№1 16.03.2022

$ax^2+bx+c=y$

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

$$\left|\begin{matrix}1&1&1\\9&3&1\\25&5&1\end{matrix}\right|\left|\begin{matrix}2\\10\\1\end{matrix}\right| \begin{matrix}\\ \cdot(-9)+ \\ \cdot(-25)+\end{matrix} \rightarrow \left|\begin{matrix}1&1&1\\0&-6&-8\\0&-20&-24\end{matrix}\right|\left|\begin{matrix}2\\-8\\-48\end{matrix}\right| :(-6) \rightarrow \left|\begin{matrix}1&1&1\\0&1&\frac{8}{6}\\0&-20&-24\end{matrix}\right|\left|\begin{matrix}2\\\frac{8}{6}\\-48\end{matrix}\right| \begin{matrix}\\ \cdot(-1)+ \\ \cdot 20+\end{matrix} \rightarrow$$

$$\rightarrow \left|\begin{matrix}1&0&-\frac{2}{6}\\0&1&\frac{8}{6}\\0&0&\frac{16}{6}\end{matrix}\right|\left|\begin{matrix}\frac{4}{6}\\\frac{8}{6}\\-\frac{134}{6}:\frac{16}{6}\end{matrix}\right| \rightarrow \left|\begin{matrix}1&0&-\frac{2}{6}\\0&1&\frac{8}{6}\\0&0&1\end{matrix}\right|\left|\begin{matrix}\frac{4}{6}\\\frac{8}{6}\\-\frac{134}{16}\end{matrix}\right| \begin{matrix}\\ \cdot(-\frac{8}{6})+ \\ \cdot\frac{2}{6}+\end{matrix} \rightarrow \left|\begin{matrix}1&0&0\\0&1&0\\0&0&1\end{matrix}\right|\left|\begin{matrix}-\frac{204}{96}\\\frac{75}{8}\\-\frac{136}{16}\end{matrix}\right| \rightarrow$$

$$\rightarrow \left|\begin{matrix}1&0&0\\0&1&0\\0&0&1\end{matrix}\right|\left|\begin{matrix}-2,125\\12,5\\-8,375\end{matrix}\right|$$

Ответ: $-2,125x^2+12,5x-8,375=0$

~~Ответ: $a=-2,125$~~
$b=12,5$
~~c~~

№2 $100 \cdot 0,99 = 99$ м → вода → 1 м (ост.).

$$\frac{1}{100-98\%}=\frac{x}{100\%}$$

$x=50$ м.

Ответ: 50 м.

№3. 1) $2^x=256$

$x=8$

2) $2^x=300$

$x=\log_2 300$

3) $\log_8 2^{8x-4}=4$ ОДЗ: $(-\infty;+\infty)$

$\log_8 2^{8x-4}=\log_8 4096$

$2^{8x-4}=4096$

$12 = 8x - 4$

$x = 2$

4) $3^{\log_3(5x-5)} = 5$ ОДЗ $(-\infty; +\infty)$

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

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

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

$5x - 5 = 25$

$x = 4$

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

$\log_x 9 = \log_3 x + 1$

$2\log_x 3 = \log_3 x + 1$

$2\log_x 3 = \frac{1}{\log_x 3} + 1 \mid \log_x 3 = k$

$2k^2 - k - 1 = 0$

$D = 1 - 4 \cdot 2 \cdot -1$

$D = 9$

$k_1 = 1 \quad k_2 = -0{,}5$

$\log_x 3 = 1 \quad \log_x 3 = -0{,}5$

$x^1 = 3 \quad x^{-0{,}5} = 3$

$x = 3 \quad \frac{1}{\sqrt{x}} = 3$

$3\sqrt{x} = 1$

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

№4

6) $\log_4 16 = 4$

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

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

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

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

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

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

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

14) $\log_4 32 + \log_{0,1} 10 = \log_{2^2} 2^{\frac{5}{2}} + \log_4 16 - 1 = 1,5$

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