Задание №2

(1) $y = ax^2 + bx + c$ – уравнение $(1;2), (3;10), (5;1)$

$$\begin{cases} a+b+c=2 \ (1) \\ 9a+3b+c=10 \ (2) \\ 25a+5b+c=1 \ (3) \end{cases} \quad \begin{matrix} \\ \cdot 9 \\ \cdot 25 \end{matrix} \quad \begin{cases} 9a+9b+9c=18 \ (4) \\ 25a+25b+25c=50 \ (5) \end{cases}$$

(4-2) $6b+8c=8 \quad \cdot 3$

(5-3) $20b+24c=49$

$$\begin{cases} 18b+24c=24 \\ 20b+24c=49 \end{cases}$$

$2b = 25$

$b = 12{,}5$

$c = 1 - \frac{6}{8}b = 1 - \frac{6}{8} \cdot 12{,}5 = -8{,}375$

$a = 2 - b - c = -2{,}125$

$y = -2{,}125x^2 + 12{,}5x - 8{,}375$

(2)

$$\frac{99}{100} \cdot 100 + x = 100 \quad | \quad x = 1$$

$$\frac{98}{100} y + x = y \quad | \quad y = 50$$

Ответ: 50

(3) 1) $2^x = 256 = 2^8 \Rightarrow x = 8$

2) $2^x = 300 \Rightarrow \log_2 2^x = \log_2 300 = \log_2 2^2 \cdot 75$

$x = 2 + \log_2 75$

4) $3^{\log_9 (5x-5)} = 5 \Rightarrow (5x-5)^{\log_9 3} \Rightarrow (5x-5)^{1/2} = 5$

$5x - 5 = 25$

$x = 6$

3) $\log_8 2^{8x-4} = 4 \Rightarrow \log_{2^3} 2^{8x-4} = 4 \Rightarrow \frac{1}{3}(8x-4) = 4$

$x = 2$

5) $x^{\log_3(x+1)} = 9$

$\log_3(x+1) = \log_x 9 = \frac{\log_3 9}{\log_3 x} = \frac{\log_3 9}{2}$

$(x+1)^2 = x$

$x^2 + x + 1 = 0$

решений нет $D < 0$

4) 6) $\log_4 16 = \log_4 4^2 = 2$

7) $\log_5 \frac{1}{25} = \log_5 (\frac{1}{5} \cdot \frac{1}{5}) = -1 + -1 = -2$

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

9) $\log_3 \sqrt{27} = \log_3 3 \cdot 3^{\frac{1}{2}} = 1 + \frac{1}{2} = 1,5$

10) $\log_2 12 - \log_2 3 = \log_2 2^2 \cdot 3 - \log_2 3 = 2 + \log_2 3 - \log_2 3 = 2$

11) $\log_6 12 + \log_6 3 = \log_6 6 + \log_6 2 + \log_6 3 = 1 + \log_6 (2 \cdot 3) = 2$

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

13) $\frac{\log_2 225}{\log_2 15} = \log_{225} 15 = \log_{15^2} 15 = \frac{1}{2}$

14) $\log_4 32 + \log_{0,1} 10 = \log_{2^2} 2^5 + \frac{1}{\log_{10} \frac{1}{10}} = \frac{5}{2} + \frac{1}{\lg 1 - \lg 10} = \frac{5}{2} - 1 = 1,5$

15) $9^{\log_3 \sqrt{5}} = \sqrt{5}^{\log_3 9} = (\sqrt{5})^2 = 5$