1.9 Inverse Functions

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In Exercises 7 - 14, find the inverse function of f informally. Verify that $f(f^{-1}(x)) = x$ and $f^{-1}(f(x)) = x$.

P 7. $f(x) = 6x$ **P 9.** $f(x) = x + 9$ **P 11.** $f(x) = 3x + 1$ **P 13.** $f(x) = \sqrt[3]{x}$

P 20. Verify that f and g are inverse functions.

$$f(x) = \frac{x - 9}{4}, \quad g(x) = 4x + 9$$

P 22. Verify that f and g are inverse functions.

$$f(x) = \frac{x^3}{2}, \quad g(x) = \sqrt[3]{2x}$$

P 25. Show that f and g are inverse functions (a) algebraically and (b) graphically.

$$f(x) = 7x + 1, \quad g(x) = \frac{x - 1}{7}$$

P 31. Show that f and g are inverse functions (a) algebraically and (b) graphically.

$$f(x) = 9 - x^2,\ x \geq 0, \quad g(x) = \sqrt{9 - x},\ x \leq 0$$

P 34. Show that f and g are inverse functions (a) algebraically and (b) graphically.

$$f(x) = \frac{x + 3}{x - 2}, \quad g(x) = \frac{2x + 3}{x - 1}$$

P 59. Find the inverse function of f and verify that $f(f^{-1}(x)) = x$ and $f^{-1}(f(x)) = x$.

$$f(x) = \sqrt[3]{x-1}$$

P 61. Find the inverse function of f and verify that $f(f^{-1}(x)) = x$ and $f^{-1}(f(x)) = x$.

$$f(x) = \frac{6x+4}{4x+5}$$

P 82. Restrict the domain of the function f so that the function has an inverse function. Then find f^{-1}.

$$f(x) = |x - 5|$$

P 83. Restrict the domain of the function f so that the function has an inverse function. Then find f^{-1}.

$$f(x) = -2x^2 + 5$$