Exercise 22

If the tangent line to $y = f(x)$ at $(4, 3)$ passes through the point $(0, 2)$, find $f(4)$ and $f'(4)$.

Solution

The tangent line touches the curve at $x = 4$, so

$$f(4) = 3.$$

The slope of the curve is the same as the slope of the tangent line at $x = 4$.

$$f'(4) = m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{2 - 3}{0 - 4} = \frac{1}{4}$$