1. We say that a function f is the *inverse* of a function g if

$$(f \circ g)(x) = x \text{ and } (g \circ f)(x) = x.$$

Verify that the given functions are inverses of each other.

(a) $f(x) = 2x - 8, \quad g(x) = \frac{1}{2}x + 4$

(b) $f(x) = \sqrt[3]{x} + 1, \quad g(x) = (x-1)^3$

(c) $f(x) = \frac{1}{x+1}, \quad g(x) = \frac{1}{x} - 1$

2. For each f, compute f^{-1}. Then find the range of f by finding the domain of f^{-1}.

(a) $f(x) = 4x - 1$

(b) $f(x) = 2x^3 - 1$

(c) $f(x) = \frac{2}{x-3}$

(d) $f(x) = \frac{x-5}{x+2}$

3. Determine whether each function is one-to-one.

(a) $f(x) = 2$

(b) $f(x) = 3x - 1$

(c) $f(x) = x^2$

(d) $f(x) = x^3$

(e) $f(x) = \sqrt{x}$

(f) $f(x) = \sqrt[3]{x}$

(g) $f(x) = |x|$

(h) $f(x) = \frac{1}{x}$

(i) $f(x) = \frac{1}{x^2}$

4. For each function in #3 that was one-to-one, compute its inverse.

5. For each function in #3 that was <u>not</u> one-to-one, state the largest subset of its domain for which the function would be one-to-one.