ALGEBRA UNIT 2 FUNCTIONS
DOMAIN/RANGE/FUNCTIONS (DAY 1)

Previous Vocab-definitions:

- In order to graph an equation you have to plot points (x, y)
- x-values are the _____ variable
- y-values are the _____ variable
- To find the y-value _____ x-value into equation to find answer.

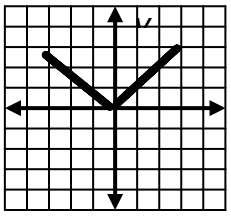
NEW TERMINOLOGY-DEFINITIONS

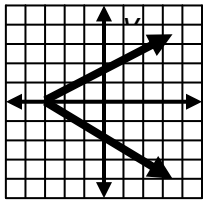
RELATION: A set of ordered pairs, (,)

FUNCTION: A relation (x, y) where NO _____ values repeat.

VERTICAL LINE TEST:

- A test to determine whether a graph is a _____.
- This test determines if _____ values repeat





HORIZONTAL LINE TEST:

- A test to determine whether the _____ of a graph is a FUNCTION
- This test determines if _____ values repeat

ONE-TO-ONE FUNCTION (1-1):

- Must pass both _____ and _____ line test
- NO _____ or _____ values repeat

DOMAIN (INPUT):

- The set of _____**values** of a relation (x , y)
- Domain is determined by **reading a graph from** _____ **to** _____.

RANGE (OUTPUT):

- The set of _____**values** of a relation (x , y)
- Range is determined by **reading a graph from** _____ **to** _____.

Domain and Range may be stated in either set or interval notation.

Interval Notation: A notation that shows the set of all numbers between, or between and including two endpoints.

Parentheses ( ) = "not included", **used when open dots** are on a graph

Brackets [ ] = "included", **used when closed dots** are on a graph

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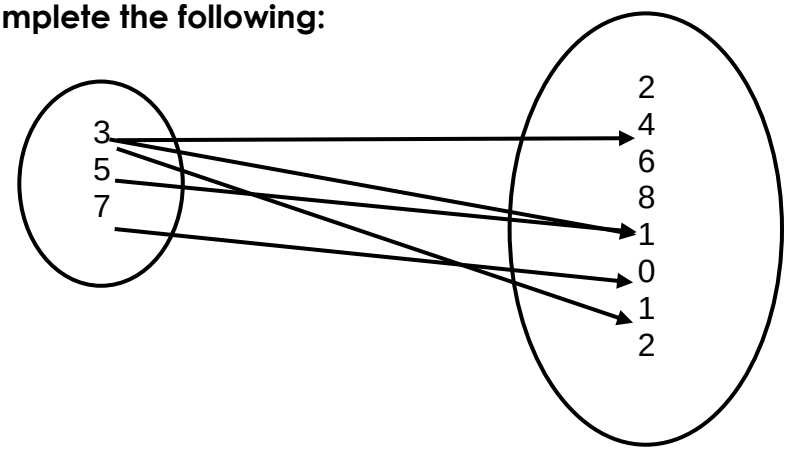
Complete the following:

1)



Domain:

Range:

Function?

1-1?

2) A= {(0, 3), (1, 8), (2, 5)}

Domain:

Range:

Function?

1-1?

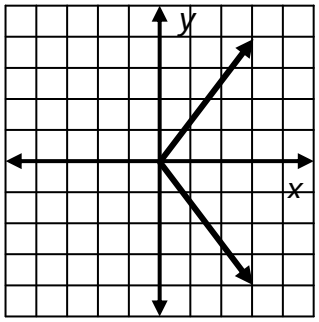
3)

Domain:

Range:

Function?

1-1?



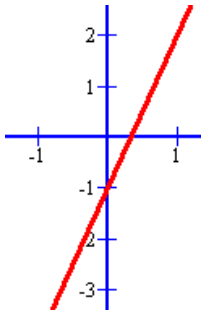
4)

Domain:

Range:

Function?

1-1?



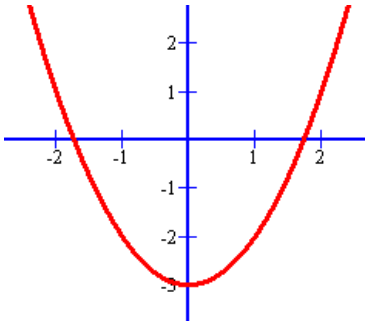
5)

Domain:

Range:

Function?

1-1?



6) Which set of ordered pairs represent a function?

(1) {(0, 4), (2, 4), (2, 5)}
(2) {(6, 0), (5, 0), (4, 0)}
(3) {(4, 1), (6, 2), (6, 3) (5, 0)}
(4) {(0, 4), (1, 4), (0, 5), (1,5)}

DOMAIN/RANGE/FUNCTIONS (DAY 2)

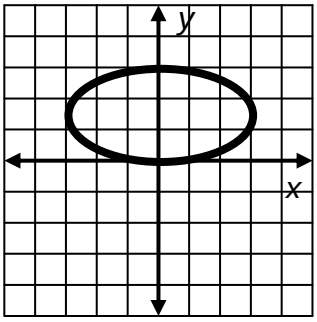
Recap: **Domain (input)** **Function:**

Range (output) **1-1 Function:**

1) Domain: _____

Range: _____

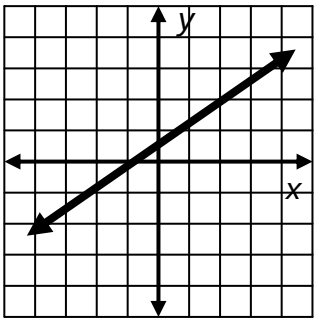
Is it a function? 1-1?



2) Domain: _____

Range: _____

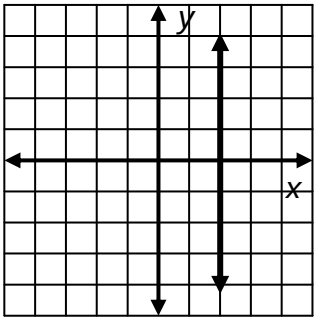
Is it a function? 1-1?



3) Domain: _____

Range: _____

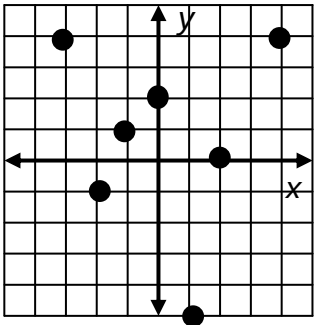
Is it a function? 1-1?



4) Domain: _____

Range: _____

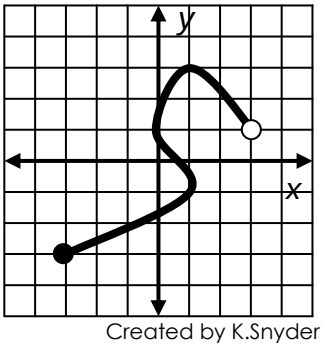
Is it a function? 1-1?



5) Domain: _____

Range: _____

Is it a function? 1-1?



6) $y = -x^2 + 2x - 3$

Domain: _____

Range: _____

Is it a function? 1-1?

7) $y = .5(3)^x$

Domain: _____

Range: _____

Is it a function? 1-1?

7) Which of the following does *not* represent a function?

(1)

x	y
2	8
6	3
8	2
9	8

(2)

x	y
1	2
2	3
6	5
1	8

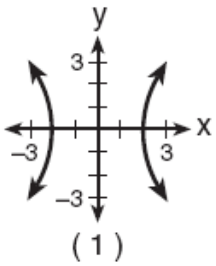
(3)

x	y
3	1
2	7
4	-2
1	-9

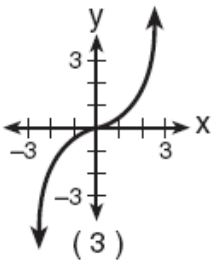
(4)

x	y
4	-1
5	7
3	-7
1	2

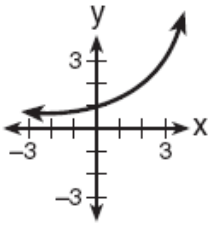
8) Which of the following ***is*** a function but is ***not*** a one-to-one function?



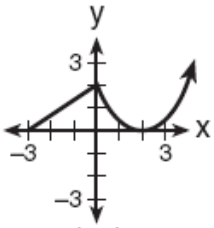
(1)



(3)

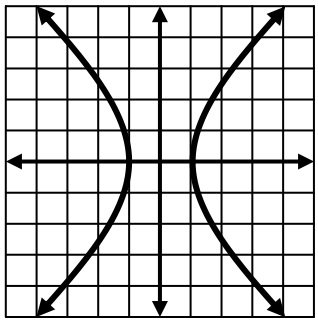


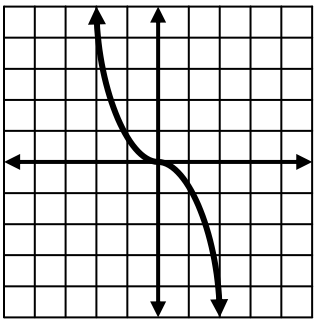
(2)

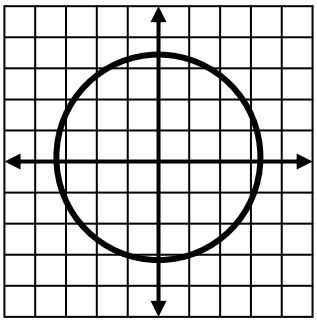


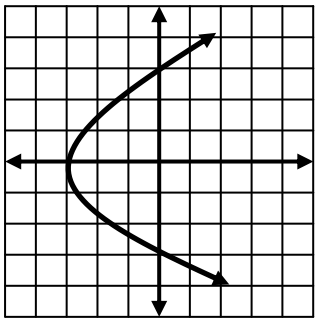
(4)

9) Which diagram represents a function?


(1)


(2)


(3)


(4)

10) Which of the following is not a function?

(1) $y = 3^x$ (2) $2x + y = 5$ (3) $y + 6 = x^2$ (4) $x^2 + y^2 = 25$

FUNCTION NOTATION (DAY 3)

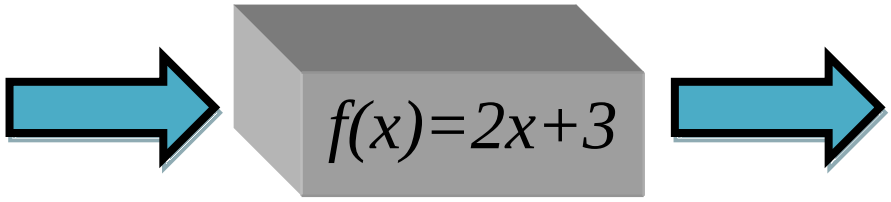
Function Notation: For every **x-value** in the **domain** that you _____ into an equation there is a ____value in the range that is the **OUTPUT**.

How to read/say f(x):_____

Since the **y-value** depends on the x-value, the y-value can be **represented by f(x).**

Illustration of how to interpret a function:

INPUT
X –VALUE



OUTPUT
Y -VALUE

HOW TO DO THE MATH:

OLD WAY: Given y = 2x + 3 find y, when x =4
y = 2(4) + 3
y= 11

NEW WAY: Given f(x) = 2x +3 find f(4)
f(4) = 2(4) + 3
f(4) = 11

Evaluate the following:

1) If $f(x) = -x^2$, find f(-2).

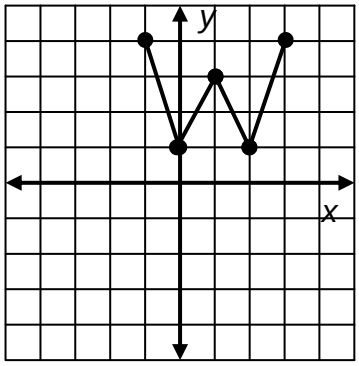
2) If $g(x) = \frac{x^2 - x}{4}$, find g(-4).

3) If $f : x \rightarrow y \mid y = \frac{5}{x-3}$, find f(7).

4) If $w(x) = x^3 + 2x$, find w(6)

5. Given $g(x) = 5x^2 - 4x + 3$, find $g(\frac{1}{2})$

6) The graph of the function f is shown at the right. Find the following:



a) f(0)

b) f(1)

c) f(x) = 4, x = ?

d) f(x) = 1, x = ?

e) $f(\frac{1}{2})$

f) f(2.5)

g) Domain

h) Range

7) In which of the following is 3 from the domain mapped to 10 in the range?

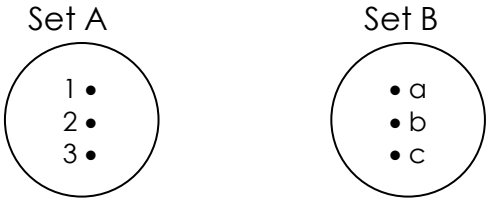
(1) $f : x \rightarrow y \mid y = x - 3$

(2) $f : x \rightarrow y \mid y = x + 3$

(3) $f : x \rightarrow y \mid y = 7$

(4) $f : x \rightarrow y \mid y = x + 7$

8) On the accompanying diagram draw a mapping of a relation from set A to set B that is a function. Explain why the relationship you drew is a function.



9) Circle the table that represents an example of a relation that is not a function.

x	f(x)
2	0
4	1
6	2
8	3

x	f(x)
2	0
4	2
6	2
2	3

x	f(x)
-2	0
-4	1
-6	2
-8	3

x	f(x)
2	0
4	1
6	2
-6	3

10) Using the table below:

x	-3	-1	0	4	10
f(x)	8	-6	10	5	12

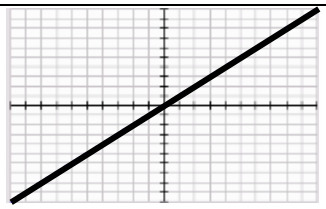
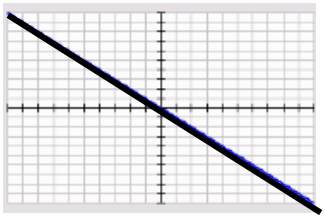
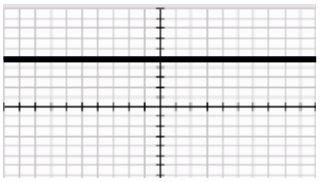
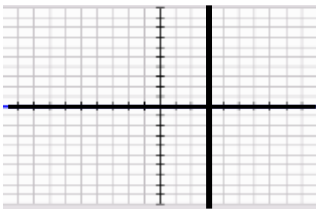
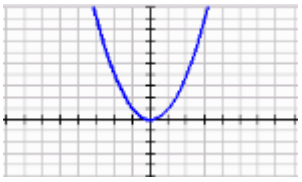
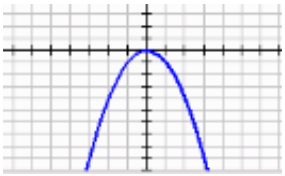
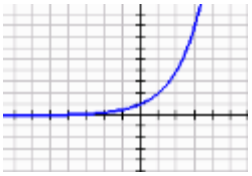
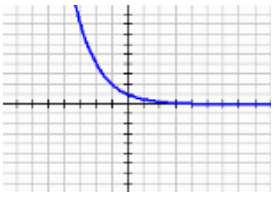
a) f(-1)

c) the value of x, if f(x) = 10

b) f(4)

d) the value of x, if f(x) = -6

FUNCTION TYPES (DAY 4)

FUNCTION NAME	PARENT FUNCTION (EQUATION)	TYPES OF GRAPHS	KEY FEATURES
LINEAR FUNCTION		  	
	Would this line be a function? Why?		
QUADRATIC FUNCTION		 	
EXPONENTIAL FUNCTION		 	

Identify the following equations as Linear, Quadratic, or Exponential. Justify your choice.

1. $2x^2 + 3 = 18$ _____

2. $3 + 5x = 20$ _____

3. $2a + 3ax^2 = 24$ _____

4. $5^x = 125$ _____

5. $30 = 6x - 8$ _____

6. $64 = 4^x$ _____

Lets watch the following videos to determine what functions are being illustrated when comparing elevation vs time. Identify key components to explain your choice.

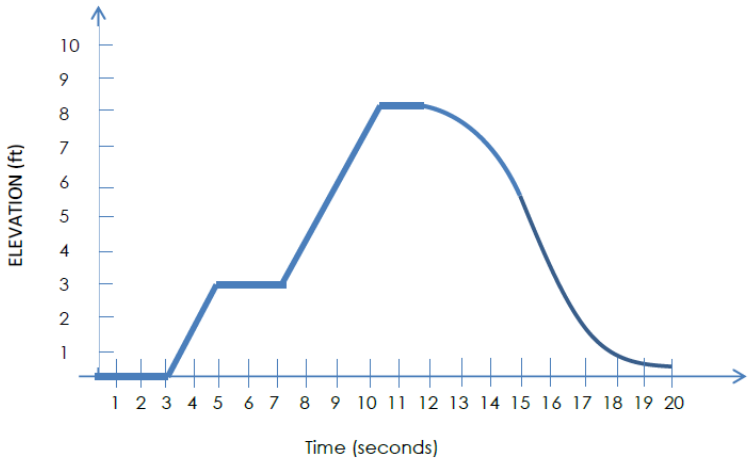
http://blog.mrmeyer.com/?p=213
http://youtu.be/xgODzAwxrx8
http://youtu.be/ZCFBC8aXz-g
https://www.youtube.com/watch?v=gEwzDydciWc

7. Given the graph below. Identify the parts that represent linear, quadratic, or exponential function.

What types of Functions are illustrated in the picture above?

What is the domain of this graph?

What is the range of this graph?



Write a real life situation that this graph could represent. Remember to use the time and elevation information within your story.