

Leonardo Faria Araujo

## Calculo II

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Exercícios em Grupo

Calculo II

$$8-1) f'(x) = \frac{1}{3\sqrt{x^2+1}} \quad f'(x) = \frac{1}{3 \cdot (x^2+1)}$$

$$f'(x) = \frac{1}{3 \cdot (1^2+1)} = \frac{1}{3 \cdot (1+1)} = \frac{1}{3 \cdot 2} = \frac{1}{6}$$

$$17-12) \log(x^2-x-2) < \log(x-4) \\ \log(x^2-x-2) < \log(x-4), x \in \langle 4, +\infty \rangle$$

$$x^2-x-2 < x-4$$

$$x^2-x-2-x+4 < x-4-x+4$$

$$x^2-x-2-x+4 < 0$$

$$x^2-2x-2+4 < 0$$

$$x^2-2x+2 < 0$$

$$x^2-2x+2 = 0$$

$$x \in \mathbb{R}$$

$$x^2-2x+2 < 0, A = \emptyset$$

$$x \in \emptyset$$

Dado que o coeficiente principal  $A$  é positivo a da equação é sempre positiva, logo a fl é falsa

$$2.10.1 \lim_{x \rightarrow 1} \frac{x^2 + x - 2}{(x-1)^2} \quad \left| \lim_{x \rightarrow 1} \frac{x \cdot (x+2) - (x+2)}{(x-1)^2} \right.$$

$$\lim_{x \rightarrow 1} \frac{x^2 + 2x - x - 2}{(x-1)^2} \quad \left| \lim_{x \rightarrow 1} \frac{(x+2) \cdot (x-1)}{(x-1)^2} \right.$$

$$\lim_{x \rightarrow 1} \frac{x+2}{x-1} \cdot (x+2)$$

Não Existe

$$2.11.a) \log_4(3x+2) = \log_4(2x+5)$$

$$\log_4(3x+2) = \log_4(2x+5), x \in \langle -\frac{2}{3}, +\infty \rangle$$

$$3x+2 = 2x+5$$

$$3x - 2x = 5 - 2$$

$$x = 3$$

$$x = 3, x \in \langle -\frac{2}{3}, +\infty \rangle \quad x = 3$$

$$2.11.b) \log_3(5x-6) = \log_4(3x-5)$$

$$c.1) \log_2(5x^2 - 14x + 1) = \log_2(4x^2 - 4x - 20)$$

$$\log_2(5x^2 - 14x + 1) = \log_2(4x^2 - 4x - 20), x \in \left( \frac{-\infty, \frac{1-\sqrt{17}}{2}}{\frac{1+\sqrt{17}}{2}, +\infty} \right)$$

$$5x^2 - 14x + 1 = 4x^2 - 4x - 20$$

$$5x^2 - 14x + 1 - 4x^2 + 4x + 20 = 0$$

$$x^2 - 10x + 21 = 0$$

$$x = \frac{-(-10) \pm \sqrt{(-10)^2 - 4 \cdot 1 \cdot 21}}{2 \cdot 1}$$

$$x = \frac{10 \pm \sqrt{100 - 84}}{2}$$

$$x = \frac{10 \pm \sqrt{16}}{2}$$

$$x = \frac{10 \pm 4}{2} \rightarrow x = \frac{10+4}{2} = 7$$

$$\rightarrow x = \frac{10-4}{2} = 3$$

$$x=7, x \in \left\langle -\infty, \frac{1-\sqrt{21}}{2} \right\rangle \cup \left\langle \frac{1+\sqrt{21}}{2}, \infty \right\rangle$$

$$x=3$$

$$x=7$$

$$x=3$$

$$x_1=3, x_2=7$$

$$1) \log_3 (3x^2 - 4x - 17) = \log_3 (2x^2 - 5x + 3)$$

$$\log_3 (3x^2 - 4x - 17) = \log_3 (2x^2 - 5x + 3), x \in \left\langle -\infty, \frac{2-\sqrt{55}}{3} \right\rangle$$

$$\cup \left\langle \frac{2+\sqrt{55}}{3}, +\infty \right\rangle$$

$$3x^2 - 4x - 17 = 2x^2 - 5x + 3$$

$$3x^2 - 4x - 17 - 2x^2 + 5x - 3 = 0$$

$$x^2 + x - 20 = 0$$

$$x = \frac{-1 \pm \sqrt{1^2 - 4 \cdot 1 \cdot (-20)}}{2 \cdot 1} = \frac{-1 \pm \sqrt{1+80}}{2} = \frac{-1 \pm \sqrt{81}}{2}$$

$$x = \frac{-1+9}{2} \rightarrow x = \frac{-1+9}{2} = 4$$

$$\rightarrow x = \frac{-1-9}{2} = -5$$

$$x=4, x \in \left\langle -\infty, \frac{2-\sqrt{55}}{3} \right\rangle \cup \left\langle \frac{2+\sqrt{55}}{3}, +\infty \right\rangle$$

$$x=4$$

$$x=-5$$

$$x_1 = -5, x_2 = 4$$

$$0 - \log_4(4x^2 + 13x + 2) = \log_4(2x + 5)$$

$$\log_4(4x^2 + 13x + 2) = \log_4(2x + 5), x \in \left\langle \frac{-13 + \sqrt{137}}{8}, +\infty \right\rangle$$

$$4x^2 + 13x + 2 = 2x + 5$$

$$4x^2 + 13x + 2 - 2x - 5 = 0$$

$$4x^2 + 11x - 3 = 0$$

$$x = \frac{-11 \pm \sqrt{11^2 - 4 \cdot 4 \cdot (-3)}}{2 \cdot 4} \quad x = \frac{-11 \pm \sqrt{121 + 48}}{8} = \frac{-11 \pm \sqrt{169}}{8} = \frac{-11 \pm 13}{8}$$

$$x = \frac{-11 + 13}{8} \rightarrow x = \frac{-11 + 13}{8} = \frac{2}{8} = \frac{1}{4}$$

$$\rightarrow x = \frac{-11 - 13}{8} = -3$$

$$x = \frac{1}{4}, x \in \left\langle \frac{13 + \sqrt{137}}{8}, +\infty \right\rangle$$

$$x = -3$$

$$x = \frac{1}{4}$$

$$x = 0, 25, x = 2^{-2}$$