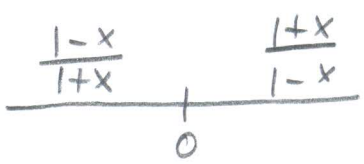
$$y = \frac{1+|x|}{1-|x|} \qquad \begin{cases} \frac{1+x}{1-x} & x \geq 0 \\ \frac{1-x}{1+x} & x < 0 \end{cases}$$

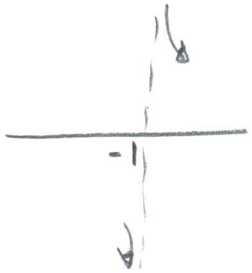


ptos Corte

$y = \frac{1-x}{1+x}$ PC $\begin{cases} x=0 \to y=1 & (0,1) \\ y=0 \to x=1 & (1,0) \text{ fuera de su definición} \end{cases}$

ASÍNTOTAS

Verticales $\boxed{x=-1}$



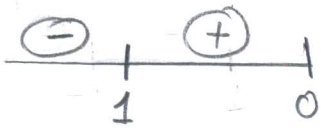
$\lim_{x \to -1^+} \frac{1-x}{1+x} = \frac{+}{+} = +\infty$

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

Horizontales

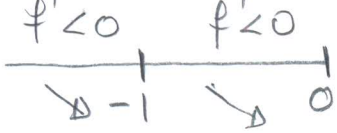
$\lim_{x \to \infty} \frac{1-x}{1+x} = \frac{\infty}{\infty} \overset{L}{=} -1$ $\boxed{y=-1}$

SIGNO

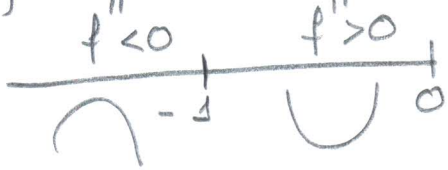


CRECIMIENTO

$f'(x) = \frac{-(1+x)-(1-x)}{(1+x)^2} = \frac{-2}{(1+x)^2}$ $\qquad f'(x)=0 \to \nexists$ PC



$f''(x) = \frac{4}{(1+x)^3}$ $\qquad f''(x)=0 \to \nexists$ P.I



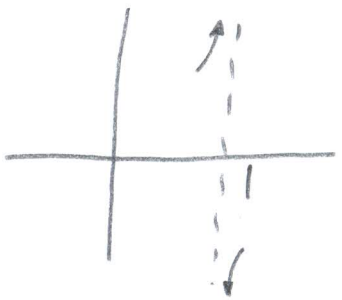
$$y = \frac{1+x}{1-x}$$

P.C $\begin{cases} x=0 \to y=-1 & (0,-1) \\ y=0 \to 1+x=0 \to x=-1 & (-1,0) \end{cases}$

ASÍNTOTAS

Verticales

$1-x=0 \to \boxed{x=1}$



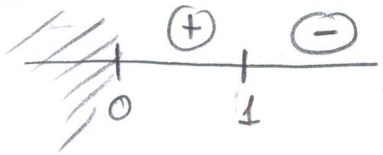
$$\lim_{x\to 1^+} \frac{1+x}{1-x} = -\infty$$

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

Horizontales

$$y = \lim_{x\to\infty} \frac{1+x}{1-x} = \frac{\infty}{\infty} \to \boxed{y=-1}$$

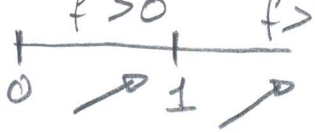
SIGNO



CRECIMIENTO

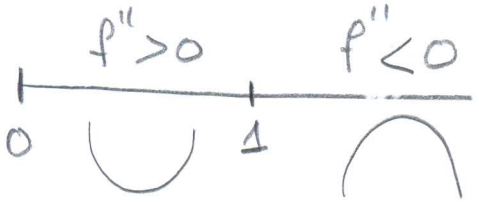
$$f'(x) = \frac{(1-x)+(1+x)}{(1-x)^2} = \frac{2}{(1-x)^2}$$

$f'(x) = 0 \nexists$ P.C



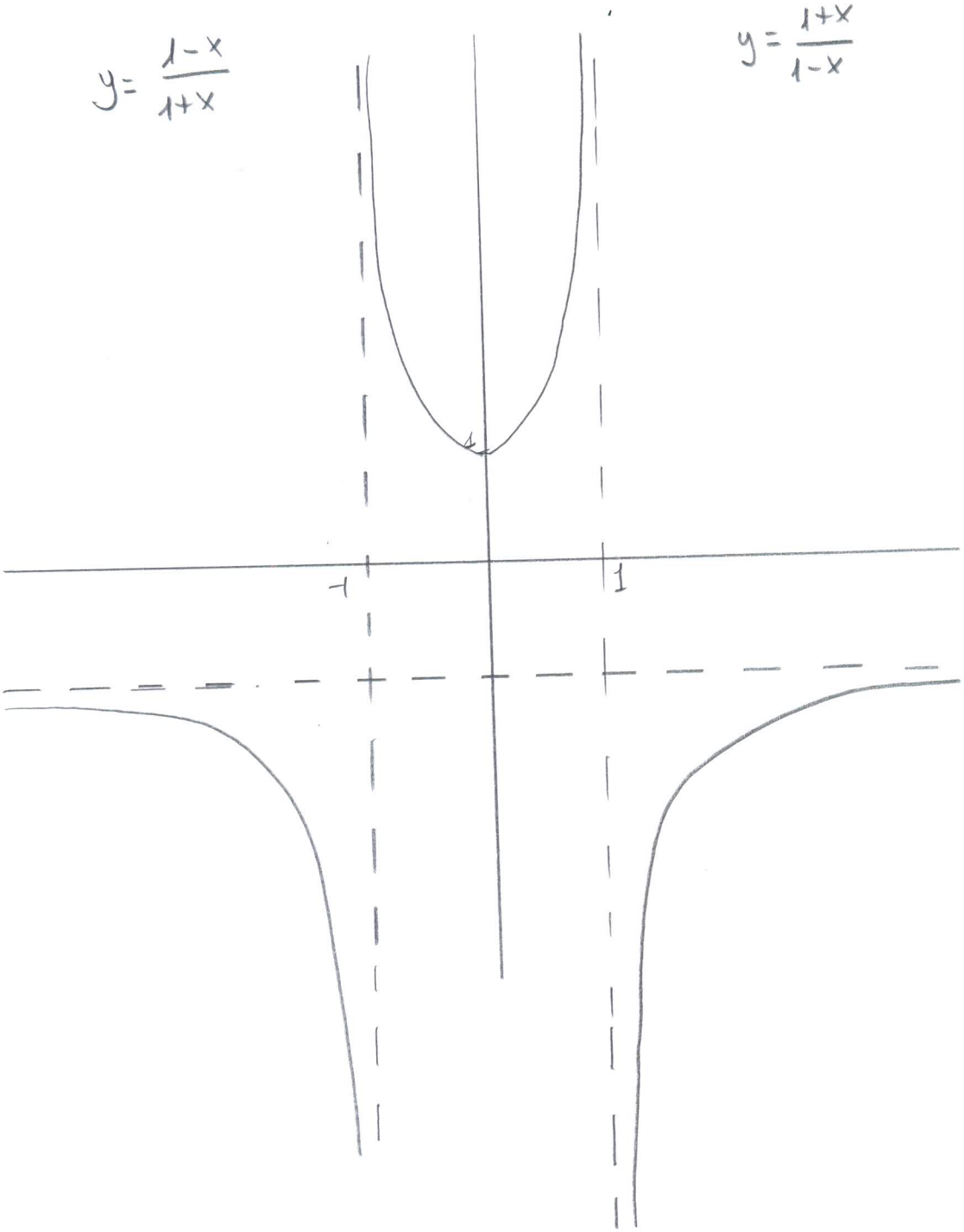
$$f''(x) = \frac{4}{(1-x)^3}$$

$f''(x) = 0 \nexists$ P.I



$y = \frac{1-x}{1+x}$

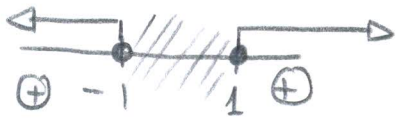
$y = \frac{1+x}{1-x}$



$$f(x) = x - \sqrt{x^2-1}$$

DOMINIO

$x^2 - 1 \geq 0$



$D = (-\infty, -1] \cup [1, +\infty)$

ptos CORTE

$x = 0 \longrightarrow y \nexists$

$y = 0 \longrightarrow x - \sqrt{x^2-1} = 0 \longrightarrow x^2 = \left(\sqrt{x^2-1}\right)^2 \longrightarrow 0 = -1 \nexists$

ASÍNTOTAS

- VERTICALES

$$\lim_{x \to 1} f(x) = 1$$

$$\lim_{x \to -1} f(x) = -1$$

- HORIZONTALES

$$\lim_{x \to +\infty} x - \sqrt{x^2-1} = \infty - \infty$$

$$\lim_{x \to +\infty} \frac{\left(x - \sqrt{x^2-1}\right)\left(x + \sqrt{x^2-1}\right)}{\left(x + \sqrt{x^2-1}\right)} = \lim_{x \to \infty} \frac{x^2 - x^2 + 1}{x + \sqrt{x^2-1}} =$$

$$= \lim_{x \to +\infty} \frac{1}{x + \sqrt{x^2-1}} = \frac{1}{+\infty} = \boxed{0}$$

$$\lim_{x \to -\infty} x - \sqrt{x^2-1} = -\infty - \infty = \boxed{-\infty} \quad \nexists \text{ A H}$$

- OBLICUA $\quad y = mx + n \quad \boxed{y = 2x}$

$$m = \lim_{x \to -\infty} \frac{f(x)}{x} = \lim_{x \to -\infty} \frac{x - \sqrt{x^2-1}}{x} = \frac{\infty}{\infty}$$

$$\lim_{x \to -\infty} \frac{1 - \sqrt{1}}{-1} = 2$$

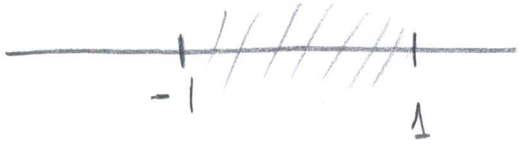
$$n = \lim_{x \to -\infty} x - \sqrt{x^2-1} - 2x = \lim_{x \to -\infty} \left(-x - \sqrt{x^2-1}\right) \neq 0$$

CRECIMIENTO

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

$f'(x) = 0 \longrightarrow \sqrt{x^2-1} - x = 0 \longrightarrow x^2 - 1 = x^2$

$-1 = 0 \longrightarrow \nexists$ P. Críticos



$f'(-2) = \frac{+}{+}$ $(-\infty, -1]$ CREC.

$f'(2) = \frac{-}{+}$ $[1, +\infty)$ DCR.

CURVATURA

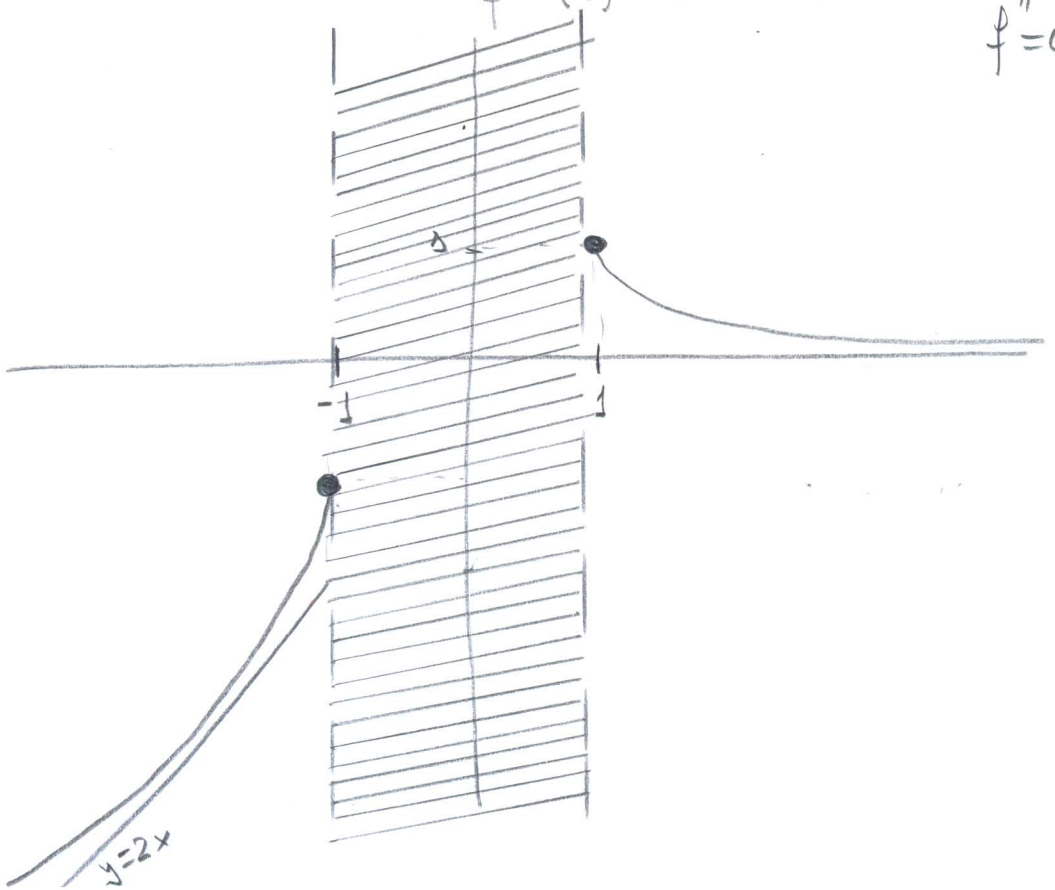
$$f'' = \frac{\left[\frac{1}{2}(x^2-1)^{-1/2} \cdot 2x - 1\right]\sqrt{x^2-1} - \left[\sqrt{x^2-1} - x\right] \cdot \frac{1}{2}(x^2-1)^{-1/2} \cdot 2x}{x^2-1}$$

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

$f''(-2) > 0$ ∪

$f''(2) > 0$ ∪

$f'' = 0 \longrightarrow \nexists$ P.I



$$y = \left| \frac{x^2 - x}{x^2 - 1} \right| \qquad y = \left| \frac{x}{x+1} \right|$$

$$\begin{cases} \dfrac{x}{x+1} & x < -1 \\ -\dfrac{x}{x+1} & -1 < x < 0 \\ \dfrac{x}{x+1} & x \geq 0 \end{cases}$$

PC $\begin{cases} x=0 \text{ — } y=0 & (0,0) \\ y=0 \text{ — } x=0 & (0,0) \end{cases}$

ASÍNTOTAS

Verticales $x=-1$

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

Horizontales

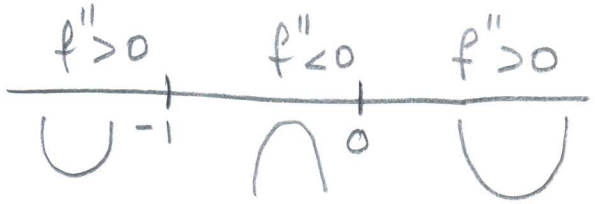
$$y = \lim_{x \to \infty} \frac{x}{x+1} = \frac{\infty}{\infty} \rightarrow \boxed{y = 1}$$

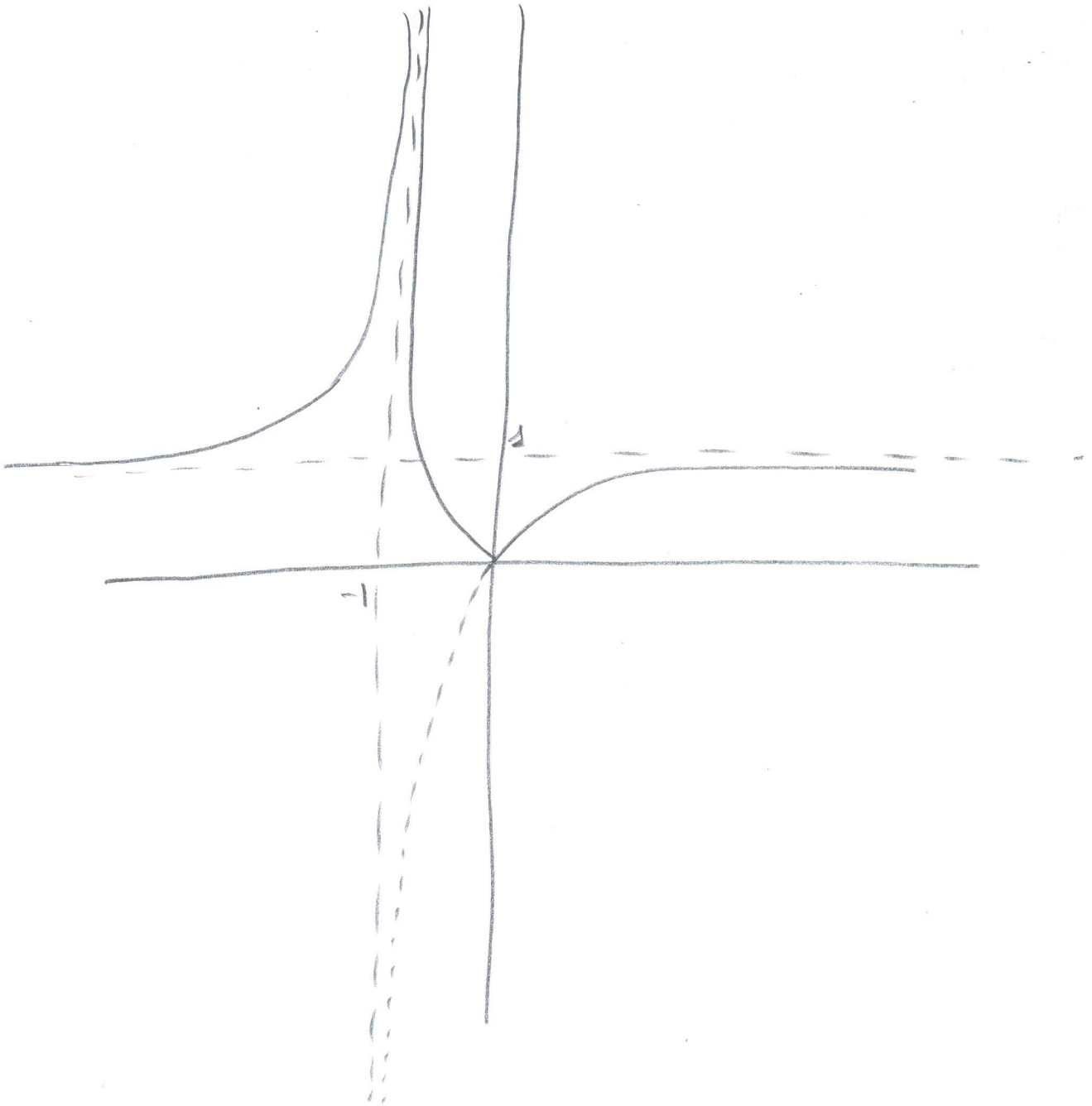
CRECIMIENTO

$$f'(x) = \frac{1}{(x+1)^2} \qquad f'(x) = 0 \longrightarrow \nexists \text{ P.C}$$

CURVATURA

$$f''(x) = \frac{-2}{(x+1)^3} \qquad f''(x) = 0 \longrightarrow \nexists \text{ P.I}$$




1
-1