Un esercizio da Matematica assistita

$$f(x) = \frac{e^x}{\sqrt{x^2-6x}}$$

I.D. $x^2-6x>0$

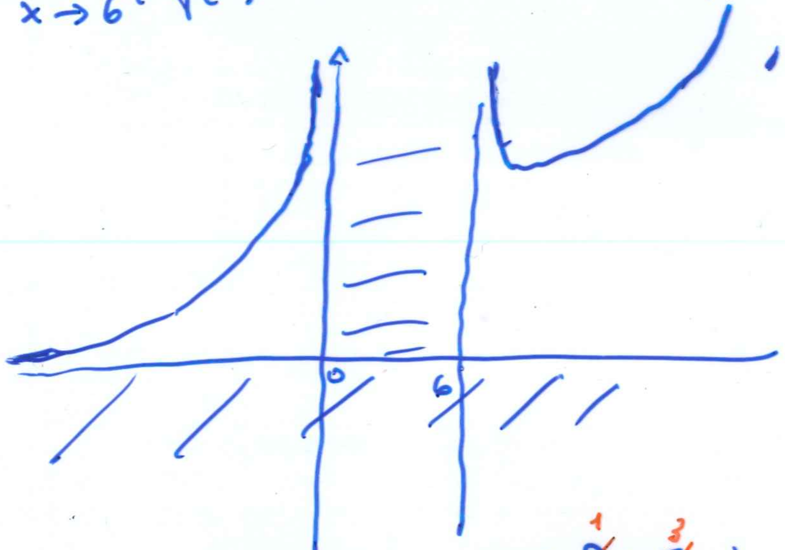
$(-\infty, 0) \cup (6, +\infty)$

$f(x) > 0 \quad \forall x \in$ I.D.

$\lim_{x\to-\infty} f(x) = \frac{0}{+\infty} = 0$; per $x \to -\infty$ asint. orizz. : $y=0$

$\lim_{x\to 0^-} f(x) = +\infty$ per $x \to 0^-$ asint. vert : $x=0$

$\lim_{x\to 6^+} f(x) = +\infty$ per $x \to 6^+$ " " : $x=6$



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

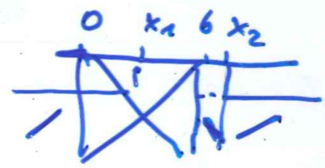
$\lim_{x\to+\infty} \frac{e^x}{|x|}$

Prevedo un minimo relativo in $(6, +\infty)$

$$f'(x) = \frac{e^x\sqrt{x^2-6x} - e^x\left(\frac{\cancel{2}^{1}x-\cancel{6}^{3}}{\cancel{2}\sqrt{x^2-6x}}\right)}{x^2-6x} = \frac{e^x}{(x^2-6x)^{3/2}}\left(x^2-6x-x+3\right) =$$

$$= \frac{e^x}{(x^2-6x)^{3/2}}\left(x^2-7x+3\right) \geq 0 \iff \begin{cases} x<0 \text{ opp. } x>6 \\ x^2-7x+3 \geq 0 \end{cases}$$

$$x^2-7x+3=0 \iff x_{1,2} = \frac{7 \pm \sqrt{49-12}}{2} = \frac{7\pm\sqrt{37}}{2}$$



Qui $f'(x) \geq 0 \iff x<0$ oppure $x \geq \frac{7+\sqrt{37}}{2}$

$f'(x)<0 \iff 6<x<\frac{7+\sqrt{37}}{2}$

in $x = \frac{7+\sqrt{37}}{2}$ ho un min. relativo.