1-bilet.

① $\log_7(-4+x)=3$. $-4+x>0$

$x>4$ an. sohasi.

$-4+x=7^3$

$-4+x=343$

$x=347$.

Javob $x=347$.

② $-\frac{2\pi}{3}\le x\le 0$ oraliqda $y=8\cos x-\frac{27}{\pi}x+8$ ning eng katta qiymati

$y'=-8\sin x-\frac{27}{\pi}$

$-8\sin x-\frac{27}{\pi}=0$ $-8\sin x=\frac{27}{\pi}$ $\sin x=-\frac{27}{8\pi}$.

$-1\le\sin x<1$ dan $\sin x=-\frac{27}{8\pi}$. $-\frac{27}{8\pi}<-1$ ∅.

$y\left(-\frac{2\pi}{3}\right)=8\cos\left(-\frac{2\pi}{3}\right)-\frac{27}{\pi}\cdot\left(-\frac{2\pi}{3}\right)+8=8\cdot\left(-\frac{1}{2}\right)+18+8=$

$=-4+18+8=22$.

Abjalilova

$y(0)=8\cos 0-\frac{27}{\pi}\cdot 0+8=8+8=16$.

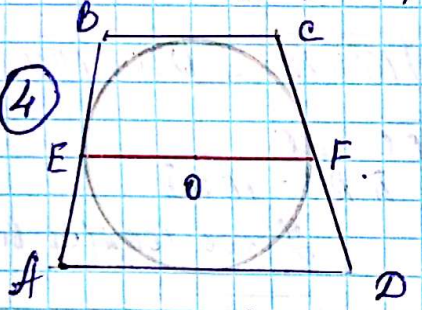
Demak eng katta qiymati 22 ekan.

③ $\int_{-1}^{1}(4x+b)dx=\left(\frac{4x^2}{2}+bx\right)\Big|_{-1}^{1}=2+b-2+b=2b$.

$2b=1$ $b=\frac{1}{2}$

Javob: $\frac{1}{2}$.

④



$AB=CD$.

$EF=5$ cm.

$AB-?$

$AB+CD=AD+BC$.

dan va $AB=CD$ dan.

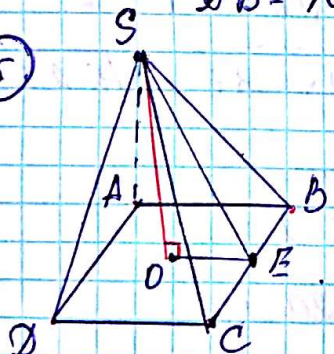
$EF=\frac{AD+BC}{2}$.

$AD+BC=2\cdot 5=10$.

$AB=10:2=5$ cm

Javob: 5 cm.

⑤



$V=36$.

$ABCD$ - kvadrat.

$\angle SEO=45^\circ$.

$AB-?$

ΔSOE dan.

$\angle SOE=90^\circ$.

$\angle SEO=45^\circ$ bo'lsa

$\angle ESO=45^\circ$ bo'ladi.

bundan $OE=SO$ va $AB=2SO$.

$V=\frac{1}{3}AB^2H$ $\frac{1}{3}AB^2\cdot\frac{AB}{2}=36$. $AB^3=216$ $AB=6$.

Javob: $AB=6$.

2 - bilet.

1. $\frac{36 \sin 42^\circ \cos 42^\circ}{\sin 84^\circ} = \frac{2 \cdot 18 \sin 42^\circ \cos 42^\circ}{\sin 84^\circ} = \frac{18 \cdot \sin 84^\circ}{\sin 84^\circ} = 18.$

$\sin 2\alpha = 2 \sin\alpha \cos\alpha.$

2. $-\frac{\pi}{4} \le x \le \frac{\pi}{4}$ da $y = 16 \operatorname{tg} x - 16x + 4\pi + 5$ eng katta qiy.

$y' = \frac{16}{\cos^2 x} - 16. \quad \frac{16}{\cos^2 x} = 16 \quad \cos^2 x = \frac{16}{16} \quad \cos^2 x = 1.$

$\cos x = \pm 1.$

$x_1 = 0 \quad x_2 = \frac{\pi}{2}.$

$0 \in [-\frac{\pi}{4}; \frac{\pi}{4}] \quad \frac{\pi}{2} \notin [-\frac{\pi}{4}; \frac{\pi}{4}]$ demak.

$y(-\frac{\pi}{4}) = 16 \operatorname{tg}(-\frac{\pi}{4}) - 16 \cdot (-\frac{\pi}{4}) + 4\pi + 5 = -16 + 4\pi + 4\pi + 5 = 8\pi - 11.$

$y(0) = 16 \operatorname{tg} 0 - 16 \cdot 0 + 4\pi + 5 = 4\pi + 5.$

$y(\frac{\pi}{4}) = 16 \operatorname{tg}(\frac{\pi}{4}) - 16 \cdot \frac{\pi}{4} + 4\pi + 5 = 16 - 4\pi + 4\pi + 5 = 21.$

Javob. Eng katta qiymati 21.

3. $\int_0^1 (2 + 3x)\,dx = \left(2x + \frac{3x^2}{2}\right)\Big|_0^1 = 2 \cdot 1 + \frac{3 \cdot 1}{2} - 0 = 2 + 1{,}5 = 3{,}5$

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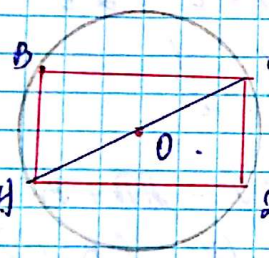
4.



$AB = 12$

$BC = 16.$

$S_{doira} - ?$

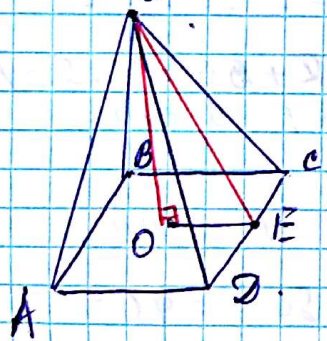
$R_{doira} = \frac{AC}{2}.$

$AC = \sqrt{16^2 + 12^2} = \sqrt{256 + 144} = \sqrt{400} = 20.$

$R = \frac{20}{2} = 10 \quad S_{doira} = \pi R^2 = 100\pi.$

Javob: 100π (bir bir)

5.



$SO = 6$ cm.

$SE = 6{,}5$ cm.

$P_{ABCD} - ?$

$OE = \sqrt{6{,}5^2 - 6^2} = \sqrt{42{,}25 - 36} = \sqrt{6{,}25} = 2{,}5.$

$AB = 2{,}5 \cdot 2 = 5.$

$P = 5 \cdot 4 = 20$ cm.

Javob: 20 cm.

3-bilet.

① $11^x \cdot 25^{-5} : 275^5 = \frac{11^x \cdot 25^{-5}}{11^5 \cdot 25^5} = 11^{x-5} = 11^2 = 121$.

② $f(x) = 2x^2 - 1$ funk. grafigiga $x_0 = 0$ nuqt. urinma teng.

$f(0) = 2 \cdot 0 - 1 = -1$.

$f'(x) = 4x \quad f'(0) = 0$. $y = f(x_0) + f'(x_0)(x - x_0)$

$y = -1 + 0 \cdot (x - 0) \quad y = -1$.

③ $f(x) = \frac{1}{2} tg\, 2x$. bolsa $f'(\frac{\pi}{6}) - ?$

$f'(x) = \frac{1}{2} \cdot \frac{2}{\cos^2 2x} = \frac{1}{\cos^2 2x} \quad f'(\frac{\pi}{6}) = \frac{1}{(\cos 2\frac{\pi}{6})^2} = \frac{1}{(\frac{1}{2})^2} = 4$.

④ $A(-3; y) \quad B(5; -4) \quad |AB| = 10 \quad y - ?$

$AB = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2} = \sqrt{(5 - (-3))^2 + (-4 - y)^2} =$

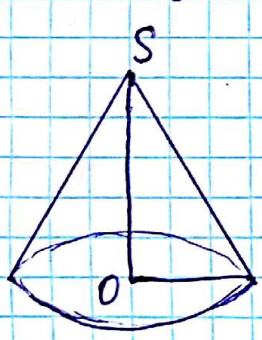
$= \sqrt{64 + 16 + 8y + y^2} = \sqrt{y^2 + 8y + 80}$. @bjalilova

$y^2 + 8y + 80 = 100 \quad y^2 + 8y - 20 = 0$.

$D = 64 + 80 = 144 \quad y_1 = \frac{-8 + 12}{2} = -10 \quad y_2 = \frac{-8 + 12}{2} = +2$.

Javob: +2 va -10.

⑤



$C_a = 8\sqrt{\pi}$.

$SO = 9$ cm.

$V - ?$

$2\pi R = 8\sqrt{\pi} \quad R = \frac{8\sqrt{\pi}}{2\pi} = \frac{4}{\sqrt{\pi}}$.

$V = \frac{1}{3} \pi R^2 \cdot H = \frac{1}{3} \pi \cdot \frac{16}{\pi} \cdot 9 = 48$.

Javob: 48 (kub. birlik).

4-bilet.

① $a=\sqrt{45\cdot 10\cdot 18}$ $\quad b=\sqrt[3]{16\cdot 36\cdot 81}$

$a=\sqrt{3^2\cdot 5\cdot 2\cdot 5\cdot 3^2\cdot 2}=2\cdot 5\cdot 3^2$. $\quad EKUB(a,b)=2\cdot 3^2=18$.

$b=\sqrt[3]{2^4\cdot 2^2\cdot 3^2\cdot 3^4}=2^2\cdot 3^2$ $\quad EKUK(a,b)=2^2\cdot 3^2\cdot 5=180$.

$EKUK(a,b)-EKUB(a,b)=180-18=162$.

② $y=6x+9$ t/ch. $y=x^2+7x-6$ f-ya gr. II.
urinish nuqtasi abssissasi-?

$y'(x_0)=6$ $\quad y'=2x+7$. $\quad 2x_0+7=6$ $\quad 2x_0=-1$ $\quad x_0=-0,5$.

Javob: $x_0=-0,5$.

③ $f(x)=x^3+x-\sqrt{2}$. $\quad g(x)=3x^2+x+\sqrt{2}$. $\quad f'(x)>g'(x)$.

$f'(x)=3x^2+1$ $\quad g'(x)=6x+1$. $\quad 3x^2+1>6x+1$.

$3x^2-6x>0$. $\quad 3x(x-2)>0$.

$x<0$ $\quad x>2$.

Javob: 3.

④ $|\bar{a}|=4$ $\quad |\bar{b}|=3|$ $\quad (\bar{a},\bar{b})=60°$. $\quad (\bar{a}+k\bar{b})\perp a$ $\quad k-?$

$(\bar{a}+k\bar{b})\cdot\bar{a}=0$

$|\vec{a}|^2+k\,\bar{a}\,\bar{b}=0$.

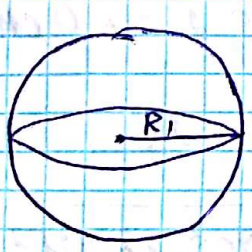
$4^2+k\,|\bar{a}|\cdot|\bar{b}|\cos\alpha=0$.

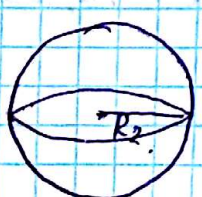
$16+k\cdot 4\cdot 3\cdot\frac{1}{2}=0$.

$6k=-16$. $\quad k=-\frac{8}{3}=-2\frac{2}{3}$.

@bjalilova

⑤





$\frac{S_1}{S_2}=2$. $\quad S=4\pi R^2$

$\frac{D_1}{D_2}=?$

$\frac{4\pi R_1^2}{4\pi R_2^2}=2$.

$\frac{R_1}{R_2}=\sqrt{2}$. $\quad D=2R$ dan.

$\frac{2R_1}{2R_2}$

$\frac{D_1}{D_2}=\sqrt{2}$.

5-bilet.

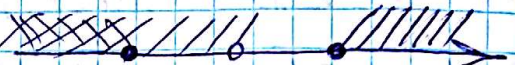
① $\sin x - \frac{1}{\sin x} = -3$ $\quad \sin^2 x + \sin^{-2} x - ?$

$\left(\sin x - \frac{1}{\sin x}\right)^2 = (-3)^2$ $\quad \sin^2 x - 2\sin x \cdot \frac{1}{\sin x} + \frac{1}{\sin^2 x} = 9$

$\sin^2 x + \frac{1}{\sin^2 x} = 9 + 2$ $\quad \sin^2 x + \sin^{-2} x = 11.$

② $y = \sqrt{x^2 - 9} + \frac{2}{\sqrt{-x}}$ aniqlanish sohasi

$\begin{cases} x^2 - 9 \geq 0, & x \leq -3 \quad x \geq 3 \\ -x > 0, & x < 0 \end{cases}$

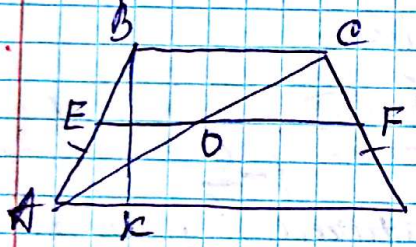


Javob $(-\infty; -3]$

③ $S(t) = e^t + \cos t + 5t$. $\quad t = 0$ dagi tezligini top.

$S'(t) = v = e^t - \sin t + 5$. $\quad v(0) = e^0 - \sin 0 + 5 = 6$

④



$AB = CD = 5$

$EO = 3 \quad OF = 7$.

EO - o'rta chiziq. @bjalilova.

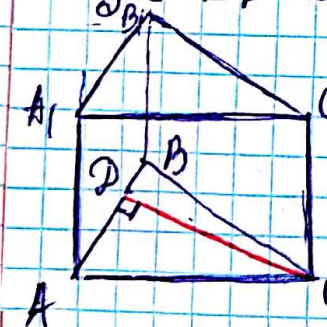
$S - ?$

$BC = 2EF \quad BC = 2 \cdot 3 = 6 \quad AD = 2 \cdot OF = 14. \quad EF = 3 + 7 = 10.$

$AK = \frac{AD - BC}{2} = \frac{14 - 6}{2} = 4 \quad BK = \sqrt{AB^2 - AK^2} = \sqrt{5^2 - 4^2} = 3.$

$S = EF \cdot BK = 10 \cdot 3 = 30$ (kv. birlik)

⑤



$A_1 = h_{AB}$

$AB = 6$ cm.

$BC = 25$ cm

$AC = 29$ cm.

$V - ?$

$P_{asos} = \frac{6 + 25 + 29}{2} = 30.$

$S_a = \sqrt{30 \cdot 24 \cdot 5 \cdot 1} =$

$= 6 \cdot 5 \cdot 2 = 60\ cm^2$

$h_{AB} = \frac{2S}{AB} = \frac{2 \cdot 60}{6} = 20.$ $\quad H = 20.$

$V = S_a \cdot H = 60 \cdot 20 = 1200\ cm^3.$

6-bilet.

① $\sqrt[3]{2001\cdot1997-1998\cdot2000+9}=\sqrt[3]{(1999+2)(1999-2)-(1999-1)(1999+1)+9}=$

$=\sqrt[3]{1999^2-2^2-1999^2+1^2+9}=\sqrt[3]{-4+1+9}=\sqrt[3]{6}$

② Agar $tg\left(\frac{\pi}{2}-\alpha\right)=\frac{29}{11}$ $tg\alpha-?$

$tg\left(\frac{\pi}{2}-\alpha\right)=ctg\alpha$. $ctg\alpha=\frac{1}{tg\alpha}=\frac{29}{11}$ $tg\alpha=\frac{11}{29}$.

③ $F'(x)=x-4$ $F(-2)=0$ $F(x)-?$

$F(x)=\frac{x^2}{2}-4x+C$. $F(-2)=\frac{(-2)^2}{2}-4\cdot(-2)+C=$

$=2+8+C$ $10+C=0$ $C=-10$.

$F(x)=\frac{x^2}{2}-4x-10$. @bjalilova

④ $\begin{cases}3x+4y+7=0\\3x+y-5=0\end{cases}$ $3y=-12$. $3x-16+7=0$.

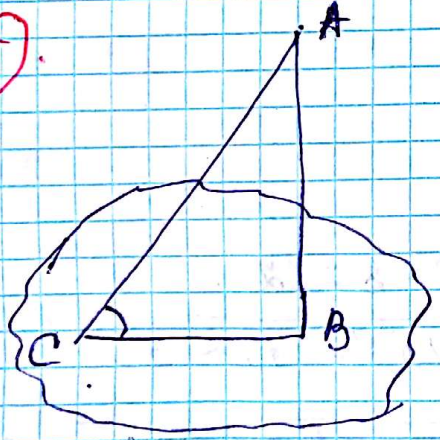
$y=-4$. $3x=9$ $x=3$.

$3y+12=0$.

Kesishish nuqtasi $A(3;-4)$.

$OA=\sqrt{3^2+4^2}=\sqrt{25}=5$ (birlik).

⑤



$\angle ACB=\arccos\frac{15}{17}$.

$BC=30$.

$AB-?$

$\cos ACB=\frac{BC}{AC}=\frac{30}{AC}$.

$\frac{30}{AC}=\frac{15}{17}$ $AC=34$.

$AB=\sqrt{34^2-30^2}=\sqrt{1156-900}=\sqrt{256}=16$.

Javob: 16 (birlik).

4-bilet.

1. $(b-c)(b^2+bc+c^2) = b^3-c^3$

$b^3-c^3 = (\sqrt[3]{5})^3 - (\sqrt[3]{3})^3 = 5-3 = 2.$

2. $\arcsin(x^2-4) \le \frac{\pi}{6}$

$\begin{cases} -1 \le x^2-4 \le 1 \\ x^2-4 \le \frac{1}{2} \end{cases} \quad \begin{cases} 3 \le x^2 \le 5 \\ x^2 \le \frac{9}{2} \end{cases}$

Javob: $\left(-\frac{3}{\sqrt{2}}; -\sqrt{3}\right) \cup \left(\sqrt{3}; \frac{3}{\sqrt{2}}\right)$

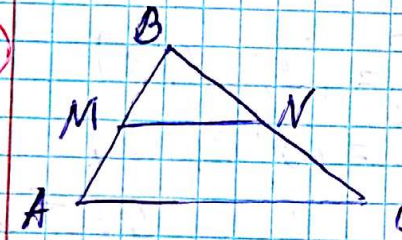
3. $y = \frac{\arcsin x}{2x}$ @boyqovut_matematiklar.

$y' = \frac{(\arcsin x)' \cdot 2x - \arcsin x \cdot (2x)'}{(2x)^2} =$

$= \frac{\frac{2x}{\sqrt{1-x^2}} - 2\arcsin x}{4x^2} = \frac{\frac{1}{\sqrt{1-x^2}}}{2x} - \frac{\arcsin x}{2x^2} =$

$= \frac{1}{2x\sqrt{1-x^2}} - \frac{\arcsin x}{2x^2}$; @bjalilova

4.



$MN \parallel AC$

$P_{MBN} = 42\,cm$

$P_{ABC} = 84\,cm$

$S_{MBN} = 44\,cm^2$

$S_{ABC} - ?$

$\frac{P_1}{P_2} = k.$

$k = \frac{42}{84} = \frac{1}{2}.$

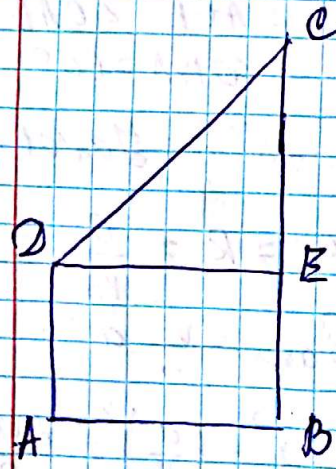
$\frac{S_1}{S_2} = k^2.$

$\frac{44}{S_{ABC}} = \frac{1}{4}.$

$S_{ABC} = 44 \cdot 4 = 176\,cm^2.$

Javob: $176\,cm^2$

5.



$AD = 8\,m.$

$BC = 20\,m$

$DC = 15\,m$

$AB - ?$

$EC = 20-8 = 12\,cm$

$DE = \sqrt{DC^2 - EC^2}$

$DE = \sqrt{15^2 - 12^2} =$

$= \sqrt{225-144} = \sqrt{81} = 9.$

$AB = DE = 9\,cm;$ Javob: 9 cm.

8-bilet

① $a = \log_{0,2} 8$, $b = \log_4 2$ $c = \log_{0,9} 0,6$

$d = \log_3 0,8$ $e = \log_{0,9} 2$.

$\log_a b$ da $\begin{cases} a>1 \\ b>1 \end{cases} \vee \begin{cases} 0<b<1 \\ 0<a<1 \end{cases}$ b-liq $\log_a b > 0$ b-di

bundan. $a<0$, $b>0$ $c>0$ $d<0$ $e<0$.

Javob: $b, c > 0$.

② $f(x) = \sqrt[3]{\sin^2 5x}$ $f'\left(\frac{\pi}{10}\right)$ - ?

$f'(x) = \left((\sin 5x)^{\frac{2}{3}}\right)' = \frac{2}{3} \cdot 5 \cdot \cos 5x \cdot (\sin 5x)^{\frac{2}{3}-1} = \frac{10}{3} \cos 5x (\sin 5x)$

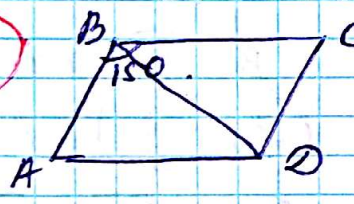
$= \frac{10 \cos 5x}{\sqrt[3]{\sin 5x}} = \frac{10 \cos \frac{\pi}{2}}{\sqrt[3]{\sin \frac{\pi}{2}}} = 0$.

③ $\frac{(n+1)!}{(n-1)!} = 30$ $n(n+1) = 30$. @bjalilova

$\frac{1 \cdot 2 \cdot 3 \cdot \ldots \cdot (n-1) \cdot n \cdot (n+1)}{1 \cdot 2 \cdot 3 \cdot \ldots \cdot (n-1)} = 30$ $n(n+1) = 30$.

$n^2 + n - 30 = 0$ $D = 1 + 120 = 121$ $n = \frac{-1+11}{2} = 5$ $n_2 = -6$

Javob: $n = 5$.

④ 

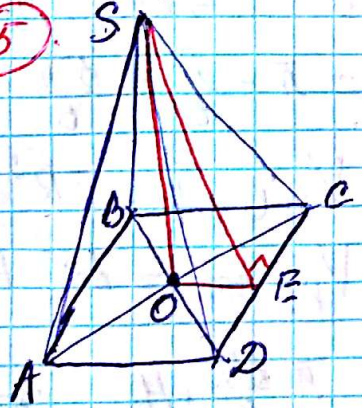
$\angle A = 180 - 150° = 30°$.

$BD = 6$. $AB \perp BD$.

$\angle ABD = 90°$. P - ?

$AD = 2 \cdot BD = 12$ $AB = \sqrt{12^2 - 6^2} = \sqrt{144 - 36} = \sqrt{108}$

$P_{ABCD} = 2 \cdot 12 + 2 \cdot 6\sqrt{3} = 12(2 + \sqrt{3})$

⑤ 

$SO = 24$

$ABCD$ - kvadrat.

$AB = 14$. @boyovut_matematiklar

SE - ?

$OE = \frac{AB}{2} = \frac{14}{2} = 7$.

$SE = \sqrt{SO^2 + OE^2} = \sqrt{24^2 + 7^2} = \sqrt{576 + 49} = \sqrt{625} =$

$= 25$ Javob: 25

9-bilet

1) $4\sqrt{7\frac{1}{2}} - \frac{2\sqrt{10}}{2\sqrt{3}-\sqrt{10}} + 8 + 3\sqrt{10} = 4\cdot\sqrt{\frac{15}{2}} -$

$- \frac{2\sqrt{10}\cdot(2\sqrt{3}+\sqrt{10})}{12-10} + 8 + 3\sqrt{10} = \frac{4\cdot\sqrt{30}}{2} - \frac{4\sqrt{30}+20}{2} +$

$+ 8 + 3\sqrt{10} = 2\sqrt{30} - 2\sqrt{30} - 10 + 8 + 3\sqrt{10} = 3\sqrt{10} - 2;$

2) $\frac{(n-1)!}{(n-3)!} \leq 72 \quad n \geq 3 \quad n \in N.$

$(n-2)(n-1) \leq 72. \qquad n^2 - 3n - 70 \leq 0.$

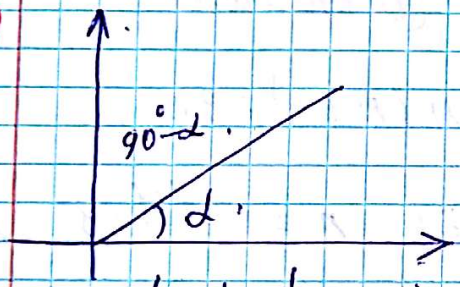
$n^2 - 3n + 2 \leq 72 \qquad D = 289. \qquad n_1 = \frac{3+17}{2} = 10.$

$n \geq 3, \; n \leq 10$ shartdan. $\quad n_2 = \frac{3-17}{2} = -7 \notin N$

$n \in [3; 10)$

@bjalilova

3)



$f'(x) = tg\alpha. \qquad x_0 = 2\sqrt{3}.$

$f(x) = \sqrt{3}\ln x. \quad f'(x) = \frac{\sqrt{3}}{x}.$

$f'(2\sqrt{3}) = \frac{\sqrt{3}}{2\sqrt{3}} = \frac{1}{2}.$

$tg\alpha = \frac{1}{2} \qquad \alpha = arctg\frac{1}{2}. \qquad \beta = 90 - \alpha$ dan.

Oy bilan hosil qilgan burchak $\beta = \frac{\pi}{2} - arctg\frac{1}{2}.$

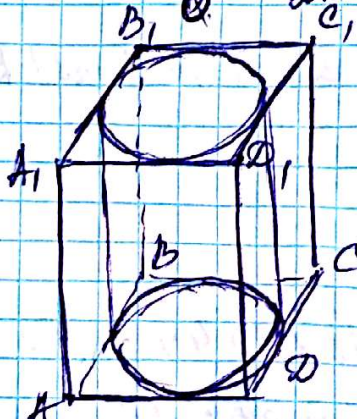
4) $\bar{a}(-4; 2; 2) \qquad \bar{b}(\sqrt{2}; -\sqrt{2}; 0) \qquad (2\bar{a}; \frac{\bar{b}}{2}) - ?$

$\cos\varphi = \frac{\bar{a}\cdot\bar{b}}{|\bar{a}|\,|\bar{b}|} \qquad 2\bar{a} = (-8; 4; 4) \qquad \frac{\bar{b}}{2} = (\frac{\sqrt{2}}{2}; -\frac{\sqrt{2}}{2}; 0)$

$\cos\varphi = \frac{-8\cdot\frac{\sqrt{2}}{2} - 4\cdot\frac{\sqrt{2}}{2} + 4\cdot 0}{\sqrt{64+16+16}\sqrt{\frac{2}{4}+\frac{2}{4}+0}} = \frac{-6\sqrt{2}}{\sqrt{96}} = -\frac{6\sqrt{2}}{4\sqrt{6}} = -\frac{3}{2\sqrt{3}} =$

$= -\frac{2\sqrt{3}}{6} = \frac{\sqrt{3}}{2}. \qquad \alpha = \pi - \arccos\left(\frac{2\sqrt{3}}{2}\right) = \pi - \frac{\pi}{6} = \frac{5\pi}{6}.$

5)



$\frac{V_{silindr}}{V_{prizma}} - ?$

$V_{silindr} = \pi R^2 \cdot H.$

$V_{prizma} = AB^2 \cdot H.$

$ABCD$ - kvadrat.

$R = \frac{AB}{2}. \qquad \frac{V_s}{V_p} = \frac{\pi\frac{AB^2}{4}\cdot H}{AB^2\cdot H} = \frac{\pi}{4}.$

@boyourt_matematiklar.

10-bilet.

① $f(x) = -x + \frac{x^2}{2}$ (6;2) nuqtadan o'tuvchi boshl. funksiya.

$F(x) = -\frac{x^2}{2} + \frac{x^3}{6} + C$. $-\frac{6^2}{2} + \frac{6^3}{6} + C = 2$.

$-18 + 36 + C = 2$. $C = 2 + 18 - 36$ $C = -16$.

$F(x) = -\frac{x^2}{2} + \frac{x^3}{6} - 16$.

② $x^{\log_3 x^2 + \log_3^2 x - 10} = \frac{1}{x^2}$ → $\log_3^2 x + 2\log_3 x - 8 = 0$.

$x^{\log_3 x^2 + \log_3^2 x - 10} = x^{-2}$. $\log_3 x = t$.

$\log_3 x^2 + \log_3^2 x - 10 = -2$. → $t^2 + 2t - 8 = 0$.

$D = 4 + 32 = 36$.

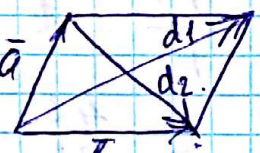
$t_1 = \frac{-2-6}{2} = -4$ $t_2 = \frac{-2+6}{2} = +2$.

$\begin{cases} \log_3 x = -4 \\ \log_3 x = +2 \end{cases}$ $\begin{cases} x = 3^{-4} \\ x = 3^2 \end{cases}$ $\begin{cases} x_1 = \frac{1}{81} \\ x_2 = 9 \end{cases}$

@boyqut_matematik @bjalilova

③ $\bar{a} = 2\bar{i} + \bar{j}$ $\bar{a} = (2; 1; 0)$

$\bar{b} = -2\bar{j} + 2\bar{k}$ $\bar{b} = (0; -2; 2)$

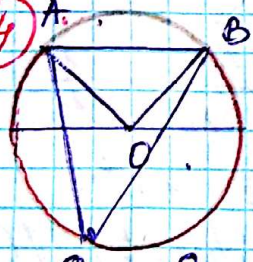


$\bar{d}_1 = \bar{a} + \bar{b}$ $\bar{d}_1 = (2; -1; 2)$

$\bar{d}_2 = \bar{a} - \bar{b}$ $\bar{d}_2 = (2; 3; -2)$

$\cos\varphi = \frac{4 - 3 - 4}{\sqrt{4+1+4}\sqrt{4+9+4}} = \frac{-3}{3\sqrt{17}} = -\frac{1}{\sqrt{17}}$ $\varphi = \pi - \arccos\left(\frac{1}{\sqrt{17}}\right)$

④



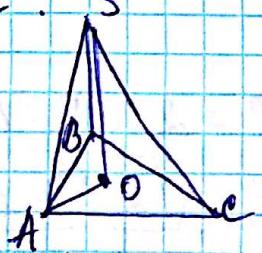
$AB = R$.

$AO = OB = AB$ bundan $\angle AOB = \angle OAB = \angle OBA = 60°$.

$\overset{\smile}{AB} = \angle AOB = 60°$

$\angle ACB = \frac{\angle AOB}{2} = \frac{60°}{2} = 30°$. Javob: 30°.

⑤



$\triangle ABC$ - muntazam. $AO = R = \frac{a}{\sqrt{3}}$

$V_{SABC} = 8\sqrt{3}$. $S_{asos} = \frac{\sqrt{3}}{4}a^2$.

$SO = H$ - ?

$\frac{1}{3} \cdot \frac{\sqrt{3}}{4} a^2 \cdot H = 8\sqrt{3}$. $Ha^2 = 96$. $H^2 = a^2 - \left(\frac{a}{\sqrt{3}}\right)^2 = \frac{2a^2}{3}$.

$a^2 = \frac{96}{H}$ $H^3 = \frac{2 \cdot 96}{3}$ $H^3 = 64$. $H = 4$.

Javob: 4.

11-bilet

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

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

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

$\begin{cases} \sin x + 1 > 1{,}5 \cdot & \sin x > 0{,}5 \cdot \\ \sin x + 1 < -1{,}5 \cdot & \sin x < -2{,}5 \Rightarrow \emptyset \end{cases}$ $-1 \le \sin x \le 1$ dan.

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

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

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

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

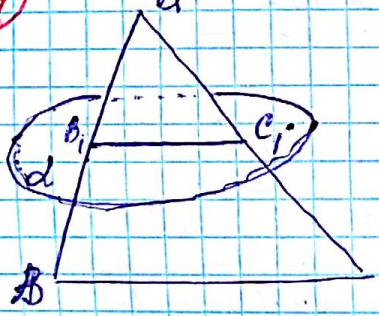
$x^2 + y^2 = 25 + 28 = 53$.

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

$= 14 \cdot 53 = 742$.

@boyovut_matematiklar

④



$AB_1 : BB_1 = 2 : 3$. bundan $AB : BB_1 = 5 : 2$.

$BC = 15$ cm

$BC \parallel B_1C_1$

$B_1C_1 - ?$

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

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

$\triangle ABC \sim \triangle AB_1C_1$ dan.

⑤ $\vec{m}(2; 3; x)$ $\vec{n}(-1; 4; 2)$ $\vec{m} \perp \vec{n} = 0$.

$2 \cdot (-1) + 3 \cdot 4 + 2 \cdot x = 0$. $2x = 2 - 12$

$2x = -10$ $x = 5$.

@yalilovo

12-bilet.

① $\frac{202^2-54^2+256\cdot352}{4^4\cdot10^2}=\frac{(202+54)(202-54)+256\cdot352}{4^4\cdot10^2}=$

$=\frac{256\cdot148+256\cdot352}{4^4\cdot10^2}=\frac{256\cdot(148+352)}{256\cdot100}=\frac{500}{100}=5$.

② $a_2-a_1=6$ bolsa $a_8-a_5-?$

$d=a_2-a_1=6$. $a_1+7d+(a_1+4d)=a_1+7d-a_1-4d=$

$=3d$ $a_8-a_5=3d=3\cdot6=18$ Javob: 18.

Javob: 5.

③ @boyovut_matematiklar

$f(x)=x^5+5x^4+4x^3+3x^2+2x-1$ $f(0)$, $f'(0)-?$

$f(0)=0+0+0+0+0+0-1=-1$.

$f'(x)=5x^4+20x^3+12x^2+6x+2$.

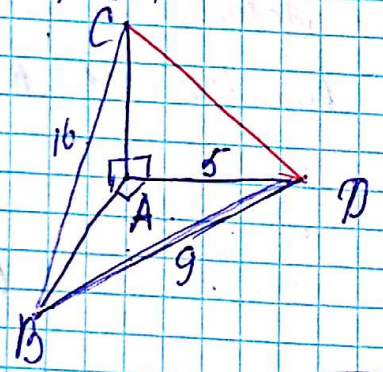
$f'(0)=0+0+0+0+2=2$.

Javob:

$f(0)=-1$

$f'(0)=2$.

④



$BD=9$ cm.

$BC=16$ cm.

$AD=5$ cm.

$CD-?$

$AB=\sqrt{81-25}=$

$=\sqrt{56}$

$AC^2=16^2-(\sqrt{56})^2$

$=256-56=200$.

$CD=\sqrt{AC^2+AD^2}=\sqrt{200+25}=\sqrt{225}=15$.

Javob: 15 cm.

⑤ $A(2;3;1)$

$B(3;2;1)$

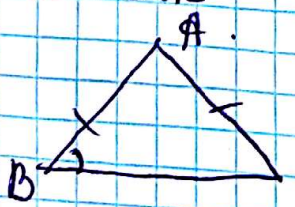
$C(3;4;1)$.

$AB=\sqrt{(3-2)^2+(2-3)^2+(1-1)^2}=\sqrt{2}$.

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

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

Demak ABC



Asosi BC. $\angle B=\angle C$.

$\cos B=\frac{AB^2+BC^2-AC^2}{2\cdot AB\cdot BC}=$

$=\frac{2+4-2}{2\cdot\sqrt{2}\cdot2}=\frac{4}{4\sqrt{2}}=\frac{1}{\sqrt{2}}$,

$\cos B=\frac{\sqrt{2}}{2}$ $B=45^\circ$.

@bjalilova

13-bilet.

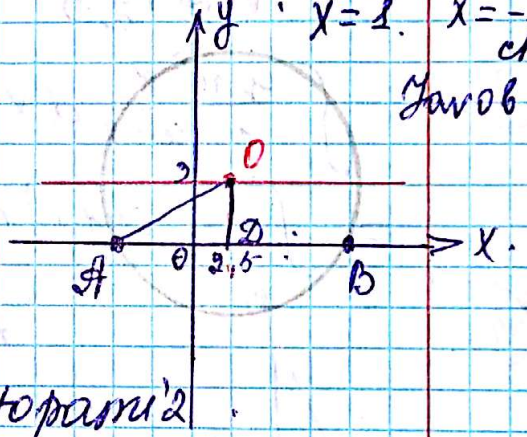
① $\log_5 tg36° + \log_5 tg54° = \log_5 (tg36° \cdot tg54°) =$
$= \log_5 (tg(90°-54°) tg54°) = \log_5 (ctg54° \cdot tg54°) =$
$= \log_5 1 = 0$.

② $2 < x \le 5$.
$3 \le y < 6$.
$a \le xy - x \le b$.

$a = xy - x = 2 \cdot 3 - 2 = 4$.
$b = xy - x = 5 \cdot 6 - 5 = 25$.
Javob $(4; 28)$.

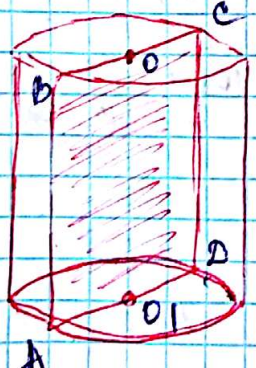
③ $y = \ln x - \frac{1}{2}x^2 + 1$. $y' = 0$.
$y' = \frac{1}{x} - \frac{1}{2} \cdot 2x = \frac{1}{x} - x$. $\frac{1}{x} - x = 0$ $x^2 = 1$ $x = \pm 1$.
$x = 1$. $x = -1$ chet.
Javob $x = 1$

④ $x^2 + y^2 - 5x - 6y + 4 = 0$.
$\left(x - \frac{5}{2}\right)^2 + (y-3)^2 = -4 + 6{,}25 + 9$.
$(x - 2{,}5)^2 + (y-3)^2 = 11{,}25$.
$O(2{,}5; 3)$ $R^2 = 11{,}25$. dan.
$AO = 7{,}5$. $OD = 3$. AD ni toparmi'z.



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

⑤



$ABCD$ - kvadrat.
$S_{yon} = 64\pi$.
R - ?
@bajalibova
@boyovlit_matematiklar

$S_{yon} = 2\pi R \cdot H$. $2R = AD$ dan.
$AD^2 \pi = 64\pi$ $AD^2 = 64$ $AD = 8$.
AD diametr. $R = \frac{AD}{2} = 4$. $\underline{R = 4}$.

Sotish taqiqlanadi!

14-bilet.

① $y = -6x^2 + 7x - 2$. $y' = -12x + 7$.

$-6x^2 + 7x - 2 = 0$ $D = 49 - 48 = 1$.

$x_1 = \frac{-7+1}{-12} = \frac{1}{2}$ $x_2 = \frac{-7-1}{-12} = \frac{8}{12} = \frac{2}{3}$. $y = -2$.

$-2 + \frac{1}{2} + \frac{2}{3} = -2\frac{1}{6} = 1\frac{1}{6} - 2 = -\frac{5}{6}$;

② $\sin\left(\frac{1}{2}\arccos\frac{1}{9}\right)$ ni hisoblan.

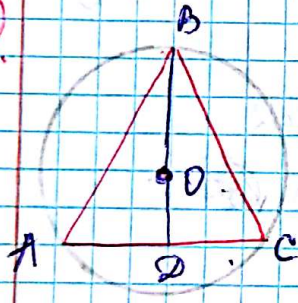
$\sin\left(\frac{1}{2}\arccos\frac{1}{9}\right) = \pm\sqrt{\frac{1-\cos\left(\arccos\frac{1}{9}\right)}{2}} = \sqrt{\frac{1-\frac{1}{9}}{2}} =$

$= \sqrt{\frac{8}{9\cdot 2}} = \sqrt{\frac{4}{9}} = \frac{2}{3}$

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



@byali'lovo.

$AB = BC = 10$.

$AC = \frac{10\sqrt{11}}{3}$

@boyovut_matematiklar.

R-?

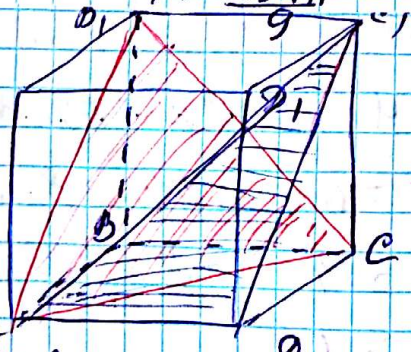
$AD = \frac{AC}{2} = \frac{5\sqrt{11}}{3}$.

$BD = \sqrt{AB^2 - AD^2} = \sqrt{100 - \left(\frac{5\sqrt{11}}{3}\right)^2} =$

$= \sqrt{100 - \frac{275}{9}} = \sqrt{\frac{625}{9}} = \frac{25}{3}$ $S = \frac{10\sqrt{11}}{3}\cdot\frac{25}{3}\cdot\frac{1}{2} = \frac{125\sqrt{11}}{9}$.

$R = \frac{10\cdot 10\cdot\frac{10\sqrt{11}}{3}}{4\cdot\frac{125\sqrt{11}}{9}} = \frac{\frac{1000\sqrt{11}}{3}}{\frac{500\sqrt{11}}{9}} = \frac{1000\sqrt{11}}{3}\cdot\frac{9}{500\sqrt{11}} = 6$.

⑤



$ABCDA_1B_1C_1D_1$ - kub.

$AB = 8$.

P_{AB_1C} - ? S_{DAC_1} - ?

$\triangle AB_1C$ dan,

kub yoqi diagonali $AB_1 = \sqrt{8^2 + 8^2} = 8\sqrt{2}$.

$AB_1 = BC = AC$

kub diagonali.

$P = 3\cdot 8\sqrt{2} = 24\sqrt{2}$.

$S_{DAC_1} = \frac{8\cdot 8\sqrt{2}}{2} = 32\sqrt{2}$.

$AC_1 = \sqrt{8^2 + (8\sqrt{2})^2} = \sqrt{64+128} = \sqrt{192} = 8\sqrt{3}$.

15-bilet.

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

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

② $\begin{array}{r} 3x+2y=3 \\ 3x-2ay=5 \\ \hline 2y+2ay=-2 \end{array}$

$2y+2ay=-2$.

$y+ay=-1$.

$y(1+a)=-1$.

$y=-\frac{1}{1+a}$.

$-\frac{1}{1+a}>0$.

$1+a<0$ $\quad a<-1$. Javob $(-\infty;-1)$

③ $\cos x\cos 2x=\cos 3x$ $\quad [0;2\pi]$ da nechta yechimga ega.

$\frac{1}{2}\cos(x+2x)+\cos(2x-x)=\cos 3x$.

$\frac{1}{2}(\cos 3x+\cos x)=\cos 3x$

$\cos 3x+\cos x=2\cos 3x$.

$\cos 3x-\cos x=0$.

$-2\sin 2x\sin x=0$.

$\sin 2x=0$. $\quad x=\frac{\pi n}{2}$

$\sin x=0$. $\quad x=\pi n$;

$n=0$ da $\quad x_1=0$.

$n=1$ da $\quad x_2=\frac{\pi}{2}$.

$n=2$ da $\quad x_3=\pi$.

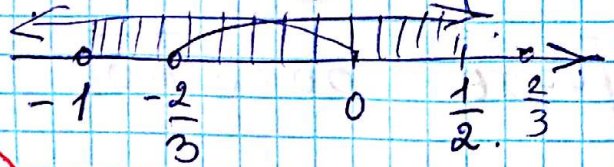
$n=3$ da $\quad x_4=\frac{3\pi}{2}$.

$n=4$ da $\quad x_5=2\pi$.

④ $a\ (-1<a<\frac{1}{2})$ $\quad 1+a,\ 1-2a;\ 2$ kesmalardan uchburchak yasash mumkin. Abjalilovo

$AB+BC>AC$ dan.

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



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

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

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

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: $(-\infty; 4,5)$

② $(\sqrt{7} + \sqrt{2} - 1)(\sqrt{7} + 1 - \sqrt{2}) = (\sqrt{7} + (\sqrt{2} - 1))(\sqrt{7} - (\sqrt{2} - 1)) =$

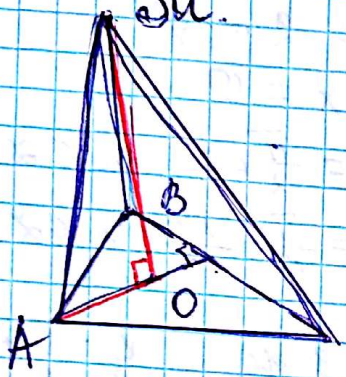
$= (\sqrt{7})^2 - (\sqrt{2} - 1)^2 = 7 - 2 + 2\sqrt{2} - 1 = 4 + 2\sqrt{2}$.

③ $f'(x) > 0$ $f(x) = 3x^2 - 4x$.

$f'(x) = 6x - 4$. $6x - 4 > 0$ $6x > 4$ $x > \frac{2}{3}$.

J: $(\frac{2}{3}; \infty)$

④ SU.



@yaliwar

ΔABC - muntasam.

$AB = 60$ cm.

$MA = MB = MC = 40$ cm. MO - ?

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

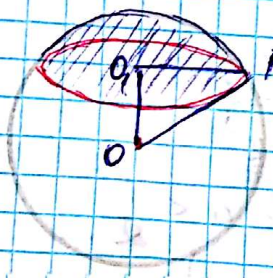
$AO = 20\sqrt{3}$.

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

$= \sqrt{400} = 20$

@boyovut_matematiklar

⑤



$O_1A = 60$ cm.

$OA = 75$ cm.

V_{sektor} - ?

$OO_1 = \sqrt{75^2 - 60^2} = \sqrt{5625 - 3600} = \sqrt{2025} = 45$.

$h = 75 - 45 = 30$.

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

$V = \pi \cdot 30^2 (45 - \frac{1}{3} \cdot 30) = 900\pi (75 - 10) =$

$= 900\pi \cdot 65 = 58500\pi$ cm^3.

17-bilet.

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

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

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

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

$\sqrt[4]{x^2+77} = -1$ $\varnothing$. Javob: ± 2.

② $y = \frac{-3}{e^x} = -3e^{-x}$ $F(x) = \frac{3}{e^x}$.

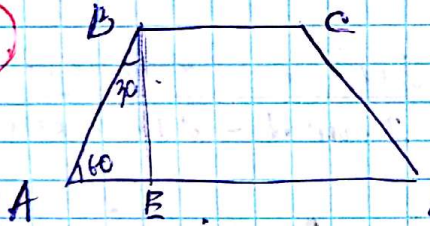
③ $\frac{(n+2)!}{n!} = 72$. $(n+1)(n+2) = 72$.

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

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

Javob: $n = 7$. @boyqovt_matematiklar.

④



$BC : AD = 1 : 2$.

$P_{ABCD} = 50$.

$\angle A = 60^\circ$.

$AB = CD$.

$AD - ?$

$BC = x$. $AD = 2x$.

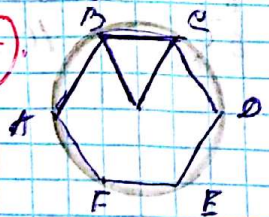
$AE = \frac{2x-x}{2} = 0,5x$.

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

Demak $x + x + x + 2x = 50$ $5x = 50$ $x = 10$.

$AD = 2x$ $AD = 20$. Javob: 20.

⑤



$C_{aylana} = 4\pi$. $2\pi R = 4\pi$.

$S_{ABCDEF} - ?$ $R = 2 = AB$ bo'ladi.

ABCDEF - muntazam.

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

@qalilova. Javob: $6\sqrt{3}$.

18 - bilet

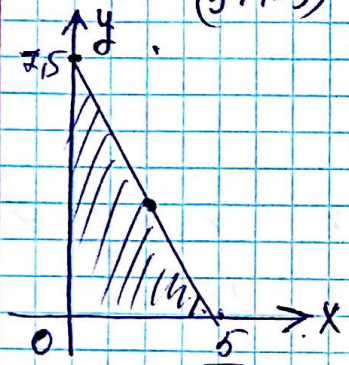
① $|x^2-36| = 36-x^2$.

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

② $y = \frac{6x}{5x-3}$ $x_0 = 1$ nuqtada o'tkazilgan urinma va koordinata o'qlari bilan chegaralangan yuzani toping.

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

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



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

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

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

@boyovut_matematiklar.

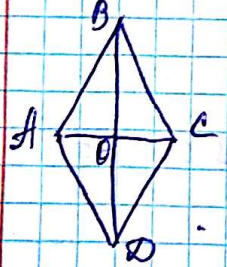
③ $tg\alpha = -\frac{1}{2}$.

$\frac{2\cos^2\alpha - \sin 2\alpha}{2\sin^2\alpha - \sin 2\alpha} = \frac{2\cos^2\alpha - 2\sin\alpha\cos\alpha}{2\sin^2\alpha - 2\sin\alpha\cos\alpha} =$

$\cos^2\alpha$ ga bo'lamiz.

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

④



$ABCD$ - romb.

$AC = 4$.

$BD = 32$.

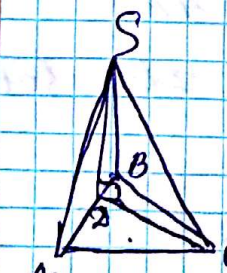
$ctgA$ - ?

$ctg\frac{A}{2} = \frac{4}{32} = \frac{1}{8}$.

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

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

⑤



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

$\angle SDC$ - ?

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

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

19-bilet

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

$x_1 \geq 0$ da $x_1 = \frac{3+11}{2} = 7$ ✓. $x_2 = \frac{3-11}{2} = -4$ qanoatlantirmaydi.

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

$x_1 \cdot x_4 = 7 \cdot (-7) = -49$. Javob: -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 $4\cos 5x = 6 + 3\cos\left(\frac{\pi}{2} + 5x\right)$ $[-\pi; 2\pi]$.

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

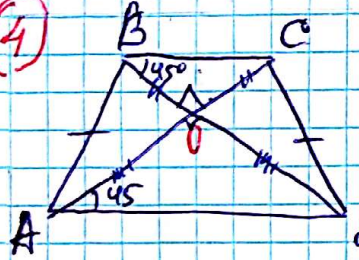
$4\cos 5x + 3\sin 5x = 6$ @boyovut_matematiklar

$y = a\sin x + b\cos x$ funksiya qiymatlar sohasi $[-\sqrt{a^2+b^2}; \sqrt{a^2+b^2}]$ ekanligidan.

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

$4\cos 5x + 3\sin 5x = 6$ ∅. Javob: ∅.

④



$AB = CD$. $\frac{BO}{\sin 45°} = \frac{BC}{\sin 90°}$ dan

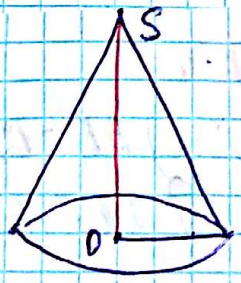
$BC = 8$. $BO = BC \cdot \sin 45° = 8 \cdot \frac{\sqrt{2}}{2} = 4\sqrt{2}$.

$AD = 12$. $AO = AD \cdot \sin 45° = 12 \cdot \frac{\sqrt{2}}{2} = 6\sqrt{2}$.

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

S - ? $S = \frac{AC^2}{2} = \frac{(10\sqrt{2})^2}{2} = 100$ (kvadrat birlik).

⑤ @bajilova



$SA = 6\sqrt[3]{3}$. $SO = \frac{1}{2}AC$.

$\angle SAO = 30°$. $\triangle SOA$ dan.

V - ? $SO = \frac{1}{2} 6\sqrt[3]{3} = 3\sqrt[3]{3}$.

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

$= \sqrt{36\sqrt[3]{9} - 9\sqrt[3]{9}} = \sqrt{27\sqrt[3]{9}}$.

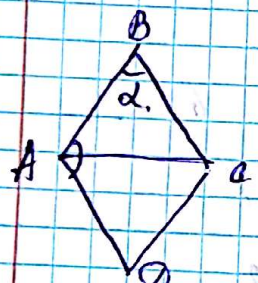
$V = \frac{1}{3}\pi \cdot \left(\sqrt{27\sqrt[3]{9}}\right)^2 \cdot 3\sqrt[3]{3} = \frac{1}{3}\pi \cdot 81\sqrt[3]{3} \cdot 3\sqrt[3]{3} = 81\sqrt[3]{9}\pi$.

20-bilet.

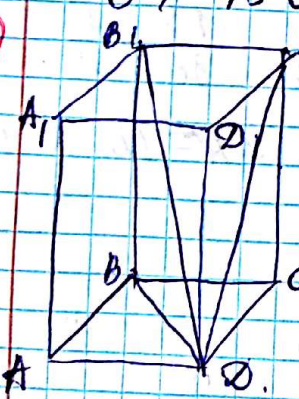
1. $\frac{3^{-10}\cdot 7^{-5}\cdot\left(\frac{1}{9}\right)^{-2}}{\left(\frac{1}{21}\right)^{-8}\cdot 49} = \frac{3^{-10}\cdot 7^{-5}\cdot 3^{4}}{3^{-8}\cdot 7^{-8}\cdot 7^{2}} = 3^{-10+4+8}\cdot 7^{-5+8+2} = 3^{2}\cdot 7 = 9\cdot 7 = 63$

2. $f(x)=x^3-27x$ $f'(x)=3x^2-27$ $(-\infty;-3)\cup(3;\infty)$ o'suvchi
$3x^2-27=0$ $x^2=9$ $x=\pm 3$. $(-3;3)$ kamayuvchi

3. $\operatorname{tg}\frac{x}{2}=3$ $\sin x$ $\cos x$ $\operatorname{ctg} x$ -?
$\operatorname{tg} x=\pm\sqrt{\frac{1-\cos x}{1+\cos x}}$ $\operatorname{tg}^2 x=\frac{1-\cos x}{1+\cos x}$ $\frac{1-\cos x}{1+\cos x}=9$
$1-\cos x=9+9\cos x$ $10\cos x=-8$ $\cos x=-\frac{8}{10}=-\frac{4}{5}$.
$\sin x=\pm\sqrt{1-\frac{16}{25}}=\pm\sqrt{\frac{9}{25}}=\pm\frac{3}{5}$. $\operatorname{ctg} x=\pm\frac{4}{3}$.

4. 

ABCD - romb. @djalilovo
$S=18$ $S_{romb}=AB^2\sin\alpha$ dan.
$\angle A$ - ? $\sin\alpha=\frac{S}{AB^2}=\frac{18}{36}=\frac{1}{2}$.
$AB=6$. $\angle B=\alpha=30°$.
$\angle A=180°-30°=150°$.

5. 

Y: 150°.
$B_1D=3{,}5$ cm.
ABCD - ten tomon.
$C_1D=2{,}5$ cm.
V - ?

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

@boyovut_matematiklar

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

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

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

$BB_1^2=6{,}25+AB^2$.

$6{,}25+AB^2=12{,}25-2AB^2$. $AB^2=12{,}25-6{,}25=6$.

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

$BB_1=0{,}5$.

Javob: 3 (kub birlik)

21-bilet

① $8\cos 5^\circ \cos 10^\circ \cos 20^\circ \cos 40^\circ = \frac{4\cdot 2\sin 5^\circ \cdot \cos 5^\circ \cdot \cos 10^\circ \cdot \cos 20^\circ \cdot \cos 40^\circ}{\sin 5^\circ} =$

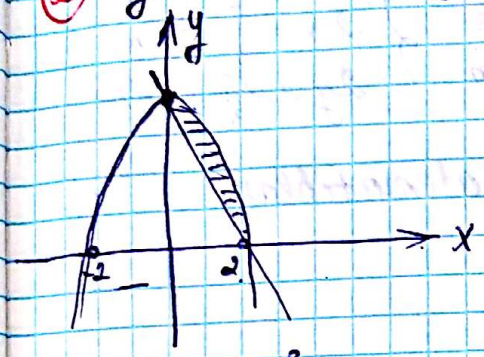
$= \frac{4\cos 10^\circ \cdot \sin 10^\circ \cdot \cos 20^\circ \cdot \cos 40^\circ}{\sin 5^\circ} = \frac{2\cdot \sin 20 \cos 20 \cos 40}{\sin 5^\circ} =$

$= \frac{\sin 40 \cdot \cos 40^\circ}{\sin 5^\circ} = \frac{\sin 80}{2\sin 5^\circ}$.

② $y = 4-2x$. $y = 4-x^2$. $4-x^2 = 4-2x$.

$x^2 - 2x = 0$.

$x_1 = 0$, $x_2 = 2$.



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

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

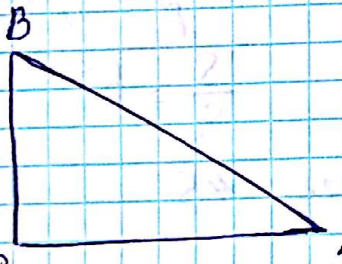
$= -\frac{8}{3} + 4 + 0 - 0 = \frac{4}{3}$ (kv. birlik).

③ $\{a_n\}$ - arif. pr-ya. $a_{10} = 131$ $d = 12$ $a_1 - ?$

$a_n = a_1 + (n-1)d$ $a_1 = a_n - (n-1)d$.

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

④



$AC = 12$ cm. @boyovut_matematika

$BC = AB - 6$.

$S - ?$

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

$AB^2 - 12AB + 36 + 144 = AB^2$ $12AB = 180$ $AB = \frac{180}{12} = 15$.

$BC = 9$ $S = \frac{12\cdot 9}{2} = 54$ cm^2. Javob: 54 cm^2.

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

$(\overline{AB}, \overline{CD}) - ?$ $\overline{AB} = (1;-2;3)$ $CD = (-1;-4;1)$.

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

$= \frac{-1+8+3}{\sqrt{14}\cdot\sqrt{18}} = \frac{10}{\sqrt{14\cdot 18}} = \frac{10}{6\sqrt{7}} = \frac{5}{3\sqrt{7}}$

$\varphi = \arccos\left(\frac{5}{3\sqrt{7}}\right)$

22 - bilet.

1. $\frac{9-4\sqrt{5}}{9+4\sqrt{5}} + \frac{9+4\sqrt{5}}{9-4\sqrt{5}} = \frac{(9-4\sqrt{5})^2}{81-80} + \frac{(9+4\sqrt{5})^2}{81-80} =$

$= 81 - 72\sqrt{5} + 80 + 81 + 72\sqrt{5} + 80 = 322.$

2. $\begin{cases} \sin x \cos y = 0{,}25 \\ \sin y \cos x = 0{,}75 \end{cases}$

$\sin x \cos y + \sin y \cos x = 1.$

$\begin{cases} \sin(x+y) = 1 \\ \sin(x-y) = -\frac{1}{2} \end{cases} \quad \begin{cases} x+y = \frac{\pi}{2} + 2\pi n \\ x-y = -\frac{\pi}{6} + 2\pi n \end{cases} \quad \begin{cases} 2x = \frac{\pi}{3} + 2\pi n \\ 2y = \frac{2\pi}{3} + 2\pi n \end{cases}$

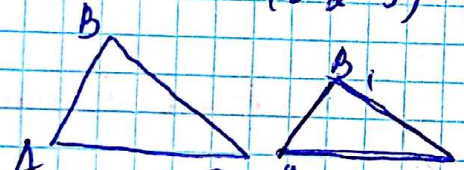
$\begin{cases} x = \frac{\pi}{6} + \pi n, \ n \in Z \\ y = \frac{\pi}{6} + \pi n, \ n \in Z \end{cases}$ @boyooqut_matematiklar.

3. $f(x) = \frac{2x+1}{3x-5} \quad f'(2) - ?$

$f'(x) = \frac{2(3x-5) - 3(2x+1)}{(3x-5)^2} = \frac{6x - 10 - 6x - 3}{(3x-5)^2} = -\frac{13}{(3x-5)^2}.$

$f'(2) = -\frac{13}{(3\cdot 2-5)^2} = -\frac{13}{1} = -13.$ @baliqova

4.



$P = 36.$ $k = \frac{P}{P_1} = \frac{36}{18} = 2.$

$P_1 = 18.$

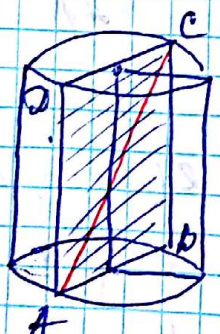
$S + S_1 = 30.$ $\frac{S}{S_1} = k^2$

$S - ?$

$\frac{S}{30-S} = 2^2$ $\frac{S}{30-S} = 4.$ $S = 120 - 4S.$

$5S = 120$ $S = 24.$ Javob 24 (kvadrat birlik).

5.



$R = 2m.$ $AB = 2R = 4.$

$H = 3m.$ $AC = \sqrt{4^2 + 3^2} =$

$ABCD$ - o'q kesim $= \sqrt{16+9} = \sqrt{25} = 5.$

$AC - ?$

Javob: 5 m.

23-bilet.

① Kasrni qisqartiring. $\frac{3^{2n+1}-3^{2n-1}}{4\cdot 3^n} = \frac{3\cdot 3^{2n}-\frac{1}{3}\cdot 3^{2n}}{4\cdot 3^n} =$

$= \frac{3^{2n}\left(3-\frac{1}{3}\right)}{4\cdot 3^n} = \frac{3^n\cdot 3^n\cdot \frac{8}{3}}{4\cdot 3^n} = 2\cdot 3^n;$

② $\{b_n\}$ - g.p-ya $\quad b_1 = \frac{243}{256} \quad q = \frac{2}{3} \quad n=8. \quad b_n - ?$

$b_8 = b_1\cdot q^7 = \frac{243}{256}\cdot\left(\frac{2}{3}\right)^7 = \frac{243}{256}\cdot\frac{128}{2187} = \frac{1}{18};$

③ $[-4;1]$ da $f(x) = x^4 - 8x^2 + 3$ ning eng katta va eng kichik.

$f'(x) = 4x^3 - 16x. \quad 4x^3 - 16x = 0, \quad 4x(x^2-4) = 0.$

$x_1 = 0 \quad x_2 = 2 \quad x_3 = -2.$ Demak.

$f(-4) = (-4)^4 - 8\cdot(-4)^2 + 3 = 256 - 128 + 3 = 131.$

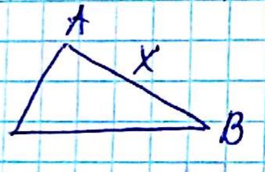
$f(-2) = (-2)^4 - 8\cdot(-2)^2 + 3 = 16 - 32 + 3 = -13.$

$f(0) = 0 - 0 + 3 = 3.$ Eng katta qiymati: 131

$f(1) = 1 - 8 + 3 = -4.$ Eng kichik qiymati: −13.

$f(2) = -13.$

④



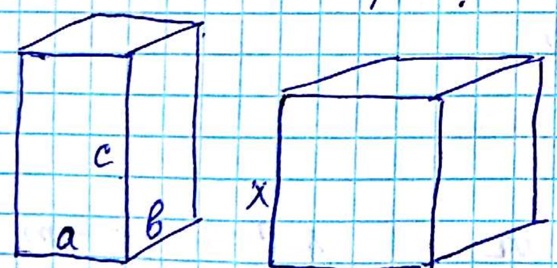
$AB = x, \quad x > 5 \qquad x + x - 4 + x + 4 = 3x.$

$AC = x - 4. \qquad P = 3x. \quad x > 5$ dan.

$BC = x + 4. \qquad P > 15.$

$P - ?$

⑤



$a = 15m.$

$b = 50m.$

$c = 36m.$

$x_{kub} - ?$

$V_p = 15\cdot 50\cdot 36 = 27000. \quad V_{kub} = x^3.$

$V_p = V_{kub}$ dan. $\quad x^3 = 27000$

$x = 30.$ Javob: 30 m

@bjalilova

@boyovut_matematiklar.

24- bilet.

1. $\frac{25x^2-20xy}{16y^2-20xy} = \frac{5x(5x-4y)}{-4y(5x-4y)} = -\frac{5x}{4y}$

2. $\lg(5-2x) > 1$

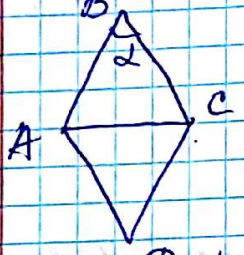
$\begin{cases} 5-2x > 10 \\ 5-2x > 0 \end{cases}$. $\begin{cases} 2x < -5 \\ 2x < 5 \end{cases}$ $\begin{cases} x < -2,5 \\ x < 2,5 \end{cases}$

Javob $(-\infty; -2,5)$

3. $\int_0^2 (1+2x)^3 dx = \int_0^2 (1+6x+12x^2+4x^3) dx =$

$= \left(x + \frac{6x^2}{2} + \frac{12x^3}{3} + \frac{x^4}{4}\right)\Big|_0^2 = 2+12+32+4 = 50.$

@bjalilova

4. 

$\angle A = 120°$.

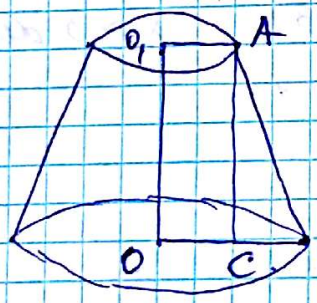
$\angle B = \alpha = 180-120 = 60°$.

$ABCD$ - romb. $S = AB^2 \sin\alpha$.

$AB = 4$.

$S_{romb} - ?$

$S = 4^2 \cdot \sin 60° = 16 \cdot \frac{\sqrt{3}}{2} = 8\sqrt{3}$ (kv. birlik).

5. 

$O_1A = 3m$

$OB = 6m$. @ bjalilova

$OO_1 = 4m$.

$AB - ?$

$CB = OB - O_1A = 6-3 = 3m$. $AC = OO_1 = 4m$.

$\triangle ACB$ dan $AB = \sqrt{CB^2 + AC^2} =$

$= \sqrt{3^2+4^2} = \sqrt{25} = 5$.

Javob: 5 m.

@boyovut_matematiklar.

25 - bilet.

① $\frac{\frac{1}{3}\sqrt{39} - \frac{1}{2}\sqrt{26}}{\frac{1}{6}\sqrt{13}} + \sqrt{18} = \frac{\frac{2\sqrt{3}\cdot\sqrt{13} - 3\sqrt{2}\cdot\sqrt{13}}{6}}{\frac{\sqrt{13}}{6}} + \sqrt{18} = \frac{\sqrt{13}(2\sqrt{3}-3\sqrt{2})}{\sqrt{13}}$

$+\sqrt{18} = 2\sqrt{3} - 3\sqrt{2} + 3\sqrt{2} = 2\sqrt{3}$.

② $49^{x^2-3x} = \left(\frac{1}{7}\right)^{3-x}$

$7^{2x^2-6x} = 7^{-3+x}$

$2x^2 - 6x = -3 + x$.

$2x - 7x + 3 = 0$

$D = 7^2 - 4\cdot 2\cdot 3 = 49 - 24 = 25$.

$x_1 = \frac{7+5}{4} = 3 \quad x_2 = \frac{7-5}{4} = \frac{1}{2}$.

③ $\int_0^{\pi} x \sin x\, dx = \int_0^{\pi} u\, dv = uv - \int_0^{\pi} v\, du = x\cdot(-\cos x) +$

$u = x \quad du = dx$

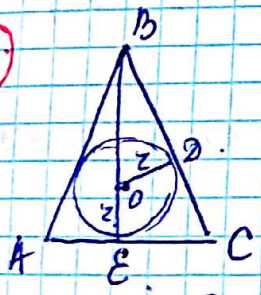
$dv = \sin x\, dx \quad v = -\cos x$

$+ \int_0^{\pi} \cos dx = (x\cdot(-\cos x) + \sin x)\Big|_0^{\pi} =$

$= \pi$.

@bjalilova

④



$AB = BC = b$.

$\angle B = 2\alpha$.

$OD = r - ?$

$S_\Delta = \frac{1}{2} b^2 \sin 2\alpha$.

ΔABE dan. $\angle ABE = \frac{2\alpha}{2} = \alpha$.

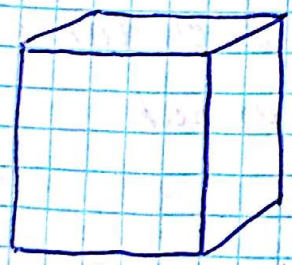
$AE = b\cdot\sin\alpha$. $AC = 2b\sin\alpha$

$r = \frac{2S}{a+b+c}$

$r = \frac{2\cdot\frac{1}{2} b^2 \sin 2\alpha}{2b\sin\alpha + b + b} = \frac{b^2 \sin 2\alpha}{b(2\sin\alpha + 2)} = \frac{b\sin 2\alpha}{2\sin\alpha + 2} =$

$= \frac{2b^2 \sin\alpha\cos\alpha}{2(\sin\alpha + 1)} = \frac{b^2 \sin\alpha\cos\alpha}{\sin\alpha + 1}$

⑤



@boyovut_matematiklar.

$V = a^3$.

$V_1 = (a+2)^3 = 98\,m^3 + V$.

$(a+2)^3 = 98 + a^3$.

$a^3 + 6a^2 + 12a + 8 = 98 + a^3$

$6a^2 + 12a - 90 = 0 \quad a^2 + 2a - 15 = 0$.

$D = 4 + 60 = 64$ $\quad a_1 = \frac{-2+8}{2} = 3 \quad a_2 = \frac{-2-8}{2} = -5$ chet ildiz

Javob: $a = 3$.

26 - bilet

(1) $y=\sqrt{49-x^2}$ aniqlanish sohasi

$49-x^2\geq 0$. $x^2\leq 49$. $-7\leq x\leq 7$ Javob $[-7;7]$

(2) $f(x)=3x^2+2x+1$ $F(0)=3$. $F(x)$ - ?

$F(x)=\frac{3x^3}{3}+\frac{2x^2}{2}+x+c=x^3+x^2+x+c$

$F(0)=0+0+0+c=3$ $c=3$. $F(x)=x^3+x^2+x+3$

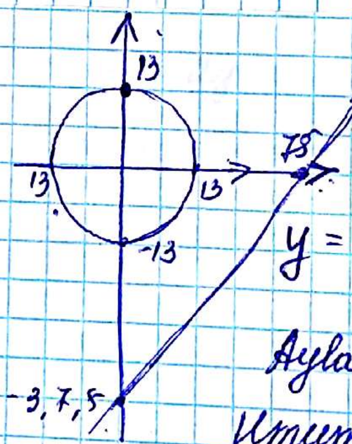
(3) $\arccos(2x-1)=\frac{\pi}{3}$. $2x=\frac{1}{2}+1$.

$2x-1=\cos\frac{\pi}{3}$. $2x=\frac{3}{2}$.

$2x-1=\frac{1}{2}$. $x=\frac{3}{4}$

(4) $\begin{cases} x-2y=75 \\ x^2+y^2=169 \end{cases}$

(+ qilib olamiz).



$x^2+y^2=13^2$.

$y=\frac{x-75}{2}$.

$y=\frac{x-75}{2}$. $x=0$ $y=-37,5$.

$y=0$ $x=75$.

Aylana $y,x\in[-13;13]$.

Umumiy nuqtaga ega emas.

@boyovut_matematiklar.

@bjalilovo.

(5) 

$\alpha=150$.

kopburchak muntazam.

n - ?

$\angle A_i=150$. $\angle A_t=180-150=30°$.

Tashqi burchaklar yig'indisi 360 dan.

$n=\frac{360}{30}=12$. Javob 12 burchak.

27-bilet.

① $731^3 - 611^3 = (731-611)(731^2 + 731\cdot 611 + 611^2) =$

$= 120\cdot(731^2 + 731\cdot 611 + 611^2)$

$\frac{731^3 - 611^3}{120} = \frac{120\cdot(731^2 + 731\cdot 611 + 611^2)}{120} = 731^2 + 731\cdot 611 + 611^2.$

② $y = tg\,x(2x-4)$ $\quad y' = (tg\,x(2x-4))' = \frac{1}{\cos^2 x}\cdot(2x-4) +$

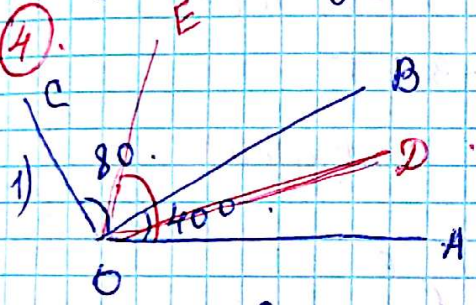
$+ tg\,x\cdot 2 = \frac{2x-4}{\cos^2 x} + 2\,tg\,x.$ @bjalilov

③ $x^2 + y^2 + 4x - 6y - 3 = 0.$

$(x^2+4x+4) + (y^2 - 2\cdot 3y + 9) = 3 + 4 + 9.$

$(x+2)^2 + (y-3)^2 = 16.$ $\quad R = 4$ $\quad O(-2;3)$ ekan.

④



1) OD bissektrisa $\angle BOA$.

EO bissektrisa $\angle COB$.

$\angle BOA = 40$ dan $\angle BOD = 20°$.

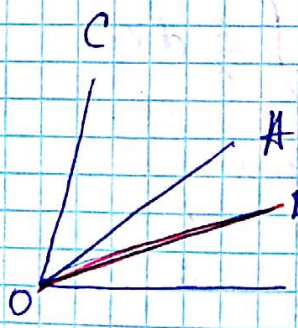
$\angle COB = 80$ dan $\angle EOB = 40°$.

bundan $\angle EOD = 20° + 40° = 60°$

bo'lsa. OE $\angle AOB$ ning bissektrisasi

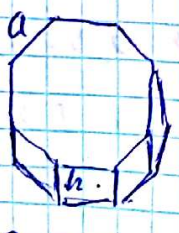
OA $\angle COB$ ning bissektrisasi b-d

$\angle AOE = 40° - 20° = 20°$



2) Agar.

⑤



8 burchak mentasam $\quad a = 3,2$ cm.

$h = 0,7$ cm.

$m = 17,3$ gr.

ρ - ?

$S_{8\angle} = \frac{2a^2}{\sqrt{2}-1} = 2a^2(\sqrt{2}+1).$

$S_a = 2\cdot 3,2^2(\sqrt{2}+1) = 2\cdot 10,24(\sqrt{2}+1) = 20,48\sqrt{2} + 20,48.$

$V = S_a\cdot h = 20,48(\sqrt{2}+1)\cdot 0,7 = 14,336(\sqrt{2}+1).$

$\rho = \frac{m}{V} = \frac{17,3}{14,336(\sqrt{2}+1)} \approx \frac{17,3}{34,6} \approx \frac{1}{2} = 0,5$

$\rho \approx 0,5\ g/sm^3;$ @boyqovut_matematiklar

28 - bilet.

① $\sqrt{\frac{1+x}{x}} + \frac{1}{x} = 5$ $\quad 5 - \frac{1}{x} \geq 0$ $\quad -\frac{1}{x} \geq -5$ $\quad x \geq \frac{1}{5}$.

$\sqrt{\frac{1+x}{x}} = 5 - \frac{1}{x}$ $\quad \frac{1+x}{x} = 25 - \frac{10}{x} + \frac{1}{x^2}$.

$\frac{1}{x} + 1 = 25 - \frac{10}{x} + \frac{1}{x^2}$ $\quad \frac{1}{x^2} - \frac{11}{x} + 24 = 0$. $\quad \frac{1}{x} = t$.

$t^2 - 11t + 24 = 0$. $\quad D = 121 - 96 = 25$.

$t_1 = \frac{11+5}{2} = 8$ $\quad t_2 = \frac{11-5}{2} = 3$.

$\frac{1}{x} = 8$ $\quad x = \frac{1}{8}$ $\quad \frac{1}{x} = 3$ $\quad x = \frac{1}{3} \notin \left[-\infty; \frac{1}{5}\right]$

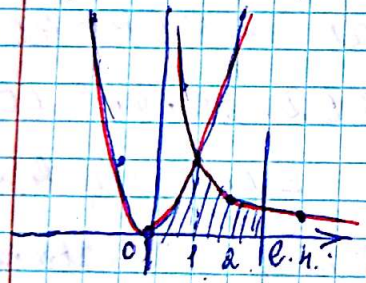
Javob $x = \frac{1}{8}$.

② $s(t) = 2t^2 - 3t + 4$. $\quad t = 2$. $\quad v(t)$, $a(t)$ - ?

$v(t) = 4t - 3$. $\quad v(2) = 4 \cdot 2 - 3 = 5$.

$a(t) = v'(t) = 4$. $\quad a(2) = 4$. @galilovo

③ $y = 2x^2$ $\quad y = \frac{2}{x}$ $\quad y = 0$ $\quad x = e$.



$S = \int_0^1 2x^2 dx + \int_1^e \frac{2}{x} dx =$

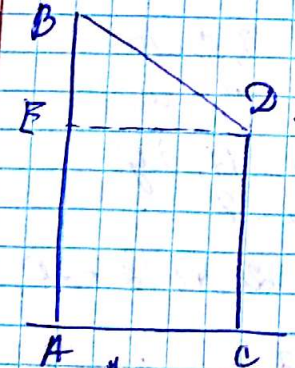
$= \frac{2x^3}{3}\Big|_0^1 + 2\ln x\Big|_1^e =$

$= \frac{2}{3} + 2 \cdot 1 + 2\ln 1 = 2\frac{2}{3} - 0 = 2\frac{2}{3}$.

Javob $2\frac{2}{3}$ (ko'rildi).

@boyqovat_matematikasi

④



$AC = 3,4m$. $\quad BE = 5,8 - 3,9 = 1,9$.

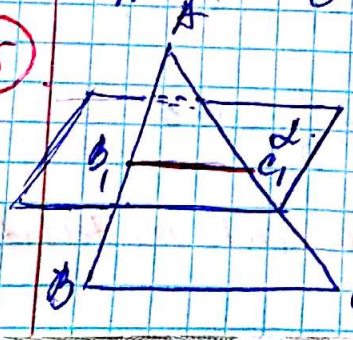
$AB = 5,8m$. $\quad BD = \sqrt{BE^2 + ED^2}$.

$CD = 3,9m$. $\quad ED = AC$.

BD - ? $\quad BD = \sqrt{1,9^2 + 3,4^2} =$

$= \sqrt{3,61 + 11,56} = \sqrt{15,17} \approx 4$,

⑤



$AB_1 : BB_1 = 3 : 1$. $\quad \frac{3x+x}{3x} = \frac{BC}{12}$.

$B_1C_1 = 12$ cm. $\quad \frac{4}{3} = \frac{BC}{12}$. $\quad BC = \frac{12 \cdot 4}{3} = 16$.

$B_1C_1 \parallel d$.

BC - ?

Javob 16 cm.

29-bilet.

① $\frac{2\sin\alpha-1}{5-2\sin\beta}+\frac{tg^2\gamma+ctg^2\gamma}{2}$ ifodaning eng kichik qiy.

Demak. $2\sin\alpha-1$ ning eng kichik.
$5-2\sin\beta$ ning eng katta
$tg^2\gamma+ctg^2\gamma$ ning eng kichik qiymatini olish kerak.

$\sin\alpha$ ning eng kichik qiymati -1 dan $2\cdot(-1)-1=-3$.
$5-2\sin\beta$ ning eng katta qiymati $\sin\beta=(+1)$ da.
$5-2\cdot(+1)=5-2=3$. $tg^2\gamma+ctg^2\gamma$ ning eng kichik qiymati 2 ga teng.

Qiymatlarni qo'ysak $\frac{-3}{3}+\frac{2}{2}=-1+1=0$. $y:0$.

② $y=x^2+\ln(x-1)$ $x_0=2$ dagi urinma.

$y(2)=2^2+\ln(2-1)=4+0=4$.

$y'=2x+\frac{1}{|x-1|}$ $y'(2)=2\cdot2+\frac{1}{|2-1|}=4+1=5$.

$k=y'(x_0)$ dan $k=5$ ekan.

③ $f(x)=2\cos\frac{x}{2}+3$. $2\cos\frac{x}{2}=f(x)-3$. $\cos\frac{x}{2}=\frac{f(x)-3}{2}$.

$-1\le\frac{f(x)-3}{2}\le1$. $-2\le f(x)-3\le2$. $+1\le f(x)\le5$.

Demak $[1;5]$ ekan. (a) javobi bor

④ $y=\frac{1}{3}x^2-\frac{1}{3}x-3$. $4x+3y+9=0$.

$\begin{cases}3y=x^2-x-9.\\3y=-4x-9.\end{cases}$ $x^2-x-9=-4x-9$

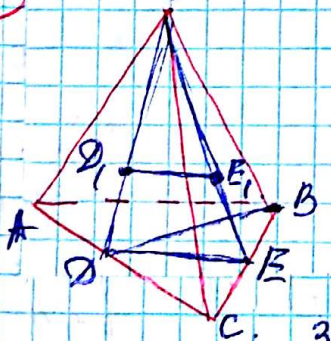
$x^2+3x=0$ $x(x+3)=0$ $x_1=0$ $x_2=-3$.

$3y=0^2-0-9=-9$ $y_1=-3$ $3y=-4\cdot(-3)-9=3$ $y_2=1$.

$(0;-3)$ va $(-3;1)$ nuqtalar orasidagi masofa.

$d=\sqrt{(-3+0)^2+(1-(-3))^2}=\sqrt{9+16}=\sqrt{25}=5$.

⑤



$S_{t.s}=8\sqrt{3}$. $S_a=\frac{a^2\sqrt{3}}{4}$ dan.

$S_{q.}=\frac{8\sqrt{3}}{4}$. $\frac{a^2\sqrt{3}}{4}=\frac{8\sqrt{3}}{4}$

$D_1E_1-?$ $a^2=8|$ $a=9$.

$DE=\frac{9}{2}=4,5$. $SD=\sqrt{9^2-\left(\frac{9}{2}\right)^2}=\frac{9}{2}\sqrt{3}$.

$SD_1=\frac{9}{2}\sqrt{3}\cdot\frac{2}{3}=3\sqrt{3}$. $\frac{SD}{SD_1}=\frac{DE}{D_1E_1}$.

$\frac{3}{2}=\frac{4,5}{D_1E_1}$ $D_1E_1=\frac{4,5\cdot2}{3}=3$. Javob 3.

30-bilet

1. $A = 5^B$ $\quad B = 2\log_{25} 8 + \log_{\frac{1}{5}} 5^{-} = 2\log_{5^2} 2^3 + \log_{5^{-1}} 5^{-} =$

$= \frac{3\cdot 2}{2}\log_5 2 - \log_5 5 = 3\log_5 2 - 1.$

$A = 5^{3\log_5 2 - 1} = \frac{5^{-3\log_5 2}}{5^{-}} = \frac{5^{-\log_5 8}}{5^{-}} = \frac{8}{5} = 1{,}6.$

2. $f(x) = x\ln(x^2+2x-7)$ $\quad f'(2) - ?$

$f'(x) = \ln(x^2+2x-7) + \frac{x\cdot(2x+2)}{x^2+2x-7} = \frac{2x^2+2x}{x^2+2x-7} + \ln(x^2+2x+7)$

$f'(2) = \frac{2\cdot 2^2 + 2\cdot 2}{2^2+2\cdot 2-7} + \ln(2^2+2\cdot 2-7) = 12 + \ln 1 = 12.$

3. $f(x) = \frac{1}{\sin^6 x + \cos^6 x}$ qiymatlar sohasi?

$\sin^6 x + \cos^6 x = (\sin^2 x)^3 + (\cos^2 x)^3 = (\sin^2 x + \cos^2 x)\times(\sin^4 x - \sin^2 x\cos^2 x + \cos^4 x) = \sin^4 x + \cos^4 x + 2\sin^2 x\cos^2 x - 3\sin^2\cos^2 x = (\sin^2 x + \cos^2 x)^2 - 3\sin^2 x\cos^2 x =$

$= 1 - 3\sin^2 x\cos^2 x = 1 - \frac{3}{4}\sin^2 2x. \quad 0 \le \sin 2x \le 1.$

dan $x = \frac{1}{1-\frac{3}{4}\cdot 0} = 1. \quad x = \frac{1}{1-\frac{3}{4}} = 4.$

Javob: $[1; 4]$

Sotish taqiqlanadi!

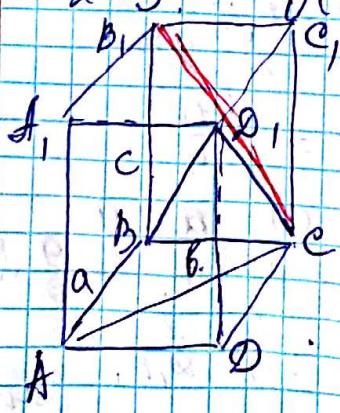
4. $\begin{cases} 2x - y = 10 \\ 3x + 2y = 1 \end{cases}$ $\quad O(0,0)$ - aylana markazi.

$\begin{cases} 4x - 2y = 20 \\ 3x + 2y = 1 \end{cases}$ $\quad y = 2x - 10 = 2\cdot 3 - 10 = -4.$

$7x = 21$ $\quad C(3; -4)$

$x = 3.$ $\quad R = \sqrt{3^2 + (-4)^2} = \sqrt{25} = 5$ $\quad$ Javob: 5.

5.



$BD_1 = 13.$ $\quad B_1C = 4\sqrt{10}$ $\quad CD_1 = 3\sqrt{17}.$ $\quad V - ?$

$\begin{cases} a^2 + b^2 + c^2 = 169 \\ b^2 + c^2 = 160 \\ a^2 + c^2 = 153 \end{cases}$

$c^2 = 169 - 160$

$c = 3.$

$a^2 = 153 - 9$

$a^2 = 144$

$a = 12.$

$b^2 = 169 - 153$

$b^2 = 16 \quad b = 4.$

$V = 3\cdot 12\cdot 4 = 144$ (kub.b)