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$$1) \lim_{x \rightarrow 1} \begin{cases} x^2 & \text{se } x < 1 \\ \dots & \\ \dots & \end{cases}$$

$$\lim_{x \rightarrow 1^-} f(x) = \lim_{x \rightarrow 1^-} x^2 = 1$$

$$\lim_{x \rightarrow 1^+} f(x) = \lim_{x \rightarrow 1^+} x^2 = 1$$

$$\lim_{x \rightarrow 1} f(x) = \lim_{x \rightarrow 1} x^2 = 1$$

$$\lim_{x \rightarrow 1} = \lim_{x \rightarrow 1} x^2 = 1$$

$$\lim_{x \rightarrow +\infty} f(x)$$

$$\lim_{x \rightarrow 1^-} f(x) = \lim_{x \rightarrow 1^-} 0 = 0$$

$$\lim_{x \rightarrow 1^+} f(x) = \lim_{x \rightarrow 1^+} 0 = 0$$

$$\lim_{x \rightarrow 1} f(x) = \lim_{x \rightarrow 1} 0 = 0$$

$$\lim_{x \rightarrow x-1} f(x) = \lim_{x \rightarrow -1} 0 = 0$$

$$\lim_{x \rightarrow +\infty} f(x) = \lim_{x \rightarrow +\infty} 0 = 0$$

$$\lim_{x \rightarrow 1^-} f(x) = \lim_{x \rightarrow 1^-} \frac{1}{x} = \frac{1}{1^-} = -1$$

$$\lim_{x \rightarrow 1^+} f(x) = \lim_{x \rightarrow 1^+} \frac{1}{x} = \frac{1}{1^+} = 1$$

$$\lim_{x \rightarrow 1^-} f(x) \neq \lim_{x \rightarrow 1^+} f(x)$$

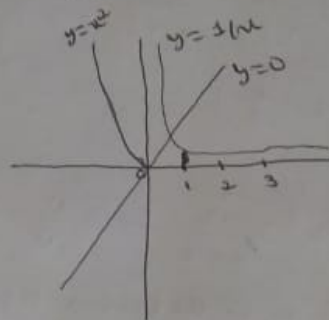
não existe

$$\lim_{x \rightarrow 1} f(x) = \lim_{x \rightarrow 1} \frac{1}{x} = 1$$

$$\lim_{x \rightarrow -1} f(x) = \lim_{x \rightarrow -1} \frac{1}{x} = -1$$

$$\lim_{x \rightarrow 1} f(x) \neq \lim_{x \rightarrow -1} f(x) \text{ não existe}$$

$$\lim_{x \rightarrow +\infty} f(x) = \lim_{x \rightarrow +\infty} \frac{1}{x} = 0$$



Questão

Questão 2

$$\frac{x^2 - 4x}{x^3 - 4x^2 + x - 4} = \frac{0}{0}$$

$$\lim_{x \rightarrow 4} \frac{x(x-4)}{(x^2+1)(x-4)}$$

$$\lim_{x \rightarrow 4} = \frac{x}{x^2+1} = \frac{4}{4^2+1}$$

$$\boxed{\lim_{x \rightarrow 4} = \frac{4}{17}}$$

$$b) \lim_{x \rightarrow 2} \frac{\sqrt{4x+1} - 3}{x-2} = \frac{0}{0}$$

levem a indeterminação

$$\lim_{x \rightarrow 2} \frac{(\sqrt{4x+1} - 3)(\sqrt{4x+1} + 3)}{(x-2)(\sqrt{4x+1} + 3)}$$

$$\lim_{x \rightarrow 2} \frac{(\sqrt{4x+1})^2 - 3^2}{(x-2)(\sqrt{4x+1} + 3)}$$

$$\lim_{x \rightarrow 2} \frac{4x+1-9}{(x-2)(\sqrt{4x+1} + 3)}$$

$$\lim_{x \rightarrow 2} \frac{4x-8}{(x-2)(\sqrt{4x+1} + 3)}$$

$$\lim_{x \rightarrow 2} \frac{4(x-2)}{(x-2)(\sqrt{4x+1} + 3)}$$

$$= \frac{4}{\sqrt{4x+1} + 3} = \frac{4}{\sqrt{4 \cdot 2 + 1} + 3}$$

$$\boxed{\lim_{x \rightarrow 2} = \frac{2}{3}}$$

$$c) \lim_{x \rightarrow \infty} \frac{3x^4 - 6x^2 + 1}{6x - x^3 - 2x^4} = \frac{0}{0}$$

aplicado o maior potencia

$$= \frac{\frac{3x^0}{x^4} - \frac{6x^0}{x^2} + \frac{1x^0}{x^4}}{\frac{6x^0}{x^3} - \frac{1x^0}{x} - 2} =$$

$$\lim_{x \rightarrow \infty} = \frac{3x^0}{x^4} - \frac{6x^0}{x^2} + \frac{1x^0}{x^4}$$

$$\lim_{x \rightarrow \infty} \frac{0}{-2} = \boxed{\lim_{x \rightarrow \infty} = 0}$$

$$d) \lim_{x \rightarrow \infty} (1 + \frac{4}{x})^2$$

$$\lim_{x \rightarrow \infty} e^4 \left(\lim_{x \rightarrow \infty} 1 + \frac{4}{x} \right)^2 \cdot \lim_{x \rightarrow \infty} e^4 (1 + 0)^2$$

$$\boxed{\lim_{x \rightarrow \infty} = e^4}$$

Questão 3

$$\lim_{x \rightarrow 1^+} \frac{2x^2}{x^2 - 4} = \frac{2x^2}{x^2(1 - \frac{4}{x^2})}$$

$$\lim_{x \rightarrow 1^+} = \frac{2}{1-0} = 2 \quad y = 2 \text{ A.H.}$$

$$\lim_{x \rightarrow 1^-} \frac{2x^2}{x^2 - 4} = \frac{1}{x^2 - 4} \quad y = -2 \text{ A.V.}$$

Questão 4

$$P_0 = 1^2 - (2,71)^2 + 2 = 0$$

$$P_0 = 0, 29 \quad P_1 < 0,5$$

$$P_2 = 2^2 - (2,71)^2 + 2 = 0$$

$$P_0 = 4 - 7,3 + 2$$

$$P_2 = -2,3 \quad P_2 < 0,5$$

Questão 5

$$f(x) = x^2 - 4$$

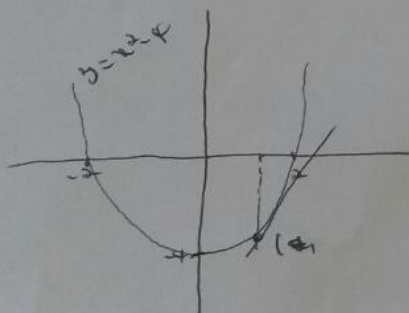
$$\lim_{x \rightarrow 0} \frac{(x + \Delta x)^2 - 4 - x^2 + 4}{\Delta x}$$

$$\lim_{\Delta x \rightarrow 0} \frac{x^2 + 2\Delta x + \Delta x^2 - 4 - x^2 + 4}{\Delta x}$$

$$\lim_{\Delta x \rightarrow 0} \frac{\cancel{\Delta x}(2x + \Delta x)}{\Delta x}$$

$$\lim_{\Delta x \rightarrow 0} 2x + \Delta x$$

$$\lim_{\Delta x \rightarrow 0} = 2x$$



Questão 6

$$a) y = \frac{x^2 - 1}{x^3 - \sin(x)}$$

$$= \frac{x^2 - 1}{x^3 - \sin(x)}$$

$$y' = \frac{x^2 - 1}{x^3 - \cos x} = \frac{2x - 1}{3x - \cos x}$$

$$b) y = (x - \cos x^2) \ln(3x^4 - 2)$$

$$a = \ln(3x^4 - 2) \quad b = x, c = \cos x^2$$

$$y' = (3x^4 - 2) \cdot \ln(3x^4 - 2) \cos x^2$$