

1.) Парабола $y = ax^2 + bx + c$

$$\begin{cases} 2 = (1)^2 a + (1) b + c \\ 10 = (3)^2 a + (3) b + c \\ 1 = (5)^2 a + (5) b + c \end{cases}$$

$$\begin{cases} a + b + c = 2 \\ 9a + 3b + c = 10 \\ 25a + 5b + c = 1 \end{cases} \quad \begin{cases} c = 2 - a - b \\ 9a + 3b + 2 - a - b = 10 \\ 25a + 5b + 2 - a - b = 1 \end{cases}$$

$$\begin{cases} c = 2 - a - b \\ b = \frac{8 - 8a}{2} \\ 24a + 4\left(\frac{8 - 8a}{2}\right) = -1 \end{cases} \quad \begin{cases} 8a = -17 \\ b = \frac{8 - 8\left(-\frac{17}{8}\right)}{2} \\ c = 2 + \frac{17}{8} - \left(\frac{8 + 17}{2}\right) \end{cases}$$

$$\begin{cases} a = -\frac{17}{8} \\ b = \frac{25}{2} \\ c = -\frac{67}{8} \end{cases} \Rightarrow \underline{\underline{y = -\frac{17}{8}x^2 + \frac{25}{2}x - \frac{67}{8}}}$$

2) x - вес огурцов без воды

$$x + 0,99 \cdot (100) = 100$$

$$x = 1$$

y - вес огурцов через месяц

$$y \cdot 0,98 + 1 = y$$

$$0,02y = 1$$

$$y = 50$$

Ответ : 50 кг.

3. 1.) $2^x = 256$

$$\log_2 2^x = \log_2 256$$

$$\log_2 2^x = \log_2 2^8$$

$$x = 8$$

2) $2^x = 300$

$$\log_2 2^x = \log_2 300$$

$$x = \log_2 300$$

3) $\log_8 2^{8x-4} = 4$

$$\log_{2^3} 2^{8x-4} = 4$$

$$\frac{1}{3} \cdot (8x-4) \log_2 2 = 4$$

$$8x - 4 = 12 ; \quad x = 2$$

$$4) 3^{\log_3(5x-5)} = 5 \quad \text{ODD3: } x > 1$$

$$\log_3 3^{\log_3(5x-5)} = \log_3 5$$

$$\log_3(5x-5) \cdot \log_3 3 = \log_3 5$$

$$\log_3(5x-5) = \log_3 5$$

$$\frac{1}{2} \log_3(5x-5) = \log_3 5$$

$$\log_3(5x-5) = \log_3 5^2$$

$$5x - 5 = 25$$

$$x = 6$$

$$\text{Ответ: } x = 6$$

$$5) x^{\log_3 x + 1} = 9 \quad \text{ODD3: } x > 0$$

$$\log_3 x^{\log_3 x + 1} = \log_3 3^2$$

$$(\log_3 x + 1) \log_3 x = 2; \log_3 x = t$$

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

~~$$t_1 = 1, t_2 = -2$$~~

$$t = 1 \text{ и } t = -2$$

$$\log_3 x = 1$$

$$x = 3$$

$$\log_3 x = -2$$

$$x = \frac{1}{9}$$

$$\text{Ответ } 3; \frac{1}{9}$$

④ 6) $\log_4 16 = 2$

7) $\log_5 \frac{1}{25} = \log_5 5^{-2} = -2$

8) $\log_{25} 5 = \log_{5^2} 5 = \frac{1}{2}$

9) $\log_3 \sqrt{27} = \log_3 3^{\frac{3}{2}} = \frac{3}{2}$

10) $\log_2 12 - \log_2 3 = \log_2 4 = 2$

11) $\log_6 12 + \log_6 3 = \log_6 36 = 2$

12) $e^{\ln 5} = 5$

13) $\frac{\log_2 225}{\log_2 15} = \log_{15} 225 = 2$

14) $\log_4 32 + \log_{0.1} 10 = \log_4 16 + \log_4 2 + \log_{10} 10 =$
 $= 2 \cdot \log_4 4 + \frac{1}{2} \cdot \log_2 2 - \log_{10} 10 = 2 + \frac{1}{2} - 1 = 1\frac{1}{2}$

15) $9 \log_3 5 = 3^2 \cdot \log_3 5^{\frac{1}{2}} = 3 \log_3 5 = 5$