

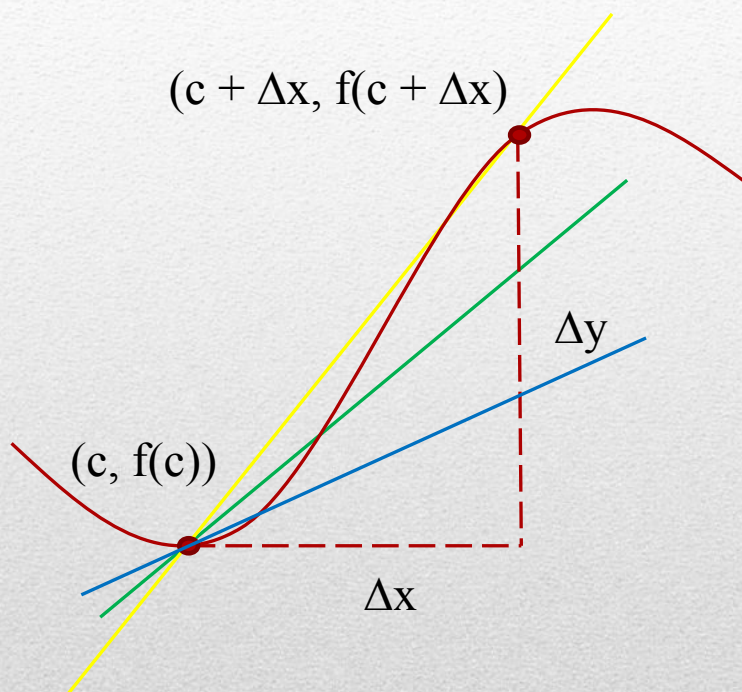


# ПРОИЗВОДНЫЕ

И ПРАВИЛА НАХОЖДЕНИЯ  
ПРОИЗВОДНЫХ

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# Производное: Геометрическое объяснение



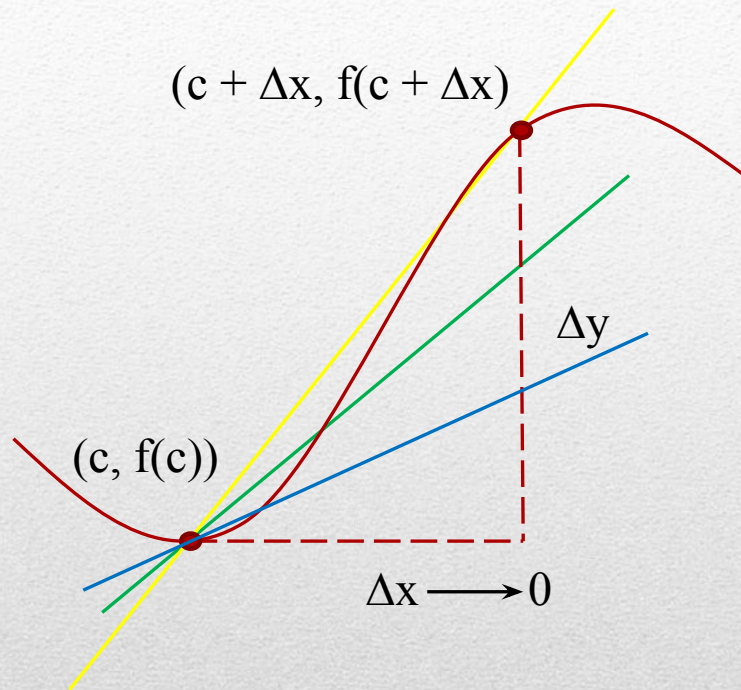
$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$m = \frac{f(x_2) - f(x_1)}{x_2 - x_1}$$

$$m = \frac{f(c + \Delta x) - f(c)}{(c + \Delta x) - c}$$

$$m = \frac{f(c + \Delta x) - f(c)}{\Delta x}$$

# Производное: Геометрическое объяснение



$$m = \lim_{\Delta x \rightarrow 0} \frac{f(c + \Delta x) - f(c)}{\Delta x}$$

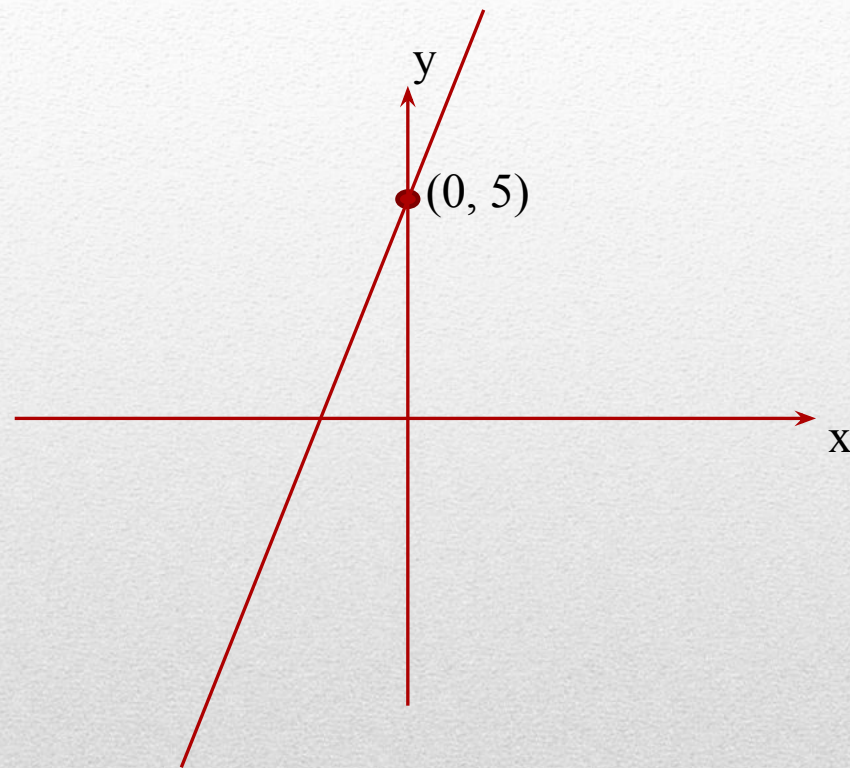
$$m = \lim_{\Delta x \rightarrow 0} \frac{f(c + \Delta x) - f(c)}{\Delta x}$$

$$\rightarrow f(x) = 3x + 5, (2, 11)$$

$$m_t = \lim_{\Delta x \rightarrow 0} \frac{(3(2 + \Delta x) - (3(2) + 5))}{\Delta x}$$

$$m_t = \lim_{\Delta x \rightarrow 0} \frac{(6 + 3\Delta x + 5 - 11)}{\Delta x}$$

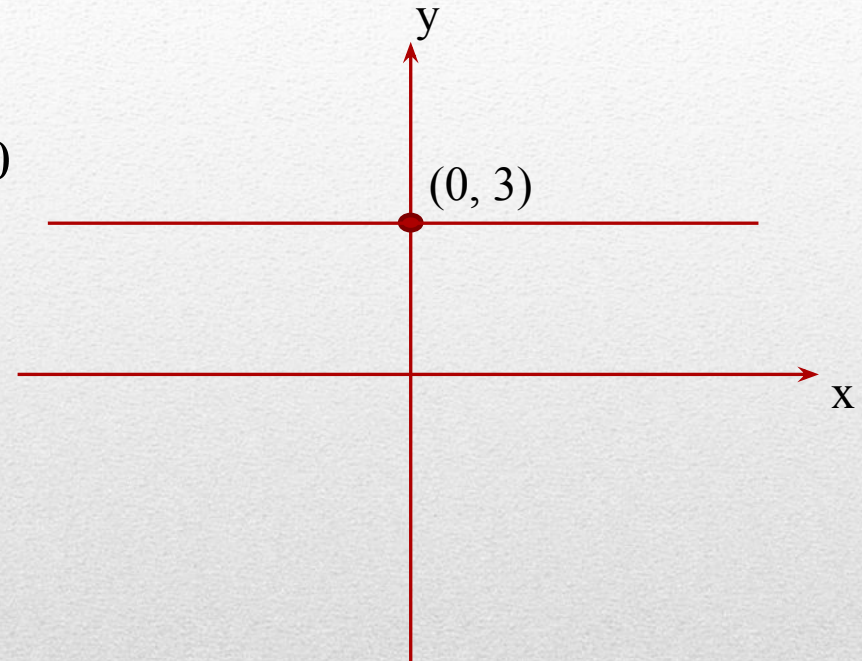
$$m_t = \lim_{\Delta x \rightarrow 0} \frac{3\Delta x}{\Delta x} = \lim_{\Delta x \rightarrow 0} (3) = 3$$



$$C' = 0$$

$$\rightarrow f(x) = 3$$

Так как, это горизонтальная линия  $\rightarrow m = 0$   
следовательно  $\rightarrow f'(3) = 0$



$$f'(x^n) = nx^{n-1}$$

$$\rightarrow f(x) = 2x^3 + 3x^2 + 4x$$

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

$$f'(x) = 6 \cdot x^2 + 6 \cdot x^1 + 4 \cdot x^0$$

$$x^0 = 1$$

$$f'(x) = 6x^2 + 6x + 4$$

$$\rightarrow f(x) = 3x^2 - 2x + 1$$

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

$$f'(x) = 6x^1 - 2x^0$$

$$x^0 = 1$$

$$f'(x) = 6x - 2$$

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$$\boxed{(\sqrt{x})' = \frac{1}{2\sqrt{x}}}$$

$$\rightarrow f(x) = \sqrt{x^3}$$

$$f'(x) = \frac{1}{2\sqrt{x^3}}$$

$$\rightarrow f(y) = \sqrt{y^7}$$

$$f'(y) = \frac{1}{2\sqrt{y^7}}$$

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