

Functions

1. If $f(x) = x^3 + 4x - 3$, find $f(1), f(-1), f(0), f(\sqrt{2})$
2. Sketch the graph and determine the domain and range of f
 - a) $f(x) = -4x + 3$
 - b) $f(x) = 3$
 - c) $f(x) = \sqrt{36 - x^2}$
 - d) $f(x) = \sqrt{x^2 - 49}$
 - e) $f(x) = \frac{1}{x - 4}$
 - f) $f(x) = \frac{5}{x^2 - x - 12}$
 - g) $f(x) = |x - 4|$
 - h) $f(x) = 2 - \sqrt{x}$
3. Find the sum, difference and product of f and g
 - a) $f(x) = 3x^2, g(x) = \frac{1}{2x - 3}$
 - b) $f(x) = x^3 + 3x, g(x) = 3x^2 + 1$
 - c) $f(x) = 2x^3 - x + 5, g(x) = x^2 + x + 2$
4. Find $(f \circ g)(x)$ and $(g \circ f)(x)$ where $(f \circ g)(x) = f(g(x))$
 - a) $f(x) = 2x^2 + 5, g(x) = 4 - 7x$
 - b) $f(x) = \sqrt{2x + 1}, g(x) = x^2 + 3$
 - c) $f(x) = 2x - 3, g(x) = \frac{x + 3}{2}$
5. Graph the following functions and determine the value of y as x gets close to the indicated value.
 - b) $f(x) = \frac{x - 4}{x^2 - x - 12}$ as x gets close to 4
 - b) $f(x) = \frac{x^3 - 27}{x^2 - 9}$ as x gets close to 3
 - c) $f(x) = \frac{4 - x^2}{3 - \sqrt{x} + 5}$ as x gets close to 2
 - d) $f(x) = \frac{3x - 2}{9x + 7}$ as x gets close to ∞
 - e) $f(x) = \frac{2x^3}{x^2 + 1}$ as x gets close to ∞