LOGARITMICKÉ ROVNICE

Řešte v $\mathcal{R}$:

7.2.P.1: $\log_3 \log_4 \log_5 x = 0$ — $K = \{625\}; \mathcal{D}: \boxed{x > 4}$

7.2.P.2: $\log_4 \log_2 \log_3 x = \frac{1}{2}$ — $K = \{81\}; \mathcal{D}: \boxed{x > 3}$

7.2.P.3: $\log_{\frac{1}{2}} \log_3(1 + 20 \log_2 x) = -2$ — $K = \{16\}; \mathcal{D}^*: \boxed{\log_3(1 + 20\log_2 x) > 0}$

7.2.P.4: $\log_2 \left[14 + 2\log_7(1 + 2\log_{\frac{1}{2}} x)\right] = 4$ — $K = \{\frac{1}{8}\}; \mathcal{D}^*: \boxed{14 + 2\log_7(1 + 2\log_{\frac{1}{2}} x) > 0}$

7.2.P.5: $\log_9 \{3\log_2[1 + \log_3(1 - 2\log_3 x)]\} = 0,5$ — $K = \{\frac{1}{3}\}; \mathcal{D}^*: \boxed{3\log_2[1 + \log_3(1 - 2\log_3 x)] > 0}$

7.4.P.1: $\log_2 \frac{1}{8} - 3\log_5 0,2 + \log_3 27 + \log_4 1 = \log_3 x$ — $K = \{\frac{1}{27}\}; \mathcal{D}: \boxed{x > 0}$

7.4.P.2: $-\log_4 a + \frac{1}{2}\log_4 b^3 - 3\log_4 2 = \log_4 x$ — $K = \{\frac{b\sqrt{b}}{8a}\}; \mathcal{D}: \boxed{a, b, x > 0}$

7.4.P.3: $10\log x^2 + 4\log x^5 + 3\log x^3 + 2\log\sqrt{x} = 100$ — $K = \{100\}; \mathcal{D}: \boxed{x > 0}$

7.4.P.4: $\log x^2 + \log\sqrt{x} - \log\frac{1}{x} = \frac{35}{2}$ — $K = \{10^5\}; \mathcal{D}: \boxed{x > 0}$

7.4.P.5: $\ln 2x + \ln x^2 - \ln\sqrt[3]{x} = 1 + \ln 2 - \ln x^{-3}$ — $K = \{e^{-3}\}; \mathcal{D}: \boxed{x > 0}$

7.4.P.6: $2\log x - \log\frac{1}{x} + \log 2\sqrt{x} = \log x^3 - \log\frac{1}{2} - 2$ — $K = \{10^{-4}\}; \mathcal{D}: \boxed{x > 0}$

7.4.P.7: $\log\frac{2}{x^2} - \log\sqrt{x} + 4\log x = \log x^2 + \log 40 - 2$ — $K = \{25\}; \mathcal{D}: \boxed{x > 0}$

7.4.P.8: $\frac{3}{5}\log\sqrt[3]{x^4} - \frac{5}{2}\log\frac{1}{x} = 11$ — $K = \{10^3\sqrt[3]{10}\}; \mathcal{D}: \boxed{x > 0}$

7.4.P.9: $\log(54 - x^3) = 3\log x$ — $K = \{3\}; \mathcal{D}: \boxed{x \in (0; \sqrt[3]{54})}$

7.4.P.10: $\log_{12}(2x + 4) - \log_{12}(x - 3) = \log_{12} 7$ — $K = \{5\}; \mathcal{D}: \boxed{x > 3}$

7.4.P.11: $\log_4(x + 3) - \log_4(x - 1) = 2 - \log_4 8$ — $K = \{5\}; \mathcal{D}: \boxed{x > 1}$

7.5.P.1: $\log\sqrt{2x - 2} = \log(x - 5)$ — $K = \{9\}; \mathcal{D}: \boxed{x > 5}$

7.5.P.2: $\log\sqrt{2x - 3} = \log(x - 3)$ — $K = \{6\}; \mathcal{D}: \boxed{x > 3}$

7.5.P.3: $\log_2\sqrt{x + 1} = 3 - \log_2 4$ — $K = \{3\}; \mathcal{D}: \boxed{x > -1}$

7.5.P.4: $\log_8\sqrt{x + 30} + \log_8\sqrt{x} = 1$ — $K = \{2\}; \mathcal{D}: \boxed{x > 0}$

7.5.P.5: $\frac{1}{2}\log(x - 9) + \log\sqrt{2x - 1} = 1$ — $K = \{13\}; \mathcal{D}: \boxed{x > 9}$

7.5.P.6: $\log\sqrt{3x - 5} + \log\sqrt{7x - 3} = 1 + \log\frac{\sqrt{11}}{10}$ — $K = \{2\}; \mathcal{D}: \boxed{x > \frac{5}{3}}$

7.5.P.7: $\log\sqrt{1 + x} + 3\log\sqrt{1 - x} = \log\sqrt{1 - x^2} + 2$ — $K = \emptyset; \mathcal{D}: \boxed{x \in (-1; 1)}$

7.6.P.2: $\frac{\log(x^2+13)}{2\log(x+5)} = 1$ — $K = \{-\frac{6}{5}\}; \mathcal{D}: \boxed{x \in (-5; -4) \cup (-4; \infty)}$

7.6.P.3: $\frac{\log(2x+13)}{\log(x+5)} = 2$ — $K = \{-2\}; \mathcal{D}: \boxed{x \in (-5; -4) \cup (-4; \infty)}$

7.6.P.4: $\frac{\log(x^2+3)}{\log(x+3)} = 2$ — $K = \{-1\}; \mathcal{D}: \boxed{x \in (-3; -2) \cup (-2; \infty)}$

7.6.P.5: $\frac{\log(x^2+14)}{\log(7-x)} = 2$ — $K = \{\frac{35}{14}\}; \mathcal{D}: \boxed{x \in (-\infty; 6) \cup (6; 7)}$

7.6.P.6: $\frac{2\log 3x}{\log(2-7x)} = 1$ — $K = \{\frac{2}{9}\}; \mathcal{D}: \boxed{x \in (0; \frac{2}{7})}$

7.7.P.1: $\log_2 x + \log_8 x = 8$ — $K = \{64\}; \mathcal{D} > \boxed{x > 0}$

7.7.P.2: $\log_9 x + \log_3 x = 6$ — $K = \{81\}; \mathcal{D} > \boxed{x > 0}$

7.7.P.3: $\log_7 2 + \log_{49} x = \log_{\frac{1}{7}}\sqrt{3}$ — $K = \{\frac{1}{12}\}; \mathcal{D} > \boxed{x > 0}$

7.7.P.4: $\log_{16} x + \log_4 x + \log_2 x = 7$ — $K = \{16\}; \mathcal{D} > \boxed{x > 0}$

7.8.P.1: $\log_2(4 \cdot 3^x - 6) - \log_2(9^x - 6) = 1$ — $K = \{1\}; \mathcal{D}: \boxed{x > 0,815}$

7.8.P.2: $\log_7(2^x - 1) + \log_7(2^x - 7) = 1$ — $K = \{3\}; \mathcal{D}: \boxed{x \in (2,8; \infty)}$

7.8.P.3: $\log 10 + \frac{1}{3}\log\left(3^{2\sqrt{x}} + 271\right) = 2$ — $K = \{9\}; \mathcal{D}: \boxed{x > 0}$

7.8.P.4: $2 + \log_2(3^{x-2} + 1) = \log_2(9^{x-2} + 7)$ — $K = \{2; 3\}; \mathcal{D}: \boxed{x \in \mathcal{R}}$

7.8.P.5: $x + \log_2(1 - 3 \cdot 2^x) = x\log_2 4$ — $K = \{-2\}; \mathcal{D}: \boxed{x < -1,584}$

7.8.P.6: $\log_3(4 \cdot 3^x - 1) = 2x + 1$ — $K = \{0; -1\}; \mathcal{D}: \boxed{x > -1,26}$

7.8.P.7: $\log_5 10 \cdot 25^x - \log_5(5^x + 25) = x + 1$ — $K = \{2\}; \mathcal{D}: \boxed{x \in \mathcal{R}}$

7.8.P.8: $x + \log_3(28 - 2 \cdot 3^x) = \log_3(9^x + 9)$ — $K = \{2; -1\}; \mathcal{D}: \boxed{x < 2,4}$

7.8.P.9: $\log_4\{2\log_3[1 + \log_2(1 + 3\log_2 x)]\} = \frac{1}{2}$ — $K = \{2\}$; $\mathcal{D}^*: \boxed{2\log_3[1 + \log_2(1 + 3\log_2 x)] > 0}$

7.9.P.1: $\log x - \frac{1}{\log x} = 0$ — $K = \{10, \frac{1}{10}\}; \mathcal{D}: \boxed{x \in (0, 1) \cup (1, \infty)}$

7.9.P.2: $\log x + \frac{3}{\log x} = 4$ — $K = \{10; 1000\}; \mathcal{D}: \boxed{x \in (0, 1) \cup (1, \infty)}$

7.9.P.3: $\log x + \frac{4}{\log x} = 4$ — $K = \{100\}; \mathcal{D}: \boxed{x \in (0, 1) \cup (1, \infty)}$

7.9.P.4: $\log x - \frac{20}{\log x} = 1$ — $K = \{10^{-4}; 10^5\}; \mathcal{D}: \boxed{x \in (0, 1) \cup (1, \infty)}$

7.9.P.5: $\frac{1}{1+\log x} + \frac{5}{3-\log x} = 3$ — $K = \{10; \frac{\sqrt[3]{100}}{10}\}$; $\mathcal{D}: \boxed{x \in (0, \frac{1}{10}) \cup (\frac{1}{10}, 10^3) \cup (10^3, \infty)}$

7.9.P.6: $\log x^3 - \frac{6}{\log x} = 7$ — $K = \{10^3; \frac{\sqrt[3]{10}}{10}\}; \mathcal{D}: \boxed{x \in (0, 1) \cup (1, \infty)}$

7.9.P.7: $\frac{20}{\log x^2} - \log x^3 = 1$ — $K = \{10\sqrt[3]{100}; \frac{1}{100}\}; \mathcal{D}: \boxed{x \in (0, 1) \cup (1, \infty)}$

7.10.P.1: $\log_2^2 x + 2\log_2 x - 3 = 0$ — $K = \{2; \frac{1}{8}\}; D: \boxed{x > 0}$

7.10.P.2: $\log^2 x - 3\log x = \log x^2 - 4$ — $K = \{10; 10^4\}; D: \boxed{x > 0}$

7.10.P.3: $4\log_9 x(\log_9 x - 1) = 2 + \log_9 x$ — $K = \{81; \frac{\sqrt{3}}{3}\}; D: \boxed{x > 0}$

7.10.P.4: $\sqrt{\log_2 x} - \log_2 x + 6 = 0$ — $K = \{512\}; D: \boxed{x \geq 1}$

7.10.P.5: $\log\log x + \log(\log x^4 - 3) = 0$ — $K = \{100\}; D: \boxed{x \in \left(\sqrt[4]{10^3}, \infty\right)}$

7.10.P.6: $\log\log x + \log(\log x^2 - 1) = 1$ — $K = \{\sqrt{10^5}\}; D: \boxed{x > 1}$

7.11.P.1: $x^{\log x} = 10000$ — $K = \{100; \frac{1}{100}\}; \mathcal{D}: \boxed{x > 0}$

7.11.P.2: $x^{\log\sqrt[3]{x}} = 1000$ — $K = \{1000; \frac{1}{1000}\}; \mathcal{D}: \boxed{x > 0}$

7.11.P.3: $x^{1 - \frac{1}{4}\log x} = 10$ — $K = \{100\}; \mathcal{D}: \boxed{x > 0}$

7.11.P.4: $x^{-2 + \log_2 x} = 8$ — $K = \{\frac{1}{2}; 8\}; \mathcal{D}: \boxed{x > 0}$

7.11.P.5: $x^{\frac{3}{8}\log^3 x - \frac{3}{4}\log x} = 1000$ — $K = \{100; \frac{1}{100}\}; \mathcal{D}: \boxed{x > 0}$

7.11.P.6: $x^{2\log^3 x - 1,5\log x} = \sqrt{10}$ — $K = \{10; \frac{1}{10}\}; \mathcal{D}: \boxed{x > 0}$

7.12.P.1: $x^{\log x} = 1000x^2$ — $K = \{\frac{1}{10}; 1000\}; \mathcal{D}: \boxed{x > 0}$

7.12.P.2: $x^{\log_3 x} = 27x^2$ — $K = \{\frac{1}{3}; 27\}; \mathcal{D}: \boxed{x > 0}$

7.12.P.3: $x^{1 + \log x} = 10x$ — $K = \{\frac{1}{10}; 10\}; \mathcal{D}: \boxed{x > 0}$

7.12.P.4: $x^{\log x + 2} = 100x$ — $K = \{\frac{1}{100}; 10\}; \mathcal{D}: \boxed{x > 0}$

7.12.P.5: $x^{3 + 2\log x} = 100x^{2 + \log x}$ — $K = \{\frac{1}{100}; 10\}; \mathcal{D}: \boxed{x > 0}$

7.12.P.6: $x^{3\log x - \frac{1}{\log x}} = \sqrt[3]{10}x$ — $K = \{\sqrt[3]{100}; \frac{\sqrt[3]{10}}{10}\}; \mathcal{D}: \boxed{x \in (0, 1) \cup (1, \infty)}$

7.12.P.7: $x^{\log x} - 10x^{-\log x} - 9 = 0$ — $K = \{10; \frac{1}{10}\}; \mathcal{D}: \boxed{x > 0}$