C) 53 D) 51
9. Tenglamani yeching: $\frac{7(2x-(3x-1))}{15} - \frac{8(3x-(2x-1))}{17} = \frac{7}{15}(1-x)$. A) $\frac{15}{17}$ B) 0 C) $\frac{8}{17}$ D) -1
10. Soddashtiring: $\frac{|a^2-25|}{5+a} - \frac{|a^2-16|}{a-4}$ bunda, $|a| < 3$ A) $2a-9$ B) 9 C) $9-2a$ D) $1-2a$



2-qism: Har bir topshiriq 1,5 balldan baholanadi

11. Uchinchi raqami to'rtinchi raqamidan 1 ga kichik bo'lgan to'rt xonali sonlar sonini toping
A) 900 B) 990 C) 720 D) 810
12. $f(x) = ax^2 + b$ funksiya grafigi $A(-1;5)$ va $B(2;-1)$ nuqtalardan o'tadi. $f(5 - f(1))$ ning qiymatini toping. A) 5 B) 2 C) 6 D) 7
13. 4 ga karrali va o'nli yozuvida 4, 5, 6, 8 raqamlari bo'lmagan to'rt xonali sonlar nechta?
A) 120 B) 210 C) 180 D) 150
14. $y = 4x^2 - 3x - 5$ parabola $O(0;0)$ nuqtaga nisbatan simmetrik bo'lgan parabola tenglamasini ko'rsating. A) $y = 4x^2 - 3x + 5$ B) $y = -4x^2 - 3x + 5$
C) $y = -4x^2 - 3x - 5$ D) $y = 4x^2 + 3x - 5$
15. $a^3b^2 = 1024$ tenglikni qanoatlantiruvchi nechta $(a; b)$ butun sonlar juftligi mavjud?
A) 3 B) 4 C) 5 D) 2
16. $\sqrt{x} + \sqrt{x+5} = \frac{10}{\sqrt{x}}$ tenglama nechta haqiqiy yechimga ega? A) 1 B) 2 C) 3 D) 4



Olimpiada topshiriqlari

MATEMATIKA 10

17. Agar $\frac{1}{x} = \frac{3}{y+z} = \frac{5}{z+x}$ bo'lsa, $\frac{z-y}{x}$ ni toping. A) 4 B) 4,5 C) 5 D) 3,5
18. 1,2,3,4,...,2021,2022 sonlar orasidan nechitasi 3 ga ham, 7 ga ham bo'linmaydi?
A) 1084 B) 1156 C) 1128 D) 1098
19. Agar $8^{\frac{a-1}{b}} = 5$ va $125^{\frac{b}{a}} = 4$ bo'lsa, $\left(\frac{2^a}{5^b}\right)^7$ ni toping. A) 8 B) 4 C) 0,8 D) 0,16
20. $y = x^2 - 2$ parabola $x = 2$ to'g'ri chiziqqa nisbatan simmetrik bo'lgan parabola tenglamasini tuzing.
A) $y = x^2 - 8x - 2$ B) $y = x^2 + 8x - 14$ C) $y = x^2 + 8x + 2$ D) $y = x^2 - 8x + 14$

3-qism: Har bir topshiriq 2,6 balldan baholanadi

21. $(a + a^2 + a^3) + \left(\frac{1}{a} + \frac{1}{a^2} + \frac{1}{a^3}\right) = 28$ bo'lsa, $(2a - 3)^2$ ifodaning qiymatini toping.

22. Chizmada $AE = 2, BE = 6, DE = 3$. Aylana diametrini toping.

23. $f(x) = \frac{1+x+x^2+x^3+\dots+x^{2020}+x^{2021}}{1+x^3+x^6+x^9+\dots+x^{2019}}$ bo'lsa, $f(5-f(1-f(1-f(0))))$ ni toping.

24. Agar $f(x) + (x+2)f(1-x) = x-3$ bo'lsa, $(f(0) + f(1)) \cdot f(-2)$ ning qiymatini toping.

25. $ABCD$ qavariq to'rtburchakda $\angle BAD = \angle CDA = 60^\circ, \angle BDA = \angle CAB$, $AB = 2$ va $CD = 9$ bo'lsa, AD ni toping.

26. a parametrning qanday musbat qiymatlarida $x^2 - (a+3)x + 3a + 11 = 0$ tenglamaning barcha ildizlari butun sonlardan iborat bo'ladi?

27. Tenglamani yeching: $\sqrt{6x - x^2 - 5} + \sqrt{6x - x^2 - 8} = 3 + \sqrt{4x - x^2 - 3}$.

28. $\angle BAD = \angle ABD = 20^\circ, \angle DBC = 110^\circ, \angle BCD = 30^\circ$ va $AB = 2, CD = ?$

29. Ikki son o'rtasidagi Δ operatsiyasiga ko'ra quyidagi natijalar olindi:

$$9 \Delta 2 = 117$$

$$3 \Delta 3 = 60$$

$$5 \Delta 4 = 91$$

$$11 \Delta 9 = 202$$

$7 \Delta 1$ operatsiya natijasini toping.

30. Raqamlari yig'indisi 3 ga teng bo'lgan o'n xonali natural sonlar nechta?

