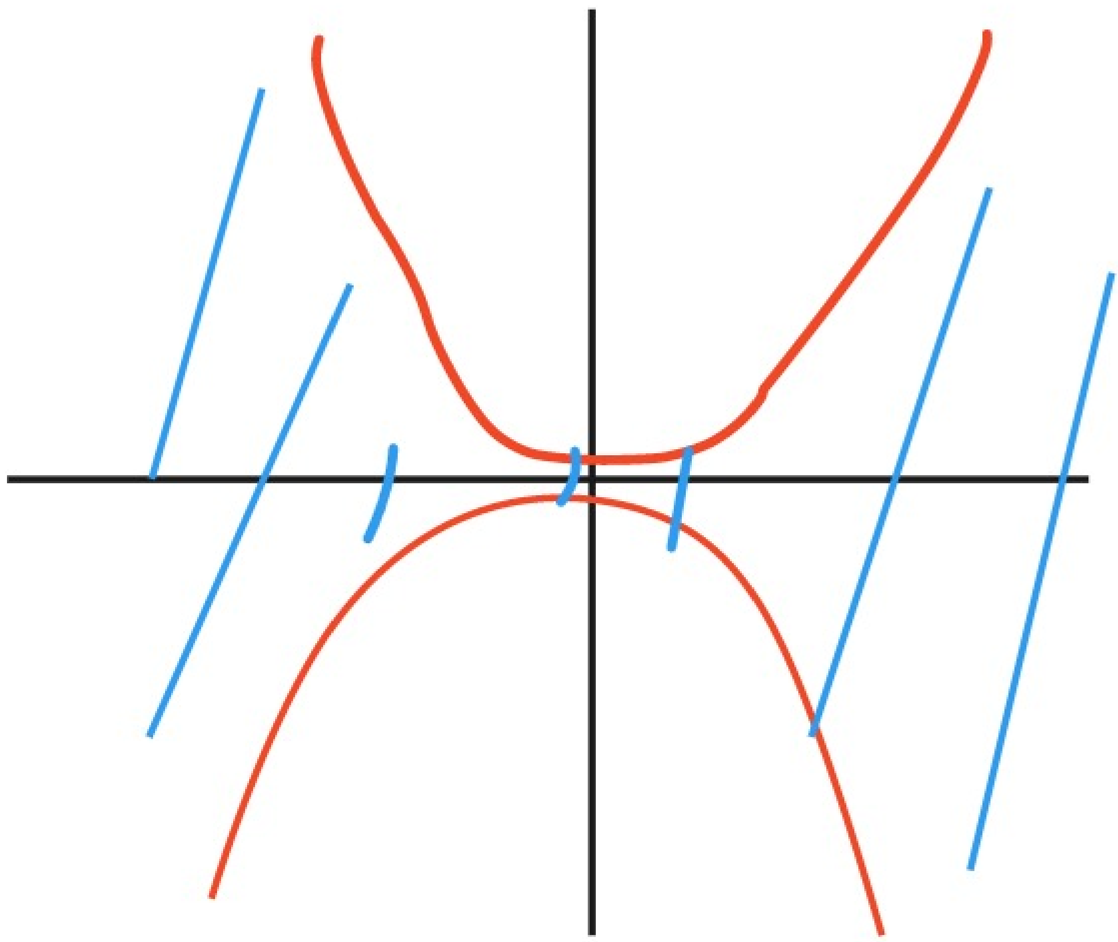
$f: \mathbb{R} \to \mathbb{R}$

$\boxed{|f(x)| \leq x^4}$

para todo $x \in \mathbb{R}$



Será que

$$\lim_{x \to 0} \frac{f(x)}{x^2} = 0$$

$$|f(x)| \leq x^4$$

$$\Downarrow$$

$$-x^4 \leq f(x) \leq x^4$$

$$-\frac{x^4}{x^2} \leq \frac{f(x)}{x^2} \leq \frac{x^4}{x^2}$$

$$-x^2 \leq \frac{f(x)}{x^2} \leq x^2$$

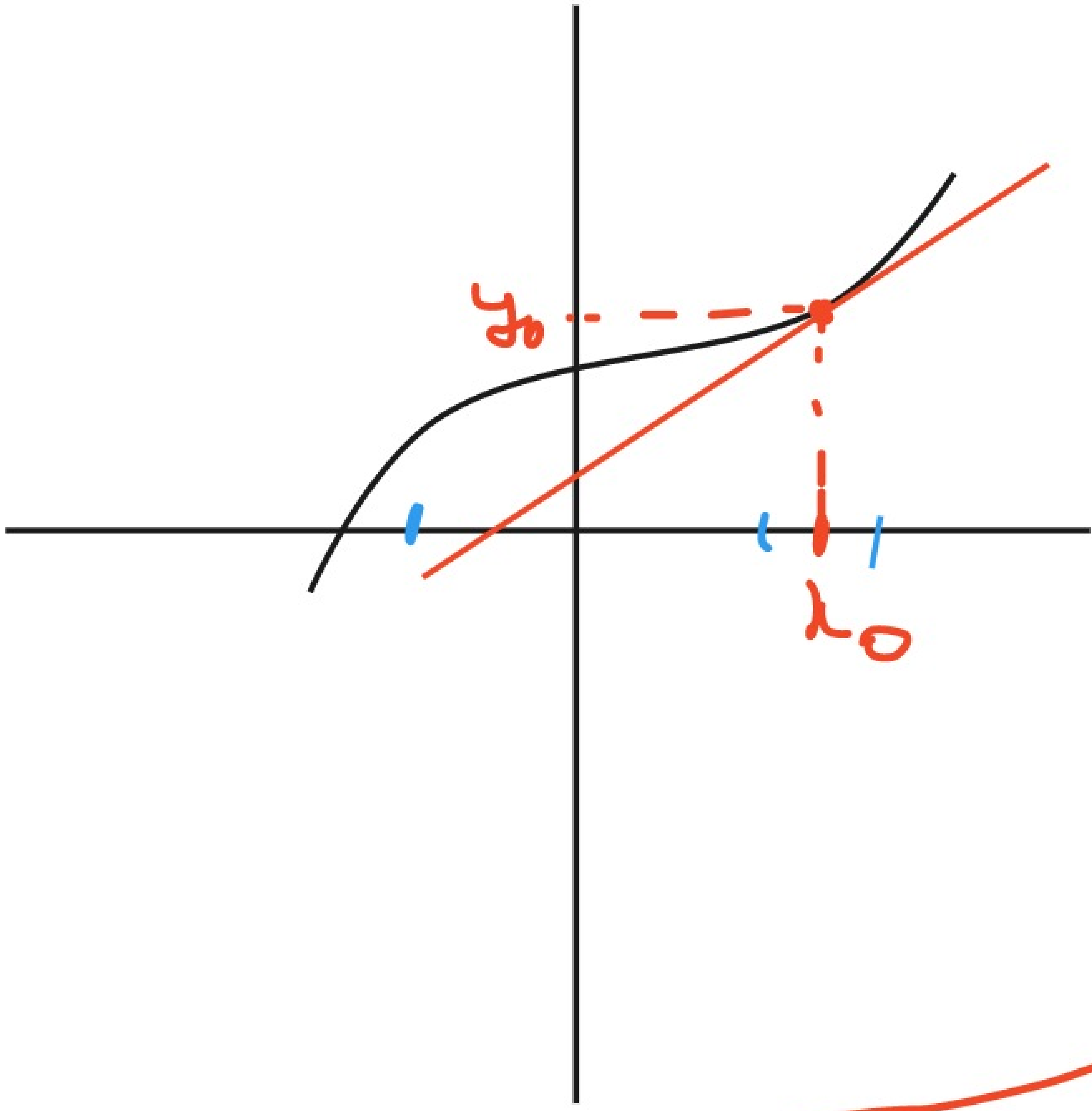
$\Downarrow$ t. do Conf.

$$\lim_{x \to 0} \frac{f(x)}{x^2} = 0 \checkmark$$

3 a) $\checkmark$

Se $|f(x)| \leq x^2$

$$-1 \leq \frac{f(x)}{x^2} \leq 1$$



$$\boxed{y - y_0 = f'(x_0) \cdot (x - x_0)}$$

$$y = y_0 + f'(x_0) \cdot (x - x_0)$$

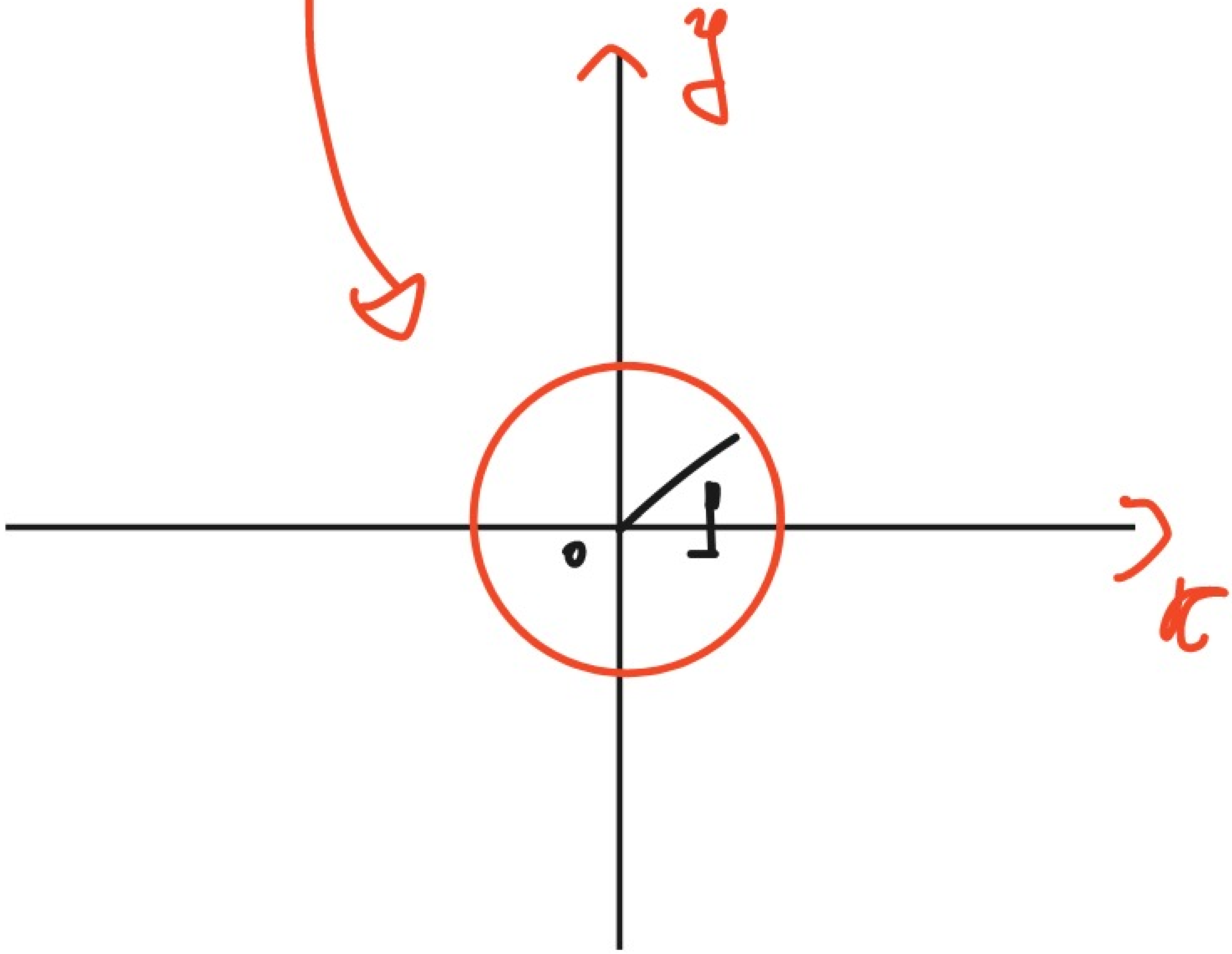
$$y = y_0 + f'(x_0)(x - x_0)$$

$$+ f''(x_0)(x - x_0)^2$$

$$+$$

miro

$$x^2 + y^2 = 1$$



Ex 1 EI 12.13

$y = f(x)$

D

$y^3 + 2xy^2 + x = 4$

$1 \in \operatorname{dom} f$

$f(1)$

$f(1)^3 + 2 \cdot 1 \cdot f(1)^2 + 1 = 4$

$z = f(1)$

$$z^3 + 2z^2 + 1 = 4$$

$$z^3 + 2z^2 - 3 = 0$$

*

1 é raiz

$$z^3 + 2z^2 - 3 \;\Big|\; z-1$$

$$+z^2 + 3$$

$$+3z^2 - 3$$

$$0$$

$$\downarrow$$

$$* = (z-1) \cdot (z^2+3)$$

$$(z-1)(z^2+3)=0$$

$$\boxed{z = 1}$$

$\in \mathbb{C}$ X

$$f(\underline{1}) = \underline{1}$$

$x = 1$

$f(1) = 1$

reta tangente

$f'(\overset{1}{x}) = ?$

Derivar

$(y^3 + 2xy^2 + x)' = 0$

$$3f(x)^2 \cdot f'(x) + 2f(x)^2 + 2x \cdot 2f(x) \cdot f'(x) + 1 = 0$$

$x=1 \rightsquigarrow 3 \cdot f(1)^2 \cdot f'(1) + 2 \cdot f(1)^2 + 2 \cdot 1 \cdot 2 \cdot f(1) \cdot f'(1) + 1 = 0$

$\rightsquigarrow 3 \cdot f'(1) + 2 + 4 \cdot f'(1) + 1 = 0$

$\rightsquigarrow 7f'(1) + 3 = 0 \rightsquigarrow f'(1) = -3/7$

$y - y_0 = f'(x_0) \cdot (x - x_0) \rightsquigarrow y = -3/7 \cdot x + 1 + 3/7 = \frac{-3x+10}{7}$

$f : [0,1] \to \mathbb{R} \quad 0 \leq f(x) \leq 1 \quad \forall x \in [0,1]$

existe $c \in [0,1]$ $f(c) = c \rightsquigarrow f(c) - c = 0$

$h : [0,1] \to \mathbb{R}$

$x \longmapsto f(x) - x$