Examples

Find the derivatives of the following functions (using the product rule).

(a)
$$y = 2x^2(x+5)$$

(b)
$$f(x) = (3 + \sqrt{x}) (5x + 9x^3)$$

Examples

Find the derivatives of the following functions (using the quotient rule).

(a)
$$f(x) = \frac{x - 3x^2}{\sqrt{x}}$$

(b) $g(x) = \frac{3 + \sqrt{x}}{5x + 9x^3}$
(c) $f(x) = \frac{\sqrt{x}}{x - 3x^2}$

Example

Suppose the cost in dollars to make *x* hundred Gulf gadgets is

$$C(x)=\frac{2x^2+50}{x+1}.$$

- (a) Find the average cost per hundred gadgets.
- (b) Find the marginal average cost.
- (c) The average cost is generally minimized when the marginal average cost is zero. How many Gulf gadgets minimize the average cost?

Example

Let $f(x) = 1 - x^2$ and let $g(x) = \sqrt{x}$.

Find f(g(x)) and g(f(x)) and their domains.