

Шифр 06

Внесите в таблицу номера правильных ответов. В заданиях, в которых отсутствуют варианты ответов, внесите правильный ответ.

1	2	3	4	5	6	7	8	9	10
3	4	37	14		3	4	5	5	2
-	-	+	-	-	-	-	-	+	+

11	12	13	14	15	16	17	18	19	20
4	5		4	3	1	2	3	2	
-	+	-	+	-	-	-	-	-	-

N3 $x^6 + 5x^3 - 6 = 0$

$x^3 = t$

$t^2 + 5t - 6 = 0$

$\begin{cases} t_1 = \frac{-5-7}{2} = -6 \\ t_2 = \frac{-5+7}{2} = 2 \end{cases}$

$\Rightarrow \begin{cases} x_1^3 = -6 \\ x_2^3 = 2 \end{cases} \Rightarrow \begin{cases} (x_1^3)^2 = (-6)^2 \\ (x_2^3)^2 = 2^2 \end{cases} \Rightarrow \begin{cases} x_1^6 = 36 \\ x_2^6 = 4 \end{cases}$

$36 + 4 = 40$

N6 $\frac{1}{125} \sqrt{-\frac{x}{5} + 1} = \left(\frac{x}{5} - 1\right)^2$

ОДР: $-\frac{x}{5} + 1 \geq 0$



N7 $\sqrt{x^2 - 10 - 3x} \geq 0$
 $6x - x^2 + 16 \geq 0$

ОДР: $\begin{cases} x^2 - 10 - 3x \geq 0 \text{ (1)} \\ 6x - x^2 + 16 \geq 0 \text{ (2)} \end{cases}$

(1) $x^2 - 10 - 3x \geq 0$
 $x^2 - 3x - 10 = 0$

$D = 9 + 40 = 49$

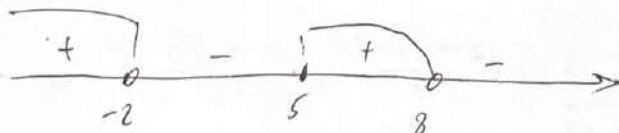
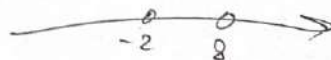
$\begin{cases} x_1 = -2 \\ x_2 = 5 \end{cases}$



(2): $6x - x^2 + 16 \geq 0$
 $x^2 - 6x - 16 \geq 0$

$D = 36 + 64 = 100$

$\begin{cases} x_1 = \frac{6-10}{2} = -2 \\ x_2 = \frac{6+10}{2} = 8 \end{cases}$



$$N11 \quad 3^{2x+1} + 27 = 82 \cdot 3^x$$

$$3^{2x} \cdot 3 + 27 = 82 \cdot 3^x$$

$$\text{Пусть } 3^x = t, \quad t > 0$$

$$3t^2 - 82t + 27 = 0$$

$$D = 6724 - 324 = 6400 = 80^2$$

$$t_1 = \frac{82-80}{6} = \frac{2}{6} = \frac{1}{3}$$

$$t_2 = \frac{82+80}{6} = \frac{162}{6} = 27$$

$$\Rightarrow \begin{cases} 3^x = \frac{1}{3} \\ 3^x = 27 \end{cases} \Rightarrow \begin{cases} x = -1 \\ x = 3 \end{cases}$$

$$N12 \quad x^{4-\lg x} = 1$$

~~$$x^b = 1 \Rightarrow \begin{cases} b = 0 \\ a = 1 \end{cases}$$~~

$$1) \quad 4 - \lg x = 0$$

$$-\lg x = -4$$

$$\lg x = 4$$

$$x = 10^4 = 10000$$

$$x_1 + x_2 = 10000 + 1 = 10001$$

$$(2) \quad x = 1$$

$$N10 \quad \log_6^3 + \frac{\log_6 18}{\log_6 2} = \log_6^3 + \frac{\log_2 18}{\log_2 6} \cdot \frac{\log_2 5}{1} = \log_6^3 + \log_2 18 =$$

$$= \log_6^2 3 + \frac{\log_6 3^2}{\log_6 2} = \log_6^2 3 + \frac{2 \log_6 3}{\log_6 2}$$

~~$$\log_6^3 + \frac{\log_6 18}{\log_6 2} = \log_6^3 + \frac{\log_2 18}{\log_2 6} \cdot \frac{\log_2 5}{1} = \log_6^3 + \log_2 18 =$$~~

~~$$\log_6^3 + \frac{\log_6 18}{\log_6 2} = \log_6^3 + \frac{\log_2 18}{\log_2 6} \cdot \frac{\log_2 5}{1} = \log_6^3 + \log_2 18 =$$~~

~~$$\log_6^3 + \frac{\log_6 18}{\log_6 2} = \log_6^3 + \frac{\log_2 18}{\log_2 6} \cdot \frac{\log_2 5}{1} = \log_6^3 + \log_2 18 =$$~~

~~$$\log_6^3 + \frac{\log_6 18}{\log_6 2} = \log_6^3 + \frac{\log_2 18}{\log_2 6} \cdot \frac{\log_2 5}{1} = \log_6^3 + \log_2 18 =$$~~

$$N9 \quad \frac{x}{x-3} - \frac{1}{x-5} = \frac{1}{5x} - \frac{2}{x-9}$$

$$\frac{x^2 + 4x}{x-3} - \frac{1}{x-5} = \frac{2}{x-9} - \frac{1}{x-5}$$

$$\frac{x^2 + 4x - 5}{x-3} - \frac{1}{x-5} = \frac{2}{x-9} - \frac{1}{x-5}$$

$$= \frac{(x-1)(x+5)}{2(x-5) - (x-9)} = \frac{(x-1)(x+5)}{1} \cdot \frac{(x-9)(x-5)}{x-9} =$$

$$= (x+5)(x-9)(x-5) = (x^2 - 25)(x-9)$$

Метод 2

Шифр 06

Внесите в таблицу номера правильных ответов. В заданиях, в которых отсутствуют варианты ответов, внесите правильный ответ.

1	2	3	4	5	6	7	8	9	10

11	12	13	14	15	16	17	18	19	20

N 18 $9x^2 + 2 \cdot 3x^2 + 9 = 0$

$3^{2x^2} + 2 \cdot 3x^2 + 9 = 0$

$3^{x^2} = 6$

$t^2 + 2t + 9 = 0$

$D > 0$ для более 2х решений.

$D = 4 - 36 = 4(1 - 9)$

$4(1 - 9) > 0 \quad | :4$

$1 - 9 > 0$

$-9 > -1$

$a < 1$

N 9. $y = |x^2 - 6x + 8|$

(1) $|x^2 - 6x + 8|, x > 0$

$x^2 - 6x + 8 = 0$

$D = 36 - 32 = 4$

$\begin{cases} x_1 = 2 \\ x_2 = 4 \end{cases}$

$x_1 = 2 \Rightarrow y_1 = (y(2)) = -1$

x	1	2	3	4	5
y	3	0	-1	0	3

(2) $|x^2 - 6x + 8|, x < 0$

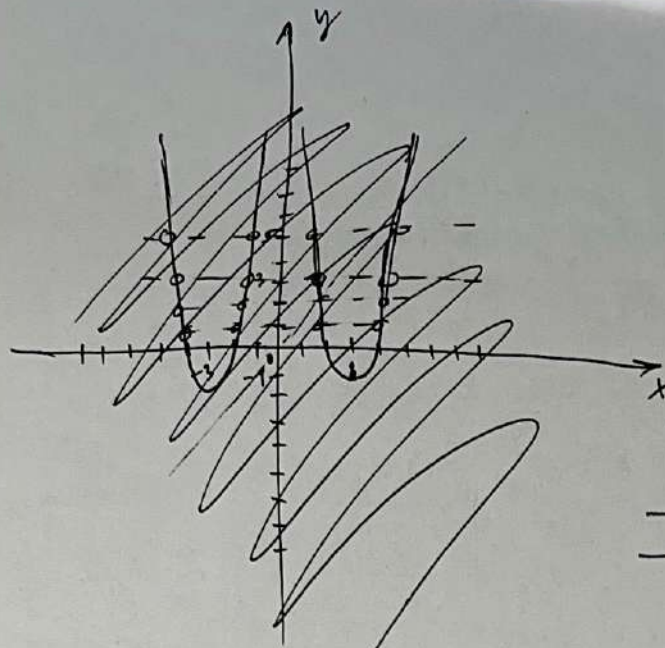
$-x^2 + 6x + 8 = 0$

$D = 36 - 32 = 4$

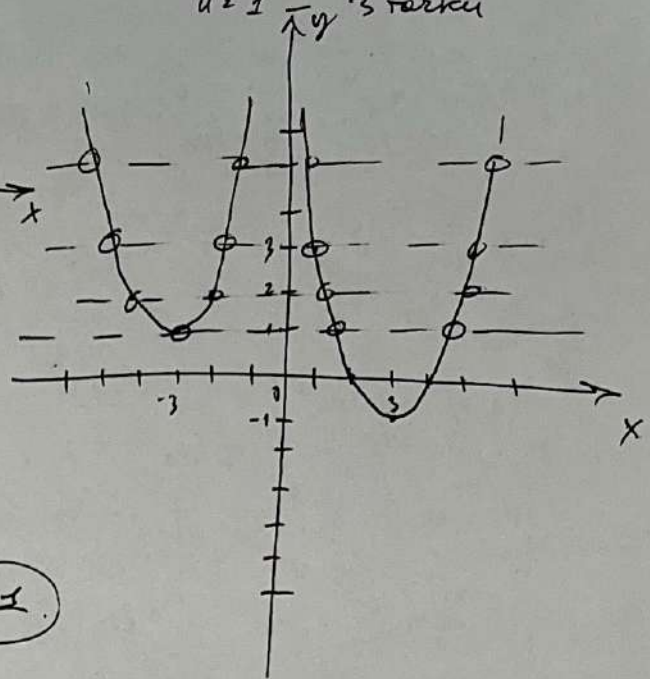
$\begin{cases} x_1 = -4 \\ x_2 = -2 \end{cases}$

$x_1 = -4 \Rightarrow y_1 = (y(-4)) = 1$

x	-4	-3	-2	
y	1	0	1	



при $a = 3$ - 4 точки
 $a = 5$ - 4 точки
 $a = 2$ - 4 точки
 $a = 1$ - 3 точки



3 обьекта точки при $a = 1$.

$$\frac{x(x+4)}{\frac{2}{x-9} - \frac{1}{x-5}} = \frac{5}{\frac{1}{5-x} + \frac{2}{x-9}}$$

$$D = 16 + 4 \cdot 5 = 36$$

$$x_1 = \frac{-4-6}{2} = -5$$

$$x_2 = \frac{-4+6}{2} = 1$$

$$\frac{x^2(x+4)}{\frac{2}{x-9} - \frac{1}{x-5}} = \frac{5}{\frac{1}{5-x} + \frac{2}{x-9}} = \frac{x^2(x+4)}{\frac{2}{x-9} - \frac{1}{x-5}} + \left(\frac{1}{x-5} + \frac{2}{x-9} \right) =$$

$$= \frac{x(x+4) + 5}{\frac{2}{x-9} - \frac{1}{x-5}} = \frac{x^2 + 4x + 5}{\frac{2x^2 - 10x - x^2 + 9}{(x-9)(x-5)}} = \frac{x^2 + 4x + 5}{x-1} = \frac{(x-1)(x+5)(x-9)(x-5)}{(x-1)(x-5)} =$$

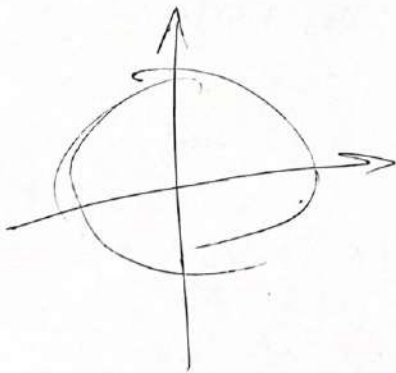
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$$\frac{(x-1)(x+5)(x-9)(x-5)}{1} \cdot \frac{1}{(x-1)} = \frac{(x-5)^2(x-9)}{(x-5)} = \frac{x^2 - 25}{x-9}$$

$$\frac{x(x+4)}{\frac{2}{x-9} - \frac{1}{x-5}} = \frac{5}{\frac{2}{x-9} - \frac{1}{x-5}}$$

$$(x+5)(x-5) = x^2 - 5x + 5x - 25 = x^2 - 25$$

$$(x^2 - 25)(x-9) = x^3 - 9x - 25x + 225 = x^3 - 36x + 225$$



$$x \left( \frac{2x-10}{x-9} - \frac{x+9}{x-5} \right) = x - 1$$

$$\log_2 18 = \frac{\log_6 18}{\log_6 2}$$

$$\log_6 18 = \frac{\log_2 18}{\log_2 6}$$

$$\log_2 6 = \frac{\log_6 6}{\log_6 2}$$

Шифр \_\_\_\_\_

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$$\log_3^2 \frac{\log_2 3}{\log_2 6}$$

|   |   |   |   |   |   |   |   |   |    |
|---|---|---|---|---|---|---|---|---|----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|   |   |   |   |   |   |   |   |   |    |

|    |    |    |    |    |    |    |    |    |    |
|----|----|----|----|----|----|----|----|----|----|
| 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
|    |    |    |    |    |    |    |    |    |    |

$$\frac{\log_6 18}{\log_2 6} = \frac{\log_2 18}{\log_2 6} \cdot \frac{\log_2 6}{1} = \log_2 18$$

$$\log_6^3 3 = \frac{\log_3^3}{\log_3 6}$$

$$\log_6 18 = \frac{\log_3 18}{\log_3 6}$$

$$\log_6^2 3 + \log_2 18 = \log_6^2 3 + \frac{\log_6 18}{\log_6 2} = \log_6^2 3 + \frac{1 + \log_6 3}{\log_6 2}$$

$$t^2 + \frac{1+t}{\log_6 2} = \log_6 2 t^2 + t + 1 = 0$$

$$D = 1 - 4 \cdot \log_6 2$$

$$(\log_6 2^4)^2 = \log_6 16$$

$$\log_2 3 = \frac{\log_6 3}{\log_6 2}$$

$$\frac{\log_6 6 + \log_6 3}{\log_2 2 + \log_2 3} = \frac{1 + \log_6 3}{1 + \log_2 3}$$

$$\log_2 9 = \frac{\log_6 9}{\log_6 2}$$

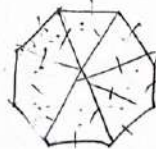
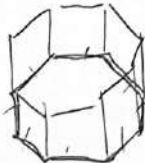
$$\log_2 12 = \log_2 2 + \log_2 6 = 1 + \log_2 6 = 1 + \log_2 3 + \log_6 2 = \frac{2 \log_6 3}{\log_6 2}$$

$$t^2 + \frac{2t}{\log_6 2} = t(\log_6 2 t + 2) = 0$$

$$t = 0$$

$$V = \text{Sum } h.$$

$$\log_6 2 t + \log_6 6^2 = 0$$



$$y = |x^2 - 6x + 8|$$

$$x^2 - 6x + 8 > 0, x > 0 \quad (1)$$

$$x^2 - 6x + 8 < 0, x < 0 \quad (2)$$

$$(1) x^2 - 6x + 8 = 0$$

$$D = 36 - 4 \cdot 8 = 36 - 32 = 4$$

$$\begin{cases} x_1 = \frac{6-2}{2} = 2 \\ x_2 = \frac{6+2}{2} = 4 \end{cases}$$

$$x_0 = \frac{6}{2} = 3$$

$$y_0 = y(3) = 3^2 - 18 + 8 = 9 - 10 = -1 \quad (1)$$

|   |   |   |    |   |   |
|---|---|---|----|---|---|
| x | 1 | 2 | 3  | 4 | 5 |
| y | 3 | 0 | -1 | 0 | 3 |

$$(2) (-x)^2 + 6x + 8 = 0$$

$$x^2 + 6x + 8 = 0$$

$$D = 36 - 32 = 4$$

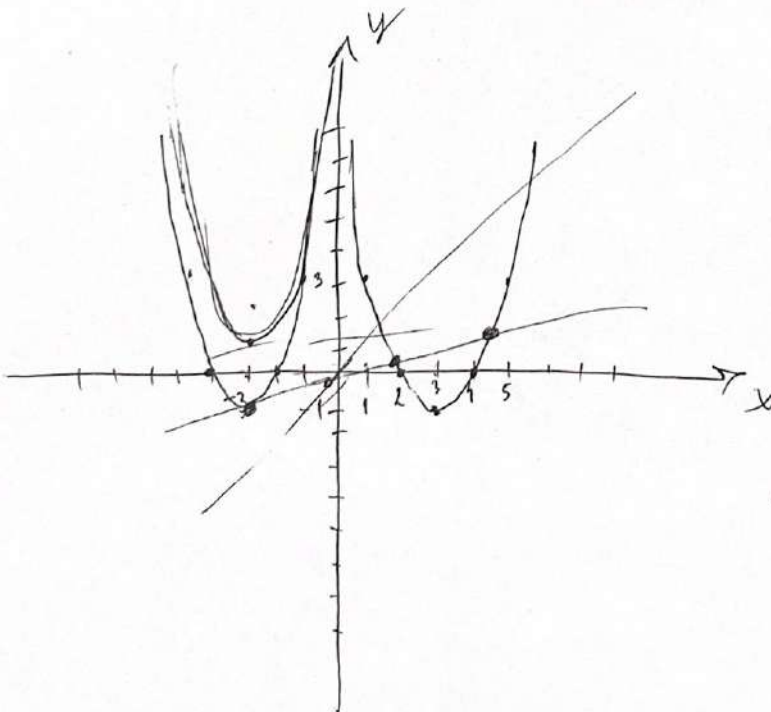
$$x_1 = \frac{-6-2}{2} = -\frac{8}{2} = -4$$

$$x_2 = \frac{-6+2}{2} = -\frac{4}{2} = -2$$

$$x_0 = \frac{-6}{2} = -3$$

$$y_0 = (y(-3)) = 9 - 18 + 8 = -1$$

|   |    |    |    |
|---|----|----|----|
| x | -4 | -3 | -2 |
| y | 0  | -1 | 0  |



$$x < 0$$

$$-x^2 + 6x - 8 = 0$$

$$D = 36 - 4 \cdot (-1) \cdot (-8) = 4$$

$$x_1 = 2$$

$$x_2 = 4$$

$$x_0 = \frac{-6}{-2} = 3$$

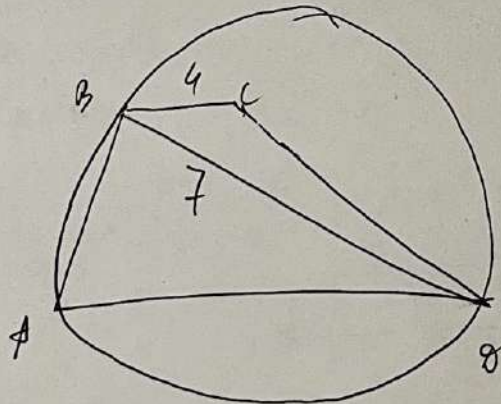
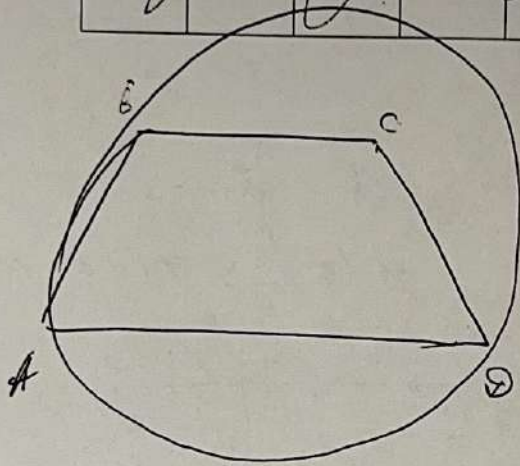
$$y(3) = -9 + 18 - 8 = 1$$

Шифр \_\_\_\_\_

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|   |   |   |   |   |   |   |   |   |    |
|---|---|---|---|---|---|---|---|---|----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|   |   |   |   |   |   |   |   |   |    |

|    |    |    |    |    |    |    |    |    |    |
|----|----|----|----|----|----|----|----|----|----|
| 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
|    |    |    |    |    |    |    |    |    |    |





$$\sqrt{x^2 - 10 - 3x} \geq 0$$

$$6x - x^2 + 16 \geq 0$$

$$9x^2 + 2 \cdot 3x^2 + a = 0$$

$$3^{2x^2} + 2 \cdot 3^{x^2} + a = 0$$

$$3^{x^2} = t$$

$$t^2 + 2t + a = 0$$

$$D = 2 - 4a \geq 0$$

$$t_1 = \frac{-2 - \sqrt{2-4a}}{2}$$

$$t_2 = \frac{-2 + \sqrt{2-4a}}{2}$$

$$\begin{array}{r} 27 \\ \times 12 \\ \hline 54 \\ 27 \\ \hline 324 \end{array}$$

$$\begin{array}{r} -6724 \\ 324 \\ \hline 6400 \end{array}$$

$$3^{2x} + 27 = 82 \cdot 3^x$$

$$3^{2x} \cdot 3 + 3^3 = 82 \cdot 3^x$$

$$3^{2x+1} + 27 = 82 \cdot 3^x$$

$$\begin{array}{r} 27 \\ \times 12 \\ \hline 54 \\ 27 \\ \hline 324 \end{array}$$

$$3t^2 - 82t + 27 = 0$$

$$D = 8724 - 4 \cdot 3 \cdot 27 = 6724 - 324 = 6400 = 80^2$$

$$t_1 = \frac{82 - 80}{6} = \frac{2}{6} = \frac{1}{3}$$

$$t_2 = \frac{82 + 80}{6} = \frac{162}{6} = 27$$

$$\log_{10} 18 = \log_{10} 2 \cdot \log_{10} 3$$

$$\log_{10} 18 = \log_{10} 2 + \log_{10} 3$$

$$\log_{10} 3 = \frac{1}{2} \log_{10} 9$$

$$\log_{10} 3 = \frac{1}{2} \log_{10} 3^2$$

$$3^x = \frac{1}{3}$$

$$3^x = 3^{-1}$$

$$x = -1$$

NR  $4 - \log x = 1$

$$4 - \log x = 1$$

$$-\log x = -4$$

$$\log_{10} x = 4$$

$$x = 10^4 = 10000$$

$$x = 1$$

NR  $\sqrt{x^2 - 2} (5 + 7 \sin x - 7 \cos x - 3 \sin 2x) = 0$

$$\sqrt{x^2 - 2} = 0$$

$$5 + 7 \sin x - 7 \cos x - 3 \sin 2x = 0$$

$$5 + 7 \sin x - 7 \cos x - 6 \sin x \cos x = 0$$

$$\log_6^2 3 + \frac{\log_6 18}{\log_2 6} = \frac{\log_6^2 3}{1} + \frac{\log_6 18}{\log_6 2}$$

$$\log_6^2 18 = \frac{\log_6 18}{\log_6 6} = \log_6^2 3 + \log_6 18 \cdot \log_6 2 =$$

$$\log_2 6 = \frac{\log_6 6}{\log_6 2} = \log_6^2 3 + (\log_6 8 + \log_6 3) \cdot \log_6 2 =$$

$$\log_6^2 3 + \frac{\log_6 6 + \log_6 3}{\log_2 6} = \log_6^2 3 + \frac{1 + \log_6 3}{\log_2 6} =$$

$$= \log_6^2 3 + \frac{1 + \log_6 3}{\log_2 2 + \log_2 3} = \log_6^2 3 + \frac{1 + \log_6 3}{1 + \log_2 3} = \log_6^2 3 + \frac{1 + \log_6 3}{1 + \frac{\log_6 3}{\log_6 2}}$$

1 - 1 - a

1 - 1 - a

ЧЕРКОВИЧКА

$$a = \sqrt[3]{\frac{1}{8}} + \frac{1}{\sqrt{3}}$$

$$b = \frac{1}{\sqrt{8}} - \frac{1}{\sqrt{3}}$$

$$\frac{a^3 - b^3}{(a-b)^3}$$

$$\downarrow (a-b)(a^2 + ab + b^2)$$

$$\frac{\left(\frac{1}{\sqrt{8}} + \frac{1}{\sqrt{3}}\right)^3 - \left(\frac{1}{\sqrt{8}} - \frac{1}{\sqrt{3}}\right)^3}{\left(\frac{1}{\sqrt{8}} + \frac{1}{\sqrt{3}} - \left(\frac{1}{\sqrt{8}} + \frac{1}{\sqrt{3}}\right)\right)^3} = \frac{\left(\frac{\sqrt{8}}{8} + \frac{\sqrt{3}}{3}\right)^3 - \left(\frac{\sqrt{8}}{8} - \frac{\sqrt{3}}{3}\right)^3}{\left(\frac{\sqrt{8}}{8} + \frac{\sqrt{3}}{3} - \frac{\sqrt{8}}{8} - \frac{\sqrt{3}}{3}\right)^3} =$$

№3  $x^6 + 5x^5 - 6 = 0$

$$x^3 = t$$

$$t^2 + 5t - 6 = 0$$

$$D = 25 + 24 = 49$$

$$t_1 = \frac{-5+7}{2} = 1$$

$$t_2 = \frac{-5-7}{2} = -6$$

Одп. замена:

$$x^3 = -6 \Rightarrow (x_1^3)^2 = 36$$

$$x^3 = 1 \Rightarrow (x_2^3)^2 = 1$$

$$\frac{\left(\frac{3\sqrt{8} + 8\sqrt{3}}{24}\right)^3 - \left(\frac{3\sqrt{8} - 8\sqrt{3}}{24}\right)^3}{\left(\frac{\sqrt{3}}{3} + \frac{\sqrt{8}}{8}\right)^3} = 2\sqrt{3}$$

~~$x_1 = \sqrt[3]{3+6} = \sqrt[3]{9}$~~   
 ~~$x_2 = \sqrt[3]{-6}$~~   
 ~~$x_3 = \sqrt[3]{-6}$~~   
 ~~$x_4 = \sqrt[3]{-6}$~~   
 ~~$x_5 = \sqrt[3]{-6}$~~   
 ~~$x_6 = \sqrt[3]{-6}$~~   
 ~~$-216 + 1 = -215$~~

№9  $\sqrt{-\frac{x}{5} + 1} = \left(\frac{x}{5} - 1\right)^2$

Одп:  $-\frac{x}{5} + 1 \geq 0$

$$-\frac{x}{5} + \frac{5}{5} \geq 0$$

$$-x + 5 \geq 0$$



$$\frac{1}{125} \left(-\frac{x}{5} + 1\right)^{\frac{1}{2}} = \left(\frac{x}{5} - 1\right)^2 \quad | : \frac{1}{125}$$

$$\left(-\frac{x}{5} + 1\right)^{\frac{1}{2}} = \left(\frac{x}{5} - 1\right)^2 \cdot 125$$

$$\sqrt{f} = g \Rightarrow$$

$$\begin{cases} f = g^2 \\ g \geq 0 \end{cases}$$

№7

$$\frac{\sqrt{x^2 - 10 - 3x}}{6x - x^2 + 16} \geq 0$$

$$\text{Одп: } \begin{cases} x^2 - 10 - 3x \geq 0 & (1) \\ 6x - x^2 + 16 \neq 0 & (2) \end{cases}$$

(1):  $x^2 - 10 - 3x \geq 0$

$$x^2 - 3x - 10 = 0$$

$$D = 9 + 40 = 49$$

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



(2):  $6x - x^2 + 16 \neq 0$

$$-x^2 + 6x + 16 \neq 0$$

$$x^2 - 6x - 16 \neq 0$$

$$D = 36 + 4 \cdot 16 = 100$$

$$x_1 = \frac{6-10}{2} = -2$$

$$x_2 = \frac{6+10}{2} = 8$$

