

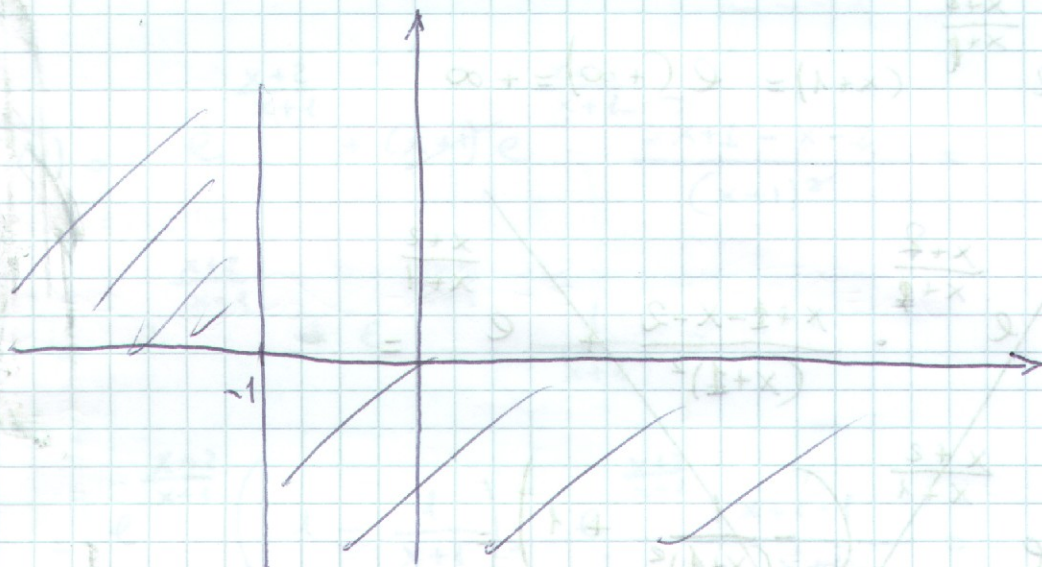
$$f(x) = (x+1)e^{\frac{x+2}{x+1}}$$

$$\text{CE: } x+1 \neq 0 \quad x \neq -1$$

$$\text{cc: } \mathbb{R} - \{-1\}$$

POSITIVITÀ

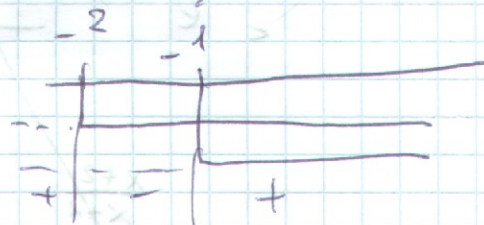
$$f(x) > 0 \quad x+1 > 0 \quad x > -1$$



Intersezione con l'asse y:  $x=0 \quad f(0) = 1 \cdot e^2 = e^2$

con l'asse x  $f(x)=0 \quad x+1=0 \quad x=-1 \notin \text{CE}$

$$\lim_{x \rightarrow -1^-} (x+1)e^{\frac{x+2}{x+1}} = 0 \cdot e^{-\infty} = 0$$



$$\lim_{x \rightarrow -1^+} (x+1)e^{\frac{x+2}{x+1}} = 0 \cdot e^{+\infty}$$

$$= \lim_{x \rightarrow -1^+} \frac{e^{\frac{x+2}{x+1}}}{\frac{1}{x+1}} = \lim_{x \rightarrow -1^+} e^{\frac{x+2}{x+1}} \cdot \frac{x+1 - x - 2}{(x+1)^2} = -\frac{1}{(x+1)^2}$$

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

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

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

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

$$f'(x) = e^{\frac{x+2}{x+1}} \cdot \frac{x+1-x-2}{(x+1)^2} + e^{\frac{x+2}{x+1}} =$$

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

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

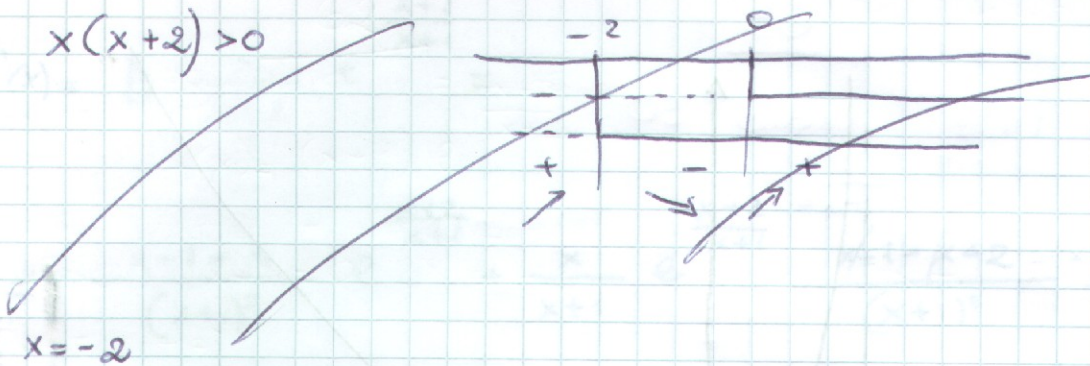
$$= e^{\frac{x+2}{x+1}} \frac{x^2 + 2x}{(x+1)^2}$$

$$f'(x) = 0 \quad \left( \begin{array}{l} x^2 + 2x + 3 = 0 \\ \Delta < 0 \end{array} \right)$$

$$f'(x) = 0 \quad \text{mai}$$

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

$$x(x+2) > 0$$



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

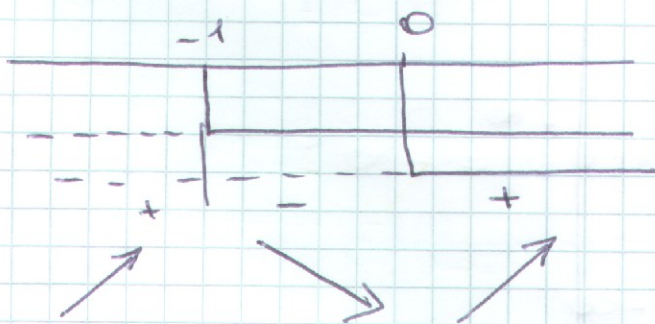
$$f'(x) = e^{\frac{x+2}{x+1}} + (x+1)e^{\frac{x+2}{x+1}} \cdot \frac{x+1-x-2}{(x+1)^2} =$$

$$= e^{\frac{x+2}{x+1}} + e^{\frac{x+2}{x+1}} \cdot \frac{1}{x+1} =$$

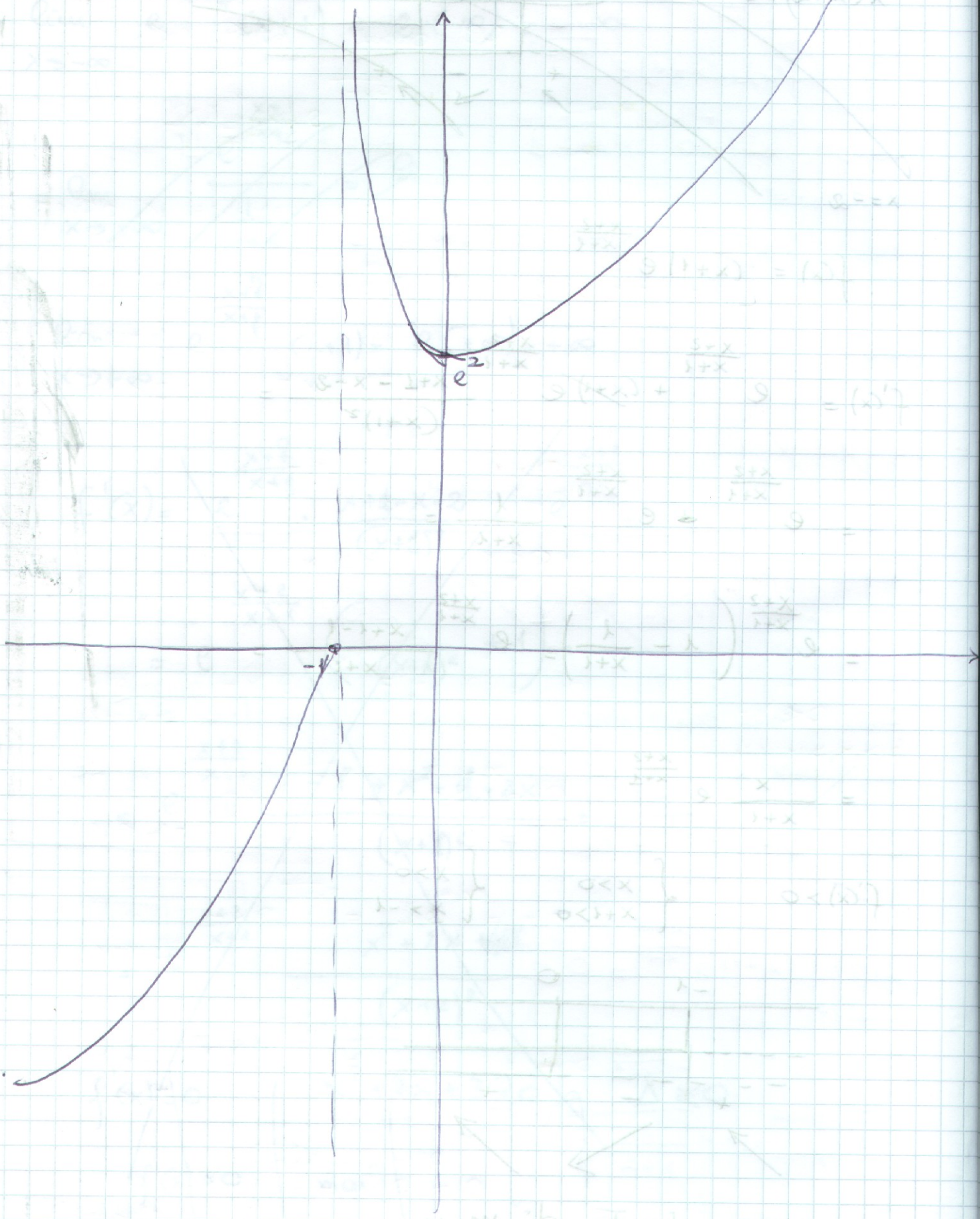
$$= e^{\frac{x+2}{x+1}} \left( 1 + \frac{1}{x+1} \right) = e^{\frac{x+2}{x+1}} \frac{x+1+1}{x+1} =$$

$$= \frac{x+2}{x+1} e^{\frac{x+2}{x+1}}$$

$$f'(x) > 0 \quad \begin{cases} x > 0 \\ x+1 > 0 \end{cases} \quad \begin{cases} x > 0 \\ x > -1 \end{cases}$$



$x=0$  punto di min



$0 < (x+1)x$   
 $0 < x$   
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$$f''(x) = D \frac{x}{x+1} e^{\frac{x+2}{x+1}} =$$

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

$$= \frac{1}{(x+1)^2} e^{\frac{x+2}{x+1}} + \frac{x}{(x+1)^3} e^{\frac{x+2}{x+1}} =$$

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

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

$$= \frac{1}{(x+1)^2} e^{\frac{x+2}{x+1}} > 0 \quad \forall x$$

$f(x)$  sempre crescente