



Funções Exponenciais e Funções Logarítmicas – Funções Logarítmicas 1

1. Resolve, em \mathbb{R} , as seguintes condições.

1.1 $\log_2(x - 1) = 5$

1.2 $\log_5(1 - 2x) = 1$

1.3 $\log_2 x + 2 \log_2 3 = \log_2 6$

1.4 $\log_3(x^2 + 4) - \log_3 2 = \log_3 4$

1.5 $\log_2 x > 2 + \log_2 \frac{1}{2}$

1.6 $\log_3 x \leq \log_3(2x) + 1$

1.7 $\log x < -1 + \log 5$

1.8 $\ln(2x - 3) \geq 2 \ln 3$

1.9 $\log_2(x + 1)^2 < 0$

1.10 $\log(2x + 1) > -\log(2) + 1$

2. Considera os números reais positivos a , b e c , diferentes de 1 e tais que $\log_a b = -2$ e $\log_c b = 3$.

Determina o valor de:

2.1 $\log_a(ab^2)$

2.2 $\log_a\left(\frac{a}{\sqrt[3]{b}}\right)$

2.3 $\log_b c + \log_b a$

2.4 $\log_b(a^2 b)$

2.5 $\frac{\log_c a}{\log_c b}$

2.6 $\log_b\left(\frac{ab^3}{\sqrt{c}}\right)$

3. Resolve, em \mathbb{R} , as seguintes condições.

3.1 $\log(x - 3) - \log(x + 1) = -\log(x - 2)$

3.2 $\log_2(x + 4) - \log_2(2x + 1) = \log_2 x$

3.3 $\ln(x^2 + e - 1) = 2 \ln(x) + 1$

3.4 $\log_3(x + 1)(1 - \log_6 x) = 0$

3.5 $\log_2(2 - x) - \log_{\frac{1}{2}} x = 1$

3.6 $\log(x^2 - 1) - \log(x - 1) > \log(2x - 1)$

3.7 $\log_3(2x - 1) - \log_9(4x^2) \leq 1 - \log_3 x$

3.8 $(\ln x)^2 - \ln x \leq 0$

3.9 $(\log_2 x^2 - 2)\left(2 - \log_{\frac{1}{2}} x\right) < 0$

3.10 $2x \ln(x + 1) - \ln(x + 1) \geq 0$

3.11 $e^{2x} + 3 < 4e^x$

3.12 $e^{5x} - 9e^{3x} + 20e^x \geq 0$

3.13 $2^{2x} - 5 \times 2^{x+1} + 21 < 0$

3.14 $e^x + 4e^{-x} \leq 4$

3.15 $3^x + 4 \times 3^{1-x} - 8 \geq 0$

3.16 $e^{2x-1} + (2 - e)e^{x-1} < 2$

Soluções

- 1.1** $C.S. = \{33\}$
1.2 $C.S. = \{-2\}$
1.3 $C.S. = \left\{\frac{2}{3}\right\}$
1.4 $C.S. = \{-2, 2\}$
1.5 $C.S. =]2, +\infty[$
1.6 $C.S. = \mathbb{R}^+$
- 1.7** $C.S. =]0, \frac{1}{2}[$
1.8 $C.S. = [6, +\infty[$
1.9 $C.S. = [-2, 0] \setminus \{-1\}$
1.10 $C.S. =]2, +\infty[$
- 2.1** -3
2.2 $\frac{5}{3}$
2.3 $-\frac{1}{6}$
2.4 0
2.5 $-\frac{1}{6}$
2.6 $\frac{7}{3}$
- 3.1** $C.S. = \{5\}$
3.2 $C.S. = \{\sqrt{2}\}$
3.3 $C.S. = \{1\}$
3.4 $C.S. = \{6\}$
3.5 $C.S. = \{1\}$
3.6 $C.S. =]1, 2[$
- 3.7** $C.S. = \left[\frac{1}{2}, \frac{7}{2}\right[$
3.8 $C.S. = [1, e]$
3.9 $C.S. = \left[\frac{1}{4}, 2\right[$
3.10 $C.S. =]-1, 0] \cup \left[\frac{1}{2}, +\infty\right[$
- 3.11** $C.S. =]0, \ln 3[$
3.12 $C.S. =]-\infty, \ln 2] \cup [\ln \sqrt{5}, +\infty[$
- 3.13** $C.S. =]\log_2 3, \log_2 7[$
3.14 $C.S. = \{\ln 2\}$
3.15 $C.S. =]-\infty, \log_3 2] \cup [\log_3 6, +\infty[$
3.16 $C.S. =]-\infty, 1[$