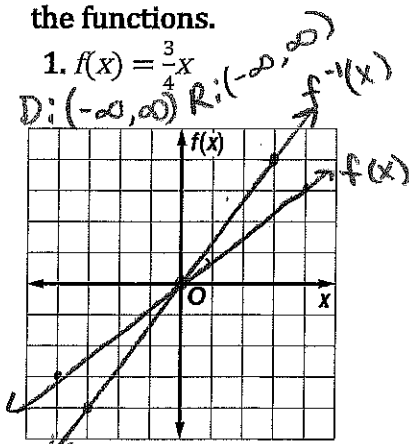


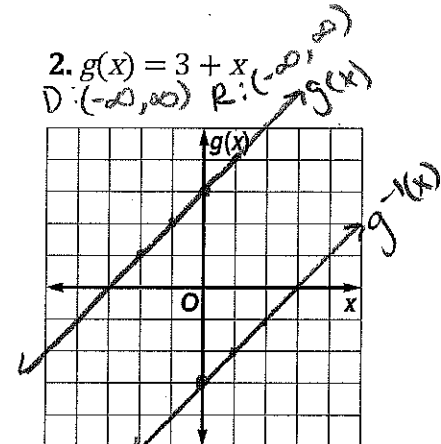
6-2 Day 2 Skills Practice

Inverse Functions and Relations

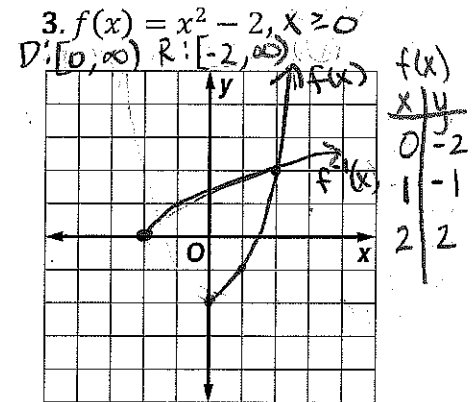
Find the inverse of each function. Then graph the function and its inverse. State the domain and range for the functions.



① $y = \frac{3}{4}x$
 ② $x = \frac{3}{4}y$
 ③ $\frac{4}{3}(x) = (\frac{3}{4}y) \cdot \frac{4}{3}$
 $\frac{4}{3}x = y$
 ↑
 slope yint: (0,0)
 $D: (-\infty, \infty)$ $R: (-\infty, \infty)$



① $y = 3 + x$
 ② $x = 3 + y$
 ③ $x - 3 = y$
 ↑ ↑
 slope yint
 1 3
 $D: (-\infty, \infty)$
 $R: (-\infty, \infty)$



① $y = x^2 - 2$
 ② $x = y^2 - 2$
 ③ $x + 2 = y^2$
 $\sqrt{x+2} = \sqrt{y^2}$
 $\sqrt{x+2} = y$
 $D: x+2 \geq 0$
 $D: x \geq -2$ $R: [0, \infty)$
 $[-2, \infty)$

x	y
-2	0
-1	1
2	2

Determine whether each pair of functions are inverse functions using composition. Write yes or no.

4. $f(x) = x - 1$
 $g(x) = 1 - x$
 $f(g(x)) = (1 - x) - 1 = 1 - x - 1 = -x$ ✓
 $g(f(x)) = 1 - (x - 1) = 1 - x + 1 = 2 - x$ ✗
 not inverses.

6. $f(x) = 5x - 5$
 $g(x) = \frac{1}{5}x + 1$
 $f(g(x)) = 5(\frac{1}{5}x + 1) - 5 = x + 5 - 5 = x$ ✓
 $g(f(x)) = \frac{1}{5}(5x - 5) + 1 = x - 1 + 1 = x$ ✓
 yes inverses

5. $f(x) = 2x + 3$
 $g(x) = \frac{1}{2}(x - 3)$
 $f(g(x)) = 2(\frac{1}{2}(x - 3)) + 3 = (x - 3) + 3 = x$ ✓
 $g(f(x)) = \frac{1}{2}(2x + 3) - 3 = \frac{1}{2}(2x) = x$ ✓
 yes inverses

7. $f(x) = -x^2 - 2$
 $g(x) = \sqrt{-x - 2}$
 $f(g(x)) = -(\sqrt{-x - 2})^2 - 2 = -(-x - 2) - 2 = x + 2 - 2 = x$ ✓
 $g(f(x)) = \sqrt{-(-x^2 - 2) - 2} = \sqrt{x^2 + 2 - 2} = \sqrt{x^2} = x$ ✓
 yes inverses

8. MEASUREMENT The points (63, 121), (71, 180), (67, 140), (65, 108), and (72, 165) give the weight in pounds as a function of height in inches for 5 students in a class. Give the points for these students that represent height as a function of weight.

$$(121, 63), (180, 71), (140, 67), (108, 65), (165, 72)$$

9. REMODELING The Clearys are replacing the flooring in their 15-foot by 18-foot kitchen. The new flooring costs \$17.99 per square yard. The formula $f(x) = 9x$ converts square yards to square feet.

a. Find the inverse $f^{-1}(x)$. What is the significance of $f^{-1}(x)$ for the Clearys?

$$\begin{aligned} \textcircled{1} & y = 9x \\ \textcircled{2} & x = 9y \\ \textcircled{3} & \frac{1}{9}x = y \end{aligned}$$

It will let them convert feet to yards to find the cost to replace their flooring.

b. What will the new flooring cost the Clearys?

$$\begin{aligned} & 15\text{ft} \times 18\text{ft} \\ & \swarrow \quad \searrow \\ \frac{1}{9}(15) = y & \quad \frac{1}{9}(18) = y \\ \frac{15}{9} = y & \quad 2 = y \\ \frac{5}{3} = y & \\ \frac{5}{3} \text{ yards} \times 2 \text{ yards} & = \frac{10}{3} \text{ yards}^2 \text{ is area.} \end{aligned}$$

$$\frac{10}{3} \cdot 17.99 = \$59.97 \text{ for flooring.}$$