

Problem of the Day

Sandra, Greg, and Michael team up for a competitive eating contest. If Sandra can eat 6 hot dogs per minute, Greg can eat 4 hot dogs per minute, and Michael can eat 5 hot dogs per minute, how long will it take them to eat a combined total of 120 hot dogs?

8 minutes

Functions Vocabulary

relation

domain

range

function

independent variable

dependent variable

vertical line test

A set of ordered pairs is called a **relation**.

The **domain** of a relation is the set of x -values of the ordered pairs.

The **range** of a relation is the set of y -values of the ordered pairs.

Ex 1. Finding Domain and Range of a Relation

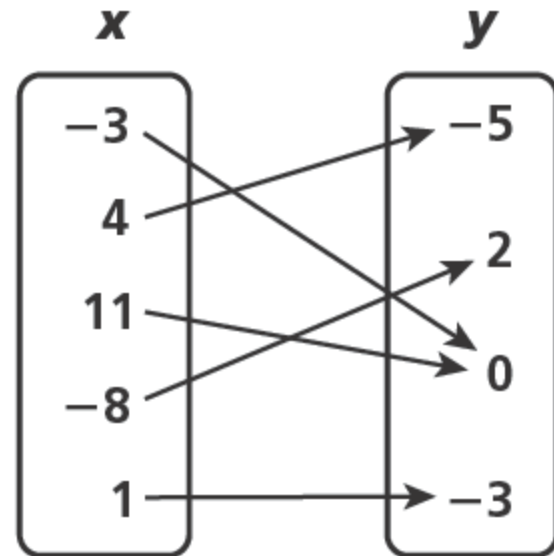
Give the domain and range of each relation.

The domain is the set of all input, or x , values.

The range is the set of all output, or y , values.

Domain: $-8, -3, 1, 4, 11$

Range: $-5, -3, 0, 2$



Ex 2. Finding Domain and Range of a Relation

Give the domain and range of each relation.

The domain is the set of all input, or x , values.

The range is the set of all output, or y , values.

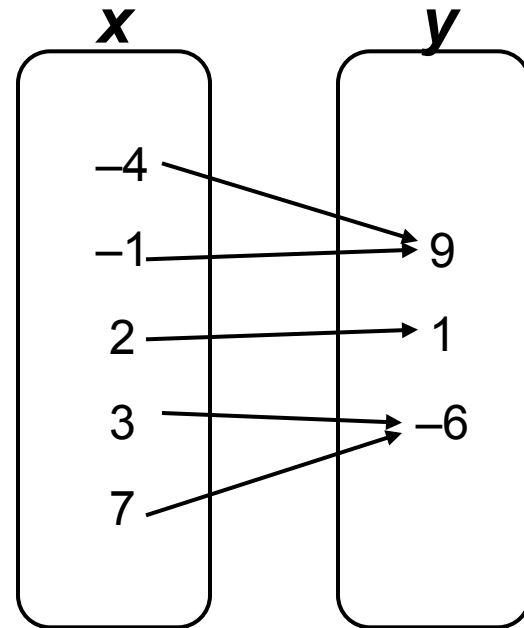
Domain: $-12, -9, -4, 2, 6, 13, 19$

Range: $1, 2, 7, 8, 9$

x	y
-12	7
-9	2
-4	7
2	1
6	9
13	8
19	9

Ex 3. Finding Domain and Range of a Relation

Give the domain and range of each relation.



Domain: $-4, -1, 2, 3, 7$

Range $-6, 1, 9$

Ex. 4 Finding Domain and Range of a Relation

Give the domain and range of each relation.

x	-5	-3	1	2	4	7	9
y	-1	4	5	8	10	14	15

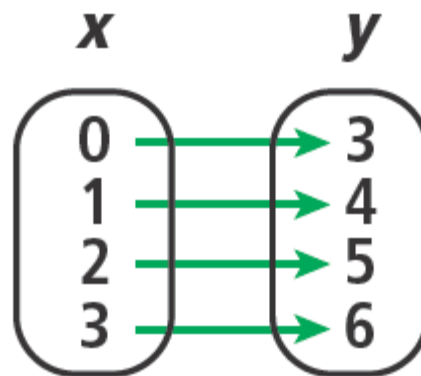
Domain: -5, -3, 1, 2, 4, 7, 9

Range: -1, 4, 5, 8, 10, 14, 15

A **function** is a special type of relation that pairs each *input*, or domain value, with exactly one *output*, or range value.

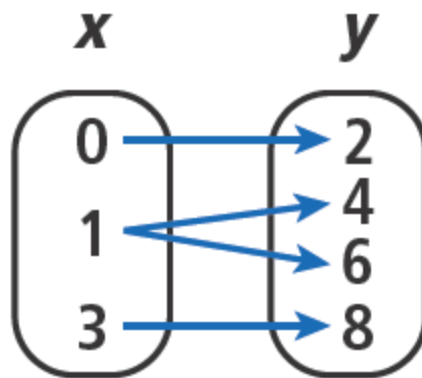
Function

Each input gives only one output.



Not a Function

One input gives more than one output.



Some functions can be written as equations in two variables.

The **independent variable** represents the input of a function.

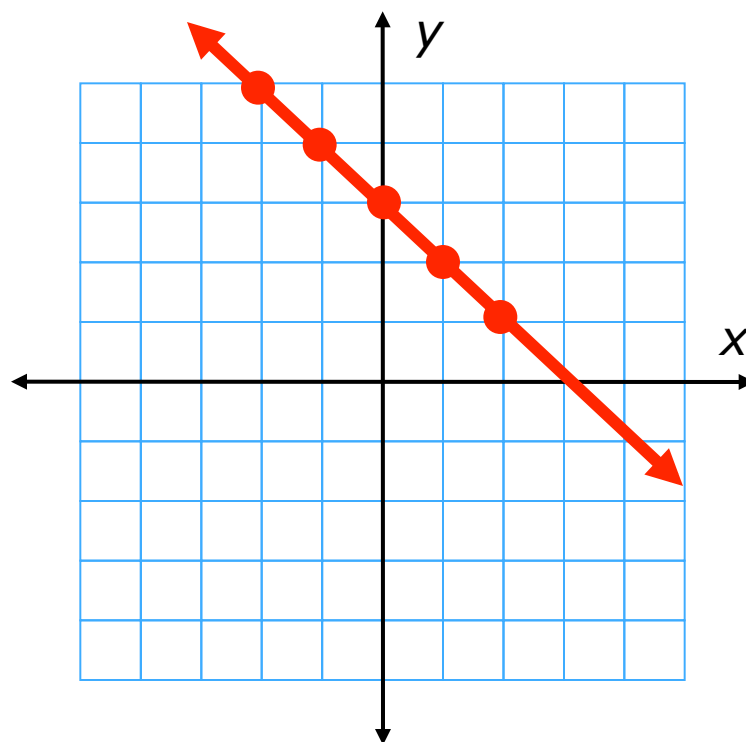
The **dependent variable** represents the output of a function.

Ex.1: Finding Different Representations of a Function

Make a table and a graph of $y = 3 - x$.

Make a table of inputs and outputs. Use the table to make a graph.

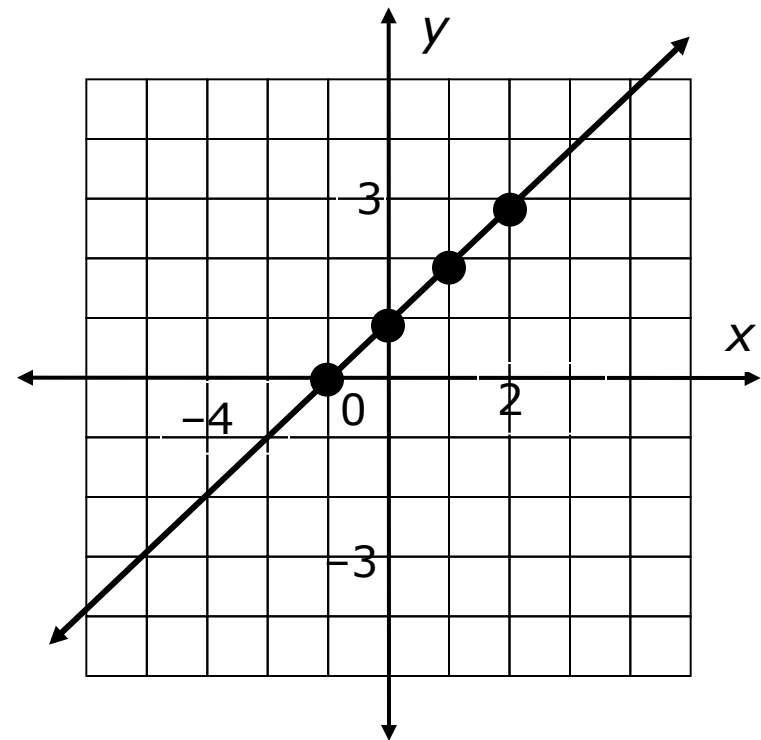
x	$3 - x$	y
-2	$3 - (-2)$	5
-1	$3 - (-1)$	4
0	$3 - 0$	3
1	$3 - 1$	2
2	$3 - 2$	1



Ex.2: Finding Different Representations of a Function

Make a table and a graph of $y = x + 1$.

x	$x + 1$	y
-1	$-1 + 1$	0
0	$0 + 1$	1
1	$1 + 1$	2
2	$2 + 1$	3



Ex. 3: Identifying Functions

Determine if each relation represents a function.

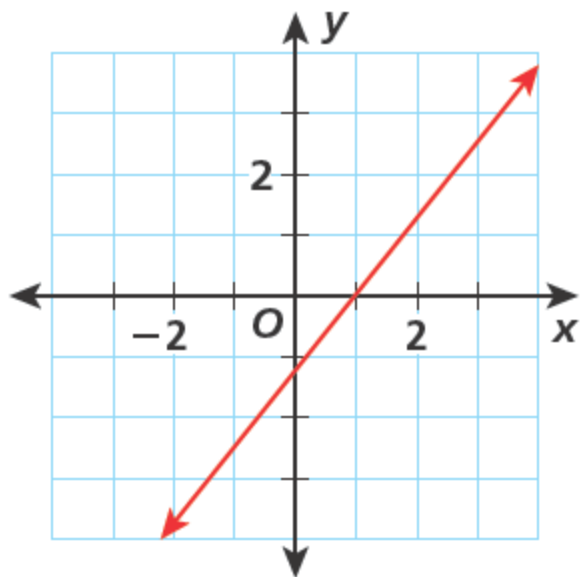
x	2	3	3	2
y	3	4	5	6

*The input $x = 2$ has two outputs, $y = 3$ and $y = 6$.
The input $x = 3$ also has more than one output.*

The relationship is not a function.

Ex. 4: Identifying Functions

Determine if the relationship represents a function.



The input $x = 0$ has two outputs, $y = 2$ and $y = -2$. Other x -values also have more than one y -value.

The relationship is not a function.

Example 5

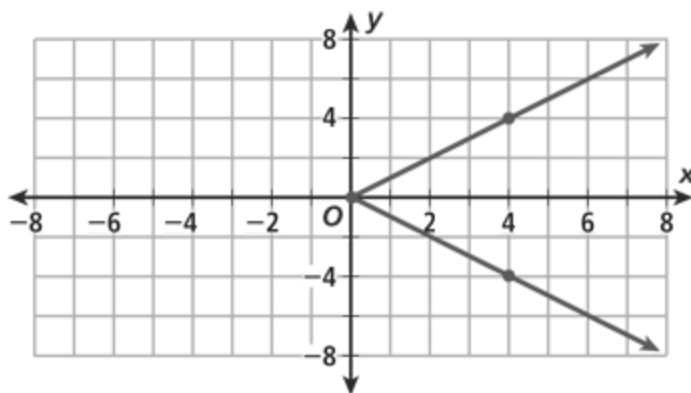
Determine if each relation represents a function.

x	0	5	10	15
y	-1	0	-1	0

This relationship represents a function.

Example 6

Determine if each relation represents a function.



This relationship does not represent a function.

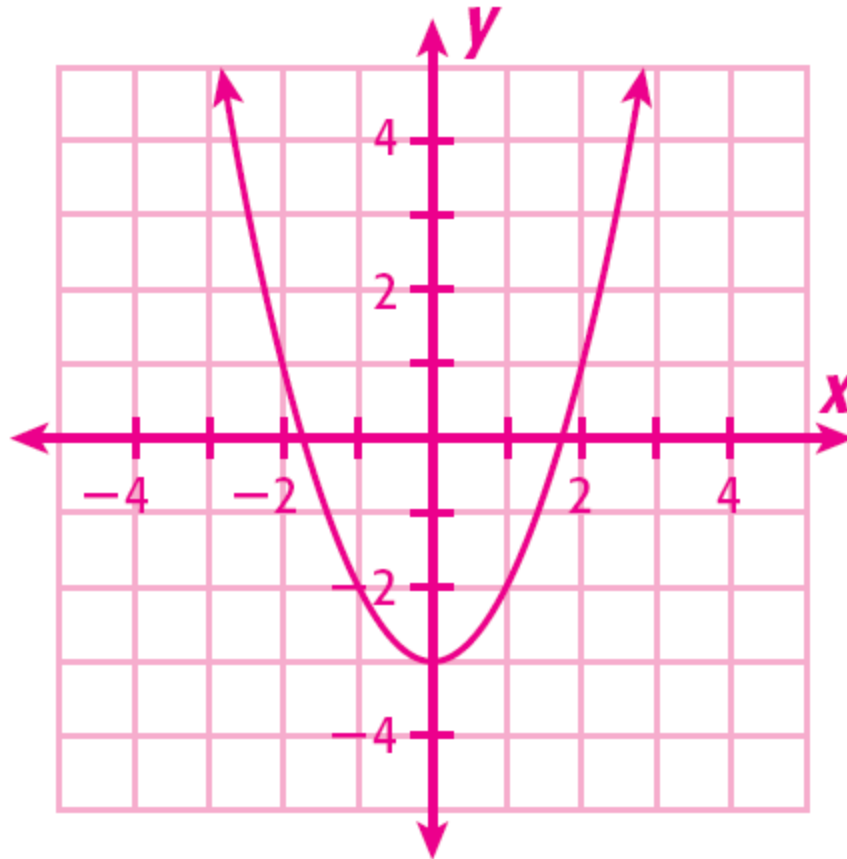
Lesson Quizzes

Standard Lesson Quiz

Lesson Quiz for Student Response Systems

Lesson Quiz: Part I

1. Graph the function $y = x^2 - 3$.



Lesson Quiz: Part II

Determine if each relationship represents a function.

2.

x	-2	-1	0	1	1
y	3	4	3	5	6

no

3. $y = 3x + 5$

yes

Lesson Quiz for Student Response Systems

1. Identify the relationship that represents a function.

A.

x	1	3	3	4
y	2	4	3	2

C.

x	1	2	3	4
y	2	3	4	5

B.

x	4	2	3	4
y	0	3	4	1

D.

x	2	3	3	2
y	1	2	3	4

Lesson Quiz for Student Response Systems

2. Identify the relationship that represents a function.

A. $y^2 = 4$

B. $y = 2x$

C. $y^2 = 9$

D. $y^2 = 16$