

$2.10.10 f_1$ $f(x) = \frac{(x+2)^3}{(2-x)^2}$

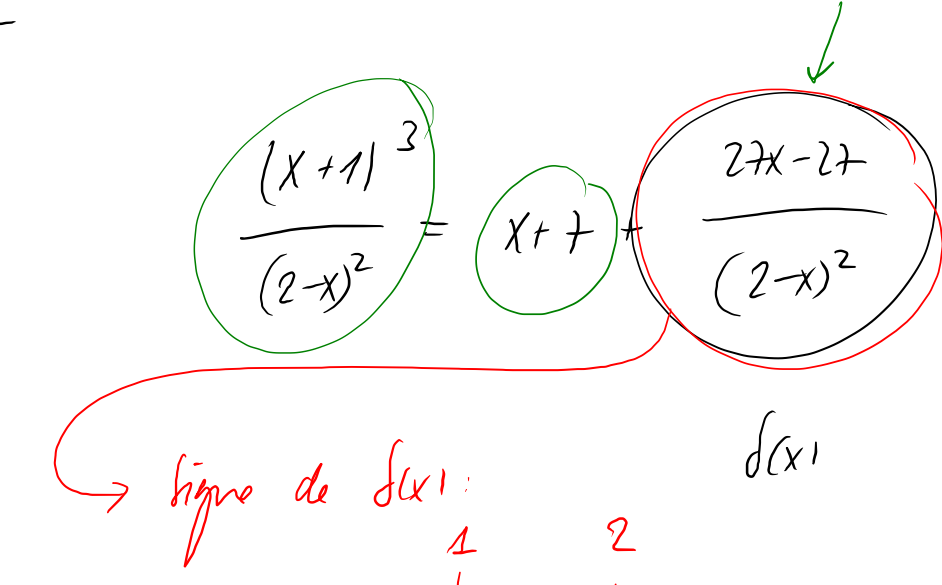
① $D_f = \mathbb{R} - \{2\}$ $\text{Signe: } \begin{array}{c} -1 & 0 & 2 & 3 \\ - & 0 & + & + \end{array}$

lettes: $x = -1$ A.V. en $x = 2 \left(\frac{(2+2)^3}{(2-2)^2} \rightarrow \infty \right)$

② Asymptotes $\frac{(x+2)^3}{(2-x)^2} \xrightarrow{x \rightarrow \infty} \frac{x^3}{x^2} = x \xrightarrow{x \rightarrow \infty} \infty$

~~AX~~
 $\log(x+2)^3 = \log(2-x)^2 + 1 \Rightarrow A.O. y = x + 1$

$$\begin{array}{r} x^3 + 3x^2 + 3x + 2 \\ x^3 - 4x^2 + 4x \\ \hline 7x^2 - x + 2 \\ 7x^2 - 18x + 18 \\ \hline 2x - 17 \end{array}$$



③ Dérivée et croissance

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

$\begin{array}{c} -1 & 2 & 8 \\ + & 0 & + \\ - & 0 & + \end{array}$

au dév. au dév. 3

$$= \frac{(x+2)(2-x) \sqrt{3(2-x) - 6(x+2) \cdot 2 \cdot (-1)}}{(2-x)^3} = \frac{(x+2)(6-3x+2x+2)}{(2-x)^3}$$

$$= \frac{(x+2)(8-x)}{(2-x)^3}$$

$$\min_{(8, f(8))} f(8) = \frac{(8+2)^3}{(2-8)^2} = \frac{9^3}{6^2} = \frac{9 \cdot 9 \cdot 9}{6 \cdot 6} = \frac{9 \cdot 9}{2 \cdot 2} = \frac{81}{4}$$

④ Dérivée seconde

$$\left(\frac{(x+2)(8-x)}{(2-x)^3} \right)' = \frac{[(x+2)(8-x)]' \cdot (2-x)^3 - (x+2)(8-x) \cdot 3(2-x)^2 \cdot (-1)}{(2-x)^6}$$

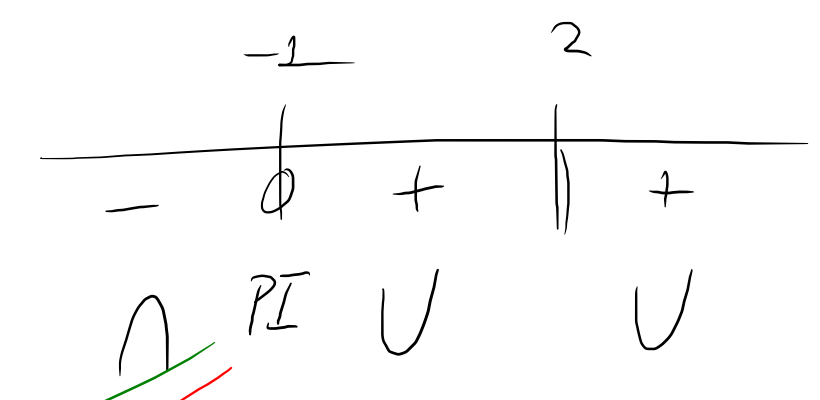
$$= \frac{(2(x+2)(8-x) + (x+2)' \cdot (8-x) - 3(x+2)(8-x)(2-x)^2)}{(2-x)^6}$$

$$= \frac{(2-x)^2 [(x+2)(2(8-x) - (x+2)) + 3(x+2)(8-x)]}{(2-x)^6}$$

$$= \frac{(x+2) [(16-2x-x-1)(2-x) + 3(8x-x^2+8-x)]}{(2-x)^4}$$

$$= \frac{(x+2) (30-3x-x^2+24x-x^2+24-x)}{(2-x)^4}$$

$$= \frac{(x+2) 54}{(2-x)^4}$$



$(-2; 0)$
 $f'(-1) = 0$
 $f(-1) = 0$

