Nome: Kerby Lovince

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

$\lim\limits_{x\to 1^-} f(x) = \lim\limits_{x\to 1^-} x^2 = 1$

$\lim\limits_{x\to 1^+} f(x) = \lim\limits_{x\to 1^+} x^2 = 1$

$\lim\limits_{x\to 1} f(x) = \lim\limits_{x\to 1} x^2 = 1$

$\lim\limits_{x\to -1} = \lim\limits_{x\to -1} x^2 = 1$

$\lim\limits_{x\to +\infty} f(x)$

$\lim\limits_{x\to 1^-} f(x) = \lim\limits_{x\to 1^-} 0 = 0$

$\lim\limits_{x\to 1^+} f(x) = \lim\limits_{x\to 1^+} 0 = 0$

$\lim\limits_{x\to 1} f(x) = \lim\limits_{x\to 1} 0 = 0$

$\lim\limits_{x\to x\to -1} f(x) = \lim\limits_{x\to -1} 0 = 0$

$\lim f(x) = \lim\limits_{x\to +\infty} 0 = 0$

$\lim\limits_{x\to 1^-} f(x) = \lim \frac{1}{x} = \frac{1}{1^-} = -1$

$\lim\limits_{x\to 1^+} f(x) = \lim \frac{1}{x} = \frac{1}{1^+} = 1$

$\lim\limits_{x\to 1^-} f(x) \neq \lim\limits_{x\to 1^+} f(x)$

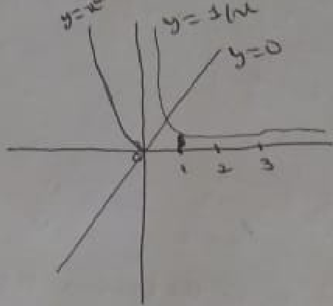
não existe

$\lim\limits_{x\to 1} f(x) = \lim\limits_{x\to 1} \frac{1}{x} = 1$

$\lim\limits_{x\to -1} = \lim\limits_{x\to -1} \frac{1}{x} = -1$

$\lim\limits_{x\to 1} f(x) \neq \lim\limits_{x\to -1} f(x)$ não existe

$\lim\limits_{x\to +\infty} f(x) = \lim\limits_{x\to \infty} \frac{1}{x} = 0$



Questão

Questão 2

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

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

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

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

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

levom a indeterminação

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

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

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

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

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

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

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

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

aplicado o maior potencia

$$= \frac{\frac{81}{x^4}\to 0 - \frac{6}{x^2}\to 0 + \frac{1}{x^4}\to 0}{\frac{6}{x^3}\to 0 - \frac{1}{x}\to 0 - 2} =$$

$$\lim_{x\to\infty} = \frac{81}{x^4}\to 0 - \frac{6}{x^2}\to 0 + \frac{1}{x^4}\to 0$$

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

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

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

$$e^4(1+0)^2$$

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

Questão 3

$$\lim_{x\to 1^+} \frac{2x^2}{x^2-4} = \frac{2\cancel{x^2}}{\cancel{x^2}\left(1-\frac{4}{x^2}\right)}$$

$$\lim_{x\to 1^+} = \frac{2}{1-0} = 2 \qquad y = 2 \text{ AH}$$

$$\lim \frac{2x^2}{x^2-4} = \frac{1}{x^2-4} \qquad y = -2 \text{ AV}$$

Questão 4

$P_1 = 1^2 - (2{,}71)^1 + 2 = 0$

$P_1 = 0{,}29 \qquad P_1 < 0{,}5$

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

$P_2 = 4 - 7{,}3 + 2$

$P_2 = -1{,}3 \qquad P_2 < 0{,}5$

Questão 5

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

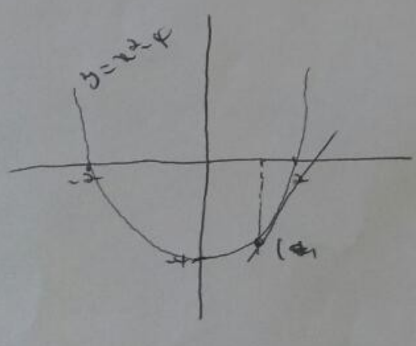
$$\lim_{x \to 0} \frac{(x+\Delta x)^2 - 4 - x^2 + 4}{\Delta x}$$

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

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

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

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



Questão 6

a) $y = \dfrac{x^2 - 1}{x^3 - \operatorname{sen}(x)}$

$= \dfrac{x^2 - 1}{x^3 - \operatorname{sen}(x)}$

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

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

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

$\boxed{y' = (3x^4 - 2) - \ln(3x^4 - 2) \cos x^2}$