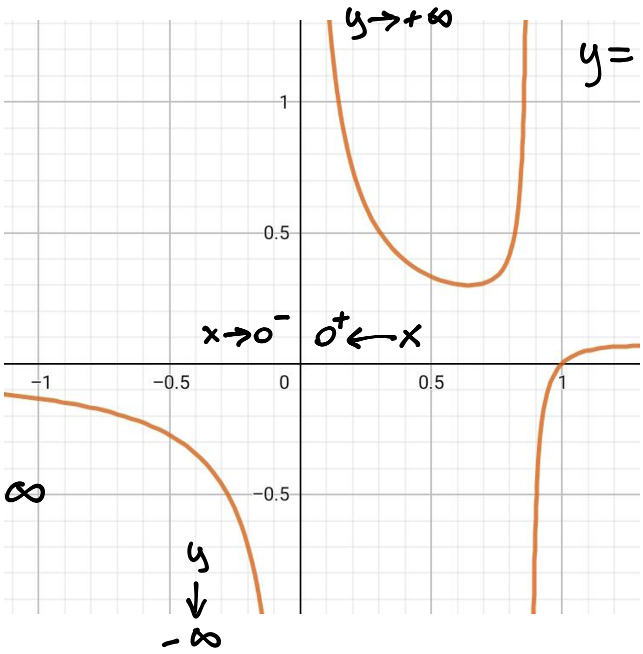
19/11/2018

257 $\displaystyle\lim_{x\to 0^-} \frac{x^2-x}{8x^3-7x^2} = \frac{0}{0}$ F.I.

$$\lim_{x\to 0^-} \frac{x^2-x}{8x^3-7x^2} = \lim_{x\to 0^-} \frac{\cancel{x}(x-1)}{x^{\cancel{2}}(8x-7)} = \lim_{x\to 0^-} \frac{x-1}{x(8x-7)} =$$

$$= \frac{0-1}{\underbrace{0}_{0^-}\underbrace{(8\cdot 0-7)}_{-7}} = \frac{-1}{0^+} = -\infty$$



ANALOGAMENTE

$$\lim_{x\to 0^+} \frac{x^2-x}{8x^3-7x^2} = \ldots = \frac{0-1}{\underbrace{0}_{0^+}\underbrace{(8\cdot 0-7)}_{-7}} = \frac{-1}{0^-} = +\infty$$

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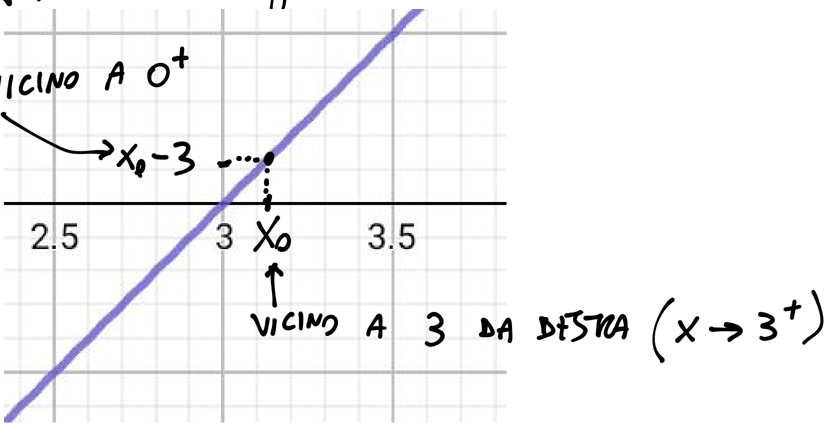
$$\lim_{x\to 3^+} \frac{x-3}{x^2-6x+9} = \frac{3-3}{9-18+9} = \frac{0}{0} \quad F.I.$$

$$\lim_{x\to 3^+} \frac{x-3}{x^2-6x+9} = \lim_{x\to 3^+} \frac{\cancel{x-3}}{(x-3)^{\cancel{2}}} =$$

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

Analizziamo il segno "$x-3$":



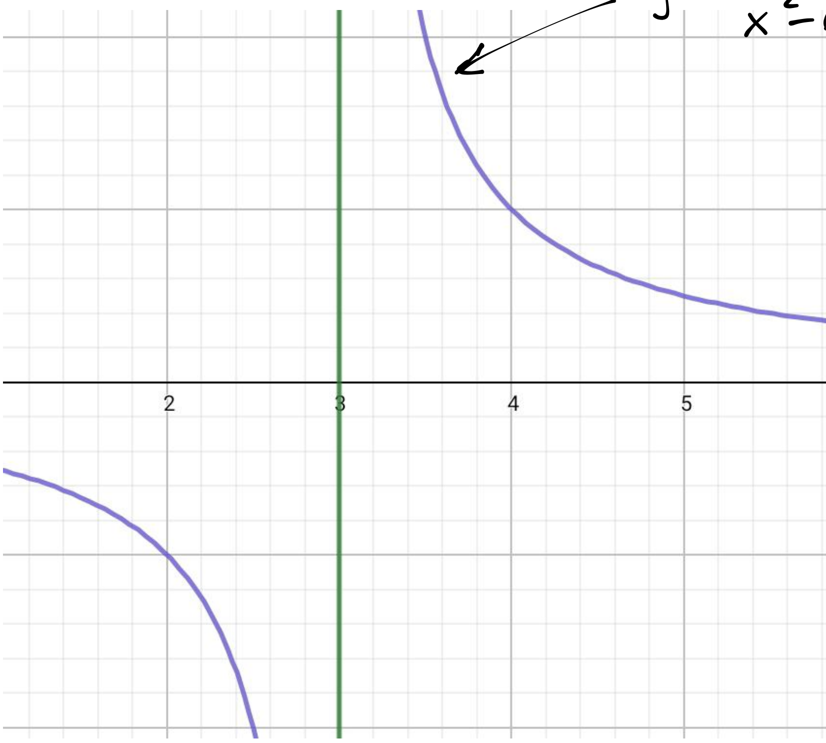
$y = \frac{x-3}{x^2-6x+9}$

POSSIAMO DIRE CHE

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

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

$$\lim_{x\to 3} f(x) = \text{NON ESISTE}$$



(SECONDO UN'ALTRA IMPOSTAZIONE SI POTREBBE SCRIVERE $\lim_{x\to 3} f(x) = \infty$)

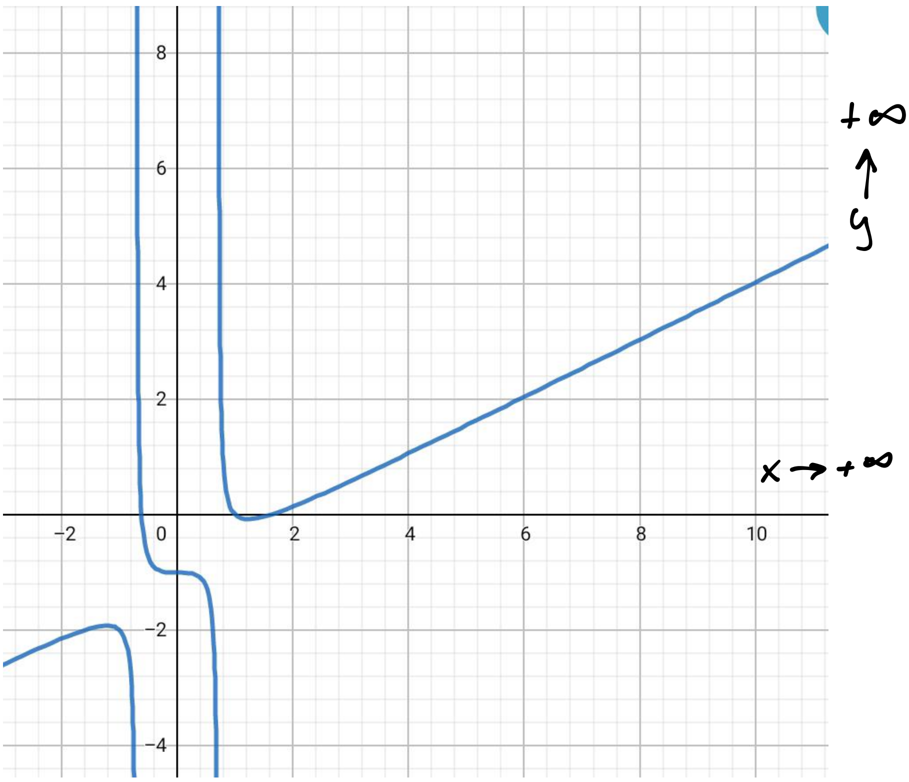
259

$$\lim_{x\to+\infty}\frac{x-2x^3+x^4}{2x^3-x} = \frac{\overbrace{+\infty-\infty}^{F.I.}+\infty}{\underbrace{+\infty-\infty}_{F.I.}}$$

$$\lim_{x\to+\infty}\frac{x-2x^3+x^4}{2x^3-x} = \lim_{x\to+\infty}\frac{\overset{+\infty}{x^{\cancel{4}}}\left(\overset{0}{\frac{1}{x^3}}-\overset{0}{\frac{2}{x}}+1\right)}{\cancel{x^3}\left(2-\underset{0}{\frac{1}{x^2}}\right)} =$$

$$= \frac{+\infty\,(0-0+1)}{2-0} = \frac{+\infty\cdot(+1)}{2} =$$

$$= \frac{+\infty}{2} = +\infty$$



260

$$\lim_{x \to 2} \frac{x^3 - 4x}{x^3 - x^2 - 2x} = \frac{8-8}{8-4-4} = \frac{0}{0} \quad F.I.$$

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

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