Exercise 51

Find the derivative of the function. Simplify where possible.

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

Solution

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

$$\frac{dy}{dx} = \frac{d}{dx} \sin^{-1}(2x + 1)$$

$$= \frac{1}{\sqrt{1 - (2x + 1)^2}} \cdot \frac{d}{dx}(2x + 1)$$

$$= \frac{1}{\sqrt{1 - (4x^2 + 4x + 1)}} \cdot (2)$$

$$= \frac{2}{\sqrt{-4x^2 - 4x}}$$

$$= \frac{2}{\sqrt{-4x(x + 1)}}$$

$$= \frac{1}{\sqrt{-x(x + 1)}}$$