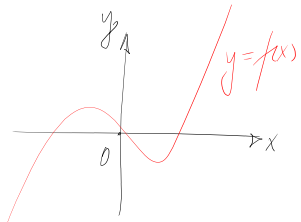
Analyse : Étude d'une fonction



① $ED_f = D_f$ / zéros / signe

Exemple : $f(x)$ donnée par $\dfrac{x^2-2x-3}{x+1}$

ED_f ⚠ $\dfrac{?}{0}$ / $\sqrt{<0}$

DIV. PAR 0.

$\sqrt{}$ NÉG.

$x+1=0$

$x=-1$ ← À exclure

$D_f = ED_f = \mathbb{R} - \{-1\}$ ← tous les nombres

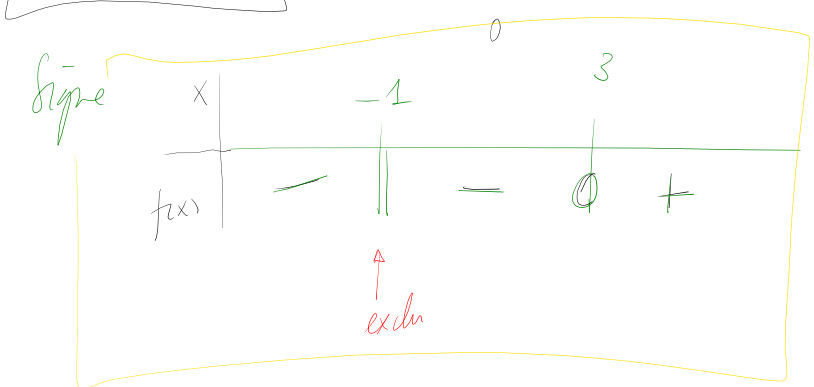
Pour que $f(x)=0$, il est nécessaire que

$$\frac{x^2-2x-3}{x+1} = 0 = \frac{0}{x+1} \Rightarrow x^2-2x-3=0$$

$$x = \frac{2 \pm \sqrt{16}}{2} = \begin{cases} 3 \\ -1 \text{ EXCLU} \end{cases}$$

$$\frac{(-1)^2-2(-1)-3}{-1+1} \quad \frac{0}{0}$$

Zéro : $x=3$



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

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

$$\frac{(-2)^2-2\cdot(-2)-3}{-2+1} = \frac{5}{-1}$$

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

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

$$h(x) = \sin x$$

$$i(x) = \frac{\sin x}{\cos x}$$

$$\left(-\frac{2}{3}\right)^5 = -\frac{2}{3}\cdot\left(-\frac{2}{3}\right)\left(-\frac{2}{3}\right)\cdot\left(-\frac{2}{3}\right)\cdot\left(-\frac{2}{3}\right)$$

$$= -\frac{2^5}{3^5}$$

$$\left(\frac{a}{b}\right)^n = \frac{a^n}{b^n}$$

$$\sqrt{x} = \sqrt[2]{x^1}$$

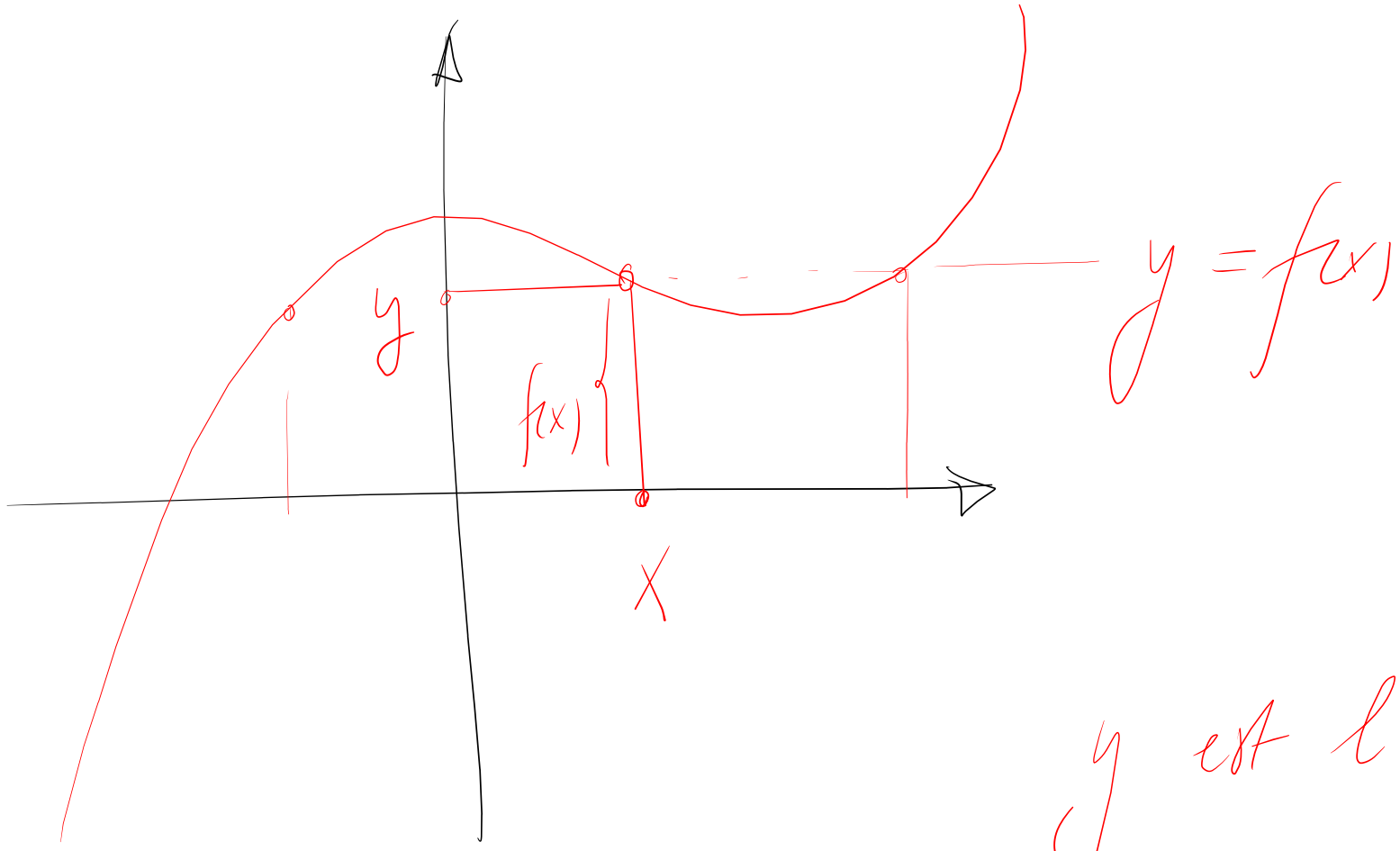
$$= x^{\frac{1}{2}}$$

$$\sqrt[3]{\sqrt{2}\cdot 2} = \sqrt[3]{2^{\frac{1}{2}}\cdot 2^{1}}$$

$$\sqrt[n]{x} = x^{\frac{1}{n}} = \left(2^{\frac{1}{2}}\cdot 2^{1}\right)^{\frac{1}{3}}$$

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

$$= \sqrt{2}$$



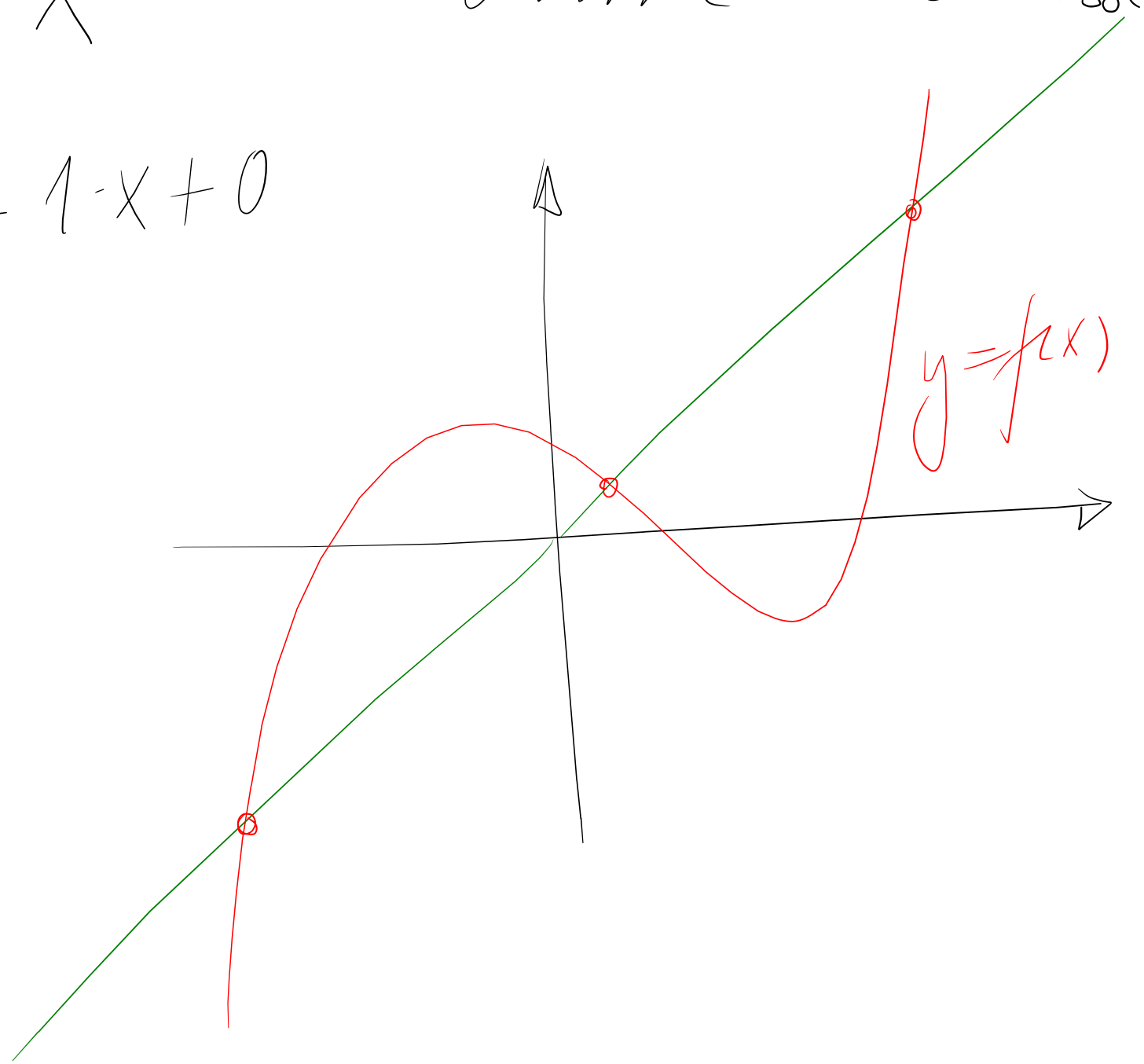
y est l'IMAGE de x par f.

x est le PRÉIMAGE de y par f.

$y = x$

$= 1 \cdot x + 0$

ordonnée = abscisse

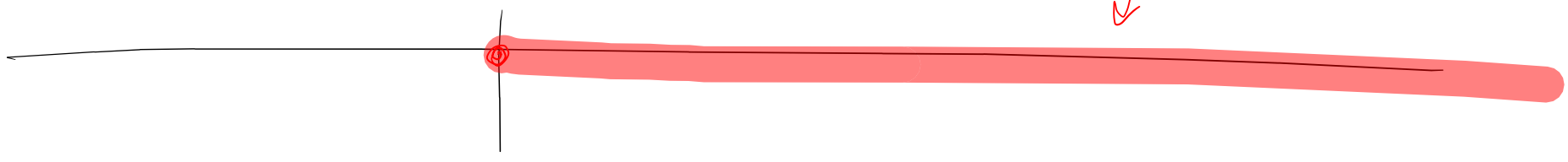


$$|a| = \begin{cases} a & \text{si } a \geq 0 \\ -a & \text{sinon} \end{cases}$$

$|-5| = 5$ $\quad$ $|6| = 6$

$|0| = 0$ $\quad$ $|-1| = 1$

$[2;+\infty[$



$\mathbb{R} -]-\infty; 2[$