$$\frac{dx}{dt}\Big|_{t_0} := \frac{dx(t)}{dt}\Big|_{t_0} = \lim_{t \to t_0} \frac{x(t) - x(t_0)}{t - t_0}$$

$d: \ y - y_1 = m(x - x_1) \Leftrightarrow A = (x_1, y_1) \in d$

$T_{x_1} f: \ y - y_1 = \frac{dy}{dx}\Big|_{x_1} (x - x_1)$

$y - y_1 = y'(x_1) \cdot (x - x_1)$

$B = (x_2, y_2)$

$A = (x_1, y_1)$

$C = (x_1, y_2)$

$|AC| = y_2 - y_1 = \Delta y$

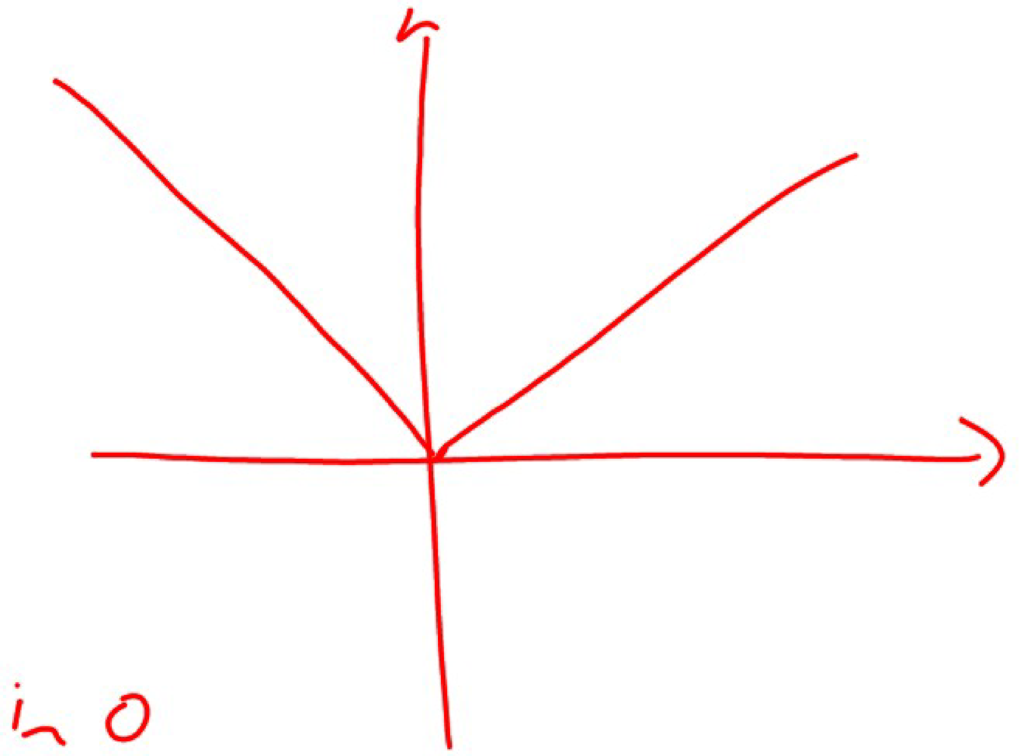
$|BC| = x_2 - x_1 = \Delta x$

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

$f(x) = |x| = \begin{cases} x & x \geq 0 \\ -x & x < 0 \end{cases}$

$$\frac{\Delta y}{\Delta x} = \frac{|AC|}{|BC|}$$

Panta lui $AB = \frac{|AC|}{|BC|} = \frac{\Delta y}{\Delta x}$



$f: \mathbb{R} \to \mathbb{R}$ liniară $\Leftrightarrow f(x) = a \cdot x \ (a \in \mathbb{R})$

$$f'(x) = \lim_{t \to x} \frac{f(t) - f(x)}{t - x}$$

f nu e derivabilă în 0

$$\lim_{\Delta x \to 0} \frac{(x+\Delta x)^2 - (x+\Delta x) - x^2 + x}{\Delta x} = \lim_{\Delta x \to 0} \frac{\cancel{x^2} + 2x\Delta x + \Delta x^2 - \cancel{x} - \Delta x - \cancel{x^2} + \cancel{x}}{\Delta x} =$$

$$= \lim_{\Delta x \to 0} \frac{2x\Delta x + \Delta x^2 - \Delta x}{\Delta x} = \lim_{\Delta x \to 0} (2x + \Delta x - 1) = 2x - 1$$

$$(x^4)' = 4x^3$$

$$\left(x^{-\frac{2}{3}}\right)' = -\frac{2}{3} x^{-\frac{5}{3}} = -\frac{2}{3} \frac{1}{\sqrt[3]{x^5}}$$

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

$$(a^x)' = a^x \cdot \ln a$$

$$\left(\frac{f}{g}\right)' = \frac{f'g - g'f}{g^2}$$

$f: A \to B,\ g: B \to C \qquad g \circ f: A \to C \qquad (g \circ f)(x) = g(f(x))$

$f(x) = exp(\sin(3x^2)) = e^{\sin(3x^2)} = e^{\sin(3x^2)} \cdot (\sin 3x^2)' = e^{\sin(3x^2)} \cdot \cos(3x^2) \cdot 6x = 6x \cos 3x^2 e^{\sin 3x^2}$

În punctele de minim și maxim tangenta este paralelă cu Ox $\Rightarrow$ are panta 0

x_0 punct de extrem $\Rightarrow f'(x_0) = 0$

Căutăm punctele de extrem printre rădăcinile lui $f'(x_0)$.