

**1-gism: Har bir topshiriq 0.9 balldan baholanadi.**

- Soddalashtiring:  $\frac{a^2-9}{3+a} - \frac{4+a^2-5a}{a-4}$  bunda,  $|a| < 1$ . A)  $2a + 4$  B)  $-2$  C)  $2 - 2a$  D)  $4 - 2a$
- $ff(3) \cdot (x - 2) + ff(x - 1) = 3x$  bo'lsa,  $ff(1)$  ni toping. A) 4 B) 2 C) 3 D) 6
- Soddalashtiring:  $\frac{\operatorname{sssn}12^\circ + \operatorname{sssn}14^\circ}{\operatorname{sssn}12^\circ - \operatorname{sssn}14^\circ} \cdot \operatorname{ctg}1^\circ \cdot \operatorname{ctg}13^\circ$   
A)  $-1$  B)  $-\operatorname{ctg}1^\circ$  C)  $-\operatorname{ctg}13^\circ$  D)  $-\operatorname{ctg}21^\circ$
- Soatning minut mili  $144^\circ$  ga burilganda, soatning soat mili qanday burchakka burilada?  
A)  $6^\circ$  B)  $12^\circ$  C)  $18^\circ$  D)  $8^\circ$
- To'g'ri burchakli uchburchakning bir burchagi  $60^\circ$  ga teng. Bu burchakdan chiqarilgan bissektrisaning uzunligi 2 m. Uchburchakning gipotenuzasi uzunligini toping.  
A)  $2\sqrt{3}$  B)  $\sqrt{5}$  C)  $\sqrt{3}$  D)  $\sqrt{5} + 1$
- Soddalashtiring:  $\sqrt{-16a} + \sqrt[3]{-27a} + \sqrt{-9a} + 3\sqrt[3]{a}$   
A)  $-7\sqrt{a}$  B)  $-\sqrt{-a} - 6\sqrt[3]{a}$  C)  $7\sqrt{-a}$  D)  $-\sqrt[3]{a} - \sqrt{-a}$
- Tenglamani yeching:  $\frac{211-4x}{21} - \frac{221-3x}{22} = \frac{20+3x}{22} - \frac{30+4x}{21}$  A) 0 B)  $\frac{29}{462}$  C)  $\frac{10}{21}$  D)  $\emptyset$
- Uchlari  $A(2; -3)$ ,  $B(6; -1)$ ,  $C(6; 4)$  va  $D(2; 2)$  nuqtalarda bo'lgan  $ABCD$  to'rtburchak yuzini toping.  
A) 20 B) 18 C) 16 D) 15
- $x$  soniga teskari bo'lgan son  $x$  ning 9%ini tashkil qiladi.  $x$  ni toping. (bu yerda,  $x > 0$ )  
A)  $4\frac{1}{3}$  B)  $5\frac{1}{3}$  C)  $2\frac{2}{3}$  D)  $3\frac{1}{3}$
- Arifmetik progressiyada  $a_2 = 12$ ,  $a_7 - a_4 = 9$  bo'lsa,  $a_{19}$  ni toping A) 63 B) 54 C) 61 D) 56

**2-gism: Har bir topshiriq 1.5 balldan baholanadi**

- Nargizada 2 ta olma va 3 ta nok bor. U 5 kun ketma-ket har kuni singliga bittadan meva beradi. Bu ishni necha usul bilan amalga oshirish mumkin? A) 10 B) 8 C) 12 D) 6
- Tengsizliklar sistemasining butun yechimlari sonini toping  $\begin{cases} \log_2(x - 4)^2 \leq 4 \\ (x - 2)^2 \geq 4 \end{cases}$   
A) 5 B) 4 C) 6 D) 7
- $y = x^2 - 2x + 3$  parabolaga  $y = 3$  to'g'ri chiziqqa nisbatan simmetrik bo'lgan parabola tenglamasini tuzing. A)  $y = x^2 - 2x - 3$  B)  $y = -x^2 + 2x - 3$  C)  $y = -x^2 - 2x + 3$  D)  $y = -x^2 + 2x + 3$
- Agar  $\operatorname{sssn}2\alpha = \frac{1}{3}$ ,  $\alpha \in \left(\frac{\pi}{4}; \frac{\pi}{2}\right)$  bo'lsa  $\operatorname{sssn}2\alpha$  ni toping.  
A)  $\frac{1}{2} + \frac{\sqrt{2}}{3}$  B)  $\frac{\sqrt{2}}{2} + \frac{1}{3}$  C)  $-\frac{1}{2} + \frac{\sqrt{2}}{3}$  D)  $\frac{1}{2} - \frac{\sqrt{2}}{3}$
- $x_n = \frac{2n+1}{3}$  formula bilan berilgan sonli ketma-ketlikning dastlabki 20 ta hadining o'рта arifmetigini toping. A)  $\frac{25}{6}$  B)  $\frac{20}{3}$  C)  $\frac{22}{3}$  D)  $\frac{23}{6}$

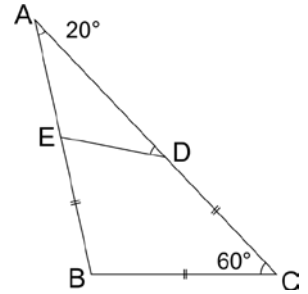


16. O'tkir burchakli uchburchakning ikki tomon uzunliklari ayirmasi 8, bu tomonlarning uchinchi tomondagi proyeksiyalari mos ravishda 8 va 20 ga teng. Berilgan uchburchakka tashqi chizilgan aylana radiusini toping. A)  $13\frac{5}{6}$  B)  $12\frac{1}{3}$  C)  $14\frac{1}{6}$  D)  $11\frac{2}{3}$

17. Agar  $4^{\frac{a+1}{b}} = 125$  va  $5^{\frac{b}{a}} = 2$  bo'lsa,  $\frac{25^{b+1}}{5a^2}$  ifodaning qiymatini toping.  
A) 0,8 B) 4 C) 20 D) 0,05

18. Hisoblang:  $\frac{1}{1^2 \cdot 3^2} + \frac{2}{3^2 \cdot 5^2} + \frac{3}{5^2 \cdot 7^2} + \dots + \frac{n}{(2n-1)^2(2n+1)^2}$   
A)  $\frac{n(n-1)}{(2n+1)^2}$  B)  $\frac{n(n+1)}{(2n+1)^2}$  C)  $\frac{n(n+1)}{2(2n+1)^2}$  D)  $\frac{n(n-1)}{2(2n+1)^2}$

19.  $BC = BE = CD$ ,  $\angle DAE = 20^\circ$ ,  $\angle BCD = 60^\circ$ ,  $\angle ADE = ?$  (chizmaga qarang)  
A)  $30^\circ$  B)  $20^\circ$  C)  $50^\circ$  D)  $40^\circ$

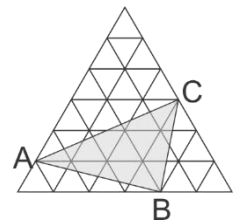


20.  $a^2b^5 = 6^{20}$  tenglikni qanoatlantiruvchi nechta  $(a; b)$  butun sonlar juftligi mavjud?  
A) 10 B) 18 C) 14 D) 12

**3-gism: Har bir topshiriq 2.6 balldan baholanadi**

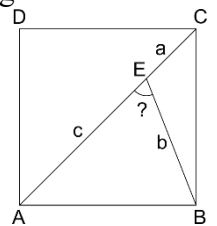
21.  $P(x^2 - 5x) = x + \frac{1}{x} + x^3 + \frac{1}{x^3}$  bo'lsa,  $P(-1)$  ni toping.

22. Muntazam uchburchak 36 ta yuzi 1 ga teng bo'lgan kichkina muntazam uchburchaklardan iborat (chizmaga qarang!).  $ABC$  uchburchak yuzini toping.



23. Raqamlari yig'indisi 10 dan kam bo'lmagan, raqamlari ko'paytmasi esa 10 dan katta bo'lmagan uchxonali sonlar nechta?

24. ABCD - kvadrat, AC-diagonal. Agar  $AE=BE+CE$  ( $a + b = c$ ) bo'lsa,  $\angle AEB$  burchakni toping(chizmaga qarang!).



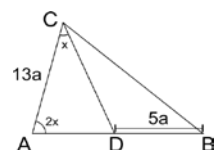
25.  $(3 - \cos^2 x - 2\sin x)(\lg^2 y + 2\lg y + 4) \leq 3$  bo'lsa,  $\sin^2 x + 20y + 1$  ni toping.

26. Natural son roppa-rosa 2 ta tub bo'luvchiga, bu sonning kvadrati esa 45 ta turli natural bo'luvchiga ega. Berilgan sonning kubi eng ko'pi bilan nechta natural bo'luvchiga ega bo'lishi mumkin?

27.  $ABC$  uchburchakda  $\operatorname{ctg} A + \operatorname{ctg} B = 3$  va  $AB = 12$  bo'lsa,  $ABC$  uchburchak yuzini toping.

28. Doskaga  $a_1, a_2, a_3, \dots, a_{200}$  sonlari yozilgan. Ma'lumki,  $a_1 = 3$ ,  $a_2 = 9$ . Agar ixtiyoriy  $n$  natural son uchun  $a_{n+2} = a_{n+1} - a_n$  tenglik o'rinli bo'lsa,  $a_{200}$  ni toping.

29.  $\angle CAD = 2\angle ACD$ ,  $AC = 13a$ ,  $BD = 5a$  va  $AB = CD$  bo'lsa,  $20 \cdot \cos \angle ACD$  ni toping.(chizmaga qarang!)



30.  $(u_n)$  ketma-ketlik quyidagicha berilgan:  $u_1 = 1$ ,  $u_{n+1} = u_n + 8n$ . U holda,  $u_{50} - u_{30}$  ni toping.





Olimpiada topshiriqlari (II tuman bosqichi)  
MATEMATIKA 11

**O'quvchilar tayyorgarlik ko'rishlari uchun o'tgan yilgi savollar keltirilmoqda.**

Maktabgacha va maktab ta'limi vazirligi Fan olimpiadalari bo'yicha iqtidorli o'quvchilar bilan ishlash departamenti tomonidan tuman bosqichi uchun nazorat materiallari shakllantirildi.

**Telegram kanalimiga obuna bo'ling!** 

<https://t.me/ustoz>

