

9-sinf

MATEMATIKA

2020-2021



## 9-SINF MATEMATIKA

### 1-BILET

1. Hisoblang:  $(1\frac{2}{3} \cdot 2,2 + 1) : 2\frac{1}{5} - \frac{5}{11} = (\frac{5}{3} * \frac{22}{10} + 1) : \frac{11}{5} - \frac{5}{11} = (\frac{11}{3} + 1) * \frac{5}{11} - \frac{5}{11} = \frac{11}{3} * \frac{5}{11} = 1\frac{2}{3}$

2.  $(a+(a-2))*2=P=32$      $2a-2=16$      $2a=18$     **a=9**    **a-2=7**    **Javob :7sm, 9sm**

3. Soddalashtiring:  $\operatorname{tg}(-\alpha)\operatorname{ctg}(-\alpha)+\cos^2(-\alpha)+\sin^2 \alpha$

$\operatorname{tg}(-\alpha)\operatorname{ctg}(-\alpha)+\cos^2(-\alpha)+\sin^2 \alpha = (-\operatorname{tg}\alpha)(-\operatorname{ctg}\alpha)+\cos^2 \alpha + \sin^2 \alpha = 1+1=2$

4. Romb barcha tomonlari teng bo'lgan parallelogramdir. Uning dioganallari o'zaro perpendikular kesishadi.

5.  $a:b=4:3$      $a+a+b=P=66$  , bundan     $4x+4x+3x=11x=66$      $x=6$

$a=4x=4*6=24$      $b=3x=3*6=18$     **Javob:24sm, 24sm, 18sm.**

### 2-BILET

1. Hisoblang:  $\frac{4,5^2-1,5^2}{0,3 \cdot 0,7-0,3} = \frac{(4,5+1,5)(4,5-1,5)}{0,3(0,7-1)} = \frac{6 \cdot 3}{0,3 \cdot (-0,3)} = -200$

2.  $t_1 = 12$      $t_2 = 30$      $3ta \text{ usta va } 5ta \text{ shogird} = t_3 = ?$

$t_3 * (3 * \frac{1}{12} + 5 * \frac{1}{30}) = 1$      $t_3 * (\frac{3}{12} + \frac{1}{6}) = 1$   
 $t_3 * \frac{5}{12} = 1$      $t_3 = \frac{12}{5} = 2,4$

**Javob: 2,4kun**

3. Agar  $\sin \alpha + \cos \alpha = \frac{1}{3}$  bo'lsa,  $\sin^3 \alpha + \cos^3 \alpha$  ni hisoblang

$\sin^3 \alpha + \cos^3 \alpha = (\sin \alpha + \cos \alpha) * ((\sin \alpha + \cos \alpha)^2 - 3 \sin \alpha * \cos \alpha) = (\sin \alpha + \cos \alpha) * ((\sin \alpha + \cos \alpha)^2 - \frac{3}{2} * ((\sin \alpha + \cos \alpha)^2 - (\sin^2 \alpha + \cos^2 \alpha))) = \frac{1}{3} * (\frac{1}{9} - \frac{3}{2} * (\frac{1}{9} - 1))$

$= \frac{1}{3} * (\frac{1}{9} + \frac{4}{3}) = \frac{1}{3} * \frac{13}{9} = \frac{13}{27}$     **Javob:  $\frac{13}{27}$**

4. Bir burchagi to'g'ri ( $90^0$ ) bo'lgan uchburchak to'g'ri burchakli uchburchak deyiladi. Uning katta tomoni tomoni *gipotenuza*, qolgan tomonlari esa *katetlar* deb ataladi. To'g'ri burchakli uchburchak gipotenuzasiga tushirilgan balandlik formulasi:

$h = \frac{a*b}{c}$ ;     $h$  – balandlik     $a, b$  – katetlar

5.  $2*(a+(a+11))=P=58\text{sm}$ ;     $2a+11=29$ ;     $2a=18$ ;     $a=9$ ;     $a+11=20$

**Javob:9sm,20sm**

### 3-BILET

01. Soddashtiring:  $4+5\sqrt{2}+\frac{\sqrt{75}}{\sqrt{3}-\sqrt{6}} = 4+5\sqrt{2}+\frac{\sqrt{75}(\sqrt{3}+\sqrt{6})}{(\sqrt{3}-\sqrt{6})(\sqrt{3}+\sqrt{6})} = 4+5\sqrt{2}-\frac{15+15\sqrt{2}}{3} = 4+5\sqrt{2}-5-5\sqrt{2} = -1$  **Javob: -1**

2.  $v_1 = 62$      $v_2 = 48$      $t=0,6$  h     $S=?$

$S=(v_1 + v_2) * t = (62 + 48) * 0,6 = 110 * 0,6 = 66km$     **Javob: 66km**

3. Soddashtiring:  $\frac{tg(\frac{\pi}{2}-\alpha)}{\cos(2\pi-\alpha)} \cdot \frac{\sin(\frac{3\pi}{2}+\alpha)}{tg(\frac{3\pi}{2}-\alpha)} = \frac{ctga}{-cosa} * \frac{cosa}{ctga} = -1$  **Javob: -1**

4. Sinuslar teoremasi:  $\frac{a}{\sin\alpha} = \frac{b}{\sin\beta} = \frac{c}{\sin\gamma} = 2R$

5.  $BE=12,5$ sm,     $CE=5,5$  sm,     $P=?$

1)  $CD=CE=AB=5,5$ sm     $AD=BC=BE+EC=12,5+5,5=18$ sm

2)  $P=AB+BC+CD+AD=5,5+18+5,5+18=47$ sm    **Javob:47sm**

### 4-BILET

1.  $-10m^2-20mn-10n^2=-10(m+n)^2=-10(-20+19,8)^2=-10*0,2^2=-10*0,04=-0,4$

2.  $v_o = 4$      $S = 48km$      $t = 5$  h     $v_q=?$

$(v_q - 4) * 5 = 48$      $v_q - 4 = 9,6$      $v_q = 13,6$     **Javob: 13,6  $\frac{km}{h}$**

3. Agar  $tg\alpha+ctg\alpha=a$  bo'lsa,  $tg^2\alpha+ctg^2\alpha$  ni toping.

$tg^2\alpha+ctg^2\alpha=(tg\alpha+ctg\alpha)^2-2*tg\alpha*ctg\alpha=a^2-2$     **Javob:a^2-2**

4. Agar uchburchakning har bir uchi aylananing yoyida yotsa, bunday holda aylana uchburchakka tashqi chizilgan, uchburchak esa aylamaga ichki chizilgan deyiladi.

$R=\frac{abc}{4S}$  -- Tashqi chizilgan aylana radiusini topish formulasi.

5.  $a=16$ sm     $b=12$ sm     $c(yon)=5$ sm     $S=?$

1)  $h=\sqrt{c^2 - (a - b)^2} = \sqrt{25 - 16} = \sqrt{9} = 3$

2)  $S=\frac{a+b}{2}*h=14*3=42sm^2$     **Javob: 42sm<sup>2</sup>**

**5-BILET**

$$1. \text{ Hisoblang: } \sqrt[4]{\frac{4,1^3 - 2,15^3}{1,95} + 4,1 \cdot 2,15} = \sqrt[4]{\frac{(4,1 - 2,15)(4,1^2 + 4,1 \cdot 2,15 + 2,15^2)}{1,95} + 4,1 \cdot 2,15} =$$

$$= \sqrt[4]{(4,1 + 2,15)^2} = \sqrt[4]{6,25^2} = \sqrt{6,25} = 2,5 \quad \text{Javob: } 2,5$$

2.  $y = 4x^2 + 12x + 11$  parabola uchining koordinatalarini uchini grafigini chizmasdan, aniqlang.  $x_0 = -\frac{b}{2a} = -\frac{12}{2 \cdot 4} = -\frac{12}{8} = -1,5$   $x_0 = -1,5$

$$y_0 = 4 \cdot x_0^2 + 12 \cdot x_0 + 11 = 4 \cdot 2,25 - 18 + 11 = 1,5 \quad \text{Javob: } (-1,5; 1,5)$$

3. Agar  $\frac{5 \sin x - 2 \cos x}{3 \cos x + 2 \sin x} = 3$  bo'lsa,  $\text{ctgx}$  ni toping.

$$\frac{5 \sin x - 2 \cos x}{3 \cos x + 2 \sin x} = 3; \quad 5 \sin x - 2 \cos x = 9 \cos x + 6 \sin x; \quad \sin x = -11 \cos x; \quad \text{ctgx} = \frac{\cos x}{\sin x} = \frac{\cos x}{-11 \cos x} =$$

$$-\frac{1}{11} \quad \text{Javob: } \text{ctgx} = -\frac{1}{11}$$

4. Doira bo'laklari: **1.sektor-----S<sub>1</sub>** **2.segmenti----S<sub>2</sub>**

$$S_1 = \frac{\pi R^2 a}{360} \quad S_2 = S_1 - \frac{1}{2} * R^2 * \sin a$$

5. Katetlar= $a$ ;  $a\sqrt{3}$  *gipotenuza* =  $2a$ ;  $2a + a = 3a = 60$   $a = 20$

$$\text{Gipotenuza} = 2a = 40 \quad \text{Javob} = 40 \text{sm}$$

**6-BILET**

1. Javob= $5 \cdot b^{0,5} \cdot (b+2)$

2.  $y = 3x^2$  va  $y = x + 2$  funksiyalar grafiklarini kesishish nuqtalarining koordinatalarini toping.

$$3x^2 = x + 2 \quad 3x^2 - x - 2 = 0 \quad x = 1; -\frac{2}{3} \quad y = 3; 1\frac{1}{3} \quad \text{Javob: } (1; 3); (-\frac{2}{3}; 1\frac{1}{3})$$

4. Ikkita uchburchakning burchaklari teng a tomonlari nisbati mos ravishda teng bo'lsa, bu uchburchaklar *o'xshash uchburchaklar* deyiladi. Uchburchaklar o'xshashligining 2-alomati-TBT(tomon-burchak-tomon) alomatidir.

$$5. h_1 = 8 \quad h_2 = 12 \quad S = 144 \quad P = ? \quad S = h_1 \cdot a_1 = h_2 \cdot a_2,$$

$$\text{Bundan } a_1 = 144 : 8 = 18; \quad a_2 = 144 : 12 = 12; \quad P = 2 \cdot (18 + 12) = 60 \quad \text{Javob: } 60 \text{sm}$$

**7-BILET**

1.  $3^9 + 3^8 + 3^7 + 2 \cdot 3^6$  ifodaning qiymatini 41 ga qoldiqsiz bo'linishini isbotlang.



$$3^9+3^8+3^7+2\cdot 3^6 = 3^6(3^3 + 3^2 + 3 + 2) = 3^6(27 + 9 + 3 + 2) = 3^6 * 41$$

2.  $|8-4x| < 32$  tengsizlikning nechta butun yechimlari bor?

$$-32 < 8 - 4x < 32 \quad 1) 4x < 40 \quad x < 10$$

$$2) 4x > -24 \quad x > -6, \text{ bundan } -6 < x < 10 \quad \text{Javob: 15ta}$$

3.  $\cos a = -\frac{12}{13}$  chorak III  $\operatorname{tga} = ?$

$$1) \sin a = -\sqrt{1 - \cos^2 a} = -\sqrt{1 - \frac{144}{169}} = -\sqrt{\frac{25}{169}} = -\frac{5}{13}$$

$$2) \operatorname{tga} = \frac{\sin a}{\cos a} = \frac{-\frac{5}{13}}{-\frac{12}{13}} = \frac{5}{12} \quad \text{Javob: } \operatorname{tga} = \frac{5}{12}$$

4. Kosinuslar teoremasi:  $a^2 = b^2 + c^2 - 2bc \cdot \cos A$  yoki  $\cos A = \frac{b^2 + c^2 - a^2}{2ac}$

$$5. \vec{c} = 3\vec{a} + \vec{b} \quad \vec{c} = (-4 * 3 + 0; 0 * 3 + 5) = (-12; 5)$$

$$|\vec{c}| = \sqrt{(-12)^2 + 5^2} = \sqrt{144 + 25} = \sqrt{169} = 13 \quad \text{Javob: 13}$$

### 8-BILET

$$1. 2\sqrt{3} - 5 - \frac{11}{\sqrt{12}-1} = 2\sqrt{3} - 5 - \frac{11(\sqrt{12}+1)}{(\sqrt{12}-1)(\sqrt{12}+1)} = 2\sqrt{3} - 5 - \sqrt{12} - 1 = -6$$

$$2. 12 \leq 6-3x < 18; \quad 1) 3x \leq -6; \quad x \leq -2 \quad 2) 3x > -12 \quad x > -4$$

$$-4 < x \leq -2 \quad (-2) * (-3) = 6 \quad \text{Javob: 6}$$

3. Soddashtiring:

$$\sin^4 x - \cos^4 x + \cos^2 x = (\sin^2 x + \cos^2 x)(\sin^2 x - \cos^2 x) + \cos^2 x = \sin^2 x - \cos^2 x - \cos^2 x = \sin^2 x - 2\cos^2 x$$

$$\text{Javob: } \sin^2 x - 2\cos^2 x$$

4. Pifagor teoremasi to'g'ri burchakli uchburchak uchun:  $c^2 = a^2 + b^2$

$$\text{Isboti: kosinuslar teoremasiga ko'ra - } c^2 = a^2 + b^2 - 2ab \cdot \cos 90^\circ$$

$$\cos 90^\circ = 0, \text{ demak } 2ab \cdot \cos 90^\circ = 0, \text{ bundan : } c^2 = a^2 + b^2$$

5. asos = a = 16  $h = 4$  yon tomon = x asosdagi burchak =  $\alpha$  R = ?

$$X = \sqrt{\left(\frac{a}{2}\right)^2 + h^2} = \sqrt{64 + 16} = 4\sqrt{5}$$

$$\sin \alpha = \frac{h}{x} = \frac{4}{4\sqrt{5}} = \frac{1}{\sqrt{5}}$$

$$R = \frac{x}{2 \sin \alpha} = \frac{4\sqrt{5}}{2/\sqrt{5}} = 2 * 5 = 10$$

$$\text{Javob: } R = 10 \text{ sm}$$

### 9-BILET

1. Hisoblang:  $(\frac{1}{7})^0 + 6 * 2^{-3} + (\frac{2}{5})^{-2} = 1 + 6 * \frac{1}{8} + \frac{25}{4} = 1 + \frac{3}{4} + \frac{25}{4} = 1 + 7 = 8$

2.  $y = -5 + 6x - x^2$  funksiyaning qiymatlar sohasini toping.

1)  $y = -5 + 6x - x^2$   $x_0 = -\frac{6}{-2} = 3$   $y_0 = -5 + 6 * 3 - 3^2 = 4$

2)  $a = -1 < 0$ , demak  $y \leq 4$  **Javob:  $y \leq 4$**

3.  $\frac{x^2 - 3x + 9}{x^3 + 27} + \frac{x - 3}{x^2 - 9} - \frac{x + 5}{x + 3} = \frac{1}{x + 3} + \frac{1}{x + 3} - \frac{x + 5}{x + 3} = \frac{1 + 1 - x - 5}{x + 3} = \frac{-(x + 3)}{x + 3} = -1$

4. 2 ta tomoni parallel, qolgan 2 ta tomoni parallel bo'lmagan to'rtburchak *trapetsiya* deyiladi. Trapetsiyaning yuzi formulasi :

$$S = \frac{a+b}{2} * h$$

5. Sinuslar teoremasiga ko'ra:  $2R = \frac{a}{\sin A}$ ;  $R = \frac{a}{2\sin A} = \frac{4,8}{2 * 0,5} = 4,8$ ; **R = 4,8 dm**

### 10-BILET

1. Ifodani soddalashtiring:  $(2a + 3b)^2 - (2a - 3b)^2 = 4a^2 + 12ab + 9b^2 - 4a^2 + 12ab - 9b^2 = 24ab$

2. 1)  $x + 8 < 12$   $x < 4$       2)  $-3x < 15$   $x > -5$

$-5 < x < 4$ , demak  $x = -4$  **Javob: -4**

3.  $\text{tga} = 1/2$  demak,  $\sin a = \frac{1}{\sqrt{5}}$   $\cos a = \frac{2}{\sqrt{5}}$ , bundan  $\text{tg} 2a = \frac{\sin 2a}{\cos 2a} = \frac{2\sin a \cos a}{\cos^2 a - \sin^2 a} =$

$\frac{2 * \frac{1}{\sqrt{5}} * \frac{2}{\sqrt{5}}}{\frac{4}{5} - \frac{1}{5}} = \frac{\frac{4}{5}}{\frac{3}{5}} = 1 \frac{1}{3}$  **Javob:  $\text{tga} = 1 \frac{1}{3}$**

4. *Trapetsiyaning o'rta chizig'i* yon tomonlar o'rtasini tutushtiradi, asoslarga parallel va asoslarning o'rta arifmetigiga teng:  $l = \frac{a+b}{2}$

5.  $a = 6\text{sm}$ ;  $r = ?$   $R = ?$ ;  $r = \frac{a}{2} = \frac{6}{2} = 3\text{sm}$   $R = \frac{a\sqrt{2}}{2} = \frac{6\sqrt{2}}{2} = 3\sqrt{2}$  **Javob:  $r = 3$ ;  $R = 3\sqrt{2}$**

### 11-BILET

1. **javob = a + 1**

2. Tenglamani yeching:  $|x^2 - 5x| = 5x - x^2$  A.S =  $0 \leq x \leq 5$

1)  $x^2 - 5x = 5x - x^2$   $2x^2 = 10x$   $x = 0$   $x = 5$

2)  $x^2 - 5x = x^2 - 5x$   $x \in R$  **Javob:  $x = 0; 5$**

4. Qarama-qarshi tomonlari teng va parallel bo'lgan to'rtburcha *to'g'ri burchakli to'rtburchak* deyiladi. Uning barcha burchaklari to'g'ri. Diagonalari o'zaro teng.

5.  $a = 2$   $b = 3$   $c = 4$

$$\cos A = \frac{b^2 + c^2 - a^2}{2bc} = \frac{9 + 16 - 4}{2 \cdot 3 \cdot 4} = \frac{21}{24}$$

$$\cos B = \frac{a^2 + c^2 - b^2}{2ac} = \frac{4 + 16 - 9}{2 \cdot 2 \cdot 4} = \frac{11}{16}$$

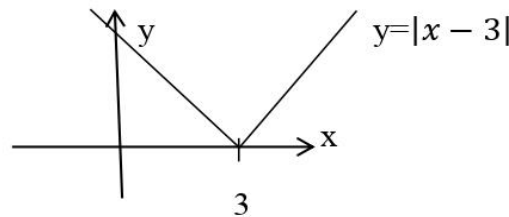
$$\cos C = \frac{a^2 + b^2 - c^2}{2ab} = \frac{4 + 9 - 16}{2 \cdot 2 \cdot 3} = -\frac{3}{4}$$

**Javob:**  $\frac{21}{24}; \frac{11}{16}; -\frac{3}{4}$

### 12-BILET

$$1. \frac{\sqrt{x}}{\sqrt{x}-5} - \frac{5}{\sqrt{x}+5} + \frac{x}{25-x} = \frac{\sqrt{x}(\sqrt{x}+5)}{(\sqrt{x}-5)(\sqrt{x}+5)} - \frac{5(\sqrt{x}-5)}{(\sqrt{x}-5)(\sqrt{x}+5)} - \frac{x}{x-25} = \frac{x+5\sqrt{x}-5\sqrt{x}+25-x}{x-25} = \frac{25}{x-25}$$

$$2. y = |x - 3|$$



$$3. \cos \alpha = -0,8 \quad \text{II chorak, demak } \sin \alpha = \sqrt{1 - 0,64} = \sqrt{0,36} = 0,6$$

$$\operatorname{tga} = \sin \alpha / \cos \alpha = 0,6 / -0,8 = -0,75 \quad \operatorname{ctga} = 1 / \operatorname{tga} = -4/3 \quad \text{Javob: } \operatorname{tga} = -\frac{3}{4}; \operatorname{ctga} = -\frac{4}{3}$$

4. Har bir tomoniga nisbatan 1 yarimtekislikda yotuvchi ko'pburchak qavariq ko'pburchak deyiladi. Qavariq ko'pburchakning diagonallarini topish formulasi:

$$d = \frac{n(n-3)}{2}$$

$$5. a = 3 \quad 120^\circ + 2\alpha = 180^\circ \quad \alpha = 30^\circ \quad R = \frac{a}{2 \sin \alpha} = \frac{3}{2 \cdot 0,5} = 3 \quad \text{Javob: } R = 3$$

### 13-BILET

$$1. \text{ Hisoblang : } 1998 = a \quad \sqrt[3]{2001 \cdot 1997 - 1998 \cdot 2000 + 9} = \sqrt[3]{a^2 + 2a - 3 - a^2 - 2a + 9} = \sqrt[3]{6} \quad \text{Javob: } \sqrt[3]{6}$$

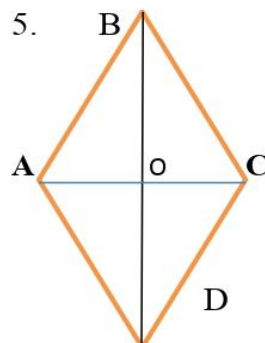
2.  $\{a_n\}$  arifmetik progressiyada  $a_2 + a_9 = 20$  bo'lsa,  $S_{10}$  ni hisoblang.

$$1) a_2 + a_9 = 2a_1 + 9d = a_1 + a_{10} = 20, \quad 2) S_{10} = \frac{a_1 + a_{10}}{2} \cdot 10 = 10 \cdot 10 = 100 \quad S_{10} = 100$$

$$3. \operatorname{ctg}\left(\frac{\pi}{4} + \alpha\right) = \operatorname{tga} = 2 \quad \operatorname{ctga} = 1 / \operatorname{tga} = 0,5$$

4. Uchburchakning 2ta tomoning o'rtalarini tutishtiruvchi va asosiga parallel kesma Uchburchakning o'rta chizig'i deyiladi.  $l = \frac{a}{2}$

$$5. \quad B \quad \angle A = 120 \quad BD = 18, \text{ bundan } BO = 9 \quad \angle OAB = 60, \text{ ya'ni}$$



$$AO = x \quad AB = 2x \quad OB = x\sqrt{3} = 9 \quad x = 3\sqrt{3}$$

$$AB = 2x = 6\sqrt{3} \quad S = (6\sqrt{3})^2 \cdot \sin 120^\circ = 54 \text{ sm}^2$$

**Javob: 54 sm<sup>2</sup>**



**14-BILET**

$$1. \frac{4^{\frac{2}{3}} * 40^{\frac{1}{3}}}{10^{-\frac{2}{3}}} = \frac{4^{\frac{2}{3}} * 4^{\frac{1}{3}} * 10^{\frac{1}{3}}}{10^{-\frac{2}{3}}} = 4 * 10 = 40$$

$$2. b_1 = 2 \quad q = 3 \quad S_n = \frac{b_1(q^n - 1)}{(q - 1)} = \frac{2 * (3^n - 1)}{2} = 242 \quad 3^n = 243 \quad n = 5$$

$$3. (\cos 15^\circ + \sin 15^\circ)^2 = \cos^2 15^\circ + 2 * \sin 15^\circ * \cos 15^\circ + \sin^2 15^\circ = 1 + \sin 30^\circ = 1 + 0,5 = 1,5$$

4. Agar aylana uchburchakning ichki sohasida yotsa va uning yoylari uchburchak tomonlari urinsa bunday aylana *uchburchakka ichki chizilgan aylana* deyiladi.

$$5. x = -7,5$$

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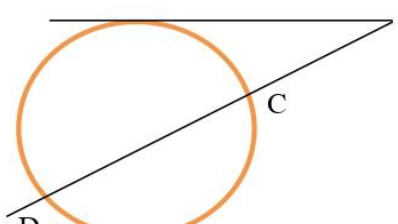
**15-BILET**

1.  $\overline{3b32576} : 4$  bundan  $b \in [0; 9]$

2.  $a_7=21$   $S_7=205$ , bo'lsa,  $a_1, d=?$

$$205 = \frac{a_1 + 21}{2} * 7; \quad 7a_1 + 147 = 410 \quad 7a_1 = 263 \quad a_1 = \frac{263}{7}; \quad d = \frac{21 - \frac{263}{7}}{6} = \frac{119}{6}$$

3.  $\sin a = \frac{4}{5}$  II chorakda  $\cos a = \sqrt{1 - \frac{16}{25}} = \sqrt{\frac{9}{25}} = \frac{3}{5}$   $\sin 2a = 2 \sin a \cos a = 2 * \frac{4}{5} * \frac{3}{5} = \frac{24}{25}$   
 $\frac{3}{5} = \frac{2*4*3}{5*5} = \frac{24}{25}$  **Javob;  $\cos a = \frac{3}{5}$   $\sin 2a = 24/25$**

4.  **A**  $AB = \text{urinma}$ —Aylana tashqarisida nuqta va aylana  
 Yoyidagi nuqtalarni birlashtiruvchi kesma;  
**AD**=kesuvchi—Aylana tashqarisidagi nuqtada o'tib  
 Aylanani kesuvchi kesma;  
 **$AB^2 = AC * AD$**

5. O'rta chiziqlar nisbati tomonlar nisbatiga tengligidan----- $a:b:c=3:4:5$   $P=144\text{sm}$   
 $3x+4x+5x=12x=144$   $x=12$   $a=3x=36$   $b=4x=48$   $c=5x=60$  **Javob:36;48;60**

**16-BILET**

1.  $25n^2 - (5n-4)^2 = (25n+5n-4)(25n-5n+4) = (30n-4)(20n+4) = 8*(15n-2)(5n+1)$

2. geometric progressiyada  $b_3=135$   $S_3=195$   
 Demak  $b_1+b_2=195-135=60$   $b_1*(1+q)=60$   $b_3=b_1*q^2=135$ , demak  $b_1=15$   $q=3$

$$S_6 = \frac{b_1(q^6-1)}{q-1} = \frac{15(729-1)}{3-1} = \frac{15*728}{2} = 15 * 364 = 5460$$

3.  $\frac{\sin a(\sin a + \cos a)}{\cos a(\cos a + \sin a)} = \frac{\sin a}{\cos a} = \frac{1}{\text{ctga}} = \frac{1}{3}$

4. Ikkita uchburchakning burchaklari teng a tomonlari nisbati mos ravishda teng bo'lsa, bu uchburchaklar *o'xshash uchburchaklar* deyiladi. Uchburchaklar o'xshashligining 1-alomati-BTB(burchak-tomon-burchak) alomatidir.

5. Kesishuvchi vatarlar teoremasiga ko'ra:  $3x*4x=12x^2=16*48$   $x^2=4*16$   $x=2*4=8$   
 $CE=3x=3*8=24$   $ED=4x=32$  **Javob:24;32**

**17-BILET**

1.  $x+y=5800$ ;  $0,1x=0,35y+220$ , yani  $x=3,5y+2200$  (x-kitob; y-daftar)

$$3,5y+2200+y=4,5y+2200=5800 \quad 4,5y=3600 \quad y=800 \quad x=5800-800=5000$$

2. Cheksiz kamayuvchi geometrik progressiya  $S=150$   $b_1=15$

$$S = \frac{b_1}{1-q} = \frac{15}{1-q} = 150 \quad 1-q = \frac{15}{150} = 0,1 \quad q = 0,9$$

$$3. 1 + \operatorname{tg}^2 a = \frac{1}{\cos^2 a}, \quad \cos^2 a = \frac{1}{1 + \operatorname{tg}^2 a} = \frac{1}{1+8} = \frac{1}{9} \quad \cos a = \frac{1}{3}$$

4. *parallelogram yuzi formulalari:*

$$S = a * b * \sin a \quad S = a * h_a = b * h_b \quad S = \frac{1}{2} * d_1 * d_2 * \sin a$$

$$5. S = 3 * 7 = 21 \text{ sm}^2$$

### 18-BILET

$$1. 100\% = 21 + 14 = 35\% \quad 21 = x\% \quad x = 100 * \frac{21}{35} = 60\%$$

$$2. a_3 + a_9 = a_1 + a_{11} = 8 \quad S_{11} = \frac{a_1 + a_{11}}{2} * 11 = 4 * 11 = 44$$

$$3. \sin(\alpha + \beta) - 2\sin\beta * \cos\alpha = \sin\alpha \cos\beta + \cos\alpha \sin\beta - 2\sin\beta \cos\alpha = \sin\alpha \cos\beta - \cos\alpha \sin\beta = \sin(\alpha - \beta) = \sin(52 - 22) = \sin 30 = 0,5; \quad 12,5 - 0,5 = 12$$

4. Ikkita uchburchakning burchaklari teng a tomonlari nisbati mos ravishda teng bo'lsa, bu uchburchaklar *o'xshash uchburchaklar* deyiladi. Uchburchaklar o'xshashligining 3-alomati-TTT(tomon-tomon-tomon) alomatidir.

$$5. 2a = 156^0 \quad a = 78^0 \quad b = 180^0 - 78^0 = 102^0 \quad \text{Javob: } 102; 78$$

### 19-BILET

$$1. \frac{a+4,6-3,4}{3} = 4,8 \quad a + 1,2 = 14,4 \quad a = 13,2$$

$$2. a*(a+5)=266 \quad a^2+5a-266=0, \text{ viyet formulasidan } a=14 \quad a+5=19 \quad \text{Javob: } 14; 19$$

$$3. \sin a = 0,8 \quad \text{II chorak, } \cos 2a = ?$$

$$\cos a = -\sqrt{1 - 0,64} = -\sqrt{0,36} = -0,6 \quad \cos 2a = 0,36 - 0,64 = -0,28$$

4.

$$5. 2a + a = 3a = 57 \quad a = 19 \quad a\sqrt{3} = 19\sqrt{3} \quad S = \frac{a^2\sqrt{3}}{2} = \frac{361\sqrt{3}}{2}$$

### 20-BILET

$$1. 2x + 3x + 4x = 9x = 639 \quad x = 71 \quad 4x - 2x = 2x = 142$$

$$2. \text{Tenglamani } x^4 - 10x^2 + 9 = 0 \text{ yig'indisini toping: } x^4 - 10x^2 + 9 = 0$$

Xossa: keltirilgan kvadrat tenglamada ildizlar doima qarama-qarshi bo'ladi:

$$x_{1,2} = \pm a \quad x_{3,4} = \pm b, \text{ demak ildizlar yig'indisi } 0 \text{ ga teng}$$

3.  $4\cos x = 2\sqrt{3}$  tenglik to'g'ri bo'ladigan  $x$  ning ikkita qiymatini aniqlang.

$$\cos x = \frac{\sqrt{3}}{2} \quad x = 30^\circ; 150^\circ$$

4.  $S = \frac{1}{2} * a * b * \sin A$

5. Doira ichki chizilgan bo'lsa,  $a+b=2c=6$   $S=6$ , demak  $h=2r=2$   $r=1$

$$S_{\text{doira}} = \pi r^2 = \pi \text{ sm}^2$$

### 21-BILET

1.  $A*(1-0,9)*(1+0,1) = A*(\frac{99}{100})$   $A*(\frac{99}{100}) - A = -\frac{A}{100}$  **Javob: -1 %**

2.  $(1,7; (1\frac{2}{3}x - 3,75)) : \frac{8}{25} = 1\frac{5}{12}$   $1,7 : (1\frac{2}{3}x - 3,75) = \frac{17}{12} * \frac{8}{25} = \frac{34}{75}$

$$1\frac{2}{3}x - 3,75 = \frac{17}{10} * \frac{75}{34} = \frac{15}{4} \quad 1\frac{2}{3}x = \frac{15}{4} + \frac{15}{4} = 7,5 \quad x = \frac{15}{2} * \frac{3}{5} = 4,4$$

3.  $\frac{(\cos(a-b) - \cos a \cos b)}{\cos a(a+b) + \sin a \sin b} = \frac{\sin a \sin b}{\cos a \cos b} = \text{tga} * \text{tgb}$

4. Agar burchakning ichki sohasi aylana ichida va uchi aylana yoyida yotsa, bu burchak *aylana-ga ichki chizilgan* deyiladi. Bu burchakning qiymati tortib turgan yoyning yarmiga teng.

$$\angle a = \frac{\angle a_{\text{yoy}}}{2}$$

5.  $S = \frac{1}{2} * 9 * 12 * \frac{1}{2} = 27$   $a_3 = \sqrt{81 + 144 - 2 * 9 * 12 * \frac{\sqrt{3}}{2}} = \sqrt{225 - 108\sqrt{3}} =$

### 22-BILET

1.  $v_1=50$   $v_2=0,6v_1=30$   $S=120$   $t = \frac{s}{v_1+v_2} = \frac{120}{50+30} = \frac{120}{80} = 1,5$

2.  $B(-2;-7)$   $-2 = -\frac{8}{k}$ , demak  $k = 4$   $y = kx^2 + 8x + m$

$$-7 = 4*(-2)^2 + 8*(-2) + m = 16 - 16 + m \quad m = -7 \quad \text{Javob: } k=4 \quad m=-7$$

3.  $\frac{\text{tga} - \text{tgb}}{1 + \text{tga} \text{tgb}} = \text{tg}(a - b) = \text{tg}(\frac{9\pi}{16} - \frac{5\pi}{16}) = \text{tg} \frac{\pi}{4}$

4. To'g'ri burchakli uchburchakning o'xshashlik alomatlarini:

GK(gipotenuza-katet) KK(katet-katet) KB(katet-burchak) GB(gipotenuza-burchak)

5.   $AB=6$   $CD=10$   $AC=BD$   $AD=10$   $AE=h$ ,

Demak,  $ED=8$   $h = \sqrt{100 - 64} = 6$

$$S = \frac{a+b}{2} * h = \frac{6+10}{2} * 6 = 8 * 6 = 48$$

C E D



**23-BILET**

1.  $a+a+2+a+4=3a+6=99$      $3a=93$      $a=31$      $a+2=33$      $a+4=35$

2. Tenglamaning ildizlari o'zaro teskari sonlar bo'ladi, shuning uchun ularning ko'paytmasi 1 ga teng.

3.  $\frac{2 \cdot \sin \frac{\pi}{8} \cdot \cos \frac{\pi}{8}}{\cos^2 \frac{\pi}{8} - \sin^2 \frac{\pi}{8}} = \frac{\sin \frac{\pi}{4}}{\cos \frac{\pi}{4}} = \operatorname{tg} \frac{\pi}{4} = 1$

4. To'g'ri burchakli uchburchakning katetlari kvadratlari yig'indisi gipotenuza kvadratiga teng. Uning ikkita o'tkir burchagi yig'indisi  $90^0$  ga teng. Katetlari har doim gipotenuzadan kichik.

5.  $\sin 30 = \frac{1}{2}$

**24-BILET**

1. a, a+1, a+2, a+3, berilgan.  $2(a+a+3)-(a+2-a-1)=2(2a+3)-1=4a+5=57$      $4a=52$      $a=13$

$a=13$      $a+1=14$      $a+2=15$      $a+3=16$

2.  $x^2 - 8x + 3 = 0$      $x_1^2 + x_2^2 = (x_1 + x_2)^2 - 2x_1x_2 = 8^2 - 2 \cdot 3 = 64 - 6 = 58$

3.  $\cos \frac{a}{2} + \sin \frac{a}{2} = \frac{1}{2}$      $\cos^2 \frac{a}{2} + 2 \sin \frac{a}{2} \cos \frac{a}{2} + \sin^2 \frac{a}{2} = 1 + \cos a = \frac{1}{4}$

$\cos a = -\frac{3}{4}$

4. o'tkir burchakning sinusi:  $\frac{\text{qarshisidagi katet}}{\text{gipotenuzaga}}$ ; cosinusi =  $\frac{\text{yopishgankatet}}{\text{gipotenuza}}$

Tangensi:  $\frac{\text{qarshisidagikatet}}{\text{yopishgankatet}}$     cotangensi =  $\frac{\text{yopishgankatet}}{\text{qarshisidagikatet}}$

5.  $R = \frac{a}{\sqrt{3}} = \frac{81}{\sqrt{3}} = 27\sqrt{3}$      $r = \frac{R}{2} = \frac{27\sqrt{3}}{2}$

**25 - BILET**

1.  $4(x-2)-5(x-3) \leq 0$      $-x + 7 \leq 0$      $x \geq 7$

2.  $\sqrt{6-5x} = x$      $x \geq 0$      $x \leq 1,2$      $6-5x = x^2$      $x^2+5x-6=0$      $x=1$

3.  $\sin 15 = \frac{\sqrt{1-\cos 30}}{2} = \frac{\sqrt{1-\frac{\sqrt{3}}{2}}}{2} = \frac{\sqrt{\frac{2-\sqrt{3}}{2}}}{2} = \frac{\sqrt{2-\sqrt{3}}}{2\sqrt{2}}$

4. Ko'pburchakning mos burchaklari teng va mas tomonlari nisbatlari ham teng bo'lsa, bunday ko'pburchaklar o'xshash ko'pburchaklar deyiladi.

5.  $5x+13x=18x=360$      $x=20^0$      $5x=100^0$      $a = \frac{5x}{2} = \frac{100^0}{2} = 50^0$

**26-BILET**

1. kumush=x    mis=7x    jami=2kg



$$x+7x=8x=2\text{kg} \quad x=0,25\text{kg} \quad 7x=1,75\text{kg} \quad \text{Javob:0,25kg, 1,75kg}$$

$$2. \frac{x-5}{3} + \frac{x-4}{4} + 2,5 \geq \frac{x+3}{6} \quad 4x - 20 + 3x - 12 + 30 \geq 2x + 6 \quad 5x \geq 8 \quad x \geq 1,6$$

$$3. \cos a = -\frac{\sqrt{2}}{2}, \frac{\pi}{2} < a < \pi, \quad a = \frac{3\pi}{4} \quad \cos\left(\frac{\pi}{4} - a\right) = \cos\left(-\frac{\pi}{2}\right) = 0$$

4. Ikki to'g'ri chiziq tekislikda kesishmasa bular, *parallel to'g'ri chiziqlar* deyiladi.

$$5. S = \frac{1}{2} * 4\sqrt{2} * 4\sqrt{2} * \frac{\sqrt{3}}{2} = 8\sqrt{3}$$

### 27-BILET

$$1. 480=3x+4x+5x=12x \quad x=40 \quad 3x=120 \quad 4x=160 \quad 5x=200$$

$$2. (12,5-x):5=(3,6+x):6 \quad 75-6x=18+5x \quad 11x=57 \quad x=\frac{57}{11}$$

$$3. \sin a \cos b - \cos a \sin b = \sin(a-b) = \sin(75-15) = \sin 60 = \frac{\sqrt{3}}{2}$$

4. Har bir tomoniga nisbatan 1 yarimtekislikda yotuvchi ko'pburchak qavariq ko'pburchak deyiladi. Qavariq ko'pburchakning dioganallari orqali yuzini topish

$$\text{formulasi: } S = \frac{1}{2} * d_1 d_2 \sin \alpha$$

$$5. AP+PO=5=R \quad ,\text{demak } AB=\text{diametr}=10$$

### 28-BILET

$$1. x^2 - 7x + 12 = 0 \quad \text{tg}(a + b) = \frac{\text{tga} + \text{tgb}}{1 + \text{tgatgb}} = \frac{7}{1+12} = \frac{7}{13}$$

$$2. b_1=2 \quad q=3 \quad S_6 = \frac{b_1(q^6-1)}{q-1} = \frac{2(729-1)}{2} = 728$$

$$3. \cos(a-b) - \sin\left(\frac{\pi}{2} - a\right) \cos b = \cos a \cos b + \sin a \sin b - \cos a \cos b = \sin a \sin b$$

4. Aylana vatar deb- aylana yoyidagi ikkita nuqtani birlashtiruvchi kesmaga aytiladi. Kesishuvchi vatarlarda- kesishishdan hosil bo'lgan kesmalar ko'paytmasi o'zaro teng.

$$5. S=30 \quad h_1=4 \quad h_2=6 \quad a=30/4=7,5 \quad b=30/6=5$$

$$P=2(a+b)=2(7,5+5)=2*12,5=25$$

### 29-BILET

$$1. a^5 + a^4 - 2a^3 - 2a^2 + a + 1 = a^5 - 2a^3 + a + a^4 - 2a^2 + 1 = a(a^4 - 2a^2 + 1) + a^4 - 2a^2 + 1 = (a+1)(a^4 - 2a^2 + 1)$$

$$2. y = \sqrt{9 - x^2} \quad 9 - x^2 \geq 0 \quad \text{AS: } -3 \leq x \leq 3$$

$$3. \sin a = -\frac{3}{4} \quad \cos b = \frac{4}{5} \quad \sin(a-b) = \sin a \cos b - \cos a \sin b = -\frac{3}{4} * \frac{4}{5} - \frac{\sqrt{7}}{4} * \frac{3}{5} = -\frac{3}{5} - \frac{3\sqrt{7}}{20}$$

$$\frac{4}{5} - \frac{\sqrt{7}}{16} * \frac{3}{5} = -\frac{3}{5} + \frac{3\sqrt{7}}{80}$$

4.  $r=S/P$   $r$ -radius  $S$ =yuza  $P$ =yarim perimetr

5.  $h=(a-b)/2=(13-7)/2=3$   $S=\frac{a+b}{2} * h = \frac{13+7}{2} * 3 = 10 * 3 = 30$

### 30-BILET

1.  $x+y=520$   $0,8x=0,24y$ , demak  $x=0,3y$   $0,3y+y=1,3y=520$   $y=400$

$X=520-400=120$  **Javob:120:400**

2.  $x^2-3|x|-40=0$  *viyetdan* :  $|x|=8; -5$   $-5$  manfiy, ya'ni boshtoplam

$|x|=8$   $x=8; -8$

3. sistemani bir marta qo'shib bir marta ayrib yuboriladi.

4. agar trapetsiyaning parallel bo'lmagan ikkita tomoni o'zaro teng bo'lsa bunday trapetsiya teng yonli trapetsiya deyiladi.

5.  $a=4$   $S=9$ , demak  $h=9/4$   $\sin a=h/a=9/16$

$d_1^2=16+16-2\cos a * a * a$   $d_2^2=16+16-2\cos a * a * a$   $\cos a$   $d_1$  va  $d_2$  da qarama qarshi,

demak,  $d_1^2+d_2^2=64$   $d_1*d_2=2S=18$   $d_1+d_2=\sqrt{d_1^2+d_2^2+2d_1d_2}=\sqrt{100}=10$

