Functions

Date:

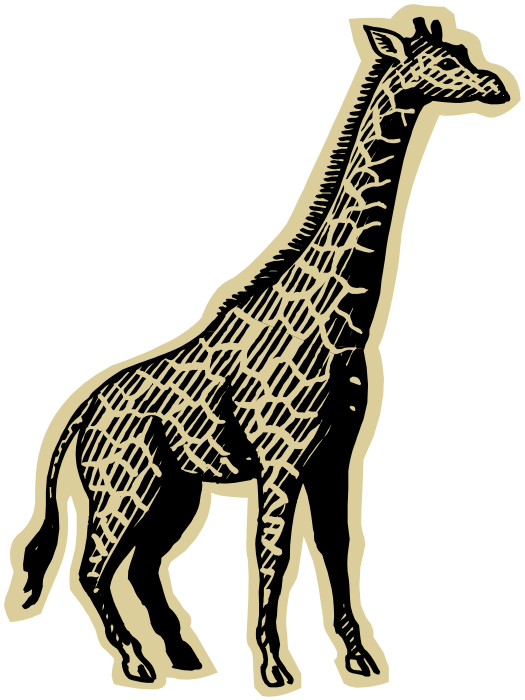
Standards

- F.IF.1 - Understand that a function from one set (called the domain) to another set (called the range)
  F.IF.2 - Use function notation, evaluate functions for inputs in their domains

Essential Questions

- What are the different ways I can show a relation ?
- How can I tell if an equation is a function?
- What is function notation?

What are the different ways I can show a relation ?



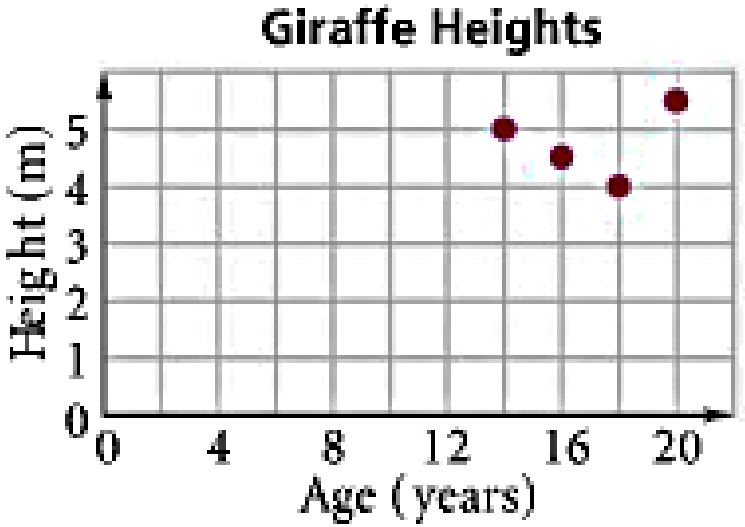
Relation: A set of ordered pairs

1) Table

Giraffe Heights

Age (years)	Height (meters)
18	4.0
16	4.5
20	5.5
14	5.0

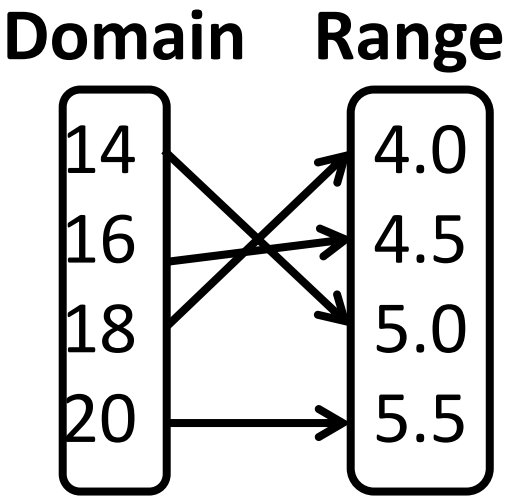
2) Graph



3) Ordered Pairs

{ (18, 4.0) , (16, 4.5) , (20, 5.5) , (14, 5.0) }

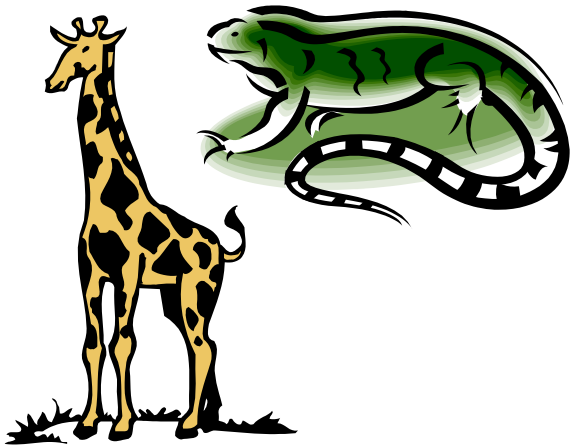
4) Mapping Diagram



DOMAIN	RANGE
X	Y
Input	Output
Independent Variable	Dependent Variable
{14, 16, 18, 20}	{4.0 , 4.5, 5.0, 5.5}

How can I tell if an equation is a function?

Table: Check for inputs with more than one output



Function: a relation where each domain value has exactly one range value

Table

Iguana Lengths

Age (years)	Length (inches)
2	30
4	37
3	31
4	40

NOT A FUNCTION

4 years → 37 in. and 40 in.

Table

Giraffe Heights

Age (years)	Height (meters)
18	4.0
16	4.5
20	5.5
14	5.0

FUNCTION

One output for every input

How can I tell if an equation is a function?

Table: Check for inputs with more than one output

Input	Output
2	7
1	5
0	6
3	9
4	11

FUNCTION

Input	Output
2	7
3	9
5	2
2	11
4	8

NOT A FUNCTION

Input	Output
7	2
3	2
-5	2
6	2
4	2

FUNCTION

Input	Output
-1	3
-5	6
8	8
-1	5
4	4

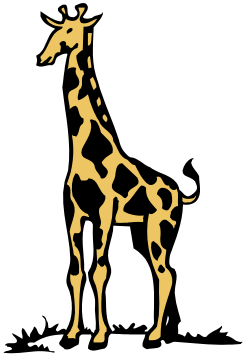
NOT A FUNCTION

How can I tell if an equation is a function?

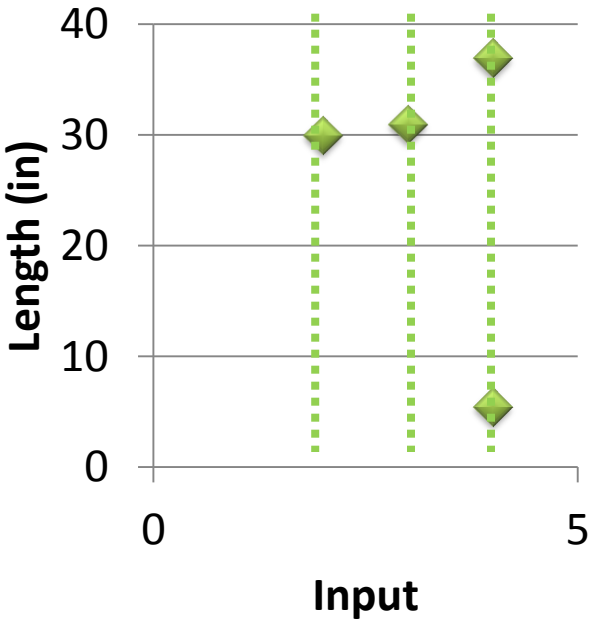
Graphing:

Draw a vertical line; line should **NOT** hit more than one point

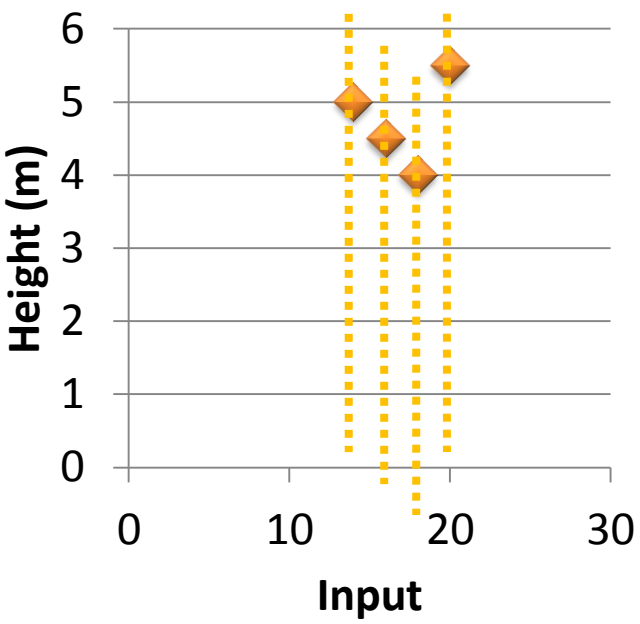
Graphing



Iguana Length



Giraffe Height



NOT A FUNCTION

Line crosses two points at the same time

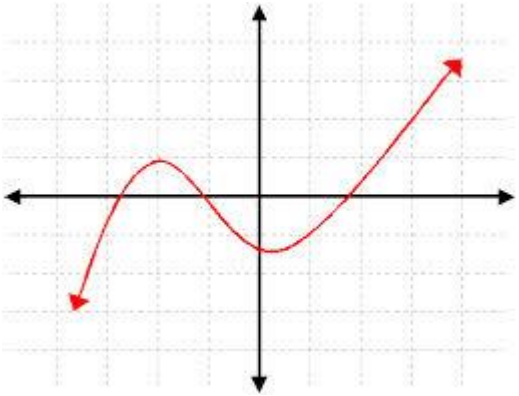
FUNCTION

Line does not cross two points at the same time

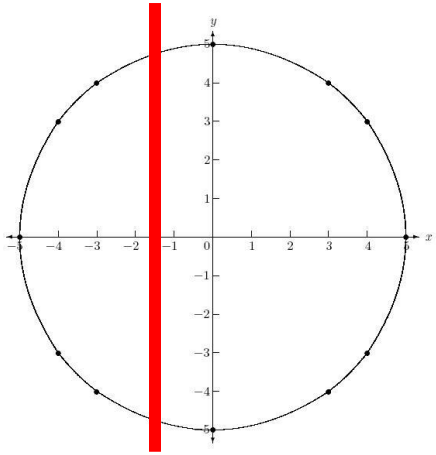
How can I tell if an equation is a function?

Graphing:

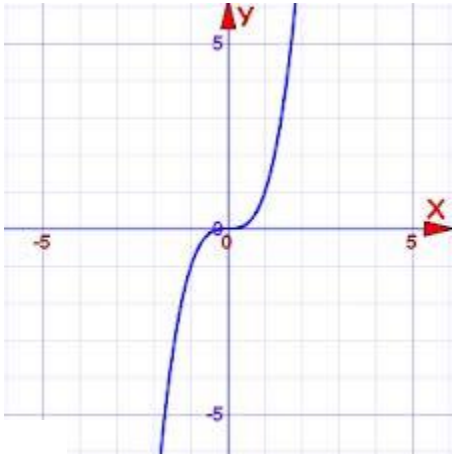
Draw a vertical line; line should **NOT** hit more than one point



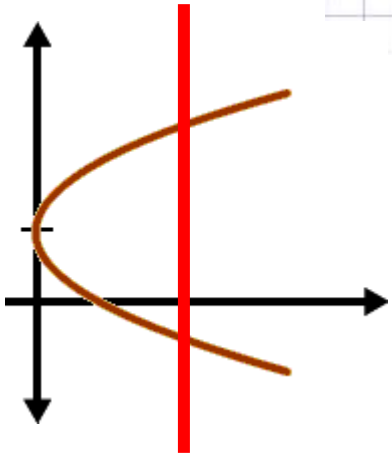
FUNCTION



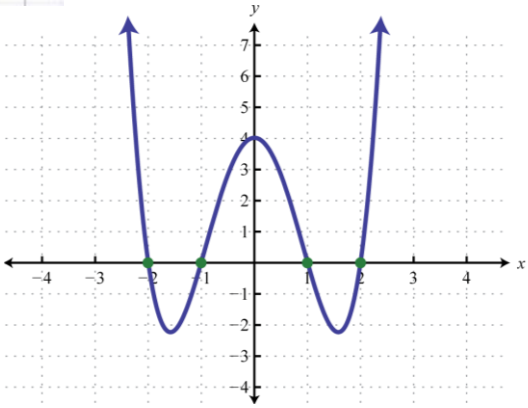
NOT A FUNCTION



FUNCTION



NOT A FUNCTION

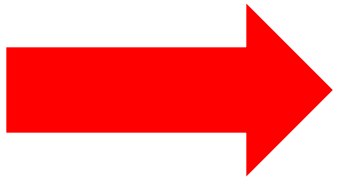


FUNCTION

What is function notation?

Function notation is a different way of writing an equation.

x	y



x	$f(x)$

What is function notation?

Function notation is a different way of writing an equation.

$$f(x) = 3x - 4$$

Input (x)	3x -4	Output f (x)
f(2)	3(2) - 4	2
f(4)	3(4) - 4	8
f(6)	3(6) - 4	14
f(8)	3(8) - 4	20

Domain

2, 4, 6, 8

Range

2, 8, 14, 20

What is function notation?

Function notation is a different way of writing an equation.

$$f(x) = \frac{1}{2}x + 3$$

Input (x)	$\frac{1}{2}x + 3$	Output f (x)
f(2)	$\frac{1}{2}2 + 3$	4
f(4)	$\frac{1}{2}4 + 3$	5
f(6)	$\frac{1}{2}6 + 3$	6
f(8)	$\frac{1}{2}8 + 3$	7

Domain

2, 4, 6, 8

Range

4, 5, 6, 7

What is function notation?

Function notation is a different way of writing an equation.

$$f(x) = x - 4$$

Input (x)	3x -4	Output f (x)
f(1)	1 - 4	-3
f(2)	2 - 4	-2
f(3)	3 - 4	-1
f(4)	4 - 4	0

Domain

1, 2, 3, 4

Range

-3, -2, -1, 0

REFLECTION:

1) Answer one of the essential questions
2) How have previous lessons helped or connect with this lesson?
3) What are you still confused on or what new info did you learn?

Homework

- Sort Green functions into two sections
  - Function
  - Not a function

1. $f(x) = x + 4$

x	-5	-4	-2	0	1
f(x)					

2. $f(x) = -6 - x$

x	-9	-6	-4	-2	-1
f(x)					

3. $f(x) = 2x + 3$

x	-4	-3	-1	0	1
f(x)					