

Warm-Up

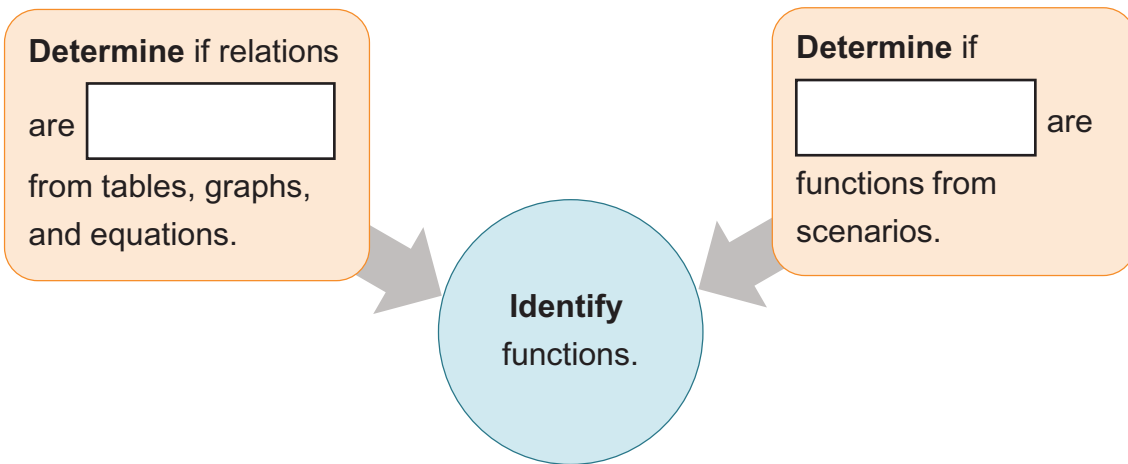
Introduction to Functions



Lesson Question



Lesson Goals



Words to Know

Fill in this table as you work through the lesson. You may also use the glossary to help you.

function	a relation in which each element of the input is mapped to (paired with) exactly [] element of the output
input	a value that is transformed by a process and becomes []
output	the result of an [] that has been transformed by a process

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2K

Words to Know

relation	a set of <input type="text"/> pairs
vertical line test	a test showing that if any vertical line passes through no more than one point of the graph of a relation, then the relation is a <input type="text"/>



Input/Output Table

Fill in the missing values in the table.

Input $y = 4x + 5$

$y = 4(-2) + 5$

$y = -8 + 5$

$y = \text{[]}$

$y = 4(1) + 5$

$y = \text{[]} + 5$

$y = 9$

x	y
-2	-3
-1	1
0	5
1	
2	13

ordered pair (x, y)

$(0, \text{[]})$

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Identifying Functions

$$y = x^2 - 3$$

function

x	y
-3	6
-1	-2
3	6
5	22

The input 9 is paired with two different outputs.

$$y^2 = x$$

a function

x	y
9	-3
1	-1
9	3
25	5

A **function** is a **relation** in which one **input** is paired with exactly **output**.

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Tables of Equations

- Equations are functions or not functions.

$$y^2 = x + 12$$

x	y
-3	-3
-3	3
4	-4
4	4

not a function

$$x^2 + y^2 = 9$$

x	y
-3	0
0	-3
0	3
3	0

a function

$$y = 3x + 4$$

x	y
-4	-8
-1	1
1	7
4	16

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Function and Non-Function Equations**EXAMPLE****Functions**

$$y = 4$$

$$y = \frac{1}{2}x + 3$$

$$1 = y - 5x$$

$$y = x^2 + 4$$

$$y = x^2 + 3x - 12$$

They all have = somewhere
in the equation. So that's what makes
these all functions. y is going to equal

number.

Not Functions

$$x = -6$$

$$y^2 = x + 4$$

$$y^2 + x^2 = 25$$

It's not a function if you have

= some number, or if you have

in the equation.

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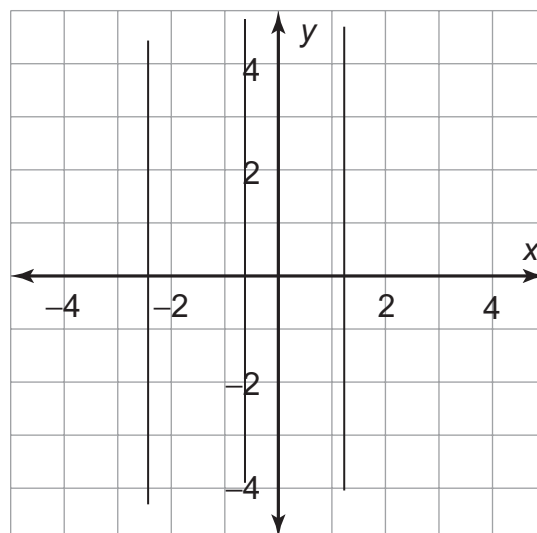
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The Vertical Line Test

Consider the points in the following table:

x	y
-3	-4
-1	0
1	4

Plot the points from the table on the coordinate plane and draw the line through them.



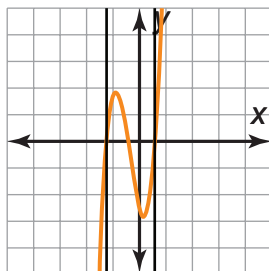
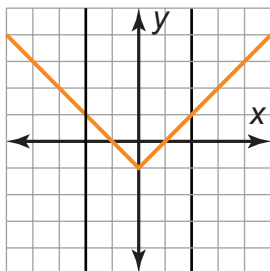
Vertical line test: If any vertical line passes through no more than

point, then the relation is

a .

Functions Versus Non-Functions

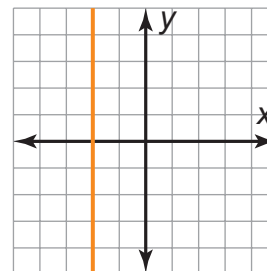
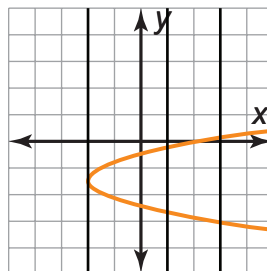
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Each line passes through exactly

point on the graph.

• a Function



The vertical lines go through

than one point.

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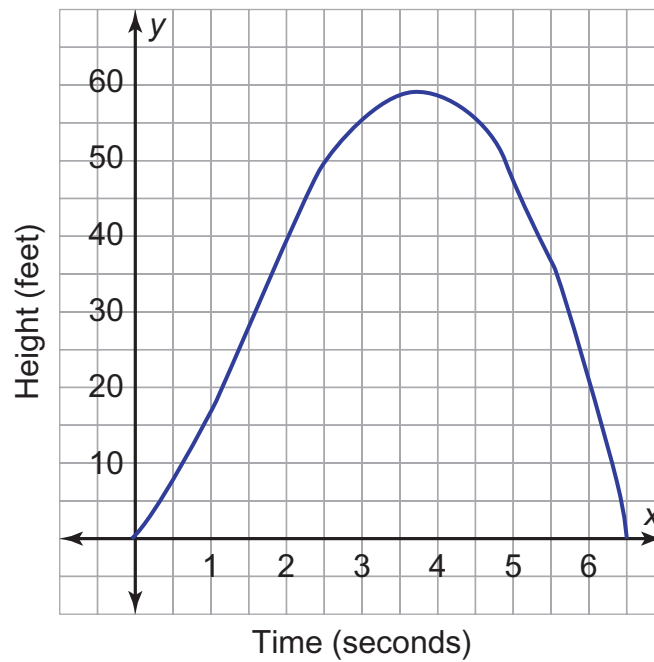
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Determine Whether a Real-World Relationship is a Function**REAL-WORLD CONNECTION**

Determine if the following scenario represents a function.

Is the height of a football kicked across a field a function of the time?

The is a function of the .



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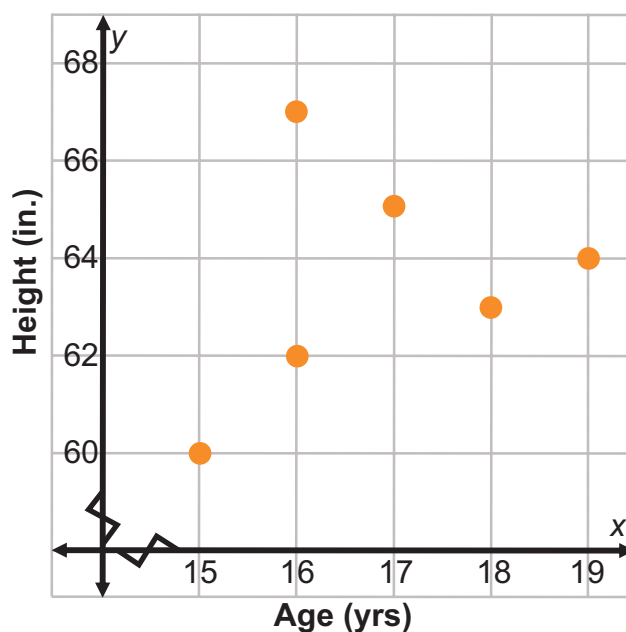
Determining Whether a Real-World Relationship is a Function**EXAMPLE**

A survey asked high school math students their ages and heights. The results are shown in the table. Is the height a function of the age?

Age (yrs)	Height (in.)
15	60
16	62
16	67
17	65
18	63
19	64

This scenario is a function.

Circle the points that represent an input with more than one output.



Summary

Introduction to Functions



Lesson Question

What is a function and how can I identify one?



Answer

Use this space to write any questions or thoughts about this lesson.