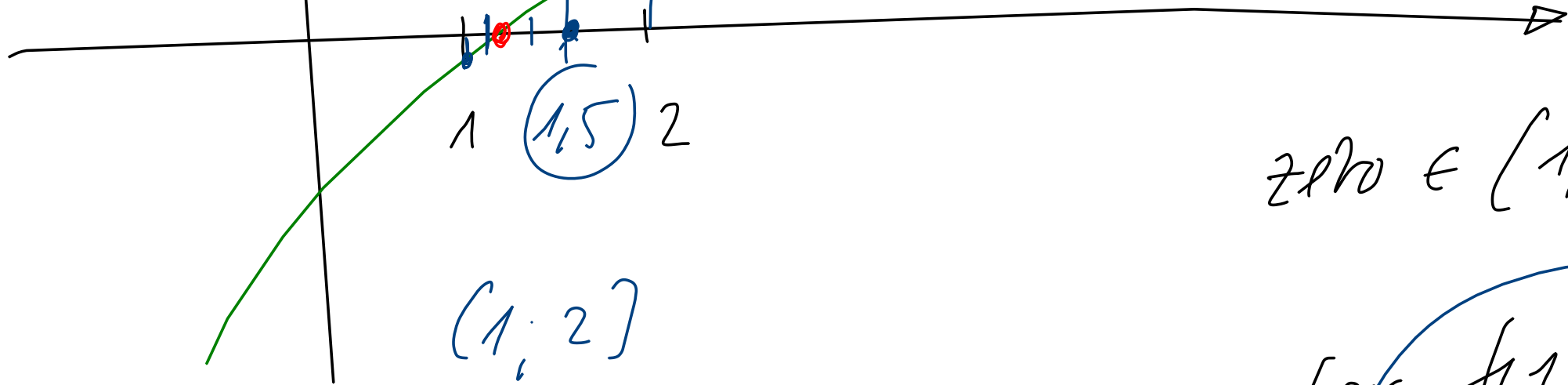


BISSECTION

$$f(x) = 0$$



$$\text{zero} \in [1, 2]$$

$$[1, 2]$$

$$[1, 1.5]$$

$$[1, 1.25]$$

$$[1.125, 1.25]$$

$$f(1) < 0 \quad f(1.5) > 0$$

$$\text{Car } f(1) < 0$$

$$f(2) > 0$$

f et $[a; b]$

hg. $f(a) \cdot f(b) < 0$

$[a; \frac{a+b}{2}]$ si $f(a) \cdot f(\frac{a+b}{2}) < 0$

milieu

$[a; b]$ ←

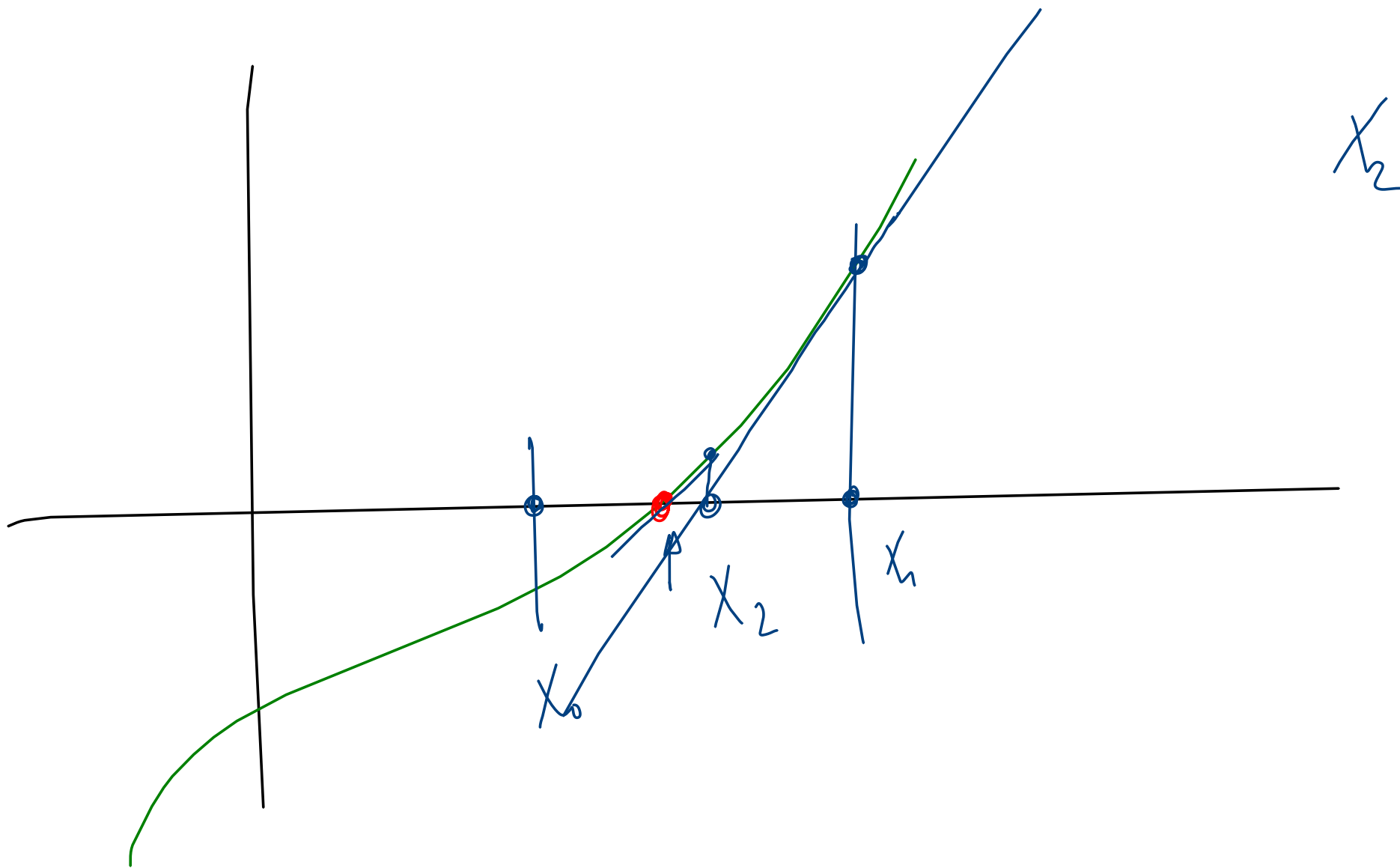
$[\frac{a+b}{2}, b]$ sinon

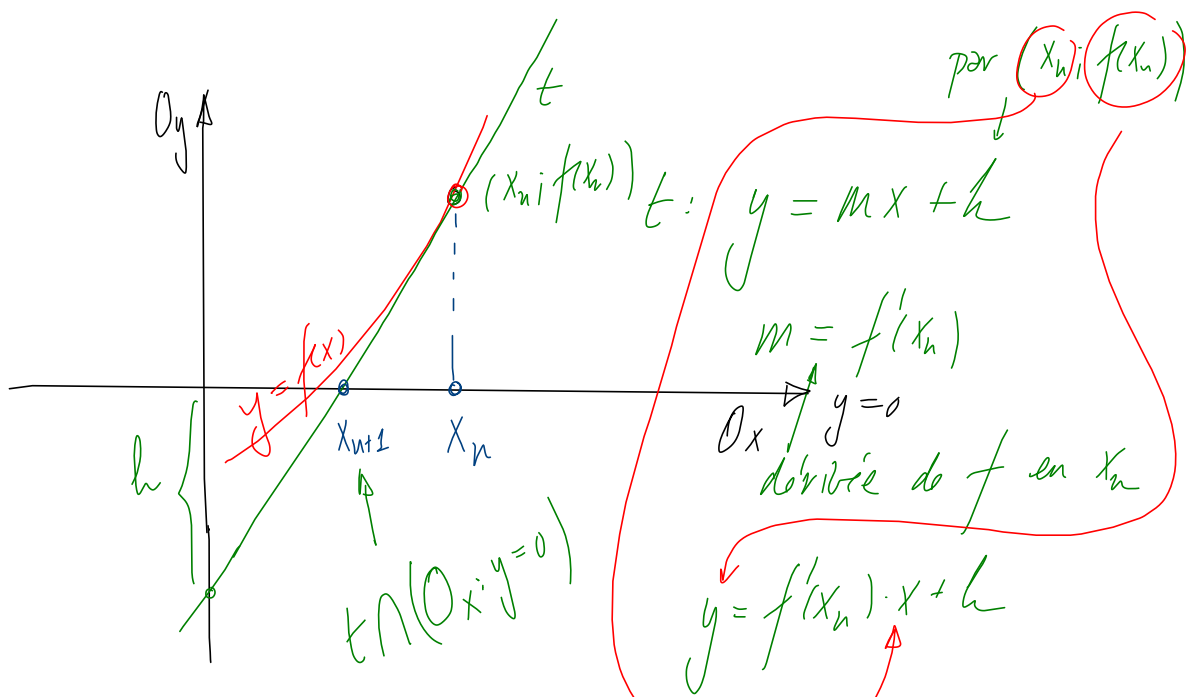
$$f(x) = \sin x + e^x - x - 2$$

$$f'(x) = \cos x + e^x - 1$$

1/22/20 Newton

$$f(x) = 0$$





$$f(x_n) = f'(x_n) \cdot x_n + h \Leftrightarrow h = f(x_n) - f'(x_n) \cdot x_n$$

$$t: y = f'(x_n) \cdot x + f(x_n) - f'(x_n) \cdot x_n$$

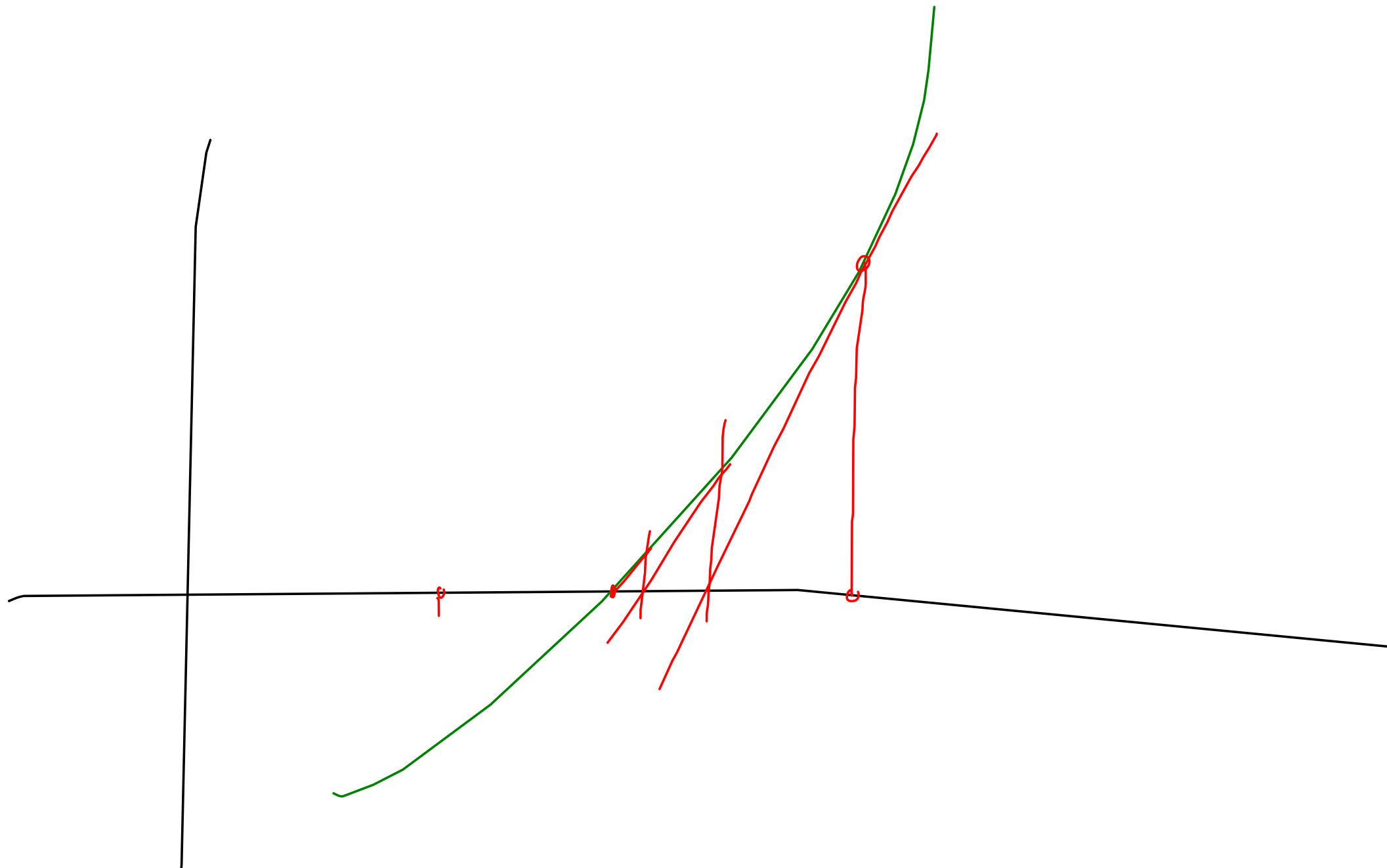
$$O_x: y = 0$$

$$0 = f'(x_n) \cdot x + f(x_n) - f'(x_n) \cdot x_n$$

$$\Rightarrow -f'(x_n) \cdot x = f(x_n) - f'(x_n) \cdot x_n$$

$$x = x_n - \frac{f(x_n)}{f'(x_n)}$$

$$\Rightarrow x_{n+1} = x_n - \frac{f(x_n)}{f'(x_n)}$$



$$f(x) = -5x^3 + 7x^2 + 3x - 3$$

$$f'(x) = -15x^2 + 14x + 3$$

$$f''(x) = -30x + 14$$

$$x_{n+1} = x_n - \frac{f(x_n)}{f'(x_n)}$$

$$x_0 = 1 \quad / \quad x_1 = 1 - \frac{f(1)}{f'(1)} \Leftrightarrow x_1 = 1 - \frac{f(x_0)}{f'(x_0)}$$

$= 1 - \frac{2}{2} = 0$

$$x_2 = 0 - \frac{f(0)}{f'(0)} = 0 - (-1) = 1$$

x_3

$$x_0 = C$$

$$x_{n+1} = x_n - \frac{f(x_n)}{f'(x_n)}$$

$f(x_{n+1}) > \text{tolerance}$
compteur $< 10^6$