Example

Find the slope of the tangent line to the graph of $f(x) = x^2 - 1$ at $x = -1$.

Find the equation of the tangent line.

Example

Find the derivative of $f(x) = x^2$.

Example

Find the derivatives of each of the following functions.

(a) $f(x) = 2x^3 + 4x$

(b) $g(x) = \dfrac{1}{x}$

(c) $h(x) = \sqrt{x}$

Example

The cost (in dollars) of producing x Alpha air purifiers is

$$C(x) = -\frac{1}{10}x^2 + 5x + 1000.$$

(a) Find the rate of change of cost with respect to the number of units manufactured.

(b) What is the marginal cost for producing 100 Alpha air purifiers? What is the fixed cost?