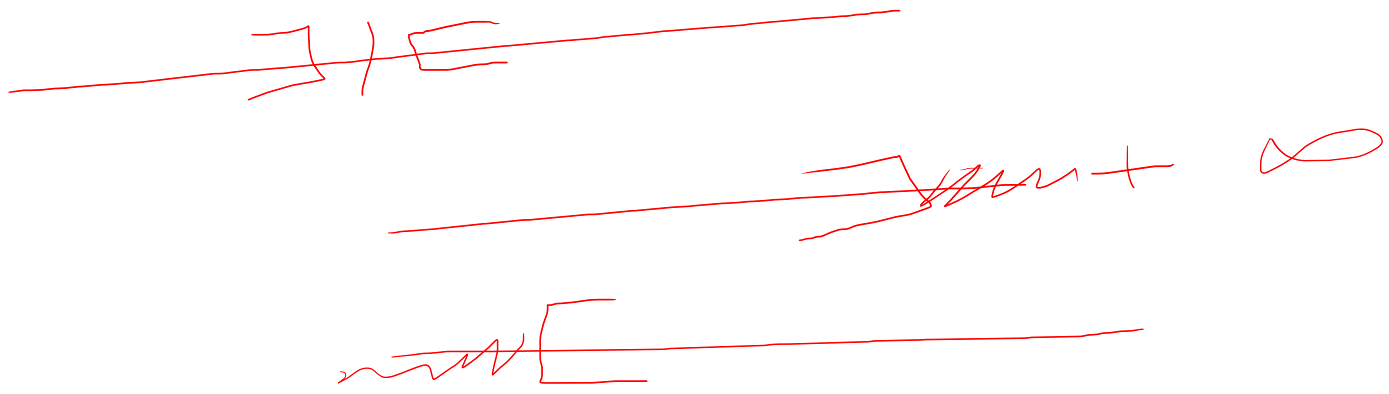
$\lim_{x \to a} f(x) = L$ $\quad$ $L \in \mathbb{R} \cup \{-\infty, +\infty\}$

$a \in \mathbb{R} \cup \{-\infty, +\infty\}$



$\lim_{n \to +\infty} x_n$ $\quad$ $f(n) = x_n$

Prop. de R: Se $\{x_n, n \in \mathbb{N}\}$ é crescente ($x_n \leq x_m, \forall n \leq m$) e limitada ($\exists M \; |x_n| \leq M, \forall n \in \mathbb{N}$)

Então $(x_n, n \in \mathbb{N})$ tem limite

$1 \quad 1{,}4 \quad 1{,}5 \quad 2$

$1 \quad (1{,}4)^2 \quad 2 \quad (1{,}5)^2 \quad 4$

$$\lim_{x \to 1^+} \frac{2x^4+3x^2-8x}{3x^3-2x^2-1} \to -3$$

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

$3x^3-2x^2-1 \to 0$

$x > 1$

$x-1>0$

$(x-1) \to 0^+$, $(3x^2+x+1) \to 5$

	3	-2	0	-1
1		3	1	1

O resto

$= -\infty$

$$\lim_{x \to 0^-} \frac{1}{x} \to -\infty$$

$\lim \frac{1}{x}$ não existe

$$\lim_{x \to 2} \frac{(x-2)^2(x^8+10x-3)}{(x-2)^4(x^3-8x^2-6)}$$

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

$$= \lim_{x \to 2} \frac{1}{(x-2)^2} \cdot \frac{x^8+10x-3}{x^3-8x^2-6}$$

$(x-2)^2 \to 0^+$

$x^8+10x-3 \to 2^8+20-3>0$

$x^3-8x^2-6 \to 8-8\cdot4-6<0$

$$= -\infty$$

-1	8	-3	-11	
		-8	-11	
	8	-11	0	0 resto

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

$$\lim_{x \to -1} \frac{(x+1)}{(x+1)^3(8x^2-3x-11)}$$

$$= \lim_{x \to -1} \frac{1}{(x+1)^2} \cdot \frac{1}{(x+1)(8x-11)}$$

$(x+1)^2 \to 0^+$

$\to -19$

$$\lim_{x \to -1^-} \underbrace{\frac{1}{(x+1)^2}}_{0^+} \cdot \underbrace{\frac{1}{(x+1)}}_{0^-} \cdot \underbrace{\frac{1}{8x-11}}_{-19} = +\infty$$

$x < -1$

$x + 1 < 0$

$$\lim_{x \to -1^+} \underbrace{\frac{1}{(x+1)^2}}_{0^+} \cdot \underbrace{\frac{1}{(x+1)}}_{0^+} \cdot \underbrace{\frac{1}{8x-11}}_{-19} = -\infty$$

$x > -1$

$x + 1 > 0$

limites laterais são $\neq$

$\therefore$ o limite não existe

$$\lim_{x \to +\infty} \overset{a}{\sqrt[4]{x^3+x}} - \overset{b}{x^{3/4}} \cdot \frac{g(x)}{g(x)}$$

$$a^4 - b^4 = (a-b)\underbrace{(a^3 + a^2 b + a b^2 + b^3)}$$

$$g(x) = \left(\sqrt[4]{\underbrace{x^3+x}}\right)^3 + \left(\sqrt[4]{x^3+x}\right)^2 x^{3/4} + \left(\sqrt[4]{x^3+x}\right)\left(x^{3/4}\right)^2 + \left(x^{3/4}\right)^3$$

$$= \lim_{x \to +\infty} \frac{\overset{a^4}{\cancel{x^3} + x} - \overset{b^4}{\cancel{x^3}}}{g(x)} = \lim_{x \to +\infty} \frac{x}{g(x)}$$

$$= \lim_{x \to +\infty} \frac{\overset{x^{-\frac{5}{4}} \to 0}{x} \cdot 1}{x^{9/4} \underbrace{\left(\left(\sqrt[4]{1+\frac{1}{x^2}}\right)^3 + \left(\sqrt[4]{1+\frac{1}{x^2}}\right)^2 \cdot 1 + \sqrt[4]{1+\frac{1}{x^2}} \cdot 1^2 + 1^3 \right)}_{\to 4}}$$

$$= 0$$

$$x^{-\frac{5}{4}} = \frac{1}{\underset{\to +\infty}{x^{5/4}}}$$