



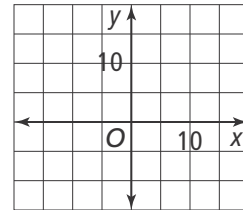
5-6 Additional Practice

Inverse Relations and Functions

1. Identify the inverse relation. Is it a function?

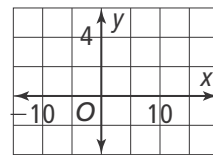
x	4	3	9	2	8	1
y	5	-1	6	3	5	7

2. Let $f(x) = 5x - 1$. Write an equation for f^{-1} . Sketch the graphs of f and f^{-1} on the same coordinate plane. Is f^{-1} a function?



3. Find the inverse of the function $f(x) = x^2 + 10x + 25$. Identify an appropriate restriction of its domain.

4. Sketch the graph of $f(x) = 3 - \sqrt[3]{x+2}$ and verify that the inverse is a function. Then write an equation for f^{-1} .



5. Use composition to determine whether f and g are inverse functions.

$$f(x) = \frac{1}{5}x - 3, \quad g(x) = 5x + 15$$

6. Describe and correct the error a student made in finding the inverse of the function $f(x) = x^2 - 25$.

$$y = x^2 - 25$$

$$x = y^2 - 25$$

$$\sqrt{x} = \sqrt{y^2 - 25}$$

$$\sqrt{x} = y - 5$$

$$\sqrt{x} + 5 = y$$

$$f^{-1}(x) = \sqrt{x} + 5$$

7. A coffee can is in the shape of a cylinder, with a radius r and height h .

a. Find the formula that gives the radius of the paint can in terms of the volume, V .

b. Describe any restrictions on the formula.

c. What is the radius of a coffee can with volume 46.25π in.³ and height is 7.4 in.?



5-6 Additional Practice

Inverse Relations and Functions

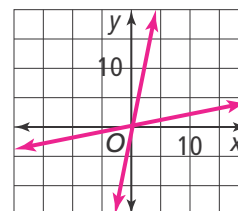
1. Identify the inverse relation. Is it a function? **No**

x	4	3	9	2	8	1
y	5	-1	6	3	5	7

x	5	-1	6	3	5	7
y	4	3	9	2	8	1

2. Let $f(x) = 5x - 1$. Write an equation for f^{-1} . Sketch the graphs of f and f^{-1} on the same coordinate plane. Is f^{-1} a function?

$$f^{-1}(x) = \frac{x+1}{5}; \text{ yes}$$

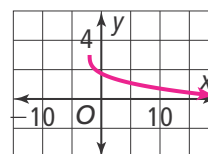


3. Find the inverse of the function $f(x) = x^2 + 10x + 25$. Identify an appropriate restriction of its domain.

$$f^{-1}(x) = \sqrt{x} - 5; x \geq 0$$

4. Sketch the graph of $f(x) = 3 - \sqrt[3]{x+2}$ and verify that the inverse is a function. Then write an equation for f^{-1} .

$$f^{-1}(x) = -(x-3)^3 - 2$$



5. Use composition to determine whether f and g are inverse functions.

$$f(x) = \frac{1}{5}x - 3, g(x) = 5x + 15$$

$$(f \circ g)(x) = (g \circ f)(x) = x; \text{ They are inverse functions.}$$

6. Describe and correct the error a student made in finding the inverse of the function $f(x) = x^2 - 25$.

$$y = x^2 - 25$$

$$x = y^2 - 25$$

$$\sqrt{x} = \sqrt{y^2 - 25} \quad x + 25 = y^2$$

$$\sqrt{x} = y - 5$$

$$\sqrt{x} + 5 = y$$

$$f^{-1}(x) = \sqrt{x} + 5$$

The student took the square root before isolating the squared term.

$$\sqrt{y^2} = \sqrt{x + 25}$$

$$y = \pm\sqrt{x + 25}$$

$$f^{-1} = \sqrt{x + 25}$$

In order for the inverse to be a function, you must consider only the positive (or only the negative) values of $\sqrt{x + 25}$.

7. A coffee can is in the shape of a cylinder, with a radius r and height h .

- a. Find the formula that gives the radius of the paint can in terms of the volume, V . $r = \sqrt{\frac{V}{\pi h}}$

- b. Describe any restrictions on the formula. $h > 0; V > 0; r > 0$

- c. What is the radius of a coffee can with volume $46.25\pi \text{ in.}^3$ and height is 7.4 in.? **2.5 in.**