

## Function derivative example

Calculate the derivative of the following function:

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

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

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

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

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

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

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

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