Exercise 50

Find the derivative of the function. Simplify where possible.

$$y = \tan^{-1}(x^2)$$

Solution

Use the chain rule and the derivatives of the inverse trigonometric functions listed on page 214.

$$\begin{aligned}\frac{dy}{dx} &= \frac{d}{dx}\tan^{-1}(x^2) \\ &= \frac{1}{1+(x^2)^2}\cdot\frac{d}{dx}(x^2) \\ &= \frac{1}{1+x^4}\cdot(2x) \\ &= \frac{2x}{1+x^4}\end{aligned}$$