

LESSON
7-2

Practice C
Inverses of Relations and Functions

Use inverse operations to write the inverse of each function.

1. $f(x) = 0.2x + 1$

2. $f(x) = x^2 + 9$

3. $f(x) = 7 - 4x$

4. $f(x) = -\frac{x+2}{8}$

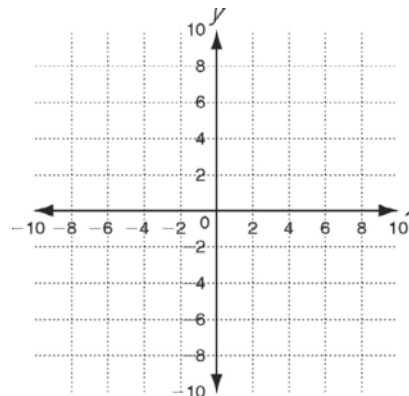
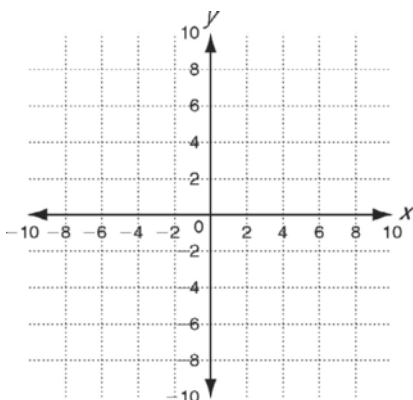
5. $f(x) = \frac{x^2}{16}$

6. $f(x) = \frac{5x-2}{6}$

Graph each function. Then write and graph its inverse.

7. $f(x) = \frac{x-4}{3}$

8. $f(x) = 3 + 0.3x$



Solve.

9. Frank wants to take out a home equity credit line. The maximum credit line he can get is equal to 80% of the equity he has in his home. Equity is the difference between the home's market value, v , and the mortgage balance, m .

a. Write an equation for the amount of the credit line, c , as a function of the market value, v , and the mortgage balance, m .

b. Find the inverse function that models the market value as a function of the amount of the credit line and the mortgage balance.

c. What is the market value of Frank's home if he qualifies for a credit line of \$72,000 and $m = \$150,000$?

b. Domain: $\{x \mid 0 \leq x \leq 6\}$; range:
 $\{y \mid 3 \leq y \leq 7\}$

d. Domain: $\{x \mid 3 \leq x \leq 7\}$; range:
 $\{y \mid 0 \leq y \leq 6\}$

2. a. Adding 9

b. Dividing by 2

c. $\frac{1}{2}(x+9)$

3. $f^{-1}(x) = -\frac{x}{4}$

4. $f^{-1}(x) = x - 6$

5. $f^{-1}(x) = \frac{x}{3} + 4$

6. $f^{-1}(x) = -\frac{x-6}{10}$

7. $f^{-1}(x) = \frac{x-1}{7}$

8. $f^{-1}(x) = \frac{x}{22}$

9. a. $c = x + 0.15x$, or $c = 1.15x$

b. $x = \frac{c}{1.15}$

c. $x = 8.60$

Practice B

1. $f^{-1}(x) = \frac{x+10}{15}$

2. $f^{-1}(x) = -\frac{x-10}{4}$

3. $f^{-1}(x) = -\frac{x-12}{9}$

4. $f^{-1}(x) = \frac{x-2}{5}$

5. $f^{-1}(x) = x - 6$

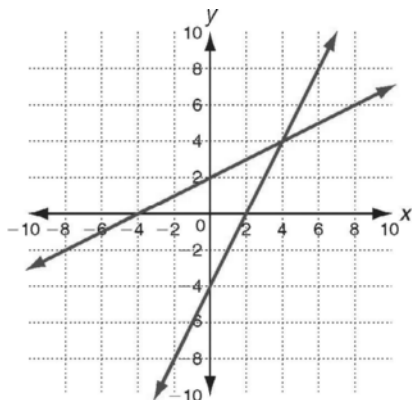
6. $f^{-1}(x) = x - \frac{1}{2}$

7. $f^{-1}(x) = -12x$

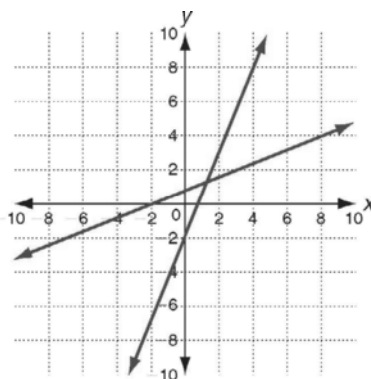
8. $f^{-1}(x) = 4x + 12$

9. $f^{-1}(x) = \frac{6x-1}{3}$, or $f^{-1}(x) = 2x - \frac{1}{3}$

10. $f^{-1}(x) = \frac{1}{2}x + 2$



11. $f^{-1}(x) = \frac{2}{5}(x+2)$



12. a. $c = \frac{d+1.5}{0.15}$

b. $c = 130$

c. \$112

Practice C

1. $f^{-1}(x) = 5x - 5$

2. $f^{-1}(x) = \pm\sqrt{x-9}$

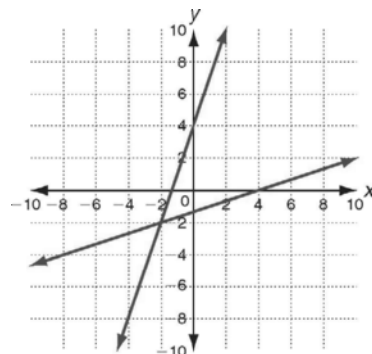
3. $f^{-1}(x) = -\frac{x-7}{4}$

4. $f^{-1}(x) = -8x - 2$

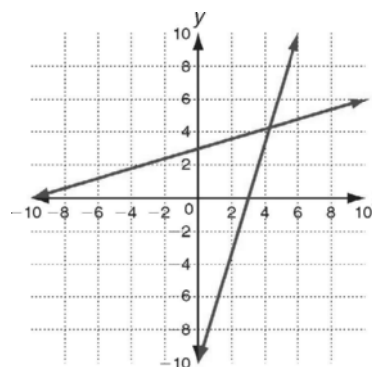
5. $f^{-1}(x) = \pm 4\sqrt{x}$

6. $f^{-1}(x) = \frac{6x+2}{5}$

7. $f^{-1}(x) = 3x + 4$



8. $f^{-1}(x) = \frac{x-3}{0.3}$



9. a. $c = 0.8(v - m)$

b. $v = \frac{c + 0.8m}{0.8}$

c. \$240,000

Reteach

1.

x	6	10	12	13	13
y	0	2	5	8	10

$\{x|0 \leq x \leq 10\}$

$\{y|6 \leq y \leq 13\}$

$\{x|6 \leq x \leq 13\}$

$\{y|0 \leq y \leq 10\}$

2. $f^{-1}(x) = x + 4$

$f(5) = 1; f^{-1}(1) = 5$

3. $f^{-1}(x) = 6x$

$f(12) = 2; f^{-1}(2) = 12$

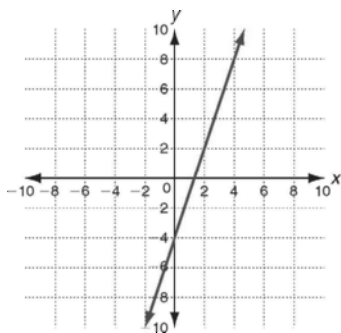
4. $f^{-1}(x) = x - 3$

5. $f^{-1}(x) = \frac{x}{14}$

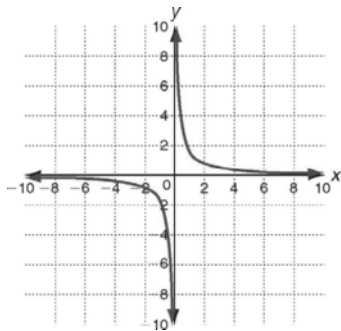
Challenge

1. Possible answer: For every value of y , except 0, there are 2 values of x .

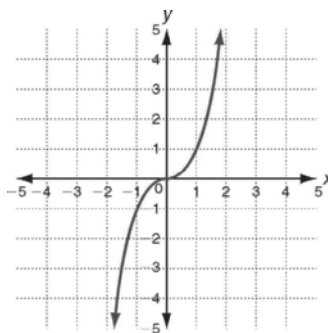
2. Yes; $y = \frac{x + 4}{3}$; yes



3. Yes; $y = \frac{1}{x}$; yes

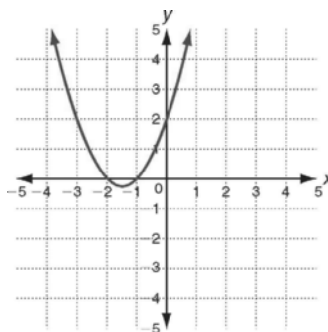


4. Yes; $y = \sqrt[3]{x}$; yes



5. No; function is not one-to-one;

$y = -3 \pm \frac{\sqrt{1 - 4x}}{2}$; inverse is not a function.



Problem Solving

1. a. $p = 1.09(3n + 5)$

b. $\frac{p - 5.45}{3.27} = n$

c. $n = \frac{42.51}{3.27} = 13$

d. The price has increased by \$1.

2. a. \$76.30

b. \$2.00

3. C

4. B

Reading Strategies

1. a. Possible answer: Reverse each ordered pair.

b. $R^{-1} = \{(1, -1), (1, 1), (4, -2), (4, 2)\}$

c. No; possible answer: Both x -values 1 and 4 have more than one y -value.

2. a. 3

b. 2

c. 8

3. Possible answer: Subtract 1 to undo the addition. Then multiply by 2 to undo the division.