

Giugno 1993 ⁶⁰ Del Prete

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

CAMPO DI ESISTENZA.

$$\lim_{x \rightarrow 2} x-2 \neq 0 \quad x \neq 2$$

$$CE: \mathbb{R} - \{2\}$$

$$\text{POSITIVITA' } f(x) > 0 \quad \forall x \in CE$$

INTERSEZIONI

$$\text{con l'asse } y: x=0 = f = e^{-\frac{0}{-2}} = 1$$

con l'asse x : nessuna

ASINTOTI

$$\lim_{x \rightarrow 2^-} e^{\frac{x}{x-2}} = e^{-\infty} = 0$$

$$\lim_{x \rightarrow 2^+} e^{\frac{x}{x-2}} = e^{+\infty} = +\infty$$

$$\lim_{x \rightarrow +\infty} e^{\frac{x}{x-2}} = e^1 = e$$

$$\lim_{x \rightarrow -\infty} e^{\frac{x}{x-2}} = e$$

MAX E MIN

$$f'(x) = e^{\frac{x}{x-2}} \cdot \frac{x-2-x}{(x-2)^2} = -e^{\frac{x}{x-2}} \frac{2}{(x-2)^2}$$

$$f'(x) < 0 \quad \forall x$$

$f(x)$ sempre decrescente

CONCAVITA' E CONVESSITA'

$$f''(x) = - \left(\frac{-2e^{\frac{x}{x-2}}}{(x-2)^2} + 2e^{\frac{x}{x-2}} \frac{2(x-2)}{(x-2)^4} \right) =$$

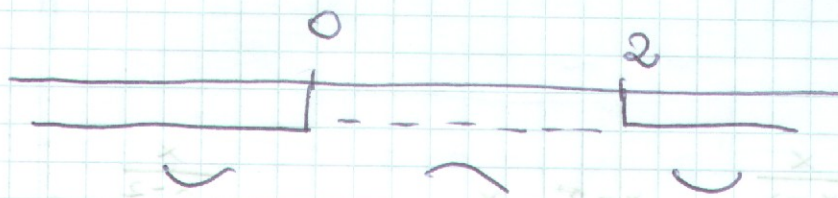
$$= 2e^{\frac{x}{x-2}} \left(\frac{1}{(x-2)^2} + 2 \frac{x-2}{(x-2)^4} \right) =$$

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

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

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

$$f''(x) \geq 0 \quad \text{per } x(x-2) \neq 0 \Rightarrow x \leq 0, x \geq 2$$



$f(x) = \frac{1}{x}$
 Graph of the function $f(x) = \frac{1}{x}$

