

## Function derivative example

Calculate the derivative of the following function:

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

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

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

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

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

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

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

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