

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**.

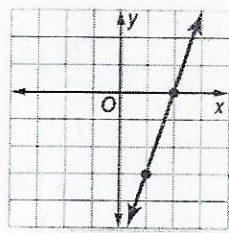
Example 1

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

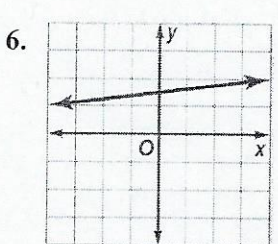
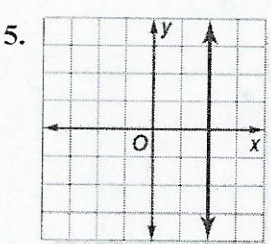
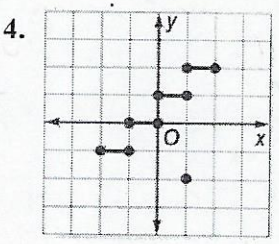
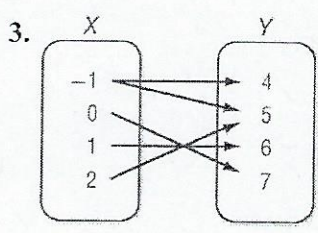
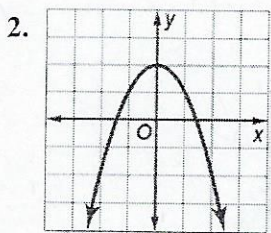
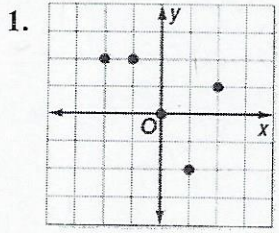
Determine whether $3x - y = 6$ is a function.
 Since the equation is in the form $Ax + By = C$, the graph of the equation will be a line, as shown.

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.



Exercises

Determine whether each relation is a function.



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. $x = -4$

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

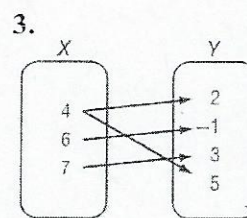
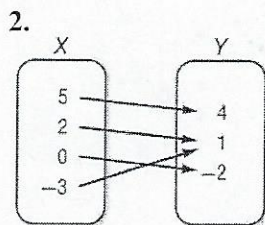
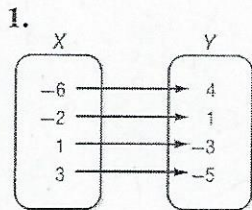
If $f(x) = 2x - 4$ and $g(x) = x^2 - 4x$, find each value.

- | | | |
|---------------|--------------------------------|--------------------------------|
| 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. $g(-4)$ |

1-7 Skills Practice

Functions

Determine whether each relation is a function.



4.

x	y
4	-5
-1	-10
0	-9
1	-7
9	1

5.

x	y
2	7
5	-3
3	5
-4	-2
5	2

6.

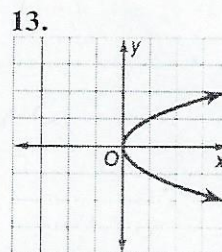
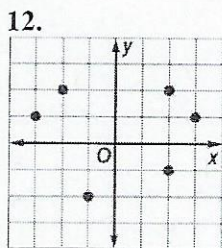
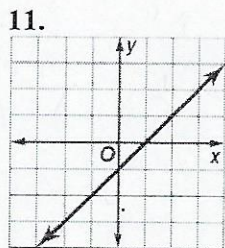
x	y
3	7
-1	1
1	0
3	5
7	3

7. $\{(2, 5), (4, -2), (3, 3), (5, 4), (-2, 5)\}$

8. $\{(6, -1), (-4, 2), (5, 2), (4, 6), (6, 5)\}$

9. $y = 2x - 5$

10. $y = 11$



If $f(x) = 3x + 2$ and $g(x) = x^2 - x$, find each value.

14. $f(4)$

15. $f(8)$

16. $f(-2)$

17. $g(2)$

18. $g(-3)$

19. $g(-6)$

20. $f(2) + 1$

21. $f(1) - 1$

22. $g(2) - 2$

23. $g(-1) + 4$

24. $f(x + 1)$

25. $g(3b)$