

Diff 2

1) $y = ax^2 + bx + c$ - $yp \cdot c$ нарастающее
Точки: $(1; 2), (3; 10), (5; 1)$

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

$$\begin{cases} c=2-a-b \\ 16=16a+4b \\ -1=24a+4b \end{cases} \quad \begin{cases} c=2-a-b \\ b=4-4a \\ 8a=-17 \end{cases} \Rightarrow \begin{array}{l} a = -\frac{17}{8} \\ b = 4 + 4 \cdot \frac{17}{8} = \frac{25}{2} \\ c = 2 + \frac{17}{8} - \frac{25}{2} = \frac{16+17-100}{8} = -\frac{67}{8} \end{array}$$

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

2) Нахождение бензина - x км

$$100 \text{ км} \cdot 0,99 = 99 \text{ км} \rightarrow \text{бензин сгорел}$$

$$x = 0,98x + 1$$

$$x(1-0,98) = 1$$

$$x = \frac{1}{0,02} = 50 \text{ км}$$

Одн. реш: 50 км

$$3) 1. 2^x = 256 \quad y=8$$

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

$$3. \log_8 2^{8x-4} = 4 \Rightarrow 8^4 = 2^{8x-4} \Rightarrow 2^{12} = 2^{8x-4}$$
$$12 = 8x - 4$$
$$x = 2$$

$$4. \frac{x=2}{3^{\log_3(5x-5)}} = 5 \quad \text{OD3: } x > 1$$

$$\sqrt[3]{\log_3(5x-5)} = 5$$

$$3^{\log_3 \sqrt[3]{5x-5}} = 5$$

$$\sqrt[3]{5x-5} = 5$$

$$5x-5 = 25$$

$$x = 6$$

$$5. x^{\log_3 x+1} = 9 \quad \text{OD3: } x \in (0; 1) \cup (1; +\infty)$$

$$\log_3 x^{\log_3 x+1} = \log_3 9$$

$$(\log_3 x+1) \cdot \log_3 x = 2$$

$$\log_3 x = 1 \quad x = 3$$

$$\log_3 x = -2 \quad x = \frac{1}{9}$$

$$\log_3 x = t$$

$$(t+1)t = 2$$

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

$$\left. \begin{array}{l} t_1 \cdot t_2 = -2 \\ t_1 + t_2 = -1 \end{array} \right\} \begin{array}{l} t_1 = 1 \\ t_2 = -2 \end{array}$$

$$\left. \begin{array}{l} t_1 + t_2 = -1 \\ t_1 \cdot t_2 = -2 \end{array} \right\} \begin{array}{l} t_1 = -2 \\ t_2 = 1 \end{array}$$

$$6. \log_4 16 = 2$$

$$7. \log_5 \frac{1}{25} = -2$$

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

$$9. \log_3 \sqrt{24} = \log_3 3^{\frac{3}{2}} = \frac{3}{2}$$

$$10. \log_2 12 - \log_2 3 = \log_2 \frac{12}{3} = \log_2 4 = 2$$

$$11. \log_6 12 + \log_6 3 = \log_6 12 \cdot 3 = \log_6 36 = 2$$

$$12. e^{\ln 5} = e^{\log_e 5} = 5$$

$$13. \frac{\log_2 225}{\log_2 15} = \frac{\log_2 15^2}{\log_2 15} = \frac{2 \log_2 15}{\log_2 15} = 2$$

$$14. \log_4 32 + \log_{0.1} 10 = \log_4 16 \cdot 2 + (-1) = 2 \cdot 2 - 1 = 3$$

$$15. 9^{\log_3 \sqrt{5}} = 3^{2 \cdot \log_3 \sqrt{5}} = (3^{\log_3 \sqrt{5}})^2 = (\sqrt{5})^2 = 5$$