Algebra 1 1.7

Determine whether a relation is a function.

Find function values

relation

function every x has 1 partner

discrete

continuous

vetical line test

cut & paste activ

3	5
2	7
4	6
1	1
3	4

3	1
7	1
5	1

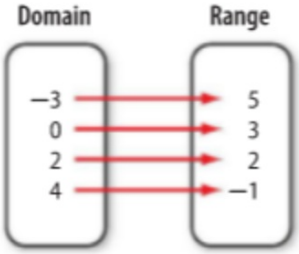
Quiz 1.5-1.6

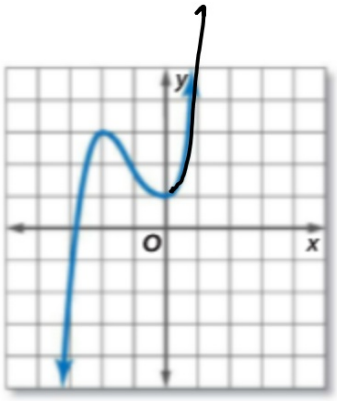
Every input has exactly one output!

KeyConcept Function

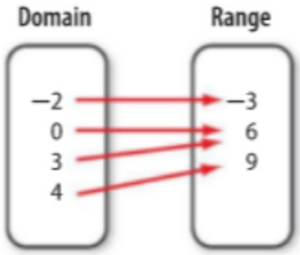
Words A function is a relation in which each element of the domain is paired with *exactly* one element of the range.

Examples





a.

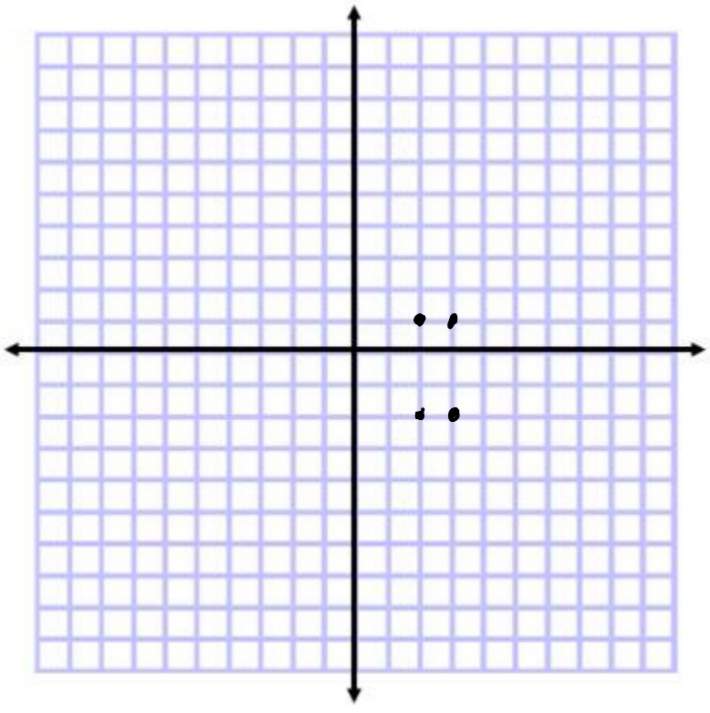


b.

Domain	1	3	5	1
Range	4	2	4	−4

GuidedPractice

1. {(2, 1), (3, −2), (3, 1), (2, −2)}



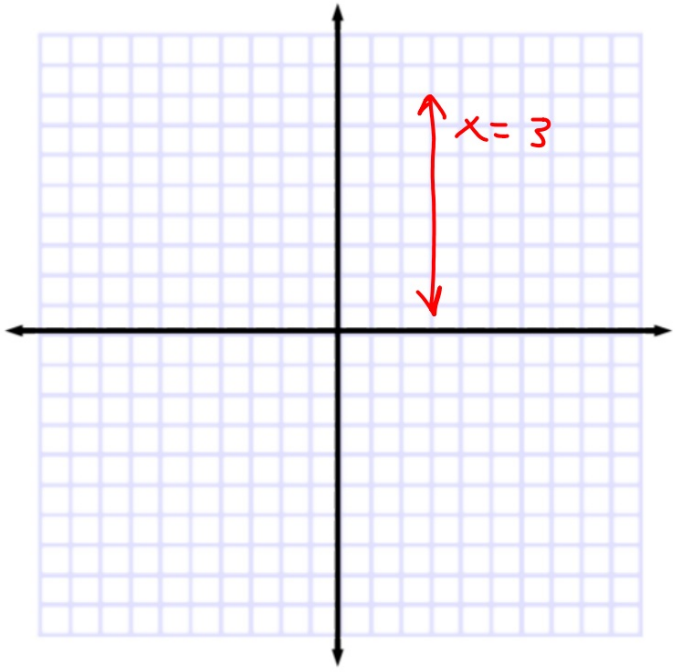
Example 3 Equations as Functions

Determine whether $-3x + y = 8$ is a function.

$y = mx + B$

$+3x \quad +3x$

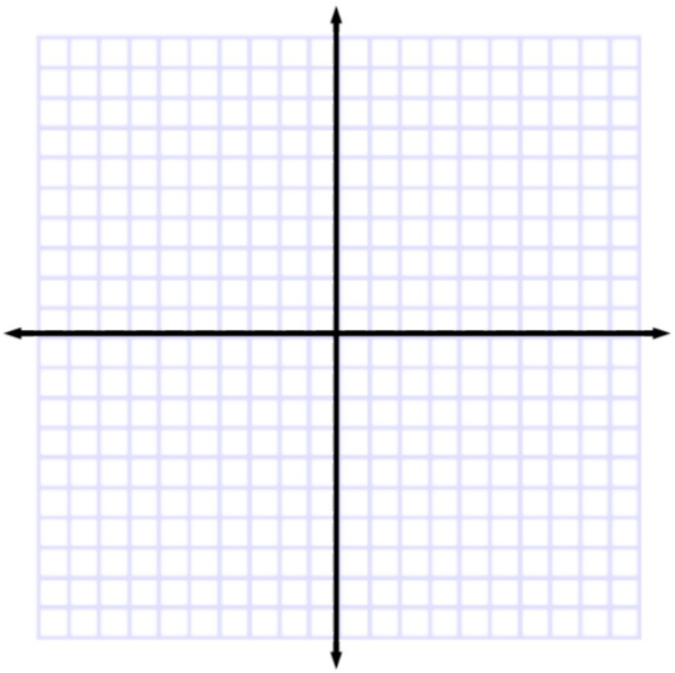
$y = 3x + 8$



GuidedPractice **Determine whether each relation is a function.**

3A. $4x = 8$

3B. $4x = y + 8$

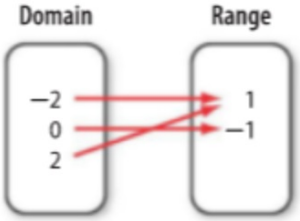


ConceptSummary Representations of a Function

Table

x	y
−2	1
0	−1
2	1

Mapping

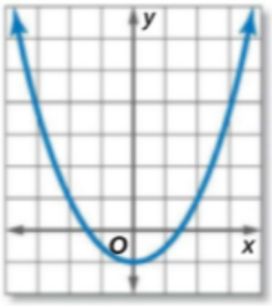


Equation

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

$y = 3x + 1$

Graph



2 Find Function Values

Equations that are functions can be written in a form called **function notation**. For example, consider $y = 3x - 8$.

Equation	Function Notation
$y = 3x - 8$	$f(x) = 3x - 8$

In a function, x represents the elements of the domain, and $f(x)$ represents the elements of the range. The graph of $f(x)$ is the graph of the equation $y = f(x)$. Suppose you want to find the value in the range that corresponds to the element 5 in the domain. This is written $f(5)$ and is read *f of 5*. The value $f(5)$ is found by substituting 5 for x in the equation.

Example 4 Function Values

For $f(x) = -4x + 7$, find each value.

$g(x)$

$h(x)$

GuidedPractice

For $f(x) = 2x - 3$, find each value.

4A. $f(1)$ $= 2(1) - 3$
$= 2 + -3$
$= -1$

4B. $6 - f(5)$
$6 - (2(5) - 3)$
$10 + -3$
$6 - 7 = -1$

4C. $f(-2) = 2(-2) - 3$
$= -4 + -3$
$= -7$

4D. $f(-1) + f(2)$
$2(-1) - 3 + 2(2) - 3$
$-2 + -3$ $\quad 4 + -3$
$-5 + 1$
-4