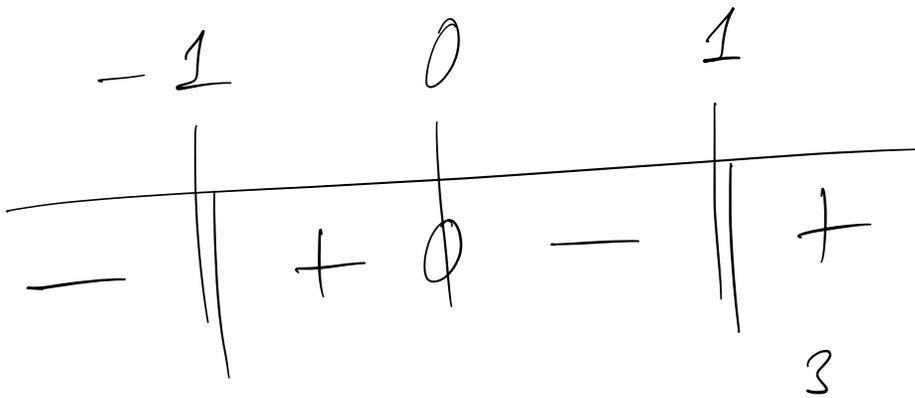


$$f(x) = \frac{x^3}{x^2-1} = \frac{x^3}{(x+1)(x-1)}$$

$$\textcircled{1} D_f = \mathbb{R} - \{\pm 1\}$$

$$f(x) = 0 \Leftrightarrow x^3 = 0 \Leftrightarrow x = 0$$



$$f(2) = \frac{8}{4-1} > 0$$

$$\textcircled{2} \lim_{x \rightarrow -1} f(x) = \ll \frac{-1^3}{0} \gg = \infty$$

$\Rightarrow$  A.V. en  $x = -1$

$$\lim_{x \rightarrow 1} f(x) = \ll \frac{1^3}{0} \gg = \infty$$

$\Rightarrow$  A.V. en  $x = 1$



$$\textcircled{3} \quad f'(x) = \left( \frac{x^3}{x^2-1} \right)' = \frac{(x^3)'(x^2-1) - x^3(x^2-1)'}{(x^2-1)^2}$$

$$= \frac{3x^2(x^2-1) - x^3 \cdot 2x}{(x^2-1)^2}$$

$$= \frac{3x^4 - 3x^2 - 2x^4}{(x^2-1)^2} = \frac{x^4 - 3x^2}{(x^2-1)^2}$$

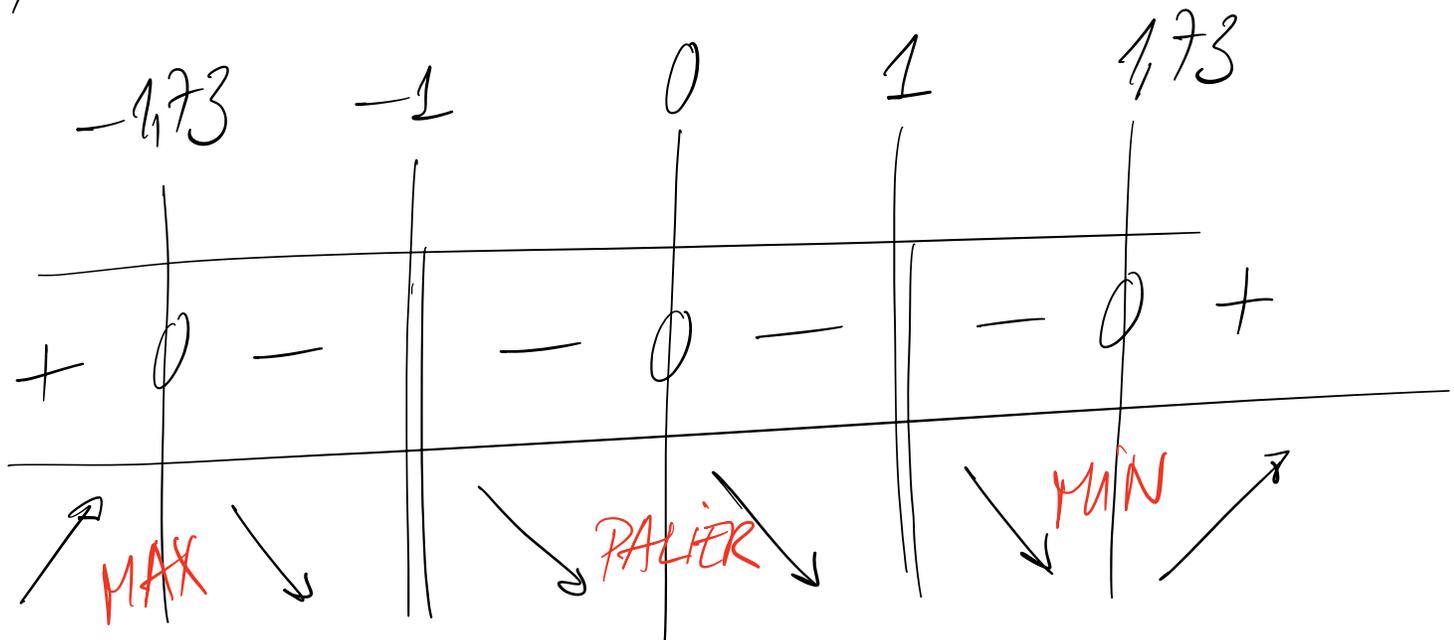
$$f'(2) = \frac{4 \cdot 1}{9} > 0$$

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

$$x^2-3=0$$

$$\Leftrightarrow x^2=3$$

$$f'(x)=0 \Leftrightarrow x=0 \text{ ou } x=\pm\sqrt{3}$$



$$\text{Maximum: } (-\sqrt{3}; f(-\sqrt{3})) \approx (-1,7; -2,6)$$

$$\text{Minimum: } (\sqrt{3}; f(\sqrt{3})) \approx (1,7; 2,6)$$

$$\text{Pfler: } (0; f(0)) = (0; 0)$$

(4)

