$$f(x) = \frac{3x+5}{x+1} \qquad D_f = \mathbb{R}\setminus\{-1\}$$

f est dérivable sur D_f soit sur $\mathbb{R}\setminus\{-1\}$

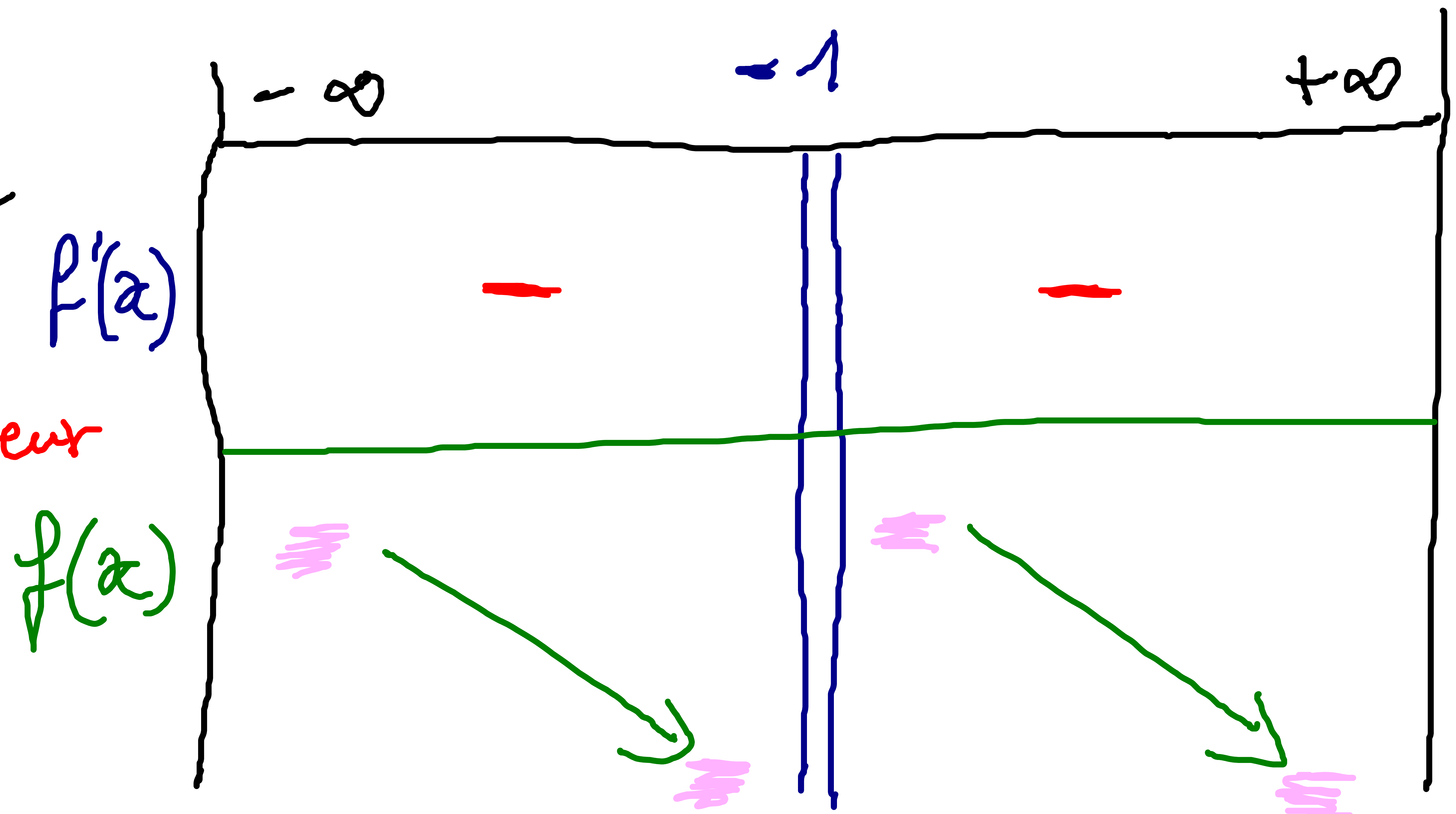
numérateur

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

dénominateur

$\forall x \in \mathbb{R}\setminus\{-1\}$

$f'(x) < 0$



$$f(x) = \frac{3x+5}{x+1}$$

$D_f =]-\infty ; -1[\cup]-1 ; +\infty[$

x	$-\infty$		-1		$+\infty$
$f'(x)$		$-$	‖	$-$	
$f(x)$	3 ↘ $-\infty$		‖	$+\infty$ ↘ 3	

$$\lim_{x \to -\infty} f(x) = \lim_{x \to -\infty} \frac{3x+5}{x+1}$$

$$\left.\begin{array}{l} \lim\limits_{x \to -\infty} 3x+5 = -\infty \\ \\ \lim\limits_{x \to -\infty} x+1 = -\infty \end{array}\right\} \text{forme } \frac{\infty}{\infty} = \text{FI}$$

on doit lever l'indétermination

$$\lim_{x \to -\infty} f(x) = \lim_{x \to -\infty} \frac{3x\overbrace{\left(1 + \overset{0}{\frac{5}{3x}}\right)}^{1}}{x\underbrace{\left(1 + \underset{0}{\frac{1}{x}}\right)}_{1}} = \lim_{x \to -\infty} \frac{3\cancel{x}}{\cancel{x}} = 3$$

$$\lim_{x \to +\infty} f(x) = \lim_{x \to +\infty} \frac{3x+5}{x+1}$$

$$\left.\begin{aligned} &\lim_{x \to +\infty} 3x+5 = +\infty \\ &\lim_{x \to +\infty} x+1 = +\infty \end{aligned}\right\} \text{ forme } \frac{\infty}{\infty} = \text{FI}$$

on doit lever l'indétermination

$$\lim_{x \to +\infty} f(x) = \lim_{x \to +\infty} \frac{3x\left(\underbrace{1 + \underbrace{\frac{5}{3x}}_{0}}_{1}\right)}{x\left(\underbrace{1 + \underbrace{\frac{1}{x}}_{0}}_{1}\right)} = \lim_{x \to +\infty} \frac{3\cancel{x}}{\cancel{x}} = 3$$

$$\lim_{\substack{x \to -1 \\ x > -1}} f(x) = \lim_{\substack{x \to -1 \\ x > -1}} \frac{3x+5}{x+1}$$

x	$-\infty$		-1		$+\infty$
$x+1$		$-$	0	$+$	

$$\lim_{\substack{x \to -1 \\ x > -1}} 3x+5 = 3\times(-1)+5 = 2$$

$$\lim_{\substack{x \to -1 \\ x > -1}} x+1 = 0^+$$

donc $\lim_{\substack{x \to -1 \\ x > -1}} f(x) = \frac{2}{0^+} = +\infty$

$$\lim_{\substack{x \to -1 \\ x < -1}} 3x+5 = 2$$

$$\lim_{\substack{x \to -1 \\ x < -1}} x+1 = 0^-$$

donc $\lim_{\substack{x \to -1 \\ x < -1}} f(x) = \frac{2}{0^-} = -\infty$