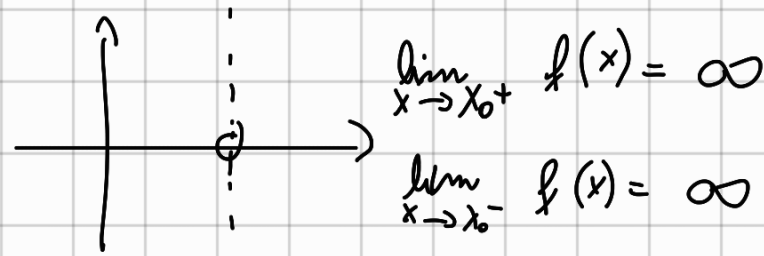
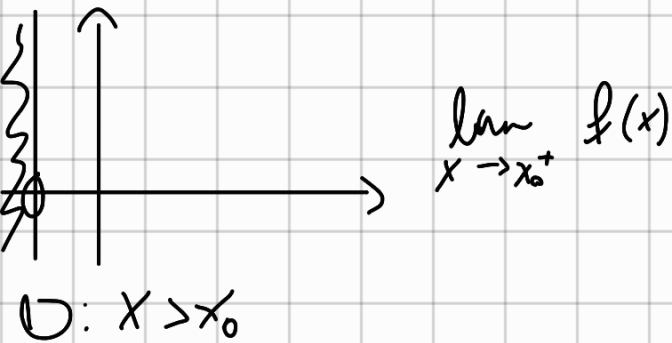


ASINTOTI

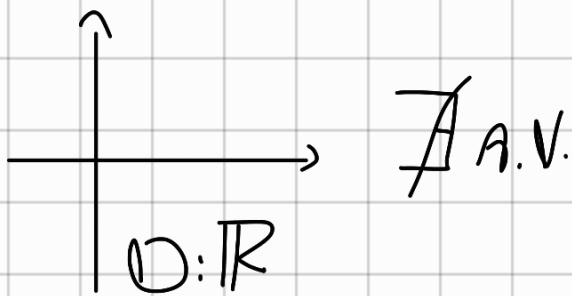
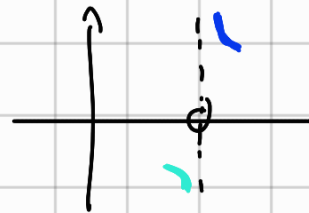
Asintoti verticali \rightarrow si studiano solo se ci sono rette escluse dal dominio.



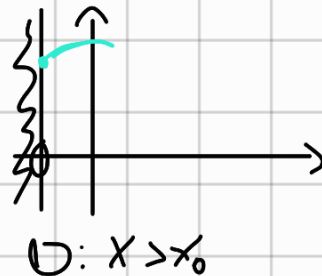
Posso dire che l'A.V. esiste se i lim sono INFINITI,
 \exists A.V. $x = x_0$



es.
 $\lim_{x \rightarrow x_0^+} f(x) = +\infty$
 $\lim_{x \rightarrow x_0^-} f(x) = -\infty$



es.



$\lim_{x \rightarrow x_0^+} f(x) = 3$
 $\lim_{x \rightarrow x_0^-} f(x) = 3$
 \nexists A.V.



$D: x \leq x_0$
 $y = \sqrt{-x-1}$ $x \leq -1$
 $D: -x-1 \geq 0$ \nexists A.V.

gli asintoti sono indipendenti:
 \neq dx e Sx.

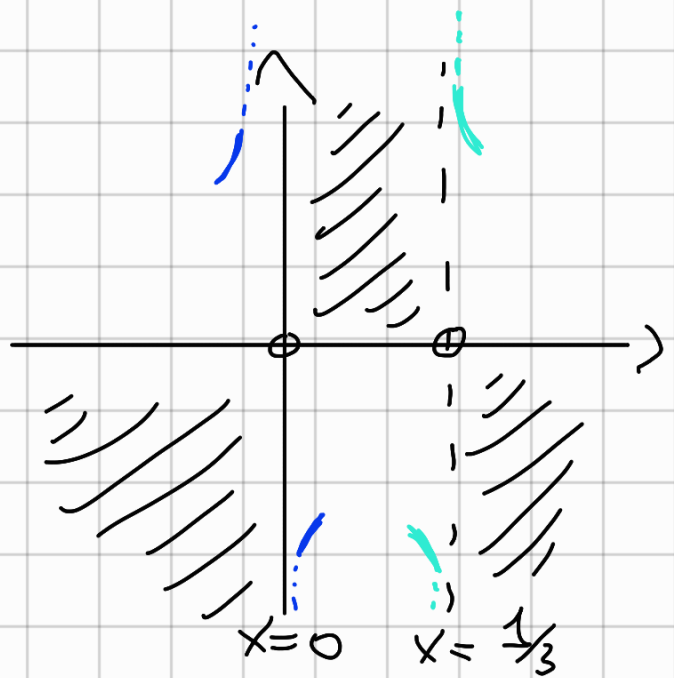
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$$y = \frac{5x^2 + 2}{3x^2 - x}$$

1) D: $3x^2 - x \neq 0$

$$\Downarrow$$

$$x(3x - 1) \neq 0 \begin{cases} x \neq 0 \\ x \neq \frac{1}{3} \end{cases}$$



2) Simmetrie

$$f(-x) = \frac{5x^2 + 2}{3x^2 + x} \neq f(x) \Rightarrow \text{non \u00e8 pari}$$

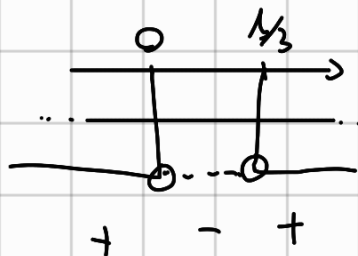
\u2193
simmetria rispetto all'asse delle "y".

$$-f(-x) = \frac{-5x^2 - 2}{3x^2 + x} \neq f(x) \Rightarrow \text{non \u00e8 dispari}$$

\u2193
simmetria rispetto all'origine.

3) Segno

$$\frac{5x^2 + 2}{3x^2 - x} > 0 \begin{cases} 5x^2 + 2 > 0 \Rightarrow 5x^2 > -2 \Rightarrow \forall x \in \mathbb{R} \\ 3x^2 - x > 0 \end{cases}$$



studio della parabola... $\Rightarrow x < 0; x > \frac{1}{3}$

$$y > 0: x < 0; x > \frac{1}{3}$$

$$y < 0: 0 < x < \frac{1}{3}$$

4] Assi

$$\Gamma_y \Rightarrow \emptyset \neq \emptyset: x \neq 0 \quad \nexists \Gamma_y$$

$$\Gamma_x \begin{cases} y=0 \end{cases}$$

$$\begin{cases} y = \frac{5x^2+2}{3x^2-x} \Rightarrow \frac{5x^2+2}{3x^2-x} = 0 \Rightarrow 5x^2+2=0 \Rightarrow \end{cases}$$

$$\nexists \Gamma_x \quad \Rightarrow 5x^2 = -2 \Rightarrow \emptyset$$

5] ASINTOTI

A.V.:

$$\bullet \lim_{x \rightarrow 0^-} \frac{5x^2+2}{3x^2-x} = \frac{2}{0} \rightarrow 0^+ \cdot 0^-? \Rightarrow \text{STUDIO DEL SEGNO DEL Den.}$$

$$\Rightarrow \frac{1}{0} \Rightarrow \frac{1}{0^+} = +\infty$$

\exists A.V. $x=0$

$$\bullet \lim_{x \rightarrow 0^+} \frac{5x^2+2}{3x^2-x} = \frac{2}{0^-} = -\infty$$

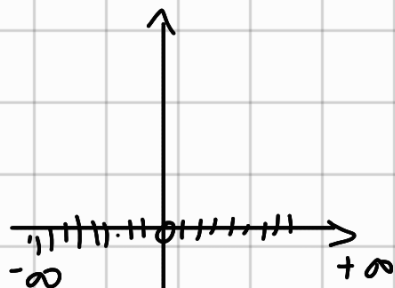
$$\bullet \lim_{x \rightarrow \frac{1}{3}^-} \frac{5x^2+2}{3x^2-x} = \frac{\frac{5}{9}+2}{0} = \frac{\frac{23}{9}}{0^-} = -\infty$$

\exists A.V. $x = \frac{1}{3}$

$$\bullet \lim_{x \rightarrow \frac{1}{3}^+} \frac{5x^2+2}{3x^2-x} = \frac{\frac{5}{9}+2}{0} = \frac{\frac{23}{9}}{0^+} = +\infty$$

ASINTOTI ORIZZONTALI

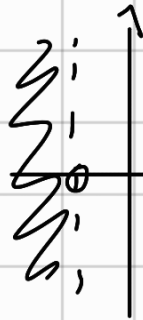
si studiano solo se il dominio ammette di andare a $+\infty$ e/o $-\infty$



D: $\mathbb{R} \Rightarrow \text{SI}$

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

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



D: $x > x_0 \Rightarrow$

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

potrebbe \exists

\nexists A.O. s_x

Gli A.O. \exists se il lim è

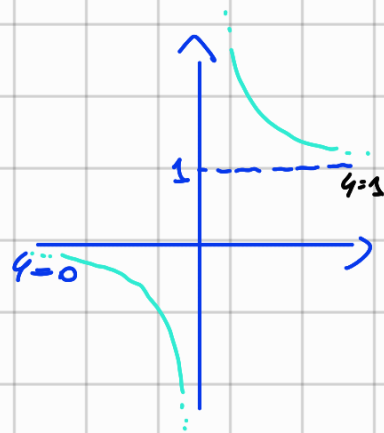
FINITO

$$\exists \text{ A.O. } y = l_1(x)$$

$$y = l_2(s_x)$$

se il lim è ∞

\nexists A.O.



A.O.:

$$\lim_{x \rightarrow +\infty} \frac{5x^2 + 2}{3x^2 - x} = \frac{+\infty}{+\infty - \infty} = \text{F.I.} \Rightarrow \sim \frac{5}{3}$$

