

Exercise 17

Calculate y' .

$$y = \sqrt{\arctan x}$$

Solution

Calculate y' by using the chain rule.

$$\begin{aligned}y' &= \frac{d}{dx} \sqrt{\arctan x} \\&= \frac{d}{dx} (\arctan x)^{1/2} \\&= \frac{1}{2} (\arctan x)^{-1/2} \cdot \frac{d}{dx} (\arctan x) \\&= \frac{1}{2} (\arctan x)^{-1/2} \cdot \left(\frac{1}{1+x^2} \right) \\&= \frac{1}{2\sqrt{\arctan x}} \cdot \left(\frac{1}{1+x^2} \right) \\&= \frac{1}{2(1+x^2)\sqrt{\arctan x}}\end{aligned}$$