1. We say that a function $f$ is the \textit{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) \( f(x) = 2x - 8, \  g(x) = \frac{1}{2}x + 4 \)
(b) \( f(x) = \sqrt[3]{x} + 1, \  g(x) = (x - 1)^3 \)
(c) \( f(x) = \frac{1}{x + 1}, \  g(x) = \frac{1}{x} - 1 \)

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 not one-to-one, state the largest subset of its domain for which the function would be one-to-one.