Написать ур-ие параболы, проходящей через три точки (x, y)

$(1, 2), (3, 10), (5, 1)$

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

$$y = ax^2 + bx + c$$

$$\begin{cases} c = 2-a-b \\ 10 = 9a+3b+2a-a-b \\ 1 = 25a+5b+2-a-b \end{cases} \quad \begin{cases} c = 2-a-b \\ 10 = 8a+2b+2 \\ 1 = 24a+4b+2 \end{cases} \quad \begin{cases} c = 2-a-b \\ 8 = 8a+2b \\ -1 = 24a+4b \end{cases} \quad -2b = 8a - 8 \ (-1)$$

$$\begin{cases} c = 2-a-b \\ 2b = 8-8a \\ -1 = 24a+4b \end{cases} \quad \begin{cases} c = 2-a-b \\ b = 4-4a \end{cases}$$

$$-1 = 24a + 4(4-4a) = 24a+16-16a = 8a+16$$

$$-1 = 8a+16 \rightarrow -8a = 17(-1) \rightarrow 8a = -17 \rightarrow a = -\frac{17}{8}$$

$$b = 4-4\left(-\frac{17}{8}\right) = 4+\frac{68}{8} = \frac{32+68}{8} = \frac{100}{8} = \frac{25}{2}$$

$$c = 2-\left(-\frac{17}{8}\right)-\frac{25}{2} = 2+\frac{17}{8}-\frac{100}{8} = 2-\frac{83}{8} = \frac{16-83}{8} = -\frac{67}{8}$$

$$y = -\frac{17}{8}x^2+\frac{25}{2}x-\frac{67}{8}$$

Задача 2

100 · 1/100 = 1

100 · 1/2 = 50

Ответ: 50кг

3.1) $2^x = 256$ $\log_2 256 = x$ $\log_2 256 = 8 \to x = 8$

3.2) $2^x = 300$ $\log_2 300 = x$ $\log_2 300 = 8{,}228819 \to x = 8{,}228819$

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

$\log_8 2^{8x-4} = (8x-4)\log_8 2 = (8x-4)\log_{2^3} 2 = (8x-4)\frac{1}{3}\log_2 2 = (8x-4)\frac{1}{3} = \frac{8x}{3} - \frac{4}{3}$

$\frac{8x-4}{3} \to 8x-4 = 12 \to 8x = 16 \to x = 2$

3.4) $3^{\log_3 x+1} = x5$

$(5x-5)^{\log_9 3} = (5x-5)^{\frac{1}{2}} = \sqrt{5x-5} \to \sqrt{5x-5} = 5 \quad (**2)$

$5x-5 = 25$

$5x = 30$

$x = 6$

4.1) $\log_4 16 = 2$

4.2) $\log_5 \frac{1}{25} = -2$

4.3) $\log_{25} 5 = 0,5$

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

4.5) $\log_2 12 - \log_2 3 = \log_2 \frac{12}{3} = \log_2 4 = 2$

4.6) $\log_6 12 + \log_6 3 = \log_6 12 \cdot 3 = \log_6 36 = 2$

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

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

4.9) $\log_4 32 + \log_{0,1} 10 = 2,5 + (-1) = 1,5$

$\log_4 32 = \log_4 2^5 = 5\log_4 2 = \frac{5}{2}$

$\log_{0,1} 10 = -1$

4.10) $9^{\log_3 \sqrt{5}} = \sqrt{5}^{\log_3 9} = (\sqrt{5})^2 = 5$