NAME _____ DATE _____ PERIOD _____

1-7 Study Guide and Intervention

Functions

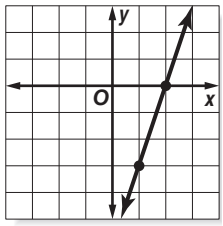
Identify Functions Relations in which each element of the domain is paired with exactly one element of the range are called **functions**.

Example 1 **Determine whether the relation {(6, −3), (4, 1), (7, −2), (−3, 1)} is a function. Explain.**

Since each element of the domain is paired with exactly one element of the range, this relation is a function.

Example 2 **Determine whether $3x - y = 6$ is a function.**

Since the equation is in the form $Ax + By = C$, the graph of the equation will be a line, as shown at the right.



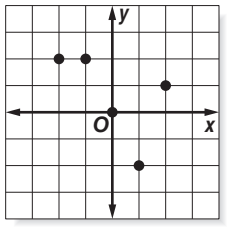
If you draw a vertical line through each value of x, the vertical line passes through just one point of the graph. Thus, the line represents a function.

Lesson 1-7

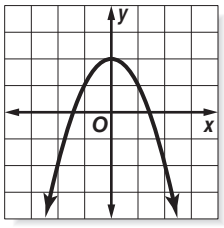
Exercises

Determine whether each relation is a function.

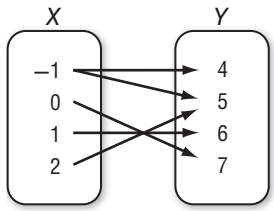
1.



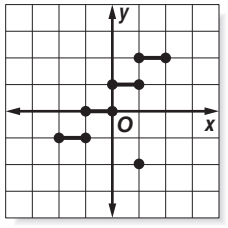
2.



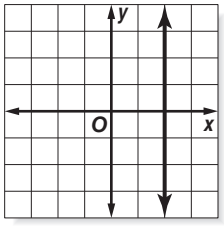
3.



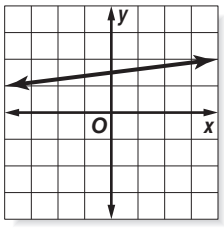
4.



5.



6.



7. {(4, 2), (2, 3), (6, 1)}

8. {(−3, −3), (−3, 4), (−2, 4)}

9. {(−1, 0), (1, 0)}

10. $-2x + 4y = 0$

11. $x^2 + y^2 = 8$

12. $x = -4$

NAME _____ DATE _____ PERIOD _____

1-7 Study Guide and Intervention *(continued)*

Functions

Find Function Values Equations that are functions can be written in a form called **function notation**. For example, $y = 2x - 1$ can be written as $f(x) = 2x - 1$. In the function, x represents the elements of the domain, and $f(x)$ represents the elements of the range. Suppose you want to find the value in the range that corresponds to the element 2 in the domain. This is written $f(2)$ and is read "f of 2." The value of $f(2)$ is found by substituting 2 for x in the equation.

Example **If $f(x) = 3x - 4$, find each value.**

a. $f(3)$

$f(3) = 3(3) - 4$ Replace x with 3.

$= 9 - 4$ Multiply.

$= 5$ Simplify.

b. $f(-2)$

$f(-2) = 3(-2) - 4$ Replace x with -2.

$= -6 - 4$ Multiply.

$= -10$ Simplify.

Exercises

If $f(x) = 2x - 4$ and $g(x) = x^2 - 4x$, find each value.

1. $f(4)$ **2.** $g(2)$ **3.** $f(-5)$

4. $g(-3)$ **5.** $f(0)$ **6.** $g(0)$

7. $f(3) - 1$ **8.** $f\left(\frac{1}{4}\right)$ **9.** $g\left(\frac{1}{4}\right)$

10. $f(a^2)$ **11.** $f(k + 1)$ **12.** $g(2n)$

13. $f(3x)$ **14.** $f(2) + 3$ **15.** $g(-4)$