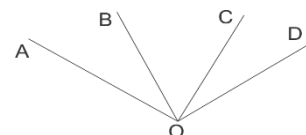


Olimpiada topshiriqlari

MATEMATIKA 9

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

- Hisoblang $\left(1\frac{3}{4}; 1,125 - 1,75; \frac{2}{3}\right) \cdot 1\frac{5}{7}$ A) $-1\frac{7}{12}$ B) $-1\frac{1}{4}$ C) $-1\frac{5}{6}$ D) $-1\frac{1}{3}$
- Soddalashtiring: $\frac{27a^3-64b^3}{b^2-4} : \frac{9a^2+12ab+16b^2}{b^2+4b+4}$
A) $\frac{(3a-4b)(b+2)}{b-2}$ B) $\frac{(3a-4b)(b-2)}{b+2}$ C) $\frac{(3a+4b)(b+2)}{b-2}$ D) $\frac{(3a+4b)(b-2)}{b+2}$
- Agar $3x - y = 7$ va $5x + 4y = 21$ bo'lsa, $24x + 9y$ ni hisoblang.
A) 90 B) 78 C) 69 D) 84
- Chizmada $\angle AOD = 120^\circ$, $\angle BOD = 3\angle AOB$ va $\angle AOC = 2\angle COD$ bo'lsa, $\angle BOC$ burchak nimaga teng? A) 45° B) 50° C) 60° D) 30°
- Soddalashtiring: $\sqrt{-4a} - \sqrt[3]{-8a} - \sqrt{-9a} - 2\sqrt[3]{a}$
A) $-5\sqrt{a}$ B) $-\sqrt{-a} - 4\sqrt[3]{a}$ C) $-\sqrt{-a}$ D) $-4\sqrt[3]{a}$
- Tenglamani yeching: $\frac{20-x}{20} - \frac{22-x}{22} = \frac{20+x}{22} - \frac{22+x}{20}$ A) 0 B) $\frac{29}{220}$ C) $\frac{10}{11}$ D) $\emptyset$
- a parametrlarning qanday qiymatlarida $9 + 3a$, $5 - 2a$ va $15 - 5a$ uzunlikdagi kesmalardan uchburchak yashash mumkin? A) $(0; 2,5)$ B) $\left(\frac{1}{6}; 1,5\right)$ C) $\left(\frac{1}{6}; 1,1\right)$ D) $\left(\frac{1}{3}; 1,2\right)$
- Soat strelkasi 5 soat vaqt o'tgandan keyin qanday burchakka buriladi?
A) 120° B) 100° C) 160° D) 150°
- Uchlari $A(2; -3)$, $B(6; 0)$, $C(6; 2)$ va $D(2; 2)$ nuqtalarda bo'lgan $ABCD$ to'rtburchak yuzini toping.
A) 14 B) 18 C) 16 D) 12
- Agar $a + b - 2c = 0$ bo'lsa, $\frac{a}{a-c} + \frac{b}{b-c}$ ni hisoblang. A) 0 B) 1 C) 2 D) 3



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

- Soddalashtiring: $\frac{a^2-ac-bc-b^2}{a^2+ac+bc-b^2}$ A) $\frac{a+b}{a-b}$ B) $\frac{a-b}{a+b}$ C) $\frac{a-b+c}{a+b-c}$ D) $\frac{a-b-c}{a-b+c}$
- ABC uchburchakning AE va BF medianalari P nuqtada kesishadi. Agar ABC uchburchak yuzi 36 bo'lsa, PECF to'rtburchak yuzini toping. A) 12 B) 18 C) 9 D) 6
- $\frac{16-x^2}{x+4} - \frac{x^2-9}{3-x} < 10$ tengsizlikning $(-5; 5)$ oraliqda nechta butun yechimi mavjud?
A) 7 B) 8 C) 9 D) 10
- Agar $ac < 0$ bo'lsa, $y = ax^2 - bx + c$ funksiya grafigi koordinatalar tekisligining qaysi choraklaridan o'tadi? A) I, II, III B) II, III, IV C) I, III, IV D) Bo'lmagan
- Anvar 2 dan boshlab barcha natural sonlarni doskaga yozdi. U yozayotganda to'la kub bo'lgan sonlarni qoldirib ketdi (8, 125 kabi). Doskaga 2186-o'rinda yozilgan sonni toping.
A) 2200 B) 2199 C) 2198 D) 2197

Olimpiada topshiriqlari
MATEMATIKA 9

16. x_0 haqiqiy son $x^3 + 1 = (x^2 - x - 1)^2 - 4$ tenglama ildizi bo'lsa, $(x_0 - 1)^2$ ni toping.

- A) 2 B) 3 C) 5 D) 7

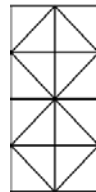
17. $ABCD$ to'rtburchakda: $AB = CD, BC = AD$. Agar A burchak B burchakdan 4 marta katta bo'lsa, to'rtburchakning A burchagini toping. A) 124° B) 144° C) 132° D) 148°

18. Chizmadagi uchburchaklar sonini toping.

- A) 24 B) 28 C) 30 D) 26

19. $f(x) = ax + b$ funksiya grafigi $A(-1;3)$ va $B(1;7)$ nuqtalar orqali o'tadi.

- $f(4 - f(-1))$ ni toping A) 10 B) 9 C) 12 D) 7



20. Ikkinchi raqami uchinchi raqamidan 4 marta katta, birinchi raqami esa ikkinchi raqamidan 3 ta kam bo'lgan uch xonali sonlar nechta? A) 1 B) 2 C) 3 D) 4

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

21. Ikkinchi raqami uchinchi raqamidan 1 ta kam bo'lgan uch xonali sonlar sonini toping.

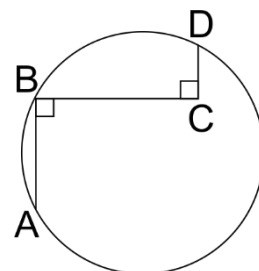
22. Hisoblang: $\left(\frac{1^2}{1 \cdot 3} + \frac{2^2}{3 \cdot 5} + \frac{3^2}{5 \cdot 7} + \dots + \frac{10^2}{19 \cdot 21}\right) \left(2 - \frac{1}{11}\right)$

23. Agar $\frac{1}{a^2-2} + \frac{1}{a^2+2} = 0,5$ bo'lsa, $20 \cdot \left(\frac{1}{a^2-2a+2} + \frac{1}{a^2+2a+2}\right)^2$ ning qiymatini toping.

24. Agar $AB = 12, BC = 14, CD = 2$ bo'lsa, aylana radiusini aniqlang.

25. Soddashtiring $\left(\sqrt{6} + \sqrt{2} - \frac{\sqrt{3} + 3\sqrt{2} + \sqrt{6} + 1}{\sqrt{2} + 2\sqrt{3} + \sqrt{6} + 1} - 1\right) \cdot \sqrt{12}$

26. $-16 \leq 2(y - 7) \leq 0$ va $-7 \leq x \leq 8$ bo'lsa, $x^2 - y^2$ ifodaning eng kichik qiymatini toping.



27. Raqamlari yig'indisi 2 ga teng bo'lgan o'n xonali natural sonlar nechta?

28. $a = 0,12(12), b = 0,1(21), c = 0,12(11)$. Agar $a + b + c = 0, x_1 x_2 x_3 x_4 \dots x_{2021} x_{2022} x_{2023} \dots$ bo'lsa, x_{2022} ni toping (bunda, $x_1, x_2 \dots$ raqamlar).

29. Oila erkak kishi, uning ayoli va talaba qizidan iborat. Agar erkak kishining maoshi 2 barobar oshsa, u holda oila daromadi 67%ga ortadi, agar talaba qizning stipendiyasi 3 barobar kamaysa, oila daromadi 4%ga qisqaradi. Ayolning maoshi oila daromadining necha foizni tashkil qiladi?

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

$$5 \Delta 2 = 74$$

$$3 \Delta 3 = 66$$

$$5 \Delta 4 = 98$$

$$9 \Delta 11 = 2022$$

12 Δ 1 operatsiya natijasini toping.