

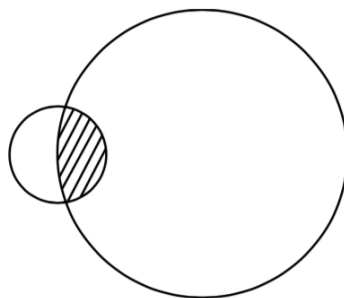
## “Intelktual Olimpiada” yozma ishi

1. Natural  $n$  sonining 14 lik sanoq sistemasidagi yozuvi  $\underline{a} \underline{b} \underline{c}$  , 15 lik sanoq sistemasidagi yozuvi  $\underline{a} \underline{c} \underline{b}$  hamda 6 lik sanoq sistemasidagi yozuvi  $\underline{a} \underline{c} \underline{a} \underline{c}$  bo'lsa bu sonning 10 lik sanoq sistemasidagi yozuvini toping?
2.  $\triangle ABC$   $AB = AC = 10$  va  $BC = 12$ .  $D$  nuqta  $AB$  kesmada,  $E$  nuqta esa  $AC$  kesmada shunday tanlanganki bunda  $AD = DE = EC$  tenglik o'rinli.  $DE$  kesma uzunligini toping?
3.  $x^4 + 2ax^3 + (2a - 2)x^2 - (4a - 3)x - 2 = 0$  tenglama haqiqiy ildizlarga ega bo'lsa,  $a$  haqiqiy sonni toping?
4.  $a_0 = 2, a_1 = 5$  va  $a_2 = 8$  hamda  $n > 2$  da  $a_n$  soni  $4(a_{n-1} + a_{n-2} + a_{n-3})$  ni 11 ga bo'lgandagi qoliq bo'lsa  $a_{2018} \cdot a_{2020} \cdot a_{2022}$  ning qiymatini toping?
5.  $ABCDEF$  olti burchakning barcha burchaklari teng, hamda  $AB = 6, BC = 8, CD = 10$  va  $DE = 12$  tomonlari uzunliklari berilgan. Bu olti burchak ichiga joylashtirish mumkin bo'lgan eng katta aylana radiusini toping?

## Test

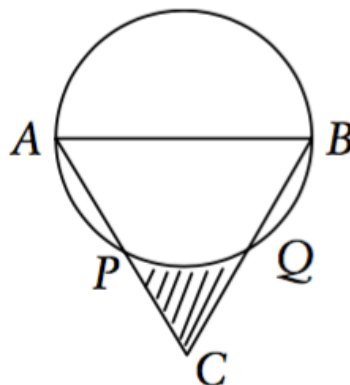
- $\alpha$  va  $\beta$  sonlari ushbu  $3x^2 + x - 1 = 0$  tenglamaning ildizlari bo'lsa,  $\frac{\alpha}{\beta} + \frac{\beta}{\alpha}$  ning qiymatini toping?  
(A)  $\frac{7}{9}$  (B)  $-\frac{7}{9}$  (C)  $\frac{7}{3}$  (D)  $-\frac{7}{3}$
- Hisoblang:  
$$\frac{\log_5 9 \log_7 5 \log_3 7}{\log_2 \sqrt{6}} + \frac{1}{\log_9 \sqrt{6}}$$
  
(A) 2 (B) 4 (C) 6 (D) 7
- Quyidagi sonlardan eng kattasini toping?  
(A)  $30^{30}$  (B)  $50^{10}$  (C)  $40^{20}$  (D)  $45^{15}$
- $x|x-1| - 4|x| + 3 = 0$  ushbu tenglamaning haqiqiy yechimlari nechta?  
(A) 0 (B) 1 (C) 2 (D) 3
- Hisoblang:  
 $50(\cos 39^\circ \cos 21^\circ + \cos 129^\circ \cos 69^\circ)$   
(A) 24 (B) 25 (C) 20 (D) 30
- Quyidagi tenglamaning ildizlari yig'indisini toping:  $\sqrt[4]{x} = \frac{12}{7 - \sqrt[4]{x}}$   
(A) 307 (B) 337 (C) 377 (D) 317
- Hisoblang:  $\sqrt{31 \cdot 30 \cdot 29 \cdot 28 + 1}$   
(A) 869 (B) 879 (C) 859 (D) 849
- Hisoblang:  
 $(\sqrt{5} + \sqrt{6} + \sqrt{7})(-\sqrt{5} + \sqrt{6} + \sqrt{7})(\sqrt{5} - \sqrt{6} + \sqrt{7})(\sqrt{5} + \sqrt{6} - \sqrt{7})$   
(A) 104 (B) 102 (C) 208 (D) 204
- Quyidagiga ko'ra,  $x^2 + y^2$  ifodaning qiymatini toping:  
 $xy + x + y = 71$  va  $x^2 y + xy^2 = 880$ .  
(A) 144 (B) 148 (C) 146 (D) 142
- $ab$  ning qiymatini toping agar quyidagilar o'rinli bo'lsa:  
 $\log_8 a + \log_4 b^2 = 5$   
 $\log_8 b + \log_4 a^2 = 7$   
(A) 156 (B) 1024 (C) 512 (D) 128
- Haqiqiy  $a$ ,  $b$ , va  $c$  musbat sonlar uchun  
 $a^{\log_3 7} = 27$   
 $b^{\log_7 11} = 49$   
 $c^{\log_{11} 25} = \sqrt{11}$  o'rinli bo'lsa  
 $a^{(\log_3 7)^2} + b^{(\log_7 11)^2} + c^{(\log_{11} 25)^2}$  ning qiymatini toping?  
(A) 496 (B) 946 (C) 649 (D) 469

12. Quyidagi chizmada, ikkita radiuslari 1 va 3 ga teng doiralar kesishmasi berilgan bo'lib, bo'yalgan soha yuzi  $\frac{\pi}{2}$  bo'lsa umimiy sohaning yuzini toping?



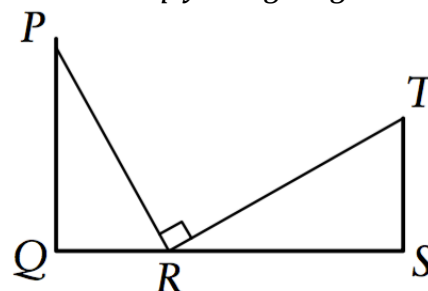
- (A)  $10\pi$  (B)  $9,5\pi$  (C)  $9\pi$  (D)  $12\pi$

13. Quyidagi chizmada,  $\triangle ABC$  muntazam,  $AB = 8$  bo'lib, uni diametr qilib chizilgan doira,  $AC$  va  $BC$  ni  $P$  va  $Q$  nuqtalarda kesib o'tadi. Bo'yalgan sohaning yuzini toping?

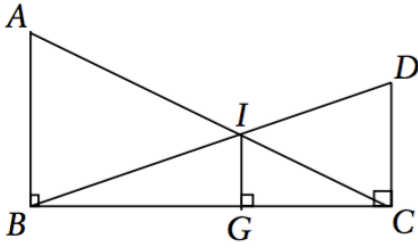


- (A) 8 (B)  $4\left(\sqrt{3} - \frac{\pi}{3}\right)$   
(C)  $8\left(\sqrt{3} - \frac{\pi}{3}\right)$  (D)  $4\left(\sqrt{3} - \frac{\pi}{2}\right)$

14. Quyidagi chizmada  $PQ$  va  $TS$  kesmalar  $QS$  kesmaga perpendukulyar,  $\angle PRT = 90^\circ$  hamda  $PQ = 12$ ,  $TS = 8$ ,  $QS = 20$  bo'lsa  $QR = x$  ning qiymati uchun qaysi to'g'ri?  
(A)  $x$  ikkita qiymatga ega va ular farqi 4  
(B)  $x$ , yig'indisi 28, ikkita qiymatga ega  
(C)  $x$  biita  $x \geq 10$  qiymatga ega  
(D)  $x$  biita  $x < 10$  qiymatga ega

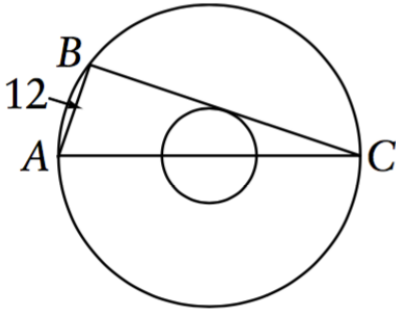


15. Quyidagi chizmada  $AB = c, BC = a, DC = b$  berilgan bo'lsa  $IG$  ni toping?



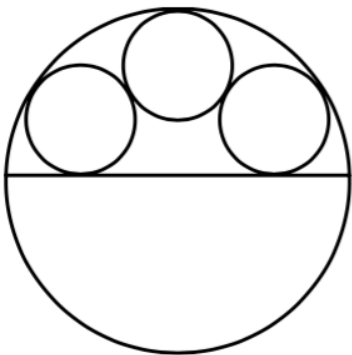
- (A)  $\frac{ab + ac + bc}{a}$  (B)  $\frac{bc}{b + c}$   
(C)  $\frac{ac}{a + c}$  (D)  $\frac{a^2 + b^2 + c^2}{a + b + c}$

16. Quyidagi chizmada, ikkita konsentrik radiuslari 1:3 nisbatdagi aylanalar berilgan bo'lib, kata aylana diametri  $AC$  va  $BC$  esa kichikaylanaga urunma hamda katta aylananing vatari. Agar  $AB = 12$  bo'lsa, kata aylana radiusini toping?



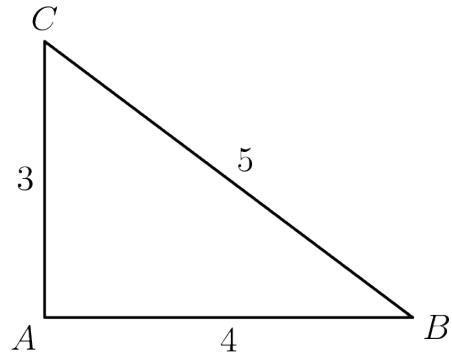
- (A) 15 (B) 18 (C) 16 (D) 20

17. Quyidagi chizmada, katta  $R$  radiusli aylana ichiga uchta teng  $r$  radiusli kichik aylanalar o'zora urinib chizilgan,  $R:r$  ni toping?



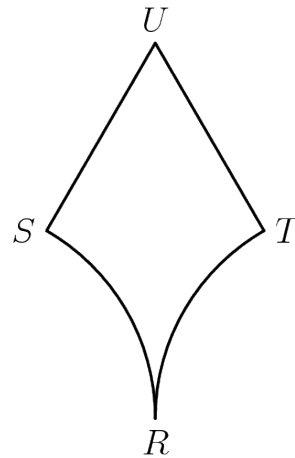
- (A) 1:2 (B) 3:1 (C) 2:3 (D) 3:5

18. Quyidagi shakilda,  $D$  nuqta  $\overline{BC}$  da shunday tanlanganki, bunda  $\triangle ACD$  va  $\triangle ABD$  lar teng perimetrga ega.  $\triangle ABD$  ning yuzini toping?



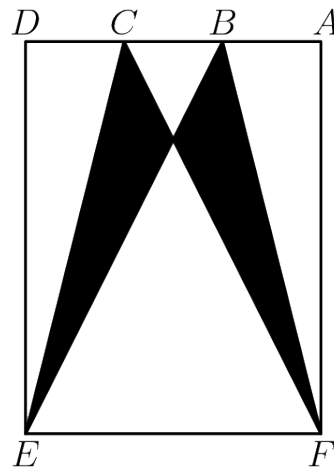
- (A)  $\frac{3}{4}$  (B)  $\frac{3}{2}$  (C) 2 (D)  $\frac{12}{5}$

19. Quyidagi chimada,  $\overline{US}$  va  $\overline{UT}$  kesmalar uzunligi 2 ga teng, hamda  $m\angle TUS = 60^\circ$   $\widehat{TR}$  va  $\widehat{SR}$  yo'ylar esa radiusi 2 ga teng radiusli aylanalarining oltidan bir qism yoyi. Bu shakilning yuzini toping?



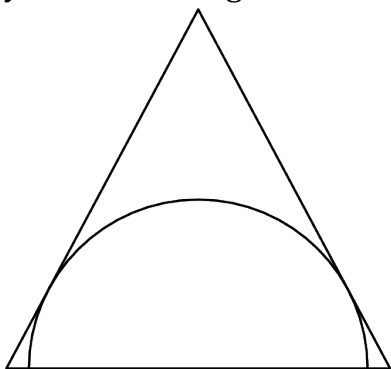
- (A)  $3\sqrt{3} - \pi$  (B)  $4\sqrt{3} - \frac{4\pi}{3}$   
(C)  $4\sqrt{3} - \frac{2\pi}{3}$  (D)  $2\sqrt{3}$

20. To'g'ri to'rtburcak  $DEFA$  ning o'lchami  $3 \times 4$  hamda,  $DC = CB = BA$ . Bo'yalgan sohaning yuzini toping?



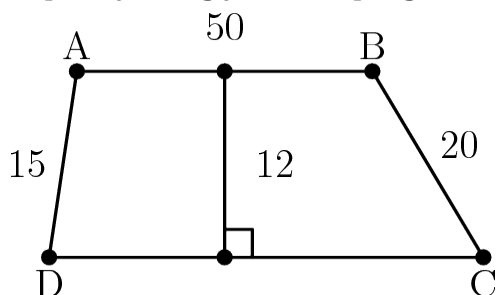
- (A) 2 (B)  $2\frac{1}{2}$  (C) 3 (D)  $3\frac{1}{2}$

21. Yarim doira asosi 16 hamda balantligi 15 bo'lgan teng yonli uchburchak asosida diametri yotadigan qilib chizilgan. Bu yarim doiraning radiusini toping? ?



(A) 10 (B)  $\frac{120}{17}$  (C) 4 (D) 6

22. Quyidagi chizmada berilganga ko'ra, trapetsiyaning yuzini toping?



(A) 900 (B) 600 (C) 800 (D) 750

23. Ushbu ikki tenglama umumiy ildizga ega bo'ladigan  $k$  ning mumkun bo'lgan qiymatlarini yig'indisini toping:

$$x^2 - 3x + 2 \text{ va } x^2 - 5x + k$$

(A) 6 (B) 8 (C) 10 (D) 12

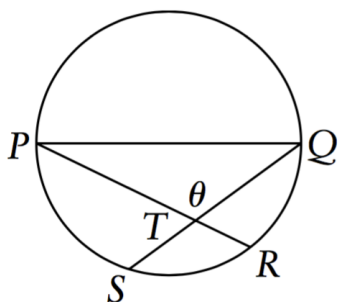
24. Hisoblang:

$$\frac{3! + 4!}{2(1! + 2!)} + \frac{4! + 5!}{3(2! + 3!)} + \cdots + \frac{12! + 13!}{11(10! + 11!)}$$

(A) 90 (B) 95 (C) 100 (D) 105

25. Quyidagi chizmada,  $PQ$  – diametr,

$\angle PTQ = \theta$  bo'lsa,  $\Delta SRT$  va  $TQP$  ning yuzlari nisbatini toping?



(A)  $\cos^2 \theta$  (B)  $\cos \theta$  (C)  $\sin \theta$  (D)  $\sin^2 \theta$

**Javoblar:**

**Yozma ish**

1. 925
2.  $\frac{250}{39}$
3.  $(-\infty; -0,5] \cup [1,5; \infty)$
4. 112
5.  $\frac{7\sqrt{3}}{2}$

**Test**

1. D
2. B
3. A
4. D
5. B
6. B
7. A
8. A
9. C
- 10.
- 11.
- 12.
- 13.
- 14.
- 15.
- 16.
- 17.
- 18.
- 19.
- 20.
- 21.
- 22.
- 23.
- 24.
- 25.

- C
- D
- B
- C
- A
- B
- B
- D
- B
- C
- B
- D
- C
- B
- A