$100x \geq \sqrt{10^{3\lg x}}$

$100x \geq 10^{\frac{3}{2}\lg x}$

$\lg 100x \geq \lg 10^{\frac{3}{2}\lg x}$

$\lg 100 + \lg x \geq \frac{3}{2}\lg x$.

$2 \geq \frac{1}{2}\lg x$

$4 \geq \lg x$

$0 < x \leq 10^4$

2)

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

$(2+\sqrt{3})^{x^2} = a \quad (2-\sqrt{3})^{x^2} = \frac{1}{a}$.

$a + \frac{1}{a} = 4. \quad a^2 - 4a + 1 = 0.$

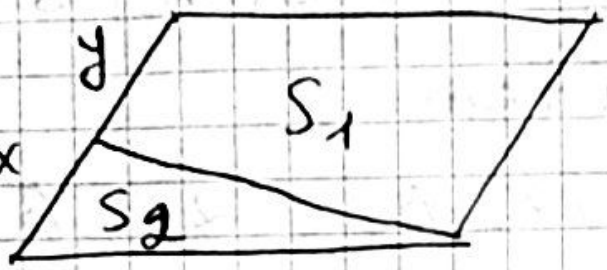
$D = 16 - 4 = 12 \quad a = \frac{4+2\sqrt{3}}{2} = 2+\sqrt{3}.$

$a = 2-\sqrt{3}.$

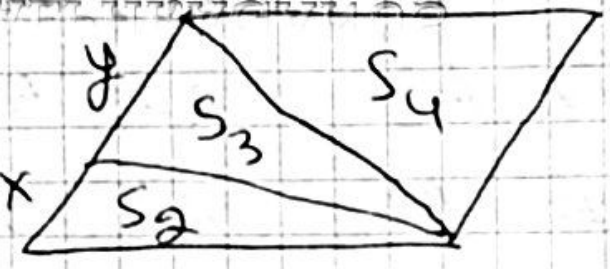
$(2+\sqrt{3})^{x^2} = 2+\sqrt{3} \quad x^2 = 1 \quad x = \pm 1.$

$(2+\sqrt{3})^{x^2} = 2-\sqrt{3}. \quad x^2 = -1 \quad \emptyset.$

3)



$$\frac{S_1}{S_2} = \frac{12}{5} \qquad \frac{x}{y} = ?$$



$$S_1 = S_3 + S_4 = 12x$$

$$S_2 + S_3 = S_4.$$

$$\frac{S_2}{S_3} = \frac{x}{y} = \frac{5}{3,5} = \frac{10}{7}.$$

$$\frac{S_1 + S_2}{2} = S_4 \qquad \frac{5x + 12x}{2} = S_4 \qquad S_4 = 8,5x$$

$$S_3 = 3,5x$$

$$S_2 = 5x.$$

4) $$\frac{(x-1)!}{(x-4)!} + \frac{(x+1)!}{(x-2)!} = (x-3)(x-2)(x-1) +$$

$$(x-1) \cdot (x+1) = (x-1)(x^2 - 5x + 6 + x^2 + x)$$

$$= (x-1)(2x^2 - 4x + 6) = 2(x-1)(x^2 - 2x + 3)$$

5) $$\Big((x-3)! + (3-x)!\Big)!\, x! = (0! + 0!)!\, 3! =$$

$$\begin{cases} x - 3 \geq 0 \\ 3 - x \geq 0 \end{cases} \quad \begin{cases} x \geq 3 \\ x \leq 3 \end{cases} \Rightarrow x = 3$$

$$= (1+1)!\, 3! = 2!\, 3! = 2 \cdot 6 = 12$$

(6) $\sqrt{(x-3)^2+(y+4)^2}+\sqrt{x^2+y^2}$

Eng kichik qiymatini toping.

$|a|+|b| \geq |a+b|$ @ALPHRAGANUS

$\bar{a}(x-3; y+4)$ $\bar{b}(x; y)$

$\sqrt{(x-3)^2+(y+4)^2}+\sqrt{x^2+y^2} \geq \sqrt{(x-3-x)^2+(y+4-y)^2}$

$\sqrt{(x-3)^2+(y+4)^2}+\sqrt{x^2+y^2} \geq 5$.

(7) $f(x)=\log_2 x(\log_2 x-10)+27$.

Eng kichik qiymat.

$f(x)=\log_2^2 x-10\log_2 x+25+2$.

$f(x)=(\log_2 x-5)^2+2$

$f(x) \xrightarrow[min]{} 2$. @ALPHRAGANUS

(8) $\sin 5x=\sin 6x$.

$\sin 5x-\sin 6x=0$ @ALPHRAGANUS

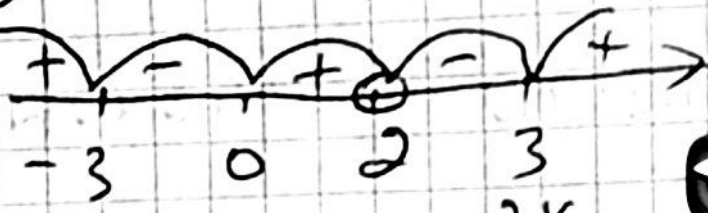
$-2\sin\frac{x}{2}\cos\frac{11x}{2}=0$. @ALPHRAGANUS

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

$\cos\frac{11x}{2}=0$. $\frac{11}{2}x=\frac{\pi}{2}+\pi n$. $x=\frac{\pi}{11}+\frac{2}{11}\pi n$.

@ALPHRAGANUS @ALPHRAGANUS

(9) $\frac{x^3}{x-2} \leq \frac{9x}{x-2}$ $\quad \frac{x(x-3)(x+3)}{x-2} \leq 0$



$[-3;0] \cup (2;3]$

(10) $\left(\sqrt[4]{2}\right)^{4x-2} = \left(\sqrt{2}\right)^{-\frac{2x}{3}}$

$\frac{4x-2}{4} \quad -\frac{x}{3}$

$2 = 2$

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

$12x - 6 = -4x$

$16x = 6$.

$x = \frac{3}{8}$.

(11) $\int x \cdot \cos x \, dx = \left[\begin{array}{ll} x = u & \cos x \, dx = dv \\ dx = du & \sin x = v \end{array}\right]$

$= x \cdot \sin x - \int \sin x \cdot dx = x \cdot \sin x + \cos x + C.$

(12)

$$\int x \cdot \sin 2x \, dx = \left[\begin{array}{l} x = u \\ dx = du \end{array} \quad \begin{array}{l} \sin 2x \, dx = dv \\ -\frac{1}{2}\cos 2x = v \end{array}\right]$$

$$= -\frac{1}{2}x \cdot \cos 2x + \int \frac{1}{2}\cos 2x \, dx =$$

$$= -\frac{1}{2}x \cdot \cos 2x + \frac{1}{4}\sin 2x + C.$$

(13.)

$$f(x) = 6 - 2\log_4 x \cdot f(16) = 6 - 2 \cdot \log_4 16$$

$$f(16) = f\left(\frac{1}{x}\right) = f(x) \cdot f(16) = 6 - 2 \cdot 2 = 2$$

$$2 = 6 - 2\log_4 x + 2\log_4 x$$

$$2 = 2\log_4 x + 2\log_4 x$$

$$\log_4 x = \frac{1}{2}$$

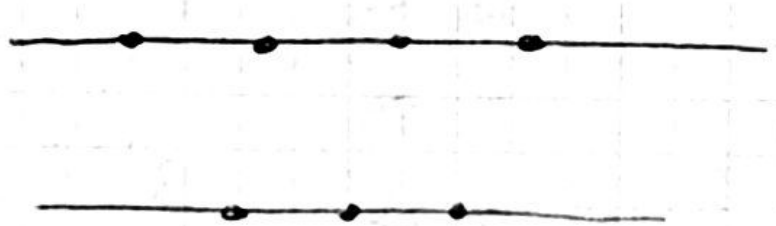
$$x = 2$$

(14) $y = kx^2 - 3$ $(-2; 9)$ $k = ?$

$9 = k \cdot 4 - 3$ $k = 3$.

(15) $(a-b)^2 - b^2 = (a-b-b)(a-b+b)$

$(a-2b) \cdot a$.

(16) 

nechta uch-burchak yasash mumkin?

$C_4^2 \cdot C_3^1 + C_3^2 \cdot C_4^1 =$

$= \frac{4!}{2!2!} \cdot \frac{3!}{1!2!} + \frac{3!}{2!1!} \cdot \frac{4!}{1!3!} = 6 \cdot 3 + 3 \cdot 4 = 30$.

(17) $|x^2 - 3x + 4| \leq |x^2 - 3x|$.

$(x^2 - 3x + 4 - x^2 + 3x)(x^2 - 3x + 4 + x^2 - 3x) \leq$

$2x^2 - 6x + 4 \leq 0$. $x^2 - 3x + 2 \leq 0$.

$[1; 2]$.

(18) $\sqrt{16-2\sqrt{15}} - \sqrt{15} + 4 =$

$= \sqrt{15} - 1 - \sqrt{15} + 4 = 3.$

(19) $f(x) = \log_3 x \quad (1;0) \quad (3;1)$

$y = kx + b.$

$\begin{cases} 0 = k + b \\ 1 = 3k + b \end{cases} \Rightarrow k = \frac{1}{2}.$

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

$\boxed{k = \frac{1}{2}}$

$y = \frac{1}{2}x - \frac{1}{2}$

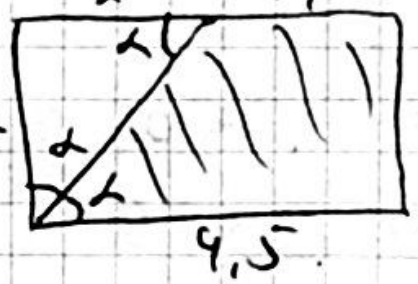
(20) $h_1 : h_2 : h_3 = 9 : 4 : 1$

$V_1 = V_2 = V_3 = V \quad$ prizma $\quad V = S_{as} \cdot H.$

$S_{as1} : S_{as2} : S_{as3} = \frac{V}{h_1} : \frac{V}{h_2} : \frac{V}{h_3} = \frac{1}{9} : \frac{1}{4} : \frac{1}{1} =$

$= 4 : 9 : 36.$

(21)



$S = \frac{2,5 + 4,5}{2} \cdot 2 = 7.$

(22) $7 \cdot 17^5 : 8 \quad r = ?$

$7 \cdot (16+1)^5 = 7 \cdot 1 = 7.$

$r = 7.$

(23)

$C_6^2 \cdot C_2^1 + C_2^2 \cdot C_6^1 =$

$= \frac{6!}{2!4!} \cdot \frac{2!}{1!1!} + \frac{2!}{2!0!} \cdot \frac{6!}{1!5!} =$

$= 15 \cdot 2 + 1 \cdot 6 = 36.$

nechta A yasash mumkin)

(24) $y = 3x^2 - 6x + 7$ koordinata boshi-ga nisbatan simmetrik $f(x) = ?$

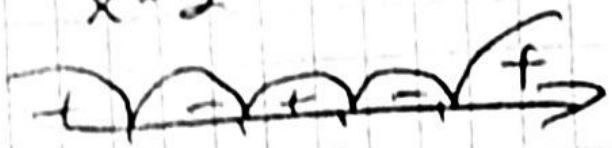
$x_0 = \frac{6}{2 \cdot 3} = 1 \quad y_0 = 4. \quad y = -3(x+1)^2 - 4 =$

$= -3x^2 - 6x - 7.$

(25) $\frac{x^3}{x-2} \leq \frac{16x}{x-2}$

$\frac{x(x-4)(x+4)}{x-2} \leq 0$

$\frac{x^3 - 16x}{x-2} \leq 0.$



$[-4; 0] \cup (2; 4]$

(26) $(a-b)^2 - c^2 = (a-b-c)(a-b+c).$

(27) $y = kx^2 - 6 \quad (-3; 12) \quad k = ?$

$12 = 9k - 6 \quad k = 2.$

(28) $4\cdot(\operatorname{tg}435^\circ - \operatorname{tg}555^\circ)\cdot\sin^2 70^\circ\cdot\sin^2 50^\circ\cdot\sin^2 10^\circ : \sin 60^\circ$

$4\cdot(\operatorname{tg}75^\circ - \operatorname{tg}15^\circ)\cdot\frac{1}{64}\cdot\frac{2}{\sqrt{3}} = \frac{1}{8\sqrt{3}}\cdot(\operatorname{ctg}15^\circ - \operatorname{tg}15^\circ)$

$\left[\sin 70^\circ\cdot\sin 50^\circ\cdot\sin 10^\circ = \frac{1}{4}\cdot\sin 30^\circ = \frac{1}{8}\right]$

$= \frac{1}{8\sqrt{3}}\cdot 2\operatorname{ctg}30^\circ = \frac{1}{8\sqrt{3}}\cdot 2\cdot\sqrt{3} = \frac{1}{4}$

(29) $|x^2+9x| = x^2+9x-20 \qquad x^2+9x = a$

$|a| = a-20$

1) $a>0 \qquad a = a-20 \qquad \varnothing$

2) $a<0 \qquad -a = a-20 \qquad a = 10$

$\begin{cases} x^2+9x<0 \\ x^2+9x=10 \end{cases} \qquad \begin{cases} x(x+9)<0 \\ x^2+9x-10=0 \end{cases}$

$-10 \quad 1 \qquad \varnothing$

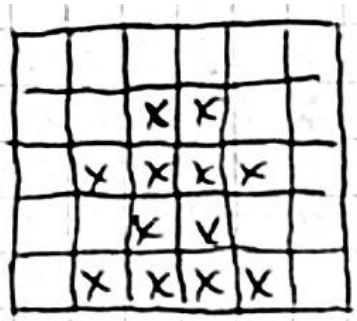
$x=-10$

$x=-1$

(30) $2{,}6\cdot 7{,}7 + 2{,}6\cdot 3{,}8 + 2{,}4\cdot 16{,}2 - 4{,}7\cdot 24$

$2{,}6\,(7{,}7+3{,}8) + 2{,}4\,(16{,}2-4{,}7) =$

$= 11{,}5\cdot(2{,}6+2{,}4) = 57{,}5$

31) 

Necha foiz? bo'yalgan.

$$\frac{\text{Bo'yalgan kataklar soni}}{\text{Jami kataklar soni}} \cdot 100\%$$

$$\frac{12}{30} \cdot 100\% = 40\%.$$

32) $\begin{cases} b_6 - b_3 = 112 \\ b_5 - b_2 = 56 \end{cases}$ $\Rightarrow$ $\begin{cases} b_3(q^3-1) = 112 \\ b_2(q^3-1) = 56 \end{cases}$: $q = 2$.

$b_2 = 8$.

$b_1 = 4$.

$b_1 + b_4 = 4 + 4 \cdot 8 = 36$.

33) $\sqrt[3]{(x+3)^2} - 2\sqrt[3]{(x-1)^2} + \sqrt[3]{(x^2+2x-3)} = 0$.

$\sqrt[3]{x+3} = a$ $\quad \sqrt[3]{x-1} = b$.

$a^2 - 2b^2 + ab = 0$.

$(a+2b)(a-b) = 0$.

$a = -2b$ $\quad a = b$.

$x+3 = x-1$ ∅. $\quad \sqrt[3]{(x+3)} = -2\sqrt[3]{(x-1)}$.

$x+3 = -8x+8$ $\quad x+3 = -8(x-1)$

$9x = 5$ $\quad x = 5/9$.

(34) $\bar{a}(x;2)$ $\bar{b}(-5;y)$ kollinear vektorlar. $2xy+15=?$

$\frac{x}{-5}=\frac{2}{y}$. $xy=-10$. $2\cdot(-10)+15)=-5$.

(35) $\sqrt{12-2\sqrt{11}}-\sqrt{11}-1=\sqrt{11-3\sqrt{11}}$

(36) $\frac{40}{13}+\frac{77}{19}-\frac{93}{23}=3+\frac{1}{13}+4+\frac{1}{19}-4-\frac{1}{23}=$

$=3+\frac{1}{13}+\frac{1}{19}-\frac{1}{23}=A$. $3<A<4$.

(37) $A=\{(x;y)\mid x^2+y^2=4\}$. $x;y\in R$. $A\cap B$.

$B=\{(x;y)\mid x+y=2\}$. $x;y\in R$.

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

$x^2+(2-x)^2=4$. $x^2+2x+x^2=0$.

$x=0$ $x=2$.

$y=2$ $y=0$.

$(0;2)$ $(2;0)$.

(38) $m=0,09$ $n=0,16$ $p=0,12$.

$\sqrt{\frac{mnp+4}{m}+4\sqrt{\frac{np}{m}}:(2+\sqrt{mnp})}=$

$=\sqrt{\frac{mnp+4\sqrt{mnp}+4}{m}}\cdot\frac{1}{2+\sqrt{mnp}}=\frac{2+\sqrt{mnp}}{\sqrt{m}}\cdot\frac{1}{2+\sqrt{mnp}}=\frac{1}{\sqrt{m}}$

$=\frac{1}{\sqrt{0,09}}=\frac{1}{0,3}=\frac{10}{3}=3\frac{1}{3}$

(39) $a = \frac{\sqrt{3}(3+2\sqrt{3})}{4}$

$$\frac{2}{1-\frac{2}{2+\frac{1}{a-2}}} = \frac{2}{1-\frac{2(a-2)}{2a-3}} =$$

$$= \frac{2(2a-3)}{2a-3-2a+4} = 4a-6 = 4\cdot\frac{\sqrt{3}(3+2\sqrt{3})}{4} - 6 = 3\sqrt{3}$$

(40) $y = \ln\left(\frac{5x-12}{4x-15}\right) - \frac{1}{9}$ $\quad y_0 = -3$

$y_0 = 0.$

$$y' = \frac{\left(\frac{5x-12}{4x-15}\right)'}{\left(\frac{5x-12}{4x-15}\right)} = \frac{\frac{5(4x-15)-4\cdot(5x-12)}{(4x-15)^2}}{\frac{5x-12}{4x-15}}$$

$$y'(-3) = \frac{5\cdot(-27)-4\cdot(-27)}{(-27)^2} = \frac{5\cdot(-27)}{(-27)^2} = -\frac{5}{27}$$

$y = -\frac{5}{27}(x+3)$ $\quad 5x+27y+15=0.$

$S = \frac{15^2}{2\cdot 5\cdot 27} = \frac{5}{6}.$

(41) $A = \{1;4;5;7;8\}$

$B = \{1;2;3;5;8;9;10;11;12\}.$

$C = \{a;b;c;d;f\}$

$n((B/A)\cup C) = ?$ $\quad B/A = \{2;3;9;10;11;12\}$

$B/A \cup C = \{2;3;9;10;11;12;a;b;c;d;f\}$

$n = 11$

4 : 9 : 1
36 : 4 : 9
2 : 3 : 1

1 $y = x^2 - 6x + 3$ квадрат функциянинг (0; 0) нуқтага нисбатан симметрик функцияни аниқланг

$y = x^2 + 6x + 3$

$y = -x^2 - 6x - 3$

$y = x^2 - 6x + 3$ ×

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

агар $a = \frac{\sqrt{2}\cdot(1+3\sqrt{2})}{4}$ бўлса

$A = \{(x, y) \mid x^2 + y^2 = 4$

$B = \{(x, y) \mid x - y = 2$

$16 - 2\sqrt{15} - \sqrt{15} + 4$

$16 - 2\sqrt{\frac{15}{3}} - \sqrt{\frac{15}{3}} - 4$

$16 - 2\sqrt{5} - \sqrt{5} - 4$

$y = \ln\left(\frac{5x - 12}{4x - 15}\right) - \frac{1}{9}$

$x_0 = -9$

$2(\operatorname{tg} 615 - \operatorname{tg} 375°) \cdot \sin^2 70° \cdot \sin 25° \sin 40° : \cos 330°$

$y = 3x^2 - 6x + 7 \quad (0; 0)$

$|x^2 + 10x| = x^2 + 10x + 18$

$6{,}4 \cdot 11{,}1 - 6{,}4 \cdot 3{,}6 + 3{,}5 \cdot 6{,}7 + 4{,}9 \cdot 3{,}5$

$y = \ln\left(\frac{5x - (-2)}{4x - 15}\right) - \frac{1}{9}$

$\frac{x^3}{x - 2} \leq \frac{9x}{x - 2}$

$(\sqrt[4]{2})^{4x-2} = (\sqrt[7]{2})^{\frac{2x}{3}}$

$\sqrt{16 - 2\sqrt{15}} - \sqrt{15} + 4$

~~$\int -\frac{x}{3} \sin 3x + \frac{1}{9} \cos 3x + C$~~

$\int x \cdot \cos x \, dx$

$(a - b)^2 - c^2$

$\sin 5x = \sin 6x$

$\int \frac{dx}{13} + \frac{dx}{19} - \frac{dx}{23}$

$\vec{a}(x; 2) \perp \vec{b}(-5; y)$ $2xy$

$$\frac{(x-1)!}{(x-4)!} + \frac{(x+1)!}{(x-2)!}$$

$$\frac{(x-1)!}{(x-4)!} + \frac{(x+1)!}{(x-2)!} = (x-3)(x-2)(x-1) + (x-1)\cdot x\cdot(x+1) =$$

$$= (x-1)(x^2-5x+6+x^2+x) = (x-1)(2x^2-4x+6)$$

---

2) $100x > \sqrt{10^{3\lg x}}$

D.S $x>0$

$100x > 10^{\frac{3\lg x}{2}}$

$\lg 100 + \lg x > \frac{3}{2}\lg x \lg 10$

$2 + \lg x > \frac{3}{2}\lg x$

$2 > \frac{1}{2}\lg x \quad \lg x < 4 \quad x < 10^4$

$(0;10^4)$

---

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

$\frac{1}{(2-\sqrt{3})^{x^2}} + (2-\sqrt{3})^{x^2} = 4 \quad \boxed{(2-\sqrt{3})^{x^2} = t}$

$\frac{1}{t} + t - 4 = 0 \quad t^2 - 4t + 1 = 0$

$\Delta = 16 - 4 = 12$

$t_1 = \frac{4+2\sqrt{3}}{2} = 2+\sqrt{3}$

$t_2 = 2-\sqrt{3}$

$(2-\sqrt{3})^{x^2} = 2+\sqrt{3}$

$(2-\sqrt{3})^{x^2} = (2-\sqrt{3})^{-1} \quad x^2 = -1 \quad \emptyset$

$(2-\sqrt{3})^{x^2} = (2-\sqrt{3})^{1} \quad x^2 = 1 \quad \boxed{x = \pm 1}$

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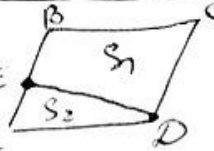
(28) $\sqrt{16-2\sqrt{15}} - \sqrt{15} + 4$

3 : 2

5 : 4

95142 3554

(1) 

$S_1 : S_2 = 12 : 5$

$AE : EB = ?$

A) $\frac{4}{5}$ B) $\frac{10}{7}$ C) $\frac{5}{4}$ D) $\frac{7}{10}$

(2) $f(x) = \log_3 x$ funksiyaning $(1;0)$ va $(3;1)$ nuqtalaridan o'tuvchi to'g'ri chiziqqa $\parallel$ bo'lgan urinma tenglamasining Δ $K = ?$

A) $\frac{2}{3}$ B) $\frac{1}{2}$ C) $\frac{1}{3}$ D) $\frac{1}{4}$

(3) 

$h = 12$

$d = 15$

$r = ?$

A) 4,5 B) $3\sqrt{3}$

C) $3\sqrt{2}$ D) 9

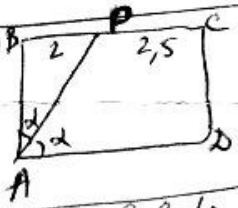
(4) Tengdosh prizma

$h_1 : h_2 : h_3 = 9 : 4 : 1$

$S_{o_1} : S_{o_2} : S_{o_3} = ?$

A) 1:2:3 B) 1:4:9

C) 4:9:36 D) 1:16:81

(5) 

$S_{apec} = ?$ $\frac{7}{A}$; $\frac{6}{B}$: $\frac{5,5}{C}$: $\frac{5}{D}$

(6) Tekislikda o'zaro kesishmaydigan a va b to'g'ri chiziqlar berilgan a to'g'ri chiziqda 2 ta B to'g'ri chiziqda 6 ta (o) berilgan. Uchlari bu (.) larda bo'lgan jami nechta Δ mavjud

30. 36 32 35

(7) $7 \cdot 17^5$ ni 8 bo'lgandagi qoldiq

1 6 3 7

(8) $y = \ln\left(\frac{5x-12}{4x-15}\right)$ $x_0 = -3$ urinma o'tqazilgan bu urinma va koordinata o'qlari hosil qilgan $S_\Delta = ?$ $\frac{1}{3}$ $\frac{1}{9}$ $\frac{1}{6}$ $\frac{2}{9}$

(9) $y = 3x^2 - 6x + 7$ $(0;0)$ ga nisbatan simmetriya $f(x) = ?$

$-3x^2 + 6x - 7$; $3x^2 + 6x + 7$

$-3x^2 - 6x - 7$; $3x^2 - 6x + 7$

(10) $\frac{x^3}{x-2} \le \frac{16x}{x-2}$ butun yechimlari soni 9. 6. 7. 8

(11) $y = kx^2 - 6$ $A(-3;12)$ $k = ?$

3 2 -2 -3

(12) $(a-b)^2 - c^2 = ?$

(13) $\sqrt[3]{(x+3)^2} - 2\sqrt[3]{(x-1)^2} + \sqrt[3]{x^2+2x-3} = 0$

$-\frac{5}{3}$; $\frac{5}{3}$; 1 ; -2

(14) $\frac{40}{13} + \frac{77}{19} - \frac{93}{23}$ ozaliqlardan qaysi biri

(2;5) (3;4) (0;1) (1;2)

(15) $(\operatorname{tg} 435^\circ - \operatorname{tg} 375^\circ)\sin^2 70^\circ \cdot \sin^2 50^\circ \cdot \sin^2 10^\circ = ?$ shuni

$\frac{1}{4}$ $\frac{1}{8}$ $\frac{1}{16}$ 1

(16) $b_6 - b_3 = 112$ $b_5 - b_2 = 56$, $b_1 + b_4 = ?$

40 20 36 68

(17) $m = 0,09$, $n = 0,16$, $p = 0,12$

$\left(\sqrt{\frac{mnp+4}{m}} + 4\sqrt{\frac{np}{m}}\right) : \left(2 + \sqrt{mnp}\right)$

$\frac{10}{3}$ $\frac{5}{4}$ 0,48 0,12

(18) $\int x \cdot \sin 2x \, dx = ?$

(19) $A = \{(x;y) \mid x^2 + y^2 = 4,\ x, y \in R\}$

$B = \{(x;y) \mid x + y = 2,\ x, y \in R\}$, $A \cap B$ To'plamni top

$\{(-2;0);(0;2)\}$ $\{(-2;0);(0;-2)\}$

$\{(2;0);(0;2)\}$ $\{(2;0);(0;2)\}$

(20) $\left(\sqrt[4]{\sqrt{2}}\right)^{4x+3} = \left(\sqrt{2}\right)^{-\frac{2x}{3}}$ $x = ?$

$-\frac{21}{16}$; $-\frac{15}{16}$ $-\frac{9}{16}$ $-\frac{17}{16}$

(21) $f(x) = 2 + \log_3 x^2$

$f(9) = f(x) - f\left(\frac{1}{x}\right)$ tenglamani yech

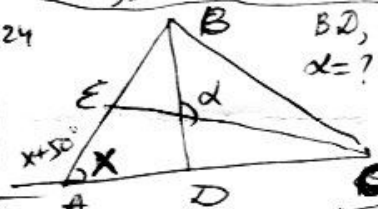
$3\sqrt[3]{3}$; 3 ; $\sqrt[3]{9}$; $\sqrt[5]{5}$

(22) $\sin 2x = \sin 3x$ eng kichik + yechimi

$\frac{6\pi}{5}$ $\frac{4\pi}{5}$ $\frac{2\pi}{5}$ $\frac{\pi}{5}$

(23) $46,7 + 2,6 \cdot 3,8 + 2,4 \cdot 16,2 - 4,7 \cdot 2,4$

57,5 115 65,5 48,5

(24) 

BD, CE bissektrisa $\alpha = ?$ 122,5 , 135,5

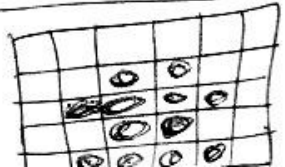
112,5 105,5°

(25) $a = \frac{\sqrt{2}\cdot(1+3\sqrt{2})}{4}$ $\frac{2}{1 - \frac{2}{2 + \frac{1}{a-2}}} = ?$

6 ; $\frac{\sqrt{2}-2}{2}$; $\sqrt{2}$; $\frac{\sqrt{2}}{2}$

(26) $|x^2 + 9x| = x^2 + 9x - 20$ haqiqiy ildizlari yig'indisi

-9 : 9 $\emptyset$ -10

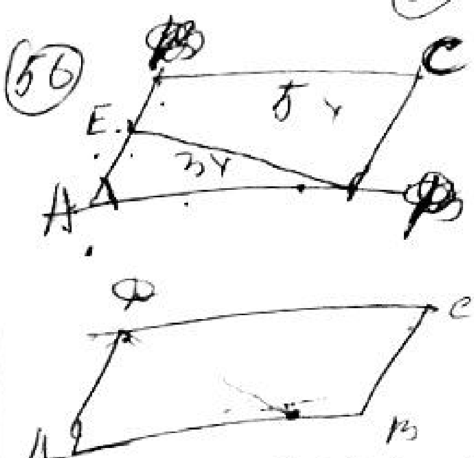
(27) 
Bo'yalgani necha % ni tashkil qiladi

55 60 — 100%
36 — x%

$x = \frac{3600}{60} = 6$

(C)

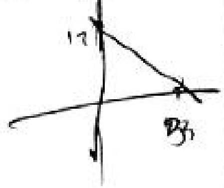
(56)



$S = \frac{a \cdot b \sin h}{2} = 5x$

$S = x$

(57) $y = kx^2 + 3$



$12 = 9k + 3$
$9k = 9$
$k = 1$ (e)

(58)

$(\sqrt[4]{2})^{4x+2} = (\sqrt{2})^{-\frac{2x}{3}}$

$2^{\frac{4x+2}{4}} = 2^{-\frac{2x}{6}}$

$\frac{2x+1}{2} = -\frac{x}{3}$

$6x + 3 = -2x$
$8x = -3$
$x = -\frac{3}{8}$

(59) $A = \{(x;y) \mid x^2 + y^2 = 4\}$

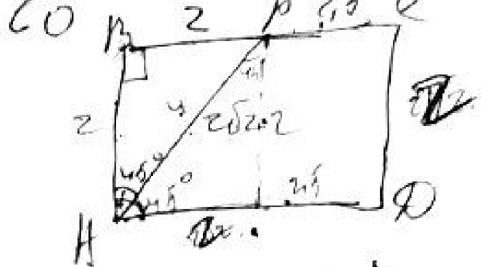
$B = \{(x,y) \mid y = \sqrt{3}x\}$

$A \cap B$

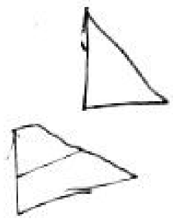
$x^2 + 3x^2 = 4$
$x = \pm 1$
$x = \pm\sqrt{3}$

(D) 4,5

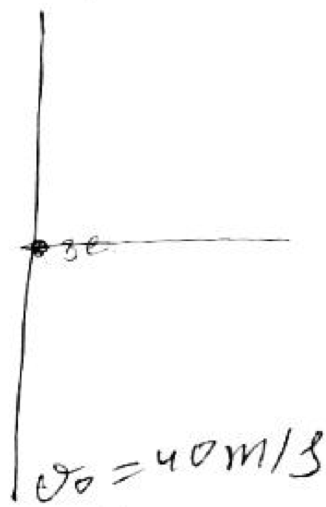
60



$tg 45° = \frac{a}{b}$



$S = \frac{a \cdot 2}{2}$



$v_0 = 40 m/s$

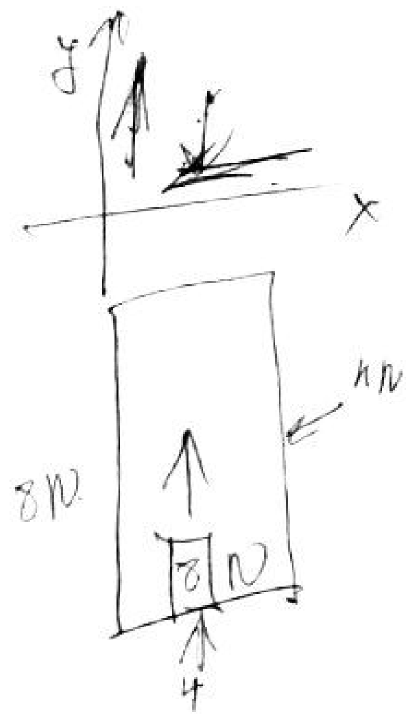
$h = v_0 t + 0$

$h = v_0 t - \frac{gt^2}{2}$

$h = 40 \cdot 3 - 45$
$h = 120 - 45$
$h = 75$

$h = \frac{v^2 - v_0^2}{}$

7,5
$\times$ 7,5



$g = \frac{m}{m_1 + m_2} \cdot g$

  42
× 32
  84
126
1244

$\frac{1}{2}\sin x$.

(46)

$\sin 4x = \sin 3x$

$\sin 4x - \sin 3x = 0$

$\cos 7x \cdot \sin x = 0$

$\cos 7x = 0$

$\sin x = 0$

$7x = 0$

$x = \frac{\pi n}{7}$ $\quad \frac{\pi}{7} + \frac{\pi n}{7}$

$x = \frac{\pi}{7} + \pi n$ (13)

(47)

$\sqrt[3]{(x+2)^2} - 2\sqrt[3]{(x-1)^2} +$

$+ \sqrt[3]{x^2+x-2} = 0$

$\sqrt[3]{x+2} = t$

$\sqrt[3]{x^2+4x+4} - 2\sqrt[3]{x^2-2x+1} +$

$+ \sqrt[3]{x^2+x-2} = 0$

$\sqrt[3]{9} - 6 +$

$2\sqrt[3]{9}$

$\sqrt[3]{(\frac{z}{3}+2)^2} - 2\sqrt[3]{(\frac{z}{3}-1)^2} + \sqrt[3]{\frac{z}{9}+\frac{2}{3}-2} =$

$\sqrt[3]{\frac{64}{9}} - 2\sqrt[3]{\frac{1}{9}} + \sqrt[3]{\frac{1+6-18}{9}} =$

$4\sqrt[3]{\frac{1}{9}} - 2\sqrt[3]{\frac{1}{3}} + 2\sqrt[3]{\frac{1}{9}} = 0$

(15)

(48) $y = 3x^2 - 6x + 7 \quad (0;4)$

$y - 7 = 3x^2 - 6x$

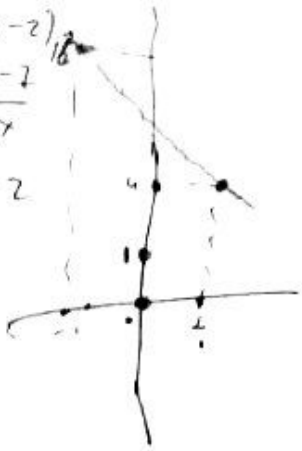
$y - 7 = 3x(x-2)$

$(x-2) = \frac{y-7}{3x}$

$x = \frac{y-7}{3x} + 2$

$3x = \frac{y-7}{x-2}$

$x = y - 7$



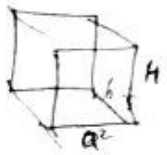
49

$h_1 : h_2 : h_3 = 1 : 9 : 4$

$S_{AC} = a \cdot b \cdot H$

$S_{AC_2} = 9$

$S_{AC} \quad 4$



(13)

50 $\int x \cdot \cos 2x \, dx =$

$\frac{x}{2} \cdot \sin 2x + \frac{1}{4}\cos 2x + C$

$x \cos 2x - \frac{1}{4} 2 \sin x$

$\frac{x}{2}\cos 2x \cdot 2 + \frac{1}{4} 2 \sin 2x$

$= 0 \quad \cos 2x - \frac{1}{2}\sin 2x$

$\frac{1}{2}\sin x + \frac{x}{2}\cos 2x \cdot 2 +$

$-\frac{1}{4}\sin 2x$

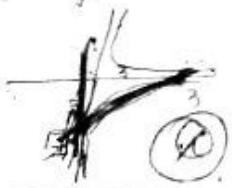
$\frac{1}{2}\sin 2x + x\cos 2x - \frac{1}{2}\sin 2x$

(A)

51 $y = \ln\left(\frac{6x+6}{2x+15}\right) - \frac{1}{7} \quad x_0 = 1$

$y = \ln \frac{12}{21} - \frac{1}{7}$

$y = -\frac{1}{7}$



(12)

52

$x^2 + 9x = x^2 + 9x - 20$

$x^2 + 9x = 0$

$-x^2 - 9x = x^2 + 9x - 20$

$2x^2 + 18x - 20 = 0$

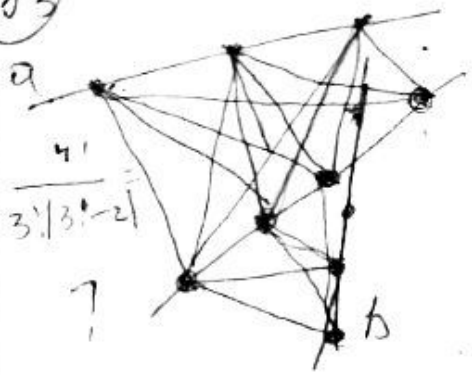
$x^2 + 9x - 10$

$x_{1,2} = \frac{-9 \pm \sqrt{81+40}}{2}$

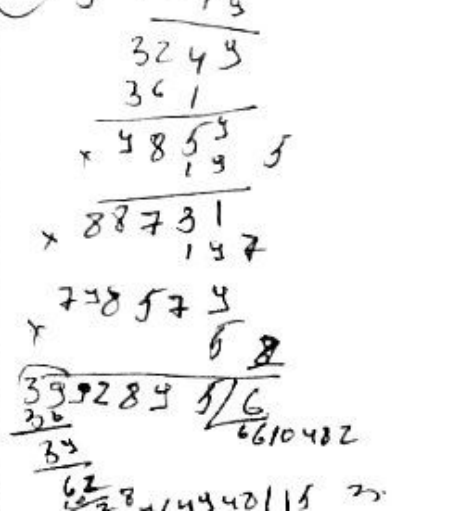
$x_1 = \frac{-9+11}{2} = 1$

$x_2 = \frac{-9-11}{2} = -10$ (2)

53



54



(46)

$\sin 4x = \sin 3x$

$\sin 4x - \sin 3x = 0$

$\cos 7x \cdot \sin x = 0$

$\cos 7x = 0$

$\sin x = 0$

$7x = 0$

$x = \frac{\pi n}{7}$ $\frac{\pi}{7} + \frac{\pi}{7}n$

$x = \frac{\pi}{2} + \pi n$ (B)

(47)

$\sqrt[3]{(x+2)^2} - 2\sqrt[3]{(x-1)^2} +$

$+ \sqrt[3]{x^2+x-2} = 0$

$\sqrt[3]{x+2} - 1$

$\sqrt[3]{x^2+4x+4} - 2\sqrt[3]{x^2-2x+1} +$

$+ \sqrt[3]{x^2+x-2} = 0$

$\sqrt[3]{9} - 20 +$
$2\sqrt[3]{9}$

$\sqrt[3]{(\frac{2}{3}+2)^2} - 2\sqrt[3]{(\frac{2}{3}-1)^2} + \sqrt[3]{\frac{4}{9}+\frac{2}{3}-2} = 0$

$\sqrt[3]{\frac{64}{9}} - 2\sqrt[3]{\frac{1}{9}} + \sqrt[3]{\frac{4+6-18}{9}} =$

$4\sqrt[3]{\frac{1}{9}} - 2\sqrt[3]{\frac{1}{9}} + 2\sqrt[3]{\frac{1}{9}} = 0$

(B)

(48) $y = 3x^2 - 6x + 7$ $(0;0)$

$y - 7 = 3x^2 - 6x$

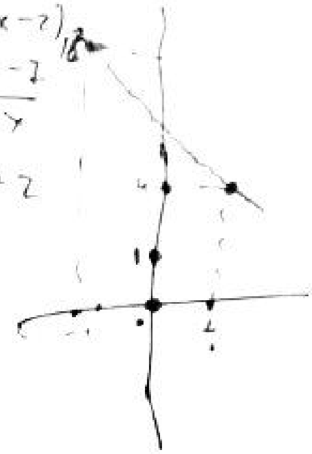
$y - 7 = 3x(x-2)$

$(x-2) = \frac{y-7}{3x}$

$x = \frac{y-7}{3x} + 2$

$3x = \frac{y-7}{x-2}$

~~$x = y - 7$~~



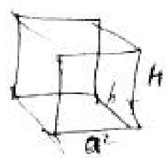
49

$h_1 : h_2 : h_3 = 1 : 9 : 4$

$S_{ac_1} = a \cdot b \cdot H$

$S_{ac_2} = 9$

S_{ac_3} 4



(B)

50 $\int x \cdot \cos 2x\,dx =$

$\frac{x}{2} \cdot \sin 2x + \frac{1}{4}\cos 2x + C$

$x \cos 2x - \frac{1}{4} 2 \sin x$

$\frac{x}{2} \cos 2x\ 2 + \frac{1}{4} 2 \sin 2x$

$= 0\ \cos 2x - \frac{1}{2}\sin 2x$

$\frac{1}{2}\sin 2x + \frac{x}{2}\cos 2x \cdot 2 +$

$\frac{1}{4}x \sin 2x$

$\frac{1}{2}\sin 2x + \boxed{x\cos 2x} - \frac{1}{2}\sin 2x$

(A)

(51) $y = \ln\left(\frac{6x+6}{2x+15}\right) - \frac{1}{7}$ $x_0 = 3$

$y = \ln\frac{24}{21} - \frac{1}{7}$

$y = -\frac{1}{7}$

(D)

(52)

$|x^2+9x| = x^2+9x-20$

$x^2+9x = 0$

$-x^2-9x = x^2+9x-20$

$2x^2+18x-20 = 0$

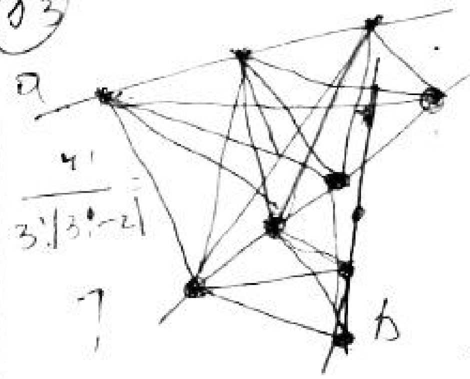
$x^2+9x-10$

$x_{1,2} = \frac{-9 \pm \sqrt{81+40}}{2}$

$x_1 = \frac{-9+11}{2} = 1$

$x_2 = \frac{-9-11}{2} = -10$ (D)

(53)



(54) 5×396.1

$\times 19$

3249

361

$\times 9859$ 5

19

$\times 88731$

197

$\times 78857$ 9

6 8

$39928955\,/\,6$

36 6610482

39

62 ... $4/4940115$

$b_1 \cdot q^4 - b_1 \cdot q = 56$

$b_1 \cdot 16 - b_1 \cdot 2 = 56$

$14 b_1 = 56$

$b_1 = 4.$

~~4·16 - 4·2 = 56~~

~~64 - 8~~

$b_1 + b_1 \cdot 8^3$

$4 + 4 \cdot 8 = 4 + 32 = 36$

(A)

(40)

$\frac{35}{17} - \frac{77}{19} + \frac{70}{23}$

$\frac{965 - 1309}{323}$

$-\frac{344}{323} + \frac{70}{23}$

$2\frac{1}{17} + 4\frac{1}{19} + 3\frac{1}{23}$

$2\left(\frac{1}{17} + 2\frac{1}{19}\right)$

$1\left(\frac{1}{17} - \frac{1}{19} + \frac{1}{23}\right)$

$\frac{19 \cdot 23 - 17 \cdot 23 + 17 \cdot 19}{17 \cdot 19 \cdot 23} =$

$23 \cdot 2 + 17 \cdot 19$

$\frac{46 + 323}{17 \cdot 19 \cdot 23}$ $\frac{769}{17 \cdot 19 \cdot 23}$

19 × 17 = 133, 19 → 323

35 × 14 = 315, 35 → 965

77 × 17 = 539, 77 → 1309

1309 − 965 = 344

344 / 14

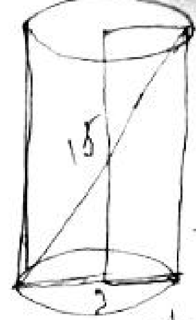
344 / 2

769 − 323 × 23: 969, 646 → 2423 + 769 = 3198

3198 / 2423 → 1, 769

(A)

(41)



$h = 12$

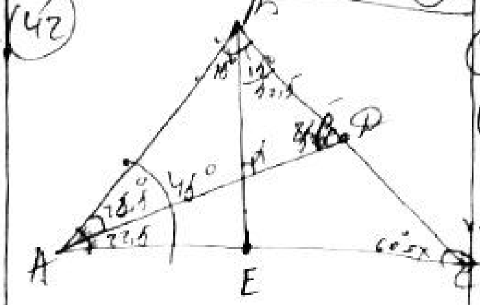
225 − 144 = 81

$d = 9$

$r = \frac{d}{2} = 4,5$

(A)

(42)



$x + x + 60° = 180°$

$2x = 120°$

$x = 60°$

105 + 22,5 = 127,5

180 − 127,5 = 52,5

75 / 2 → 37,5

105 / 2 = 52,5

$\angle B = 75°$

$\angle D = 82,5$ + 37,5 = 120,0

75 + 22,5 = 97,5

180 − 97,5 = 82,5

(B)

(43)

$\bar{a}(x;2)$ $\bar{b}(-5;y)$

$3x \cdot y + 23 = ?$

$x = 5$

$y = 2$

$-6 \cdot 5 + 23 = -7$

(B)

(44)

$3,6 \cdot 4,8 + 5,4 \cdot 3,6 + 4,8 \cdot 9,2 - 4,8 \cdot$

$3,6(4,8 + 5,4) + 4,8(9,2 - 5,6)$

$3,6 \cdot 10,2 + 4,8 \cdot 3,6$

$3,6(10,2 + 4,8) = 3,6 \cdot 15$

36 × 5 = 180

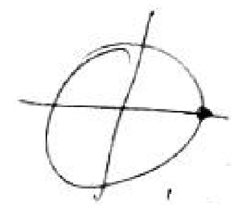
27 × 2 = 54

(C)

(45)

$(tg 435° - tg 375°) \cdot \sin^2 70° \cdot \sin^2 10°$

$\sin^2 10° : \sin 120°$



435 − 360 = 75

$tg 75° - tg 15° =$

$\sqrt{\frac{1 - \cos 150°}{1 + \cos 150°}} - \sqrt{\frac{1 - \cos 30°}{1 + \cos 30°}} =$

$\frac{1 + \frac{\sqrt3}{2}}{1 - \frac{\sqrt3}{2}} - \frac{1 - \frac{\sqrt3}{2}}{1 + \frac{\sqrt3}{2}}$

$\frac{2 + \sqrt3}{2 - \sqrt3} - \frac{2 - \sqrt3}{2 + \sqrt3}$

$(2 + \sqrt3)^2 - (2 - \sqrt3)^2 =$

$4 + 4\sqrt3 + 3 - 4 + 4\sqrt3 - 3$

$16\sqrt3$

$16\sqrt3 \cdot \frac{\sqrt3}{\sqrt3} \cdot 32$

$\frac{1}{2} \sin 80 + \cos 60°$

$\frac{1}{2} \sin 20° \cdot \sin 80° + \frac{1}{2} \sin 50°$

$\sin 40 \cdot \sin 60 + \sin 50°$

41

(31)

$3a^4b^2 - 63a^2c^2$

$3a^2(a^2b^2 - 9c^2)$ (D)

$3a^2(a^2b^2 - 9c^2)$

(32)

$\sqrt{8-2\sqrt{7}} - \sqrt{7} - 2$

$\sqrt{\frac{8+\sqrt{64-28}}{2}} - \sqrt{\frac{8-\sqrt{64-28}}{2}}$

$\sqrt{\frac{8+6}{2}} - \sqrt{\frac{8-6}{2}} =$

$\sqrt{7} - 1 - \sqrt{7} - 2 = -3$ (A)

(33)

$\left(\sqrt{\frac{mnp+4}{m}} + 4\sqrt{\frac{mnp}{m}}\right) : (2+\sqrt{mnp})$

$\sqrt{\frac{mnp+4+4\sqrt{mnp}}{m}} : A$

$\sqrt{(\sqrt{mnp}+2)^2}$

$\sqrt{\left(\frac{\sqrt{mnp}+2}{\sqrt{m}}\right)^2} \cdot \frac{1}{2+\sqrt{mnp}}$

$\frac{\sqrt{mnp}+2}{\sqrt{m}} \cdot \frac{1}{2+\sqrt{mnp}}$

$\frac{1}{\sqrt{m}} = \frac{1}{0{,}3} = \frac{10}{3} = 3\frac{1}{3}$ (B)

(38)

$a = \frac{\sqrt{3}(3+2\sqrt{3})}{4}$

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

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

$1 - \frac{2}{\frac{2a-3}{a-2}}$

$1 - \frac{2a-4}{2a-3}$

$\frac{2a-3-2a+4}{2a-3} = \frac{1}{2a-3}$

$\frac{2}{\frac{1}{2a-3}} = 4a-6.$

$4 \cdot \frac{\sqrt{3}(3+2\sqrt{3})}{4} - 6$

$3\sqrt{3} + 6 - 6 = 3\sqrt{3}$ (C)

(34)

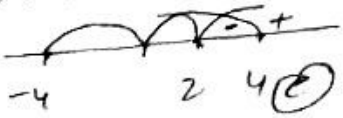
$\frac{x^3}{x-2} \le \frac{16x}{x-2}$ $\quad \frac{x(x^2-16)}{x-2} \le 0$

$\frac{x^3-16x}{x-2} \le 0$ $\quad x \neq 2.$

$x(x^2-16) \le 0$

$x = 0$

$x = \pm 4$



(C)

(35)

(36)

$f(x) = 2 + \log_3 x^3$

$f(9) = f(x) - f\left(\frac{1}{x}\right)$

$f(9) = 2 + 3\log_3 3^2 =$

$f(9) = 2 + 6\log_3 3 = 8.$

$8 = 2 + \log_3 x^3 + 2 + \log_3 \left(\frac{1}{x}\right)^3$

$4 = 3\log_3 x + (-3\log_3 x) =$

$4 = 6\log_3 x$

$6\log_3 x = \log_3 3^4$

$\log_3 x^6 = \log_3 3^4$ $\quad x = \sqrt[3]{3^2}$

$x^6 = 3^4$

$x^3 = 3^2$ (C)

(37) $f(x) \pm \log_4 x$

$(1;0), (4;1)$

(C)

(39) $2 \cdot 16 -$

$b_6 - b_3 = 112$

$b_5 - b_2 = 56.$ $\quad b_1 + b_4 = ?$

$b_1 \cdot q^5 - b_1 \cdot q^2 = 112$

$b_1 q^4 - b_1 q = 56.$

$b_1 q(q^4 - q) = 112$

$b_1 q(q^3 - 1) = 56$

$\frac{q^4 - q}{q^3 - 1} = 2$ $\quad q \neq 1.$

$q^4 - q = 2q^3 - 2.$

$q^4 - 2q^3 - q + 2 = 0$

$q^3(q-2) - (q-2) = 0$ $\quad q = 1$

$(q-2)(q^3-1) = 0$ $\quad q = 2$

$b_1 \cdot q^4 - b_1 \cdot q = 56$

$b_1 \cdot 16 - b_1 \cdot 2 = 56$

$14 b_1 = 56$

$b_1 = 4.$

~~4·16 - 4·2 = 56~~

~~64 - 8~~

$b_1 + b_1 \cdot 8^3$

$4 + 4 \cdot 8 = 4 + 32 = 36$

(A)

(40)

$\frac{35}{17} - \frac{77}{19} + \frac{70}{23}$

$\frac{665 - 1309}{323}$

$-\frac{344}{323} + \frac{70}{23}$

$2\frac{1}{17} + 4\frac{1}{19} + 3\frac{1}{23}$

$2(\frac{1}{17} + 2\frac{1}{19})$

$1(\frac{1}{17} - \frac{1}{19} + \frac{1}{23})$

$\frac{19 \cdot 23 - 17 \cdot 23 + 17 \cdot 19}{17 \cdot 19 \cdot 23} =$

$23 \cdot 2 + 17 \cdot 19$

$\frac{46 + 323}{17 \cdot 19 \cdot 23} \quad \frac{369}{17 \cdot 19 \cdot 23}$

19 × 17 = 133, 19, 323

35 × 19 = 315, 35, 665

77 × 17 = 539, 77, 1309

1309 − 665 = 344

344 / 14

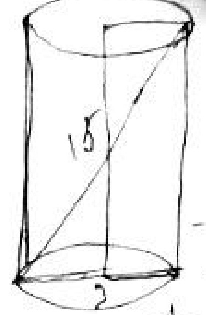
344 / 2

763: 323 × 23 = 969, 646, 7429; + 7429 … 3198

3198 / 2429, 2429, 769

(A)

(41)



$h = 12$

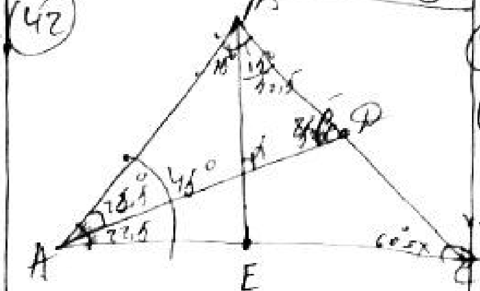
$225 - 144 = 81$

$d = 9$

$r = \frac{d}{2} = 4.5$

(A)

(42)



$x + x + 60° = 180°$

$2x = 120°$

$x = 60°$

105 + 22,5 = 127,5

75 / 2 = 37,5

105 / 2 = 52,5

180 − 127,5 = 52,5

$\angle B = 75°$

$\angle D = 82,5$

75 + 22,5 = 97,5

180 − 97,5 = 82,5

82,5 + 37,5 = 120

(B)

(43)

$\bar{a}(x; 2) \quad \bar{b}(-6; y)$

$3x \cdot y + 13 = ?$

$x = 5$

$y = 2$

$-6 \cdot 5 + 13 = -7$

(B)

(44)

$3,6 \cdot 4,8 + 5,4 \cdot 3,6 + 4,8 \cdot 9,2 - 4,8 \cdot$

$3,6(4,8 + 5,4) + 4,8(9,2 - 5,6)$

$3,6 \cdot 10,2 + 4,8 \cdot 3,6$

$3,6(10,2 + 4,8) = 3,6 \cdot 15$

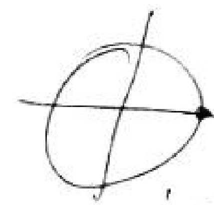
36 × 5 = 180

(C)

(45)

$(tg 435° - tg 375°) \cdot \sin^2 70° : \sin^2 10°$

$\sin^2 10° : \sin 120°$



435 − 360 = 75

$tg 75° - tg 15° =$

$\frac{1 - \cos 150°}{1 + \cos 150°} - \frac{1 - \cos 30°}{1 + \cos 30°} =$

$\frac{1 + \frac{\sqrt3}{2}}{1 - \frac{\sqrt3}{2}} - \frac{1 - \frac{\sqrt3}{2}}{1 + \frac{\sqrt3}{2}}$

$\frac{2 + \sqrt3}{2 - \sqrt3} - \frac{2 - \sqrt3}{2 + \sqrt3}$

$(2 + \sqrt3)^2 - (2 - \sqrt3)^2 =$

$4 + 4\sqrt3 + 3 - 4 + 4\sqrt3 - 3$

$16\sqrt3 \cdot \frac{2}{\sqrt3} \cdot 32$

$\frac{1}{2}\sin 80 + \cos 60°$

$\frac{1}{2}\sin 120° \cdot \sin 80° + \frac{1}{2}\sin 60°$

$\sin 40 \cdot \sin 60 + \sin 50°$

(33) A = {1; 4; 5; 7; 8}

B = {1; 2; 3; 5; 6; 8; 9; 10; 11; 12}

C = {a; b; e; d; f}

n((B/A) ∪ C) ni aniqlang

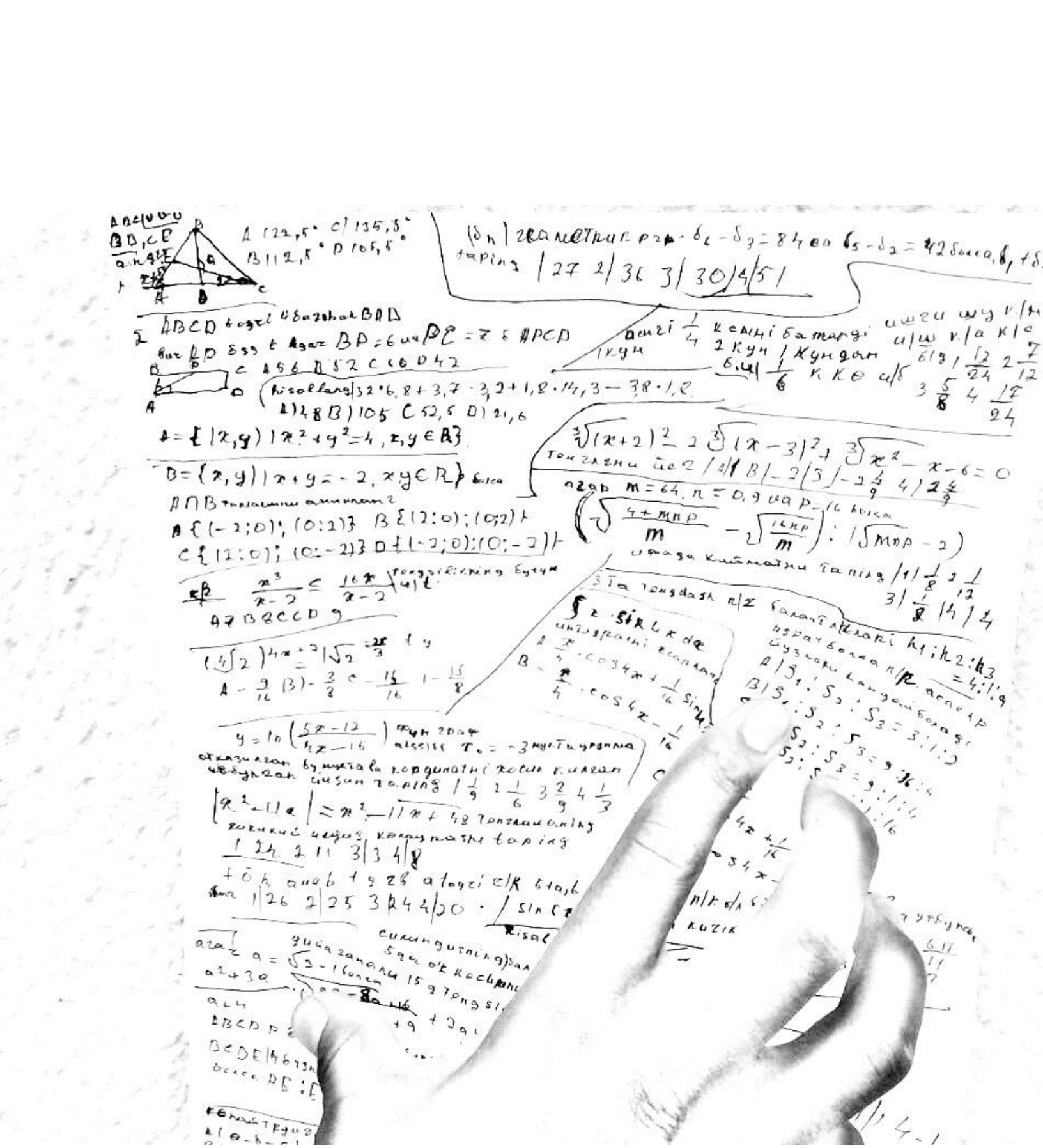
(34) $|7-2x| = |5-3x| + |x+2|$

tenglamaning butun yechimlari nechta?

(35) $a_1 = 2$ $a_n = 2^n \cdot a_{n-1} - 2$

n ta hadi kiritilishida berilgan to'rtinchi hadini toping.

(56) Muntazam uchburchakli piramidaga konus ichki chizilgan. Agar piramidaning yon yoqlari bilan asosi 60° li burchak hosil qilib, piramidaning asosiga ichki chizilgan aylananing radiusi 16ga bolsa, konusning yon sirtini toping.



$A = \{(x, y) \mid x^2 + y^2 = 4$

$B = \{(x, y) \mid x - y = 2$

$16 - 2\sqrt{15} - \sqrt{15} + 4$

$16 - 2\sqrt{\frac{15}{3}} - \sqrt{\frac{15}{3}} - 4$

$16 - 2\sqrt{5} - \sqrt{5} - 4$

$y = \ln\left(\frac{5x - 12}{4x - 15}\right) - \frac{1}{5}$

$x_0 = -3$

$2(\operatorname{tg} 15 - \operatorname{tg} 375^\circ) \sin^2 70^\circ \cdot \sin 25^\circ \sin 40^\circ : \cos 330^\circ$

$y = 3x^2 - 6x + 7 \quad (0; 0)$

$|x^2 + 10x| = x^2 + 10x + 18$

$6,4 \cdot 11,1 - 6,4 \cdot 3,6 + 3,5 \cdot 6,7 + 4,9 \cdot 3,5$

$y = \ln\left(\frac{5x - 12}{4x - 15}\right) - \frac{1}{5}$

$\frac{x^3}{x - 2} \leq \frac{9x}{x - 2}$

$\left(4\sqrt{2}\right)^{4x-2} = \left(\sqrt{2}\right)^{\frac{-2x}{3}}$

$\sqrt{16 - 2\sqrt{15}} - \sqrt{15} + 4$

~~$5 - \frac{x}{3} \sin 3x + \frac{1}{5} \cos 3x + C$~~

$\int x \cdot \cos x \, dx$

$(a - b)^2 - c^2$

$\sin 5x = \sin 6x$

$\int \frac{dx}{13} + \frac{x}{18} - \frac{95}{23}$

$\bar{a}(x; 2) \perp \bar{b}(-5; y)$ $2xy$