

2.6.17 d)

$$\frac{4x^2 - (4x^2 + 2x - 5)}{(x+3) \left(2x + \sqrt{4x^2 + 2x - 5} \right)}$$

$$= \frac{-2x + 5}{(x+3) \cdot \left(2x + \sqrt{4x^2 + 2x - 5} \right)} \cdot \frac{1}{x} = \frac{1}{\sqrt{x^2}}$$

$x \rightarrow +\infty$ $\sqrt{x^2} = x$
or $x > 0$

$$-2 + \frac{5}{x}$$

$$(x+3) \cdot \left(2 + \sqrt{4 + \frac{2}{x} - \frac{5}{x^2}} \right) \quad \checkmark$$

$$\frac{-2}{\infty \cdot 4} = 0$$

$1/x$
 $1/x$

$$\frac{2x - \sqrt{4x^2 + 2x - 5}}{x+3} = \frac{2 - \frac{1}{x} \cdot \sqrt{4x^2 + 2x - 5}}{1 + \frac{3}{x}}$$

$x \rightarrow -\infty$

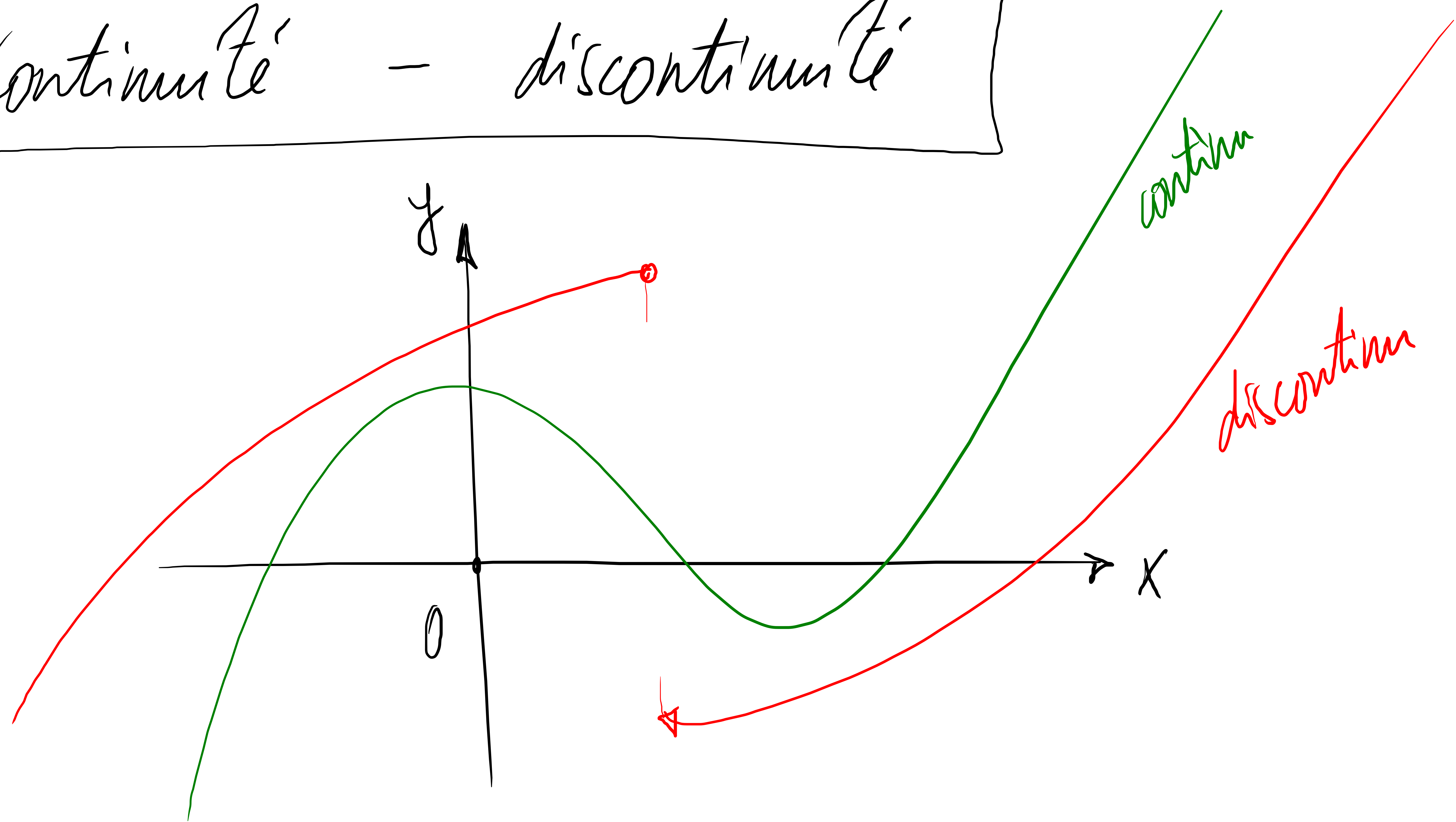
$\sqrt{x^2} = -x$
for $x < 0$
 $\frac{1}{x} = -\frac{1}{\sqrt{x^2}}$

$x > 0$
 $x < 0$

$$\frac{2 - \sqrt{4 + \frac{2}{x} - \frac{5}{x^2}}}{1 + \frac{3}{x}} \xrightarrow{x \rightarrow +\infty} \frac{2-2}{1} = 0 \checkmark$$

$$\frac{2 - \left(-\frac{1}{\sqrt{x^2}} \cdot \sqrt{4x^2 + 2x - 5}\right)}{1 + \frac{3}{x}} = \frac{2 + \sqrt{4 + \frac{2}{x} - \frac{5}{x^2}}}{1 + \frac{3}{x}} \xrightarrow{x \rightarrow -\infty} 4$$

Continuità - discontinuità

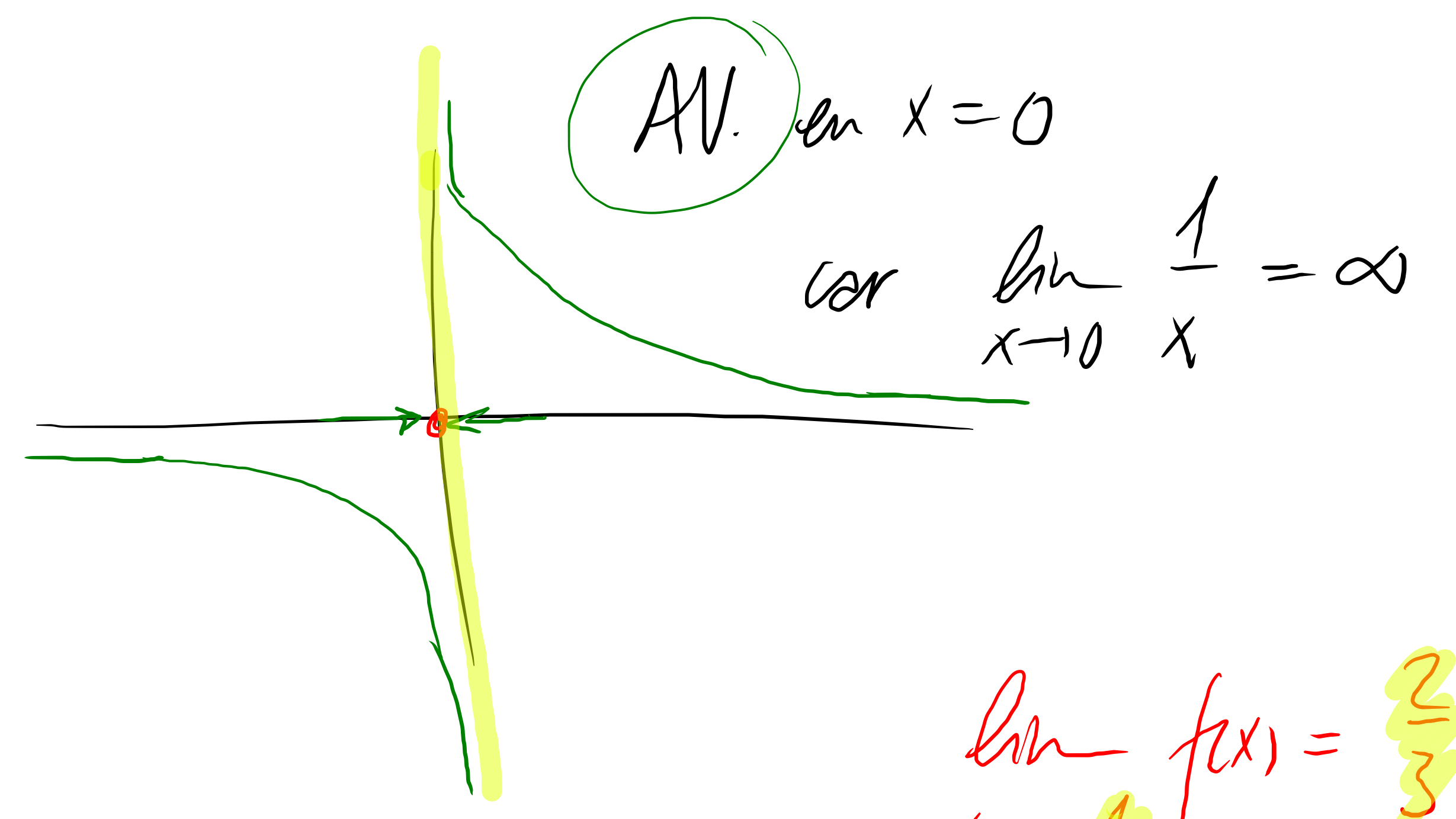


$$f(x) = \begin{cases} 1 & \text{si } x \in \mathbb{Q} \\ 0 & \text{se non} \end{cases}$$

$$\mathbb{R} \rightarrow \mathbb{R}$$

$$x \mapsto \frac{1}{x}$$

discontinue en 0



$$\mathbb{R} \rightarrow \mathbb{R}$$

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

TROU
 $x=1$
 $x=-2$ AV

$$\frac{(x+1)\cancel{(x-1)}}{\cancel{(x-1)}(x+2)} \xrightarrow{x \rightarrow 1} \frac{2}{3}$$

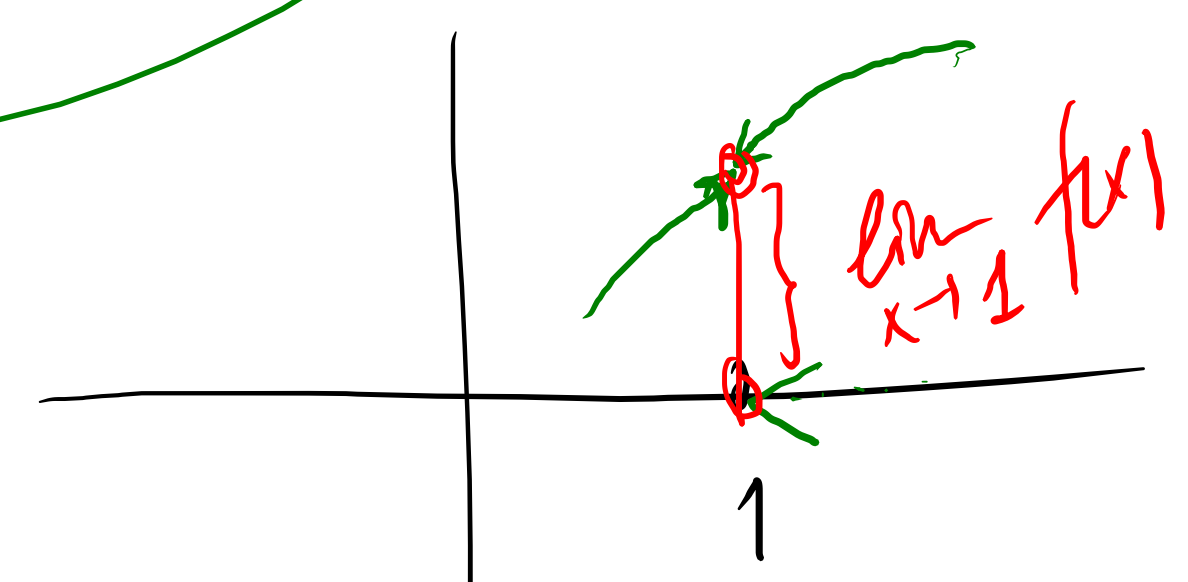
$$\lim_{x \rightarrow 1} f(x) = \frac{2}{3}$$

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

en $x=1$, on a un trou
 de la coordonnée y sont

$$x^2 - 1 = (x+1)(x-1)$$

$$x^2 + x - 2 = (x+2)(x-1)$$



$$(1; \lim_{x \rightarrow 1} f(x))$$

$x=-2$
 $x=1$
 problèmes

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

$$\lim_{x \rightarrow 1} f(x) = \ll \frac{0}{0} \gg$$

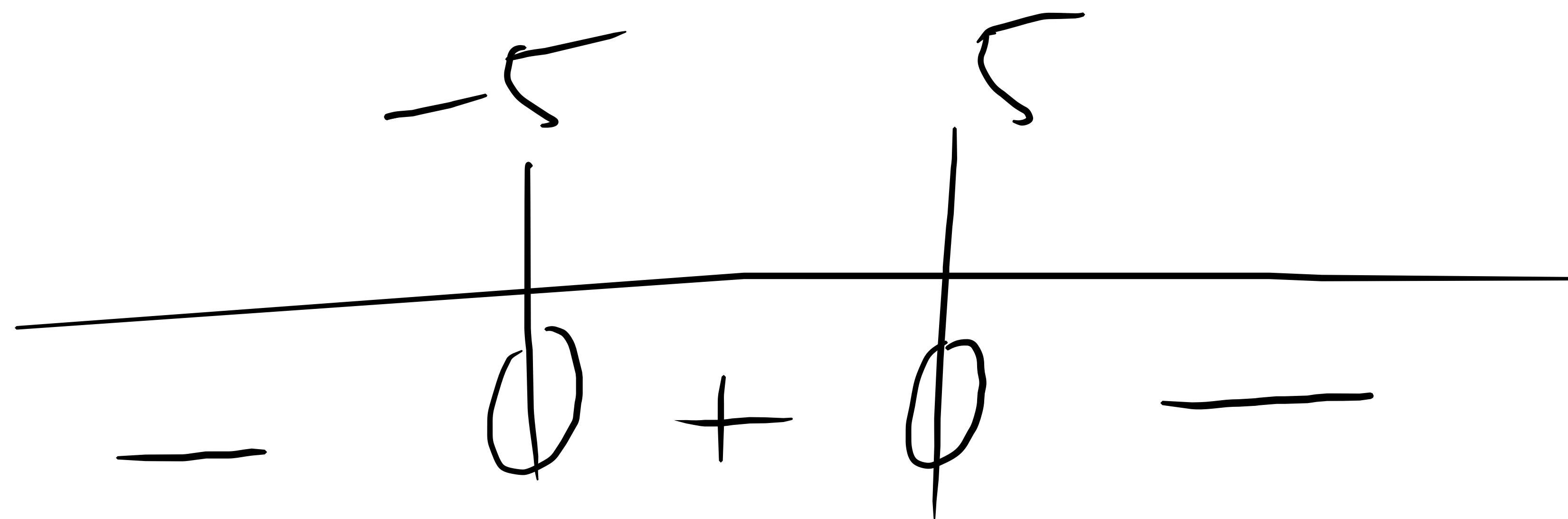
$$= \lim_{x \rightarrow 1} \frac{x+1}{x+2} = \frac{1+1}{1+2} = \frac{2}{3}$$

$$\frac{x^2 - 1}{x^2 + x - 2} \stackrel{x=1 \ll \frac{0}{0} \gg}{=} \frac{(x+1)\cancel{(x-1)}}{\cancel{(x-1)}(x+2)} \stackrel{x \neq 1}{=} \frac{x+1}{x+2} \xrightarrow{x \rightarrow 1} \frac{1+1}{1+2} = \frac{2}{3}$$

la limite est finie
 \Rightarrow on a un trou

$$25 - x^2$$

$$25 = x^2 \quad / \quad x = \pm 5$$



$$[-5; 5] \checkmark$$