$$\lim_{x\to+\infty}(x^2+x)=+\infty$$

$$\lim_{x\to-\infty}(x^2-3x)=+\infty$$

$$-3(-\infty)$$

$$\lim_{x\to-\infty} x^5=-\infty$$

$$\lim_{x\to+\infty}(x^2-x)=+\infty-\infty \quad \text{f.i.}$$

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

$$\lim_{x\to-\infty}(4x^2-5x^3+1)=+\infty$$

Prodotto

$$\lim_{x \to +\infty} x^2 \cdot \frac{1}{x} = \infty \cdot 0 \quad f.i.$$

$$\lim_{x \to +\infty} x^{\cancel{2}} \cdot \frac{1}{\cancel{x}} = \lim_{x \to +\infty} x = +\infty$$

Rapporto

$$\lim_{x\to+\infty} \frac{x^2+1}{x-2} = \frac{+\infty}{+\infty} \quad f.i.$$

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

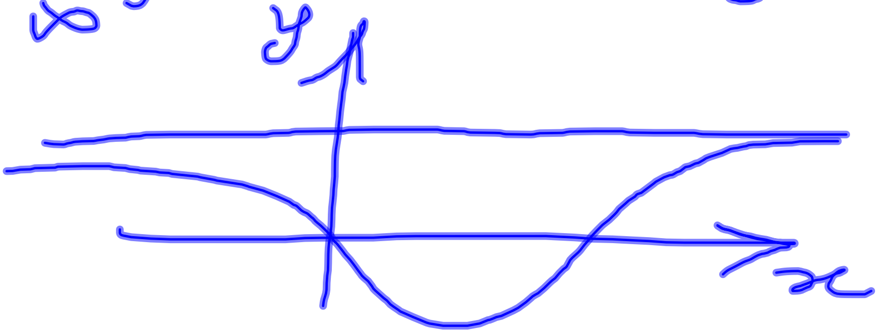
$$\lim_{x\to+\infty} \frac{7x^2-1}{x+5} = \lim_{x\to+\infty} \frac{7x^{\cancel{2}}}{\cancel{x}} = +\infty$$

$$\lim_{x\to+\infty} \frac{3x-1}{x^2+5} = \lim_{x\to+\infty} \frac{3\cancel{x}}{\cancel{x^2}} = \lim_{x\to+\infty} \frac{3}{x} = 0$$

$$\lim_{x\to+\infty} \frac{3x^2+5}{2x^2-4} = \lim_{x\to+\infty} \frac{3\cancel{x^2}}{2\cancel{x^2}} = \lim_{x\to+\infty} \frac{3}{2} = \frac{3}{2}$$

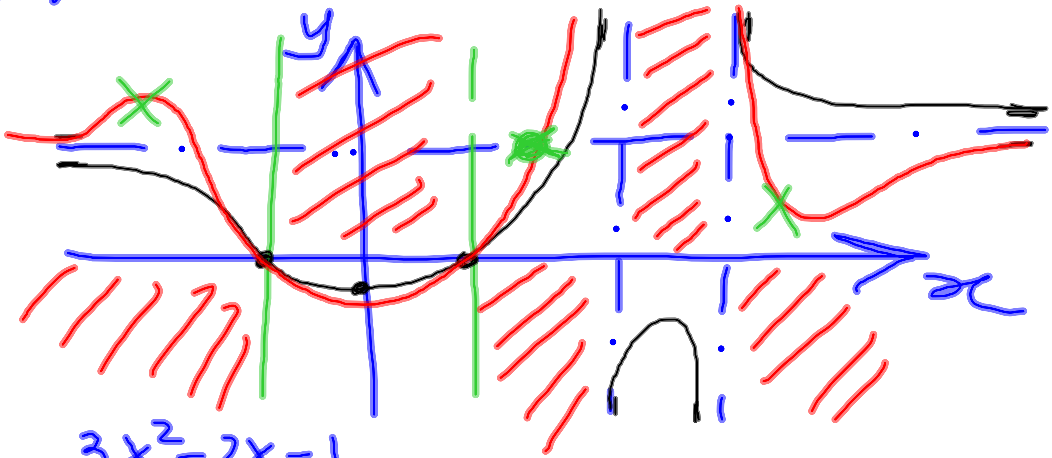
$$\lim_{x \to \infty} \frac{f(x)}{g(x)} = \begin{cases} \infty & \text{se } \partial f > \partial g \\ 0 & \text{se } \partial f < \partial g \\ l & \text{se } \partial f = \partial g \end{cases}$$

$$\lim_{x \to \infty} f(x) = \ell \qquad y = \ell \text{ A.O.}$$



$$f(x) = \frac{3x^2-2x-1}{x^2-9x+20}$$

$$\lim_{x\to\infty} \frac{3x^2-2x-1}{x^2-9x+20} = 3 \qquad y = 3 \text{ A.H.}$$



$$\begin{cases} y = \dfrac{3x^2-2x-1}{x^2-9x+20} \\ y = 3 \end{cases} \Rightarrow \frac{3x^2-2x-1}{x^2-9x+20} = 3$$

$$\Rightarrow \cancel{3x^2} - 2x - 1 = \cancel{3x^2} - 27x + 60$$

$$\lim_{x \to 2} \frac{x^2-4}{x^2-5x+6} = \frac{4-4}{4-10+6} = \frac{0}{0} \text{ f.i.}$$

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

$$\lim_{x\to -1} \frac{x^4+2x^3-2x-1}{x^2+2x+1} = \frac{0}{0} \quad f.i.$$

$$\begin{array}{r|rrrr|r} & 1 & 2 & 0 & -2 & -1 \\ -1 & & -1 & -1 & 1 & 1 \\ \hline & 1 & 1 & -1 & -1 & // \end{array}$$

$$x^2(x+1)-(x+1) =$$
$$= (x^2-1)(x+1) =$$
$$= (x+1)^2(x-1)$$

$$\lim_{x\to -1} \frac{\cancel{(x+1)}(x^3+x^2-x-1)}{(x+1)^{\cancel{2}}} = \frac{-1+1+1-1}{-1+1} = \frac{0}{0}$$

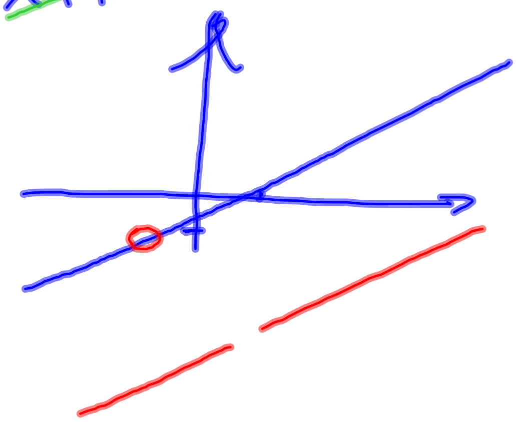
$$\lim_{x\to -1} \frac{(x+1)^{\cancel{2}}(x-1)}{\cancel{x+1}} = \lim_{x\to -1} (x-1)(x+1) = 0$$

$$f(x) = \frac{x^2-1}{x+1} = \frac{(x-1)\cancel{(x+1)}}{\cancel{x+1}} = x-1$$

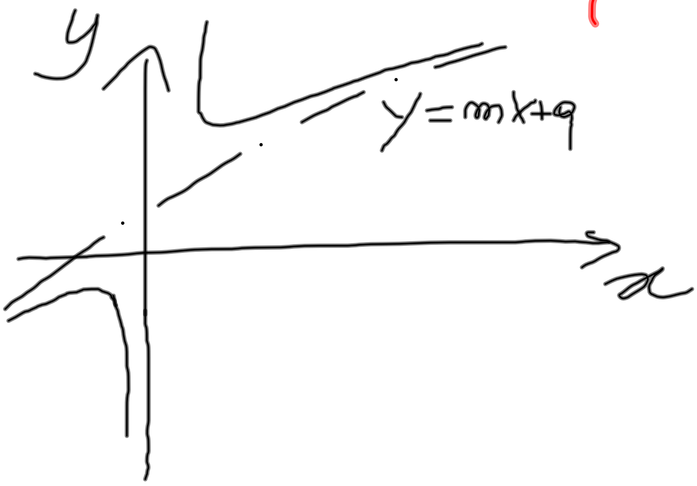
$$D = \mathbb{R} - \{-1\}$$

$$\lim_{x\to -1} \frac{x^2-1}{x+1} = \frac{0}{0}$$

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



Asintoto obliquo



$$\lim_{x \to \infty} f(x) = \infty$$

$$m = \lim_{x \to \infty} \frac{f(x)}{x}$$

$$q = \lim_{x \to \infty} [f(x) - mx]$$

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$$f(x) = \frac{x^2+3}{x-2}$$

$$\lim_{x\to\infty}\frac{x^2+3}{x-2}=\infty \qquad \frac{x^2+3}{x-2}\cdot\frac{1}{x}$$

$$\lim_{x\to\infty}\frac{x^2+3}{x^2-2x}=1=m$$

$$\lim_{x\to\infty}\left(\frac{x^2+3}{x-2}-x\right)=\lim_{x\to\infty}\left(\frac{\cancel{x^2}+3-\cancel{x^2}+2x}{x-2}\right)=$$

$$=\lim_{x\to\infty}\frac{2x+3}{x-2}=2=q$$

$y = x+2$

A. OBL.

$$f(x) = \frac{x^2+3}{x-2}$$

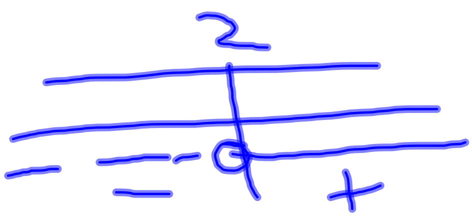
1) fne alg. raz. fr. di 2° gr.

2) $D = \mathbb{R} - \{2\}$

3) $f(-x) = \frac{x^2+3}{-x-2} \neq \pm f(x)$ non amm. sim.

4) $N \geq 0 \quad x^2+3 \geq 0 \quad \forall x \in \mathbb{R} \qquad N = 0$ mai

$D > 0 \quad x > 2$

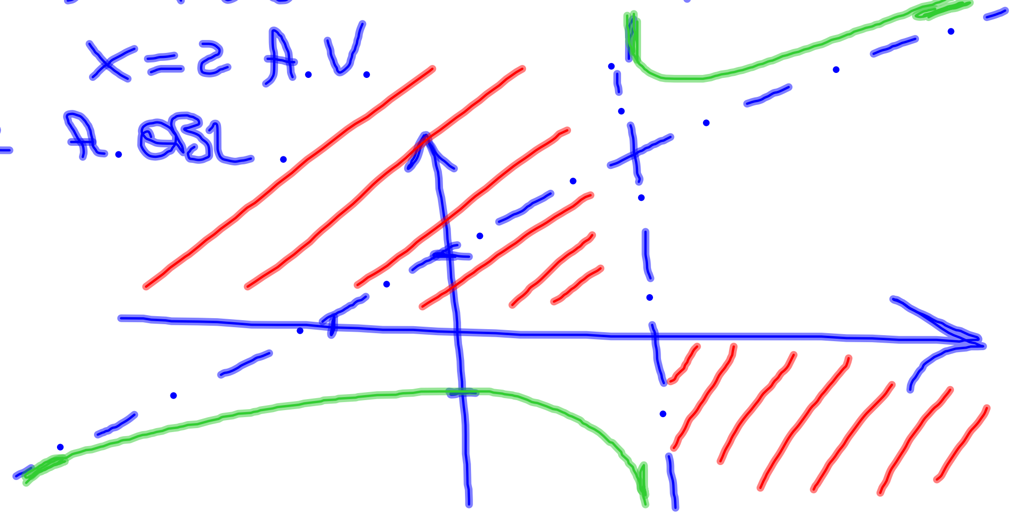


5) $\lim_{x \to 2^{\mp}} f(x) = \mp\infty$

$x = 2$ A.V.

$y = x+2$ A.OBL.

$A\left(0, -\frac{3}{2}\right)$



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

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

$$f(x) = \frac{x^2 - 9}{2x + 1}$$