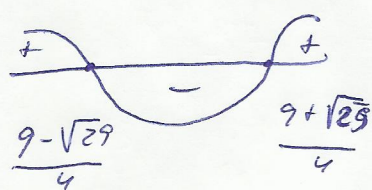


$$1) \log_7(4x^2 - 18x + 13) - \log_7(2x - 8) = 0$$

Определим ОДЗ: $4x^2 - 18x + 13 > 0 \Rightarrow 4\left(x - \frac{9 - \sqrt{29}}{4}\right)\left(x - \frac{9 + \sqrt{29}}{4}\right) > 0$



$$x < \frac{9 - \sqrt{29}}{4} \quad x > \frac{9 + \sqrt{29}}{4}$$

$2x - 8 > 0 \Rightarrow 2x > 8 \Rightarrow x > 4$, итак ОДЗ: $x > 4$

$$\log_7 \frac{4x^2 - 18x + 13}{2x - 8} = 0 \Rightarrow \frac{4x^2 - 18x + 13}{2x - 8} = 1 \Rightarrow$$

$$\Rightarrow 4x^2 - 18x + 13 - 2x + 8 = 0 \Rightarrow 4x^2 - 20x + 21 = 0$$

$$x_{1,2} = \frac{20 \pm \sqrt{20^2 - 16 \cdot 21}}{8} = \frac{20 \pm \sqrt{64}}{8} = \frac{20 \pm 8}{8}$$

$$x_1 = \frac{28}{8} = 3,5 \quad x_2 = \frac{12}{8} = \frac{3}{2} = 1,5$$

Ни одно из значений x не подходит по ОДЗ

$$2) \begin{cases} \log_{\frac{1}{3}}(x+y) = 2 \\ \log_3(x-y) = 2 \end{cases} \Rightarrow \begin{cases} x+y = \frac{1}{9} \\ x-y = 9 \end{cases} \Rightarrow 2x = 9\frac{1}{9} = \frac{82}{9}$$

$$x = \frac{41}{9} = 4\frac{5}{9} \quad y = \frac{1}{9} - x = \frac{1}{9} - \frac{41}{9} = -\frac{40}{9} = -4\frac{4}{9}$$

$$\begin{cases} x = 4\frac{5}{9} \\ y = -4\frac{4}{9} \end{cases}$$

$$3) \begin{cases} 3^{2x} - 2^y = 725 \\ 3^x - 2^{\frac{y}{2}} = 25 \end{cases} \quad \text{Замена переменной: } 3^x = a; 2^{\frac{y}{2}} = b$$

$$\begin{cases} a^2 - b = 725 \\ a - \sqrt{b} = 25 \end{cases} \Rightarrow \begin{cases} a^2 - b = 725 \\ b = a^2 - 50a + 625 \end{cases} \Rightarrow \begin{cases} a^2 - b = 725 \\ b = a^2 - 50a + 625 \end{cases}$$

$$a^2 - a^2 + 50a - 625 = 725 \Rightarrow 50a = 1350 \Rightarrow a = 27$$

$$b = 27^2 - 50 \cdot 27 + 625 = 4 \Rightarrow 3^x = 27 \Rightarrow x = 3; 2^{\frac{y}{2}} = 4 \Rightarrow y = 2$$