Warm-Up | Introduction to Functions

Lesson Question

Lesson Goals

Understand _____ relationships.

- **Define** a function in terms of its _____ and output.
- **Identify** the domain and _____ of a relation.
- **Determine** whether or not a _____ is a function.

Words to Know

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

	the set of output values corresponding to the domain values
	the variable in a function that represents the output values; the second coordinate in the ordered pairs
	a relation in which each element of the domain is mapped to (paired with) exactly one element of the range
	the set of input values for which the function is defined

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	a set of ordered pairs
	the variable in a function that represents the input values; the first coordinate in the ordered pairs

Creating an Input/Output Table of Values

Create a table of input and output values for the equation $y = 5 + 3x$.

$x = -2$ $\quad y = 5 + 3(-2) = -1$

$x = -1$ $\quad y = 5 + 3(-1) = 2$

$x = 0$ $\quad y = 5 + 3(0) =$ ☐

$x = 1$ $\quad y = 5 + 3(1) = 8$

$x =$ ☐ $\quad y = 5 + 3(2) = 11$

☐	Outputs
−2	
−1	2
0	
1	8
	11

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Slide 2

Independent and Dependent Variables

The **independent variable** represents the input values and the **dependent variable** represents the [ ] values.

Isaac takes a 216-mile trip from Boston to New York City. He drives at a rate of 54 miles per hour. The equation $d = 54t$ models his distance, d, over time, t, in hours.

Complete the table of values and identify the independent and dependent variables.

independent [ ]

[ ] output

Time	Distance
0	0
1	
2	108
3	
4	216

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Defining Domain and Range of a Function

The [ ] is the set of input values for which the **relation** is defined. The [ ] is the set of output values corresponding to the domain values.

Isaac takes a 216-mile trip from Boston to New York City. He drives at a rate of 54 miles per hour. The equation $d = 54t$ models his distance, d, over time, t, in hours.

Domain: $\{t | 0 \leq t \leq$ [ ] $\}$

Range: $\{d |$ [ ] $\leq d \leq 216\}$

Time	Distance
0	0
1	54
2	108
3	162
4	216

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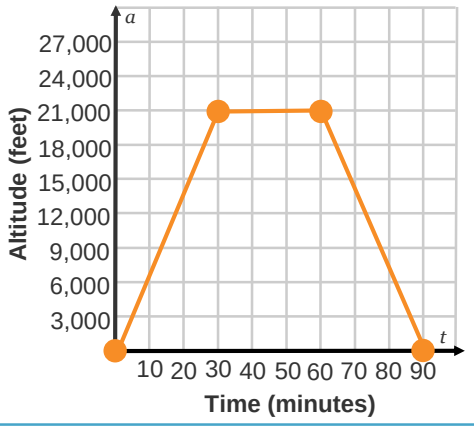
Determining the Domain and Range from a Graph

The altitude of a plane, a, over time, t, is shown in the graph. Identify the domain and range.

Domain: $\{t |$ [ ] $\leq t \leq$ [ ] $\}$

Range: $\{a |$ [ ] $\leq a \leq$ [ ] $\}$



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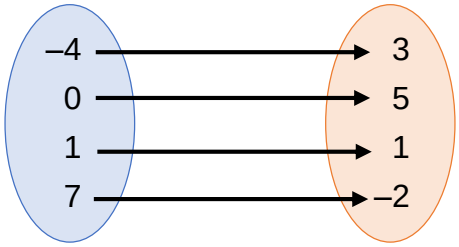
Determining Domain and Range from a Mapping Diagram

The ordered pairs $(-4, 3)$, $(0, 5)$, $(1, 1)$, and $(7, -2)$ represent a relation. Determine the domain and range.

[ ] Range



Domain:

$\{x | x = -4,$ [ ] $, 1, 7\}$

Range:

$\{y | y = -2,$ [ ] , [ ] $, 5\}$

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Defining Function

In a **function**, each value for the independent variable (input values) maps to exactly [ ] value for the dependent variable (output values).

Isaac takes a 216-mile trip from Boston to New York City. He drives at a rate of 54 miles per hour. The equation $d = 54t$ models his distance, d, over time, t, in hours.

For every given time, there was [ ] given distance.

Isaac's distance is a [ ] of time.

Time	Distance
0	0
1	54
2	108
3	162
4	216

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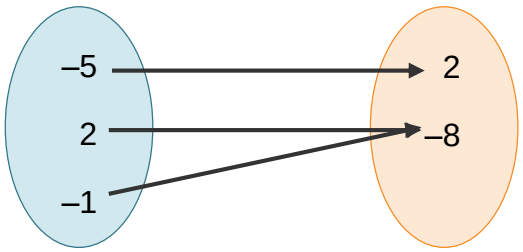
Function Versus Not a Function

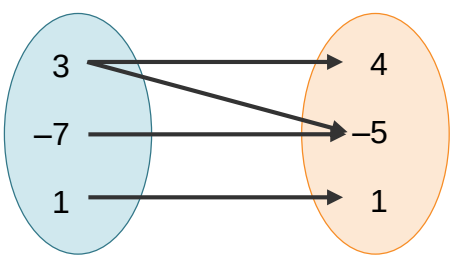
To determine if a relationship is a function, ask, "Does each element in the domain correspond to [ ] one element in the [ ]?"

Function



Each element in the domain has only one [ ].

[ ] a Function



3 has an output of 4 but it also corresponds to [ ]. Since it corresponds to more than one output, then I know it is not a function.

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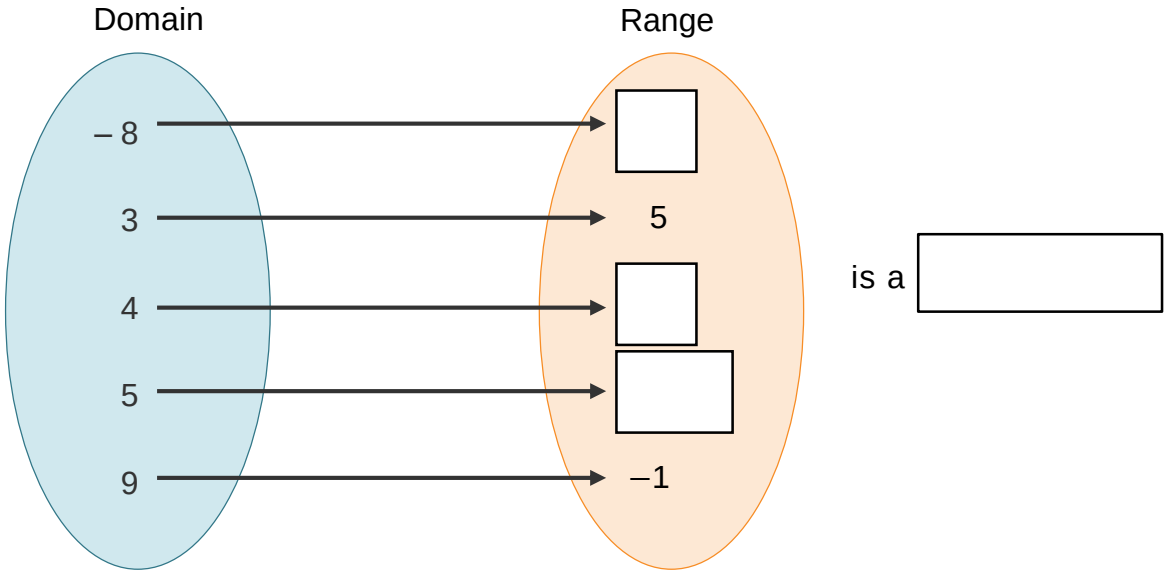
Determining if a Relationship Is a Function

Determine if the set of ordered pairs represents a function.

$(3, 5), (-8, 0), (5, -2), (4, 4), (9, -1)$



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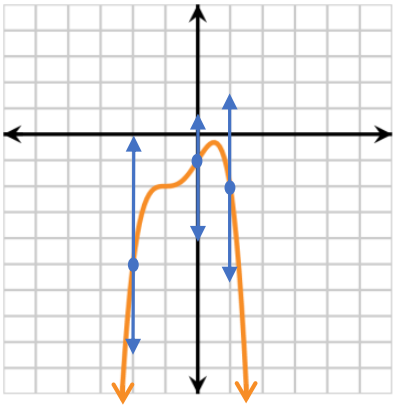
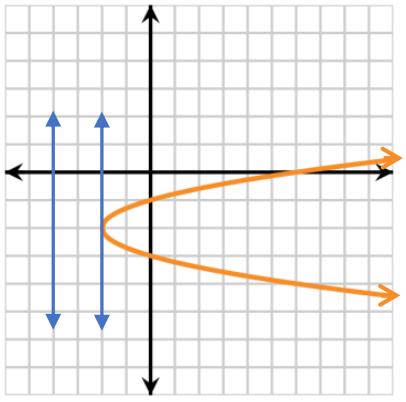
The Vertical Line Test

If any _____ line passes through no more than one point, then the graph represents a function.

_____



Not a Function



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Summary | Introduction to Functions

Lesson Question	What is a function?

Answer

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

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