

# 11. bilaf

$$\textcircled{1} \quad y = 6 \lg \frac{x}{3} \quad y = \lg \left(\frac{x}{3}\right)^6 \quad \left(\frac{x}{3}\right)^6 = 10^8 \quad x^6 = 3^6 \cdot 10^8$$

$$x = \sqrt[6]{3^6 \cdot 10^8} \quad x = 3 \sqrt[6]{10^8} \text{ bundan} \quad y = 3 \sqrt[6]{10^8}$$

$$\textcircled{2} \quad |\sin x + 1| > 1,5 \quad x \in (0; \pi)$$

$$\begin{cases} \sin x + 1 > 1,5 & \sin x > 0,5 & -1 \leq \sin x \leq 1 \text{ dan} \\ \sin x + 1 < -1,5 & \sin x < -2,5 \rightarrow \emptyset \end{cases}$$

$$\sin x > \frac{1}{2} \quad \frac{\pi}{6} + 2\pi k < x < \frac{5\pi}{6} + 2\pi k$$

$$x \in (0; \pi) \text{ dan } \left(\frac{\pi}{6}; \frac{5\pi}{6}\right) \text{ kan}$$

$$\textcircled{3} \quad \begin{cases} x - y = 5 \\ xy = 14 \end{cases} \quad x^3y + xy^3 = ?$$

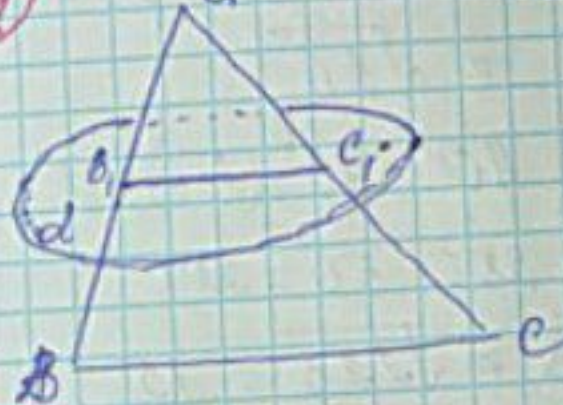
$$x^3y + xy^3 = xy(x^2 + y^2) =$$

$$= 14 \cdot 53 = 742$$

$$x^2 + y^2 - 2xy = 25$$

$$x^2 + y^2 = 25 + 28 = 53 \quad @boyout\_matematiklar$$

$$\textcircled{4} \quad AB_1 : BB_1 = 2 : 3 \quad \text{bundan } AB : BB_1 = 5 : 2$$



$$BC = 15 \text{ cm}$$

$$BC \parallel B_1C_1$$

$$B_1C_1 = ?$$

$$\triangle ABC \sim \triangle AB_1C_1 \text{ dan}$$

$$\frac{5}{2} = \frac{15}{B_1C_1}$$

$$B_1C_1 = \frac{15 \cdot 2}{5} = 6$$

$$\textcircled{5} \quad \vec{m}(2; 3; x) \quad \vec{n}(-1; 4; 2) \quad \vec{m} \cdot \vec{n} = 0$$

$$2 \cdot (-1) + 3 \cdot 4 + 2 \cdot x = 0$$

$$2x = 2 - 12$$

$$2x = -10 \quad x = -5$$

@tyalilova

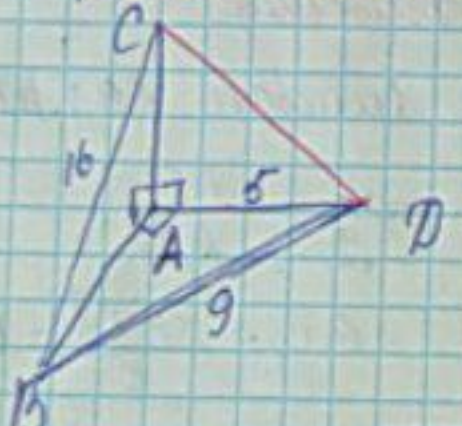


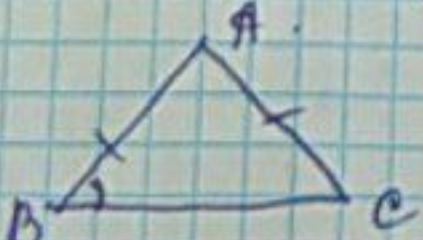
## 12. bitlet

①  $\frac{202^2 - 54^2 + 256 \cdot 352}{4^4 \cdot 10^2} = \frac{(202+54)(202-54) + 256 \cdot 352}{4^4 \cdot 10^2}$   
 $= \frac{256 \cdot 148 + 256 \cdot 352}{4^4 \cdot 10^2} = \frac{256 \cdot (148 + 352)}{256 \cdot 100} = \frac{500}{100} = 5$   
 Jawab: 5

②  $a_2 - a_1 = 6$  bolsa  $a_8 - a_5 = ?$   
 $d = a_2 - a_1 = 6$   $a_1 + 7d + (a_1 + 4d) = a_1 + 7d - a_1 - 4d$   
 $= 3d$   $a_8 - a_5 = 3d = 3 \cdot 6 = 18$  Jawab: 18

③ @boyorut-matematiklar  
 $f(x) = x^5 + 5x^4 + 4x^3 + 3x^2 + 2x - 1$   $f(0)$ ,  $f'(0)$  - ?  
 $f(0) = 0 + 0 + 0 + 0 + 0 - 1 = -1$   
 $f'(x) = 5x^4 + 20x^3 + 12x^2 + 6x + 2$  Jawab:  
 $f(0) = -1$   
 $f'(0) = 0 + 0 + 0 + 0 + 2 = 2$   
 $f'(0) = 2$

④   
 $BD = 9 \text{ cm}$   
 $BC = 16 \text{ cm}$   
 $AD = 5 \text{ cm}$   
 $CD = ?$   
 $AB = \sqrt{81 - 25} = \sqrt{56}$   
 $AC^2 = 16^2 - (\sqrt{56})^2$   
 $= 256 - 56 = 200$   
 $CD = \sqrt{AC^2 + AD^2} = \sqrt{200 + 25} = \sqrt{225} = 15$   
 Jawab: 15 cm

⑤  $A(2, 3, 1)$   
 $B(3, 2, 1)$   
 $C(3, 4, 1)$   
 Demak Asos BC  $\angle B = \angle C$   
  
 $\cos B = \frac{AB^2 + BC^2 - AC^2}{2 \cdot AB \cdot BC}$   
 $= \frac{2 + 4 - 2}{2 \cdot \sqrt{2} \cdot 2} = \frac{4}{4\sqrt{2}} = \frac{1}{\sqrt{2}}$   
 $\cos B = \frac{\sqrt{2}}{2}$   $B = 45^\circ$  @bjalilovir



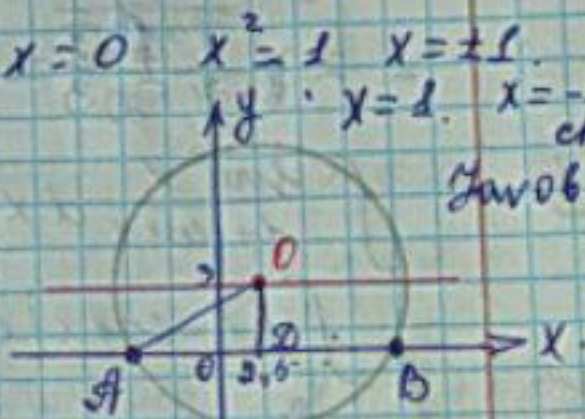
13. *hilet*

①  $\log_5 \operatorname{tg} 36^\circ + \log_5 \operatorname{tg} 54^\circ = \log_5 (\operatorname{tg} 36^\circ \cdot \operatorname{tg} 54^\circ) =$   
 $= \log_5 (\operatorname{tg} (90^\circ - 54^\circ) \operatorname{tg} 54^\circ) = \log_5 (\operatorname{ctg} 54^\circ \cdot \operatorname{tg} 54^\circ) =$   
 $= \log_5 1 = 0$

②  $2 < x < 5$   $a = xy - x = 2 \cdot 3 - 2 = 4$   
 $3 \leq y < 6$   $b = xy - x = 5 \cdot 6 - 5 = 25$   
 $a \leq xy - x \leq b$  *Javob (4; 25)*

③  $y = \ln x - \frac{1}{2}x^2 + 1$   $y' = 0$   
 $y' = \frac{1}{x} - \frac{1}{2} \cdot 2x = \frac{1}{x} - x$   $\frac{1}{x} - x = 0$   $x^2 = 1$   $x = \pm 1$   
 $x = 1$   $x = -1$  *chet*  
*Javob  $x = 1$*

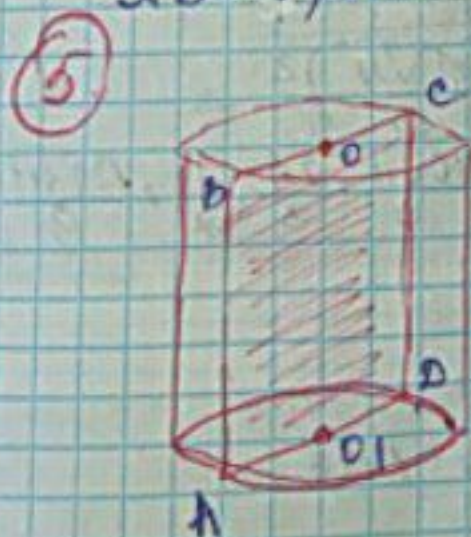
④  $x^2 + y^2 - 5x - 6y + 4 = 0$   
 $(x - \frac{5}{2})^2 + (y - 3)^2 = -4 + 6 \cdot \frac{25}{4} + 9$   
 $(x - 2,5)^2 + (y - 3)^2 = 11,25$   
 $O(2,5; 3)$   $R^2 = 1,5$  *dan*



$AO = 2,5$   $OD = 3$   $AD$  ni *toparni*2

$AD = \sqrt{11,25 - 3^2} = \sqrt{56,25 - 9} = \sqrt{47,25} = 1,5$

$AB = 1,5 \cdot 2 = 3$



$ABCD$  - kvadrat

$S_{yon} = 64\pi$

$R = ?$  *@byali'teva*

*@boyovul - matematik'klap*

$S_{yon} = 2\pi R \cdot H$   $2R = AD$  *dan*

$AD^2 \pi = 64\pi$   $AD^2 = 64$   $AD = 8$

$AD$  *diametr*  $R = \frac{AD}{2} = 4$   $R = 4$

*Sotish taqiqlanadi!*



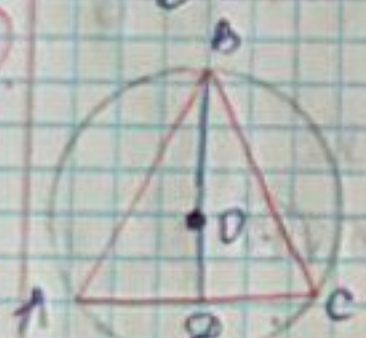
14. Gilet.

①  $y = -6x^2 + 7x - 2$   $y' = -12x + 7$   
 $-6x^2 + 7x - 2 = 0$   $\Delta = 49 - 48 = 1$

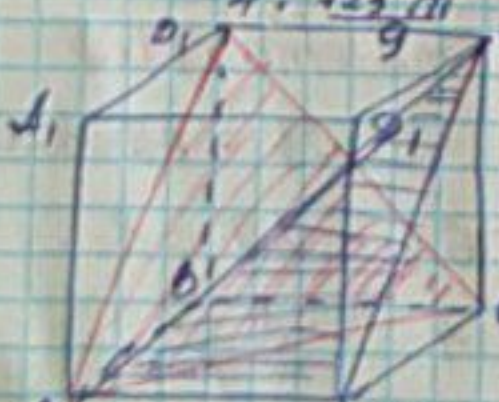
$x_1 = \frac{7+1}{-12} = -\frac{1}{2}$   $x_2 = \frac{7-1}{-12} = -\frac{1}{3}$   $y = -2$   
 $-2 + \frac{1}{3} + \frac{1}{3} = -\frac{4}{3} = -1\frac{1}{3}$

②  $\sin\left(\frac{1}{2} \arccos \frac{1}{9}\right)$  ni hisoblan.  
 $\sin\left(\frac{1}{2} \arccos \frac{1}{9}\right) = \pm \sqrt{\frac{1 - \cos(\arccos \frac{1}{9})}{2}} = \sqrt{\frac{1 - \frac{1}{9}}{2}} =$   
 $= \sqrt{\frac{8 \cdot 2}{9 \cdot 2}} = \sqrt{\frac{4}{9}} = \frac{2}{3}$

③  $\int \frac{\sin^2 x}{1 + \cos x} dx = \int \frac{1 - \cos^2 x}{1 + \cos x} dx = \int \frac{(1 - \cos x)(1 + \cos x)}{1 + \cos x} dx =$   
 $= \int (1 - \cos x) dx = x - \sin x + C$

④   $AB = BC = 10$  @bjalilova.  
 $AC = \frac{10\sqrt{3}}{3}$  @loyovut-matematiklar  
 $R = ?$   $AD = \frac{AC}{2} = \frac{5\sqrt{3}}{3}$

$BD = \sqrt{AB^2 - AD^2} = \sqrt{100 - \left(\frac{5\sqrt{3}}{3}\right)^2} =$   
 $= \sqrt{100 - \frac{25}{3}} = \sqrt{\frac{625}{3}} = \frac{25}{\sqrt{3}}$   $S = \frac{10\sqrt{3}}{2} \cdot \frac{25}{\sqrt{3}} \cdot \frac{1}{2} = \frac{125\sqrt{3}}{2}$   
 $R = \frac{10 \cdot 10 \cdot \frac{10\sqrt{3}}{3}}{4 \cdot \frac{125\sqrt{3}}{2}} = \frac{1000\sqrt{3}}{3} \cdot \frac{2}{500\sqrt{3}} = 4$

⑤   $ABCD, B, C, D_1$  - kub.  
 $AB = 8$   
 $P_{AB_1C} = ?$   $S_{AB_1C} = ?$   
 $A, AB_1, C$  dan

kub yuqori diagonali  $AB_1 = \sqrt{8^2 + 8^2} = 8\sqrt{2}$   
 $AB_1 = BC = AC$   $P = 3 \cdot 8\sqrt{2} = 24\sqrt{2}$   
 $AC = \sqrt{8^2 + (8\sqrt{2})^2} = \sqrt{64 + 128} = \sqrt{192} = 8\sqrt{3}$   
 $S_{AB_1C} = \frac{8 \cdot 8\sqrt{2}}{2} = 32\sqrt{2}$



15 - hilet

$$\textcircled{1} \sqrt{a-2a^2b^2+b} - \frac{a-b}{a^2-b^2} = \sqrt{(\sqrt{a}-\sqrt{b})^2} - \frac{(\sqrt{a}-\sqrt{b})(\sqrt{a}+\sqrt{b})}{\sqrt{a}-\sqrt{b}}$$

$$\sqrt{a}-\sqrt{b}-\sqrt{a}-\sqrt{b} = -2\sqrt{b}$$

$$\textcircled{2} \begin{array}{l} 3x+2y=3 \\ 3x-2ay=5 \end{array} \quad \begin{array}{l} 2y+2ay=-2 \\ y+ay=-1 \\ y(1+a)=-1 \end{array} \quad \begin{array}{l} y = -\frac{1}{1+a} \\ -\frac{1}{1+a} > 0 \end{array}$$

$$1+a < 0 \quad a < -1 \quad \text{Javob } (-\infty; -1)$$

$$\textcircled{3} \begin{array}{l} \cos x \cos 2x = \cos 3x \\ \frac{1}{2} \cos 3x \cos x = \cos 3x \\ \frac{1}{2} \cos x \cos 3x - \cos 3x = 0 \\ \cos 3x \left( \frac{1}{2} \cos x - 1 \right) = 0 \end{array} \quad \begin{array}{l} \cos 3x = 0 \\ \cos x = 2 \rightarrow \emptyset \\ \cos 3x = 0 \end{array}$$

$$3x = \frac{\pi}{2} + \pi n, \quad n \in \mathbb{Z}$$

$$x = \frac{\pi}{6} + \frac{\pi n}{3}, \quad n \in \mathbb{Z}$$

$$x \in [0; 2\pi] \text{ da}$$

$$n=1 \text{ da } x_1 = \frac{\pi}{6} + \frac{\pi}{3} = \frac{\pi}{2}$$

$$n=3 \text{ da } x_3 = \frac{\pi}{6} + \pi = \frac{7\pi}{6}$$

$$n=2 \text{ da } x_2 = \frac{\pi}{6} + \frac{2\pi}{3} = \frac{5\pi}{6}$$

$$n=4 \text{ da } x_4 = \frac{\pi}{6} + \frac{4\pi}{3} = \frac{9\pi}{6} = \frac{3\pi}{2}$$

$$n=5 \text{ da } x_5 = \frac{\pi}{6} + \frac{5\pi}{3} = \frac{11\pi}{6}; \quad \text{Y} \left( \frac{\pi}{2}, \frac{5\pi}{6}, \frac{7\pi}{6}, \frac{3\pi}{2}, \frac{11\pi}{6} \right)$$

$$\textcircled{4} \quad a \left( -1 < a < \frac{1}{2} \right) \quad 1+a, 1-2a; 2 \text{ kismalardan uchurichak yasash mumkin.} \quad \text{Objektiv}$$

$$AB+BC > AC \text{ dan}$$

$$\begin{cases} 1+a+1-2a > 2 \\ 1+a+2 > 1-2a \\ 1-2a+2 > 1+a \\ -1 < a < \frac{1}{2} \end{cases} \quad \begin{cases} a < 0 \\ 3a > -2 \\ 3a < 2 \\ -1 < a < \frac{1}{2} \end{cases}$$

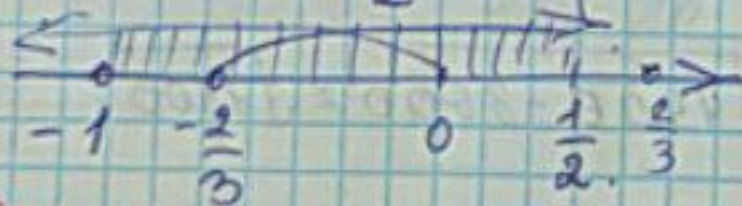
$$a < 0$$

$$a > -\frac{2}{3}$$

$$a < \frac{2}{3}$$

$$-1 < a < \frac{1}{2}$$

$$y: \left( -\frac{2}{3}; 0 \right)$$



$$\textcircled{5} \quad \vec{m}(-1; 5; 3) \quad \vec{n}(2; -2; 4)$$

$$\vec{m}\vec{n} = -1 \cdot 2 + 5 \cdot (-2) + 3 \cdot 4 = -2 - 10 + 12 = 0$$

$$\text{demak } \vec{m} \perp \vec{n}$$

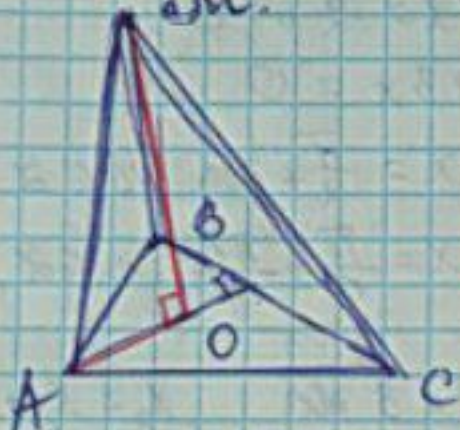


# 16-bilet

①  $f(x) = -2x^2 + 18x + 12$   $f'(x) = -4x + 18$   
 $-4x + 18 > 0$   $4x < 18$   $x < 4,5$   $J_1: (-\infty; 4,5)$

②  $(\sqrt{3} + \sqrt{2} - 1)(\sqrt{3} + 1 - \sqrt{2}) = (\sqrt{3} + (\sqrt{2} - 1))(\sqrt{3} - (\sqrt{2} - 1)) =$   
 $= (\sqrt{3})^2 - (\sqrt{2} - 1)^2 = 3 - 2 + 2\sqrt{2} - 1 = 4 + 2\sqrt{2};$

③  $f'(x) > 0$   $f(x) = 3x^2 - 4x$   
 $f'(x) = 6x - 4$   $6x - 4 > 0$   $6x > 4$   $x > \frac{2}{3}$   
 $J_2: (\frac{2}{3}; \infty)$



Qiyali lozu

$\Delta ABC$  - muntazam.

$AB = 60 \text{ cm}$

$MA = MB = MC = 40 \text{ cm}$  -  $MO$  - ?

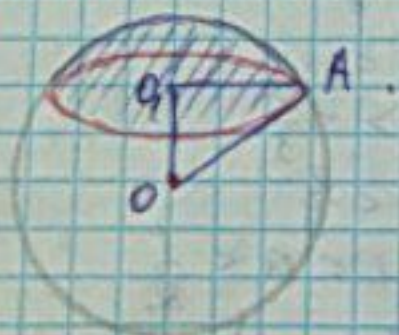
$AO = R = \frac{60}{\sqrt{3}} = 20\sqrt{3}$

$AO = 20\sqrt{3}$

$MO = \sqrt{40^2 - (20\sqrt{3})^2} = \sqrt{1600 - 1200} =$

$= \sqrt{400} = 20$

Qiyosat - matematika klasi



$O_1A = 60 \text{ cm}$

$OA = 45 \text{ cm}$

$V_{\text{sektor}} - ?$

$OO_1 = \sqrt{25^2 - 60^2} = \sqrt{5625 - 3600} = \sqrt{2025} = 45$

$h = 45 - 45 = 30$

$V = \pi H^2 \left( R - \frac{1}{3} H \right)$  dan

$V = \pi \cdot 30^2 \left( 45 - \frac{1}{3} \cdot 30 \right) = 900\pi (45 - 10) =$   
 $= 900\pi \cdot 35 = 31500\pi \text{ cm}^3$



17. felet.

$$\textcircled{1} \sqrt{x^2+77} - 2\sqrt{x^2+77} - 3 = 0, \quad \sqrt[4]{x^2+77} = t.$$

$$t^2 - 2t - 3 = 0 \quad D = 4 + 12 = 16.$$

$$t_1 = \frac{2+4}{2} = 3 \quad t_2 = \frac{2-4}{2} = -1.$$

$$\sqrt[4]{x^2+77} = 3, \quad x^2+77 = 81 \quad x^2 = 4 \quad x_{1,2} = \pm 2.$$

$$\sqrt[4]{x^2+77} = -1 \quad \emptyset. \quad \text{Javob: } \pm 2.$$

$$\textcircled{2} y = \frac{3}{e^x} \quad F(x) = \frac{3}{e^x};$$

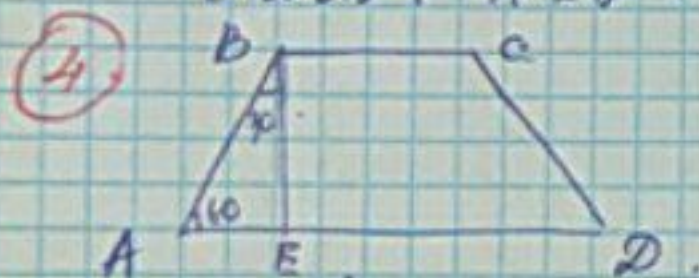
$$= -3e^{-x} + C$$

$$\textcircled{3} \frac{(n+2)!}{n!} = 72. \quad (n+1)(n+2) = 72.$$

$$n^2 + 3n + 2 = 72 \quad n^2 + 3n - 70 = 0.$$

$$D = 9 + 280 = 289. \quad n = \frac{-3 \pm 17}{2} = 7 \quad n_2 = -10 \notin \mathbb{N}.$$

Javob:  $n = 7$ . @logovut-matematika.klae



$$BC:AD = 1:2$$

$$P_{ABCD} = 50.$$

$$\angle A = 60^\circ.$$

$$AB = CD.$$

$$AD = ?$$

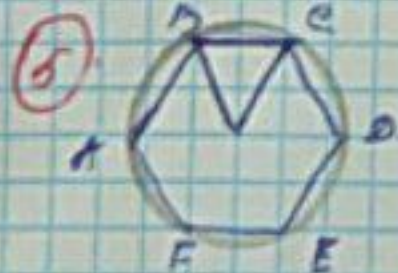
$$BC = x, \quad AD = 2x.$$

$$AE = \frac{2x - x}{2} = 0,5x.$$

$$\angle ABE = 30^\circ \text{ dan } AB = 2AE = 0,5x \cdot 2 = x.$$

$$\text{Demak } x + x + x + 2x = 50 \quad 5x = 50 \quad x = 10.$$

$$AD = 2x \quad AD = 20. \quad \text{Javob: } 20.$$



$$C_{ayl} = 4\pi.$$

$$2\pi R = 4\pi.$$

$$S_{ABDEF} = ?$$

$$R = R = AB \text{ fõladi'}$$

ABDEF - muntazam.

$$S = \frac{3\sqrt{3}}{2} a^2.$$

$$S = \frac{3\sqrt{3}}{2} \cdot 2^2 = 6\sqrt{3}.$$

@byalilova.

Javob:  $6\sqrt{3}$ .



①  $|x^2 - 36| = 36 - x^2$

$|x^2 - 36| = 36 - x^2 \quad x = \pm 6$

$\begin{cases} x^2 - 36 = 36 - x^2 \\ x^2 - 36 = x^2 - 36 \\ 36 - x^2 \geq 0 \end{cases} \quad \begin{matrix} x \in (-\infty; \infty) \\ x \in [-6; 6] \end{matrix}$  bundan  $x \in [-6; 6]$

②  $y = \frac{6x}{5x-3} \quad x_0 = 1$  nuktada o'tkazilgan urinma va koordinata o'qi bilan chegaralangan qizilni toping.

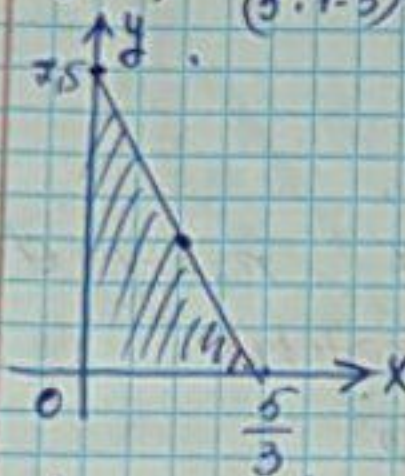
$y(1) = \frac{6 \cdot 1}{5 \cdot 1 - 3} = \frac{6}{2} = 3 \quad y' = \frac{6(5x-3) - 5 \cdot 6x}{(5x-3)^2} = \frac{-18}{(5x-3)^2}$

$y'(1) = \frac{-18}{(5 \cdot 1 - 3)^2} = -\frac{18}{4} = -4,5 \quad y = 3 - 4,5(x-1) = 7,5 - 4,5x$

$y = 7,5 - 4,5x$  - urinma tenglamasi.

$7,5 - 4,5x = 0 \rightarrow x = \frac{7,5}{4,5} = \frac{5}{3}$

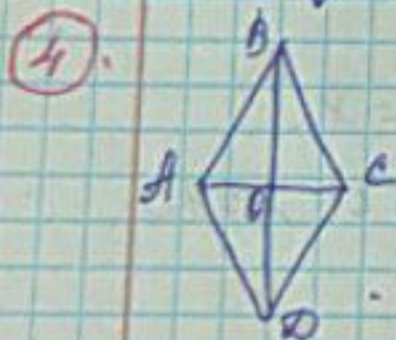
$S = \frac{5}{3} \cdot 7,5 \cdot \frac{1}{2} = 6,25$  (ko' birlik)



Qayg'urat matematiklar.

③  $\operatorname{tg} \alpha = -\frac{1}{2} \quad \frac{2 \cos^2 \alpha - \sin^2 \alpha}{2 \sin^2 \alpha - \sin^2 \alpha} = \frac{2 \cos^2 \alpha - 2 \sin \alpha \cos \alpha}{2 \sin^2 \alpha - 2 \sin \alpha \cos \alpha} =$

$\frac{2 - 2 \operatorname{tg} \alpha}{2 \operatorname{tg}^2 \alpha - 2 \operatorname{tg} \alpha} = \frac{2 - 2 \cdot (-\frac{1}{2})}{2 \cdot (-\frac{1}{2})^2 - 2 \cdot (-\frac{1}{2})} = \frac{2 + 1}{\frac{1}{2} + 1} = \frac{3}{1,5} = 2$



ABCD - romb.

$AC = 4$

$BD = 32$

$\operatorname{ctg} A = ?$

$\operatorname{ctg} \frac{\alpha}{2} = \frac{4}{32} = \frac{1}{8}$

$\operatorname{ctg} \alpha = \frac{\operatorname{ctg}^2 \frac{\alpha}{2} - 1}{2 \operatorname{ctg} \frac{\alpha}{2}} =$

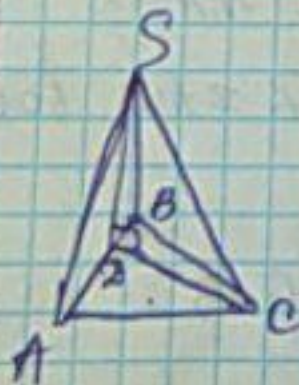
$= \frac{\frac{1}{64} - 1}{2 \cdot \frac{1}{8}} = \frac{63}{64} \cdot 4 = \frac{63}{16}$

$S_{\text{yon}} = 0,6 S_{\text{tola}}$

$\angle SDC = ?$

$S_{\text{asos}} = S_{\text{tola}} \cdot 0,4$

$\cos \angle SDC = \frac{S_{\text{asos}}}{S_{\text{yon}}} = \frac{2}{3} \quad \angle SDC = \arccos\left(\frac{2}{3}\right)$





# 19. filel

①  $x^2 - 3|x| - 28 = 0$   $D = 3^2 + 4 \cdot 28 = 121$

$x_1 \geq 0$  da  $x_1 = \frac{3+11}{2} = 7 \checkmark$   $x_2 = \frac{3-11}{2} = -4$  qanoqlantir-  
maydi.

$x < 0$  da  $x_3 = \frac{-3+11}{2} = 4 \notin$   $x_4 = \frac{-3-11}{2} = -7 \checkmark$

$x_1 \cdot x_4 = 7 \cdot (-7) = -49$  Jarob:  $-49$

②  $F(x) = \frac{1}{2}x^2 - \cos x + C$   $f(x) = \frac{1}{2} \cdot 2x - (-\sin x) = x + \sin x$

$f'(x) = (x + \sin x)' = 1 + \cos x$

③  $4 \cos 5x = 6 + 3 \cos(\frac{\pi}{2} + 5x)$   $[-\pi; 2\pi]$

$4 \cos 5x = 6 + 3(-\sin 5x)$

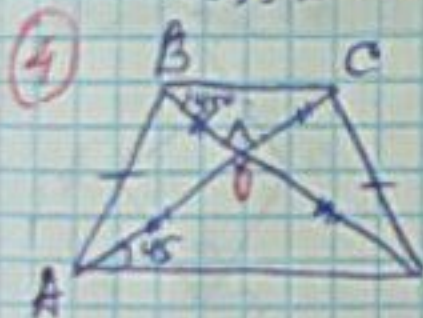
$4 \cos 5x + 3 \sin 5x = 6$  @boyovut matematiklar

$y = a \sin x + b \cos x$  funksiya qiymatlar to'liq

$[-\sqrt{a^2+b^2}; \sqrt{a^2+b^2}]$  ekanligidan.

$4 \cos 5x + 3 \sin 5x$  ning  $y \in [-5; 5]$  bunda.

$4 \cos 5x + 3 \sin 5x = 6 \notin$  Jarob:  $\emptyset$



$AB = CD$

$BC = 8$

$AD = 12$

$AC \perp BD$

$S = ?$

$\frac{BO}{\sin 45^\circ} = \frac{BC}{\sin 90^\circ}$  dem

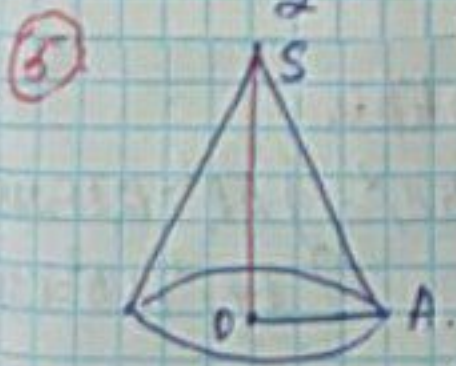
$BO = BC \cdot \sin 45^\circ = 8 \cdot \frac{\sqrt{2}}{2} = 4\sqrt{2}$

$AO = AD \cdot \sin 45^\circ = 12 \cdot \frac{\sqrt{2}}{2} = 6\sqrt{2}$

$BD = AC = 4\sqrt{2} + 6\sqrt{2} = 10\sqrt{2}$

$S = \frac{AC \cdot BD}{2} = \frac{(10\sqrt{2})^2}{2} = 100$  (kvadrat birlik)

@byali'tova



$SA = 6\sqrt{3}$

$\angle SAO = 30^\circ$

$V = ?$

$SO = \frac{1}{2} AC$

$\Delta SOA$  dan

$SO = \frac{1}{2} 6\sqrt{3} = 3\sqrt{3}$

$OA = R = \sqrt{SA^2 - SO^2} = \sqrt{(6\sqrt{3})^2 - (3\sqrt{3})^2} =$

$= \sqrt{36 \cdot 3 - 9 \cdot 3} = \sqrt{27 \cdot 3}$

$V = \frac{1}{3} \pi \cdot (\sqrt{27 \cdot 3})^2 \cdot 3\sqrt{3} = \frac{1}{3} \pi \cdot 81 \cdot 3 = 81\pi$



20-bilet.

$$\textcircled{1} \quad \frac{3^{-10} \cdot 4^{-5} \cdot \left(\frac{1}{9}\right)^{-2}}{\left(\frac{1}{21}\right)^8 \cdot 49} = \frac{3^{-10} \cdot 4^{-5} \cdot 3^4}{3^{-8} \cdot 4^{-8} \cdot 4^2} = 3^{-10+4+8} \cdot \frac{4^{-5+8}}{4^2} = 3^2 \cdot 4 = 9 \cdot 4 = 63$$

$$\textcircled{2} \quad f(x) = x^3 - 24x \quad f'(x) = 3x^2 - 24 \quad (-\infty; -3) \cup (3; \infty) \text{ oshuvchi}$$

$$3x^2 - 24 = 0 \quad x^2 = 9 \quad x = \pm 3 \quad (-3; 3) \text{ kamayuvchi}$$

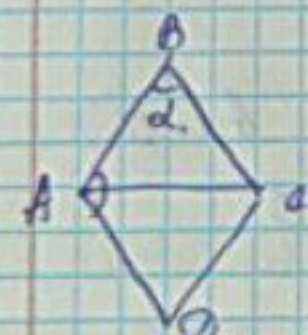
$$\textcircled{3} \quad \lg \frac{x}{8} = 3 \quad \sin x \quad \cos x \quad \operatorname{ctg} x ?$$

$$\lg x = \pm \sqrt{\frac{1 - \cos x}{1 + \cos x}} \quad \lg^2 x = \frac{1 - \cos x}{1 + \cos x} \quad \frac{1 - \cos x}{1 + \cos x} = 9$$

$$1 - \cos x = 9 + 9 \cos x \quad 10 \cos x = -8 \quad \cos x = -\frac{8}{10} = -\frac{4}{5}$$

$$\sin x = \pm \sqrt{1 - \frac{16}{25}} = \pm \sqrt{\frac{9}{25}} = \pm \frac{3}{5} \quad \operatorname{ctg} x = \pm \frac{4}{3}$$

$\textcircled{4}$



ABCD - romb.

$S = 18$

$\angle A = ?$

$AB = 6$

$\angle B = \alpha = 30^\circ$

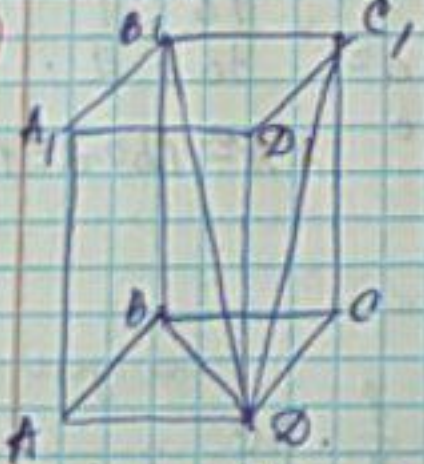
$\angle A = 180^\circ - 30^\circ = 150^\circ$

Abjalilova

$S_{\text{romb}} = AB^2 \sin \alpha$  dan.

$\sin \alpha = \frac{S}{AB^2} = \frac{18}{36} = \frac{1}{2}$

$\textcircled{5}$



$\gamma: 150^\circ$

$B_1D = 3,5 \text{ cm}$

ABCD - munosari.

$C_1D = 2,5 \text{ cm}$

$V = ?$

$\begin{cases} AB^2 + AD^2 = BD^2 \\ B_1D^2 - BB_1^2 = BD^2 \\ BB_1^2 + AB^2 = C_1D^2 \end{cases}$

$\begin{cases} 2AB^2 = BD^2 \\ 12,25 - BB_1^2 = BD^2 \\ AB_1^2 + AB^2 = 6,25 \end{cases}$

$\begin{cases} 2AB^2 = 12,25 - BB_1^2 \\ BB_1^2 + AB^2 = 6,25 \end{cases}$

$\begin{cases} BB_1^2 = 12,25 - 2AB^2 \\ BB_1^2 + AB^2 = 6,25 \end{cases}$

$6,25 + AB^2 = 12,25 - 2AB^2 \quad AB^2 = 12,25 - 6,25 = 6$

$BB_1^2 = 6,25 - 6 \quad BB_1^2 = 0,25 \quad V = S_a \cdot H = AB^2 \cdot BB_1 = 6 \cdot 0,5 = 3$

$BB_1 = 0,5$

Javob: 3 (kut birlak)



21. tiyet

$$\begin{aligned} 78-2 \quad (1) \quad 8 \cos 5^\circ \cos 10^\circ \cos 20^\circ \cos 40^\circ &= \frac{4 \cdot 2 \sin 5^\circ \cos 5^\circ \cos 10^\circ \cos 20^\circ \cos 40^\circ}{\sin 5^\circ} \\ &= \frac{4 \cos 10^\circ \sin 10^\circ \cos 20^\circ \cos 40^\circ}{\sin 5^\circ} = \frac{2 \cdot \sin 20^\circ \cos 20^\circ \cos 40^\circ}{\sin 5^\circ} \\ &= \frac{\sin 40^\circ \cos 40^\circ}{\sin 5^\circ} = \frac{\sin 80^\circ}{2 \sin 5^\circ} \end{aligned}$$

$$(2) \quad y = 4 - 2x \quad y = 4 - x^2 \quad 4 - x^2 = 4 - 2x$$

$$x^2 - 2x = 0$$

$$x_1 = 0, \quad x_2 = 2$$

$$S = \int_0^2 (4 - x^2) dx - \int_0^2 (4 - 2x) dx =$$

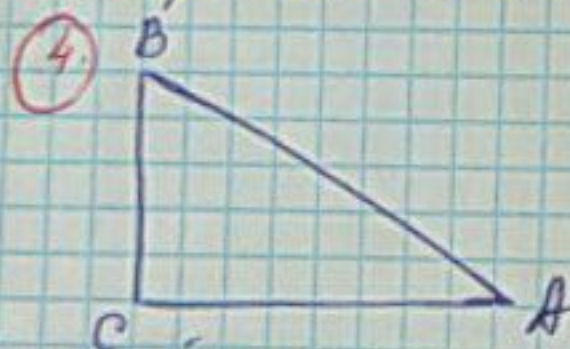
$$= \left( 4x - \frac{x^3}{3} - 4x + x^2 \right) \Big|_0^2 = \left( -\frac{x^3}{3} + x^2 \right) \Big|_0^2 =$$

$$= -\frac{8}{3} + 4 + 0 - 0 = \frac{4}{3} \text{ (ko. birlik)}$$

$$(3) \quad \{a_n\} \text{ - arif. pr. yo.} \quad a_{10} = 131 \quad d = 12 \quad a_1 = ?$$

$$a_n = a_1 + (n-1)d \quad a_1 = a_n - (n-1)d$$

$$a_1 = 131 - 9 \cdot 12 = 131 - 108 = 23$$



$$AC = 12 \text{ cm}$$

$$BC = AB - 6$$

$$S = ?$$

$$BC + AC^2 = AB^2 \quad (AB - 6)^2 + 12^2 = AB^2$$

$$AB^2 - 12AB + 36 + 144 = AB^2$$

$$12AB = 180$$

$$AB = \frac{180}{12} = 15$$

$$S = \frac{12 \cdot 15}{2} = 90 \text{ cm}^2$$

$$S: 90 \text{ cm}^2$$

$$(5) \quad A(0; 1; -1) \quad B(1; -1; 2) \quad C(3; 1; 0) \quad D(2; -3; 1)$$

$$(\overrightarrow{AB}, \overrightarrow{CD}) = ?$$

$$\overrightarrow{AB} = (1; 0; 3)$$

$$\overrightarrow{CD} = (-1; -4; 1)$$

$$\cos \varphi = \frac{\overrightarrow{AB} \cdot \overrightarrow{CD}}{|\overrightarrow{AB}| \cdot |\overrightarrow{CD}|} = \frac{1 \cdot (-1) + 0 \cdot (-4) + 3 \cdot 1}{\sqrt{1^2 + 0^2 + 3^2} \sqrt{(-1)^2 + (-4)^2 + 1^2}} =$$

$$= \frac{-1 + 3}{\sqrt{10} \cdot \sqrt{18}} = \frac{2}{3\sqrt{5}} = \frac{1}{3\sqrt{5}}$$

$$\varphi = \arccos\left(\frac{1}{3\sqrt{5}}\right)$$

@byalilov

@boyovut\_matematika