

Name: _____ Date: _____ Hour: _____

Guided Notes: Relations and Functions

Learning Target: I can analyze relations and functions.

D	I	X	R	O	Y

Ordered Pairs	Table
Mapping Diagram	Graph
Domain:	Range:

Continuous Relation

Discrete Relation

RELATION

<u>Definition:</u>	<u>Facts:</u>
<u>Examples:</u>	<u>Non-examples:</u>

FUNCTION

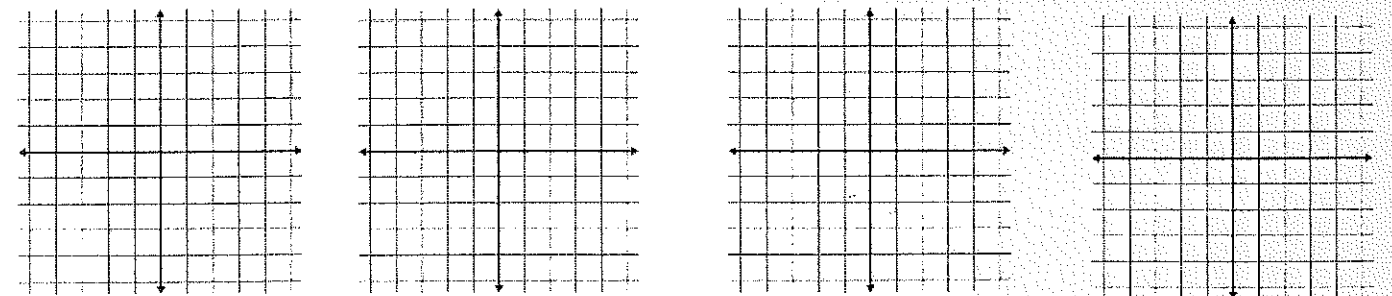
<u>Definition:</u>	<u>Facts:</u>
<u>Examples:</u>	<u>Non-examples:</u>

***** WITH FUNCTIONS, DOMAIN VALUES ARE ONLY USED ONCE! *****

What if you are given a graph, and you want to determine if it is a function?

Use the Vertical Line Test!

- Run an imaginary vertical line across your graph
 - If the vertical line ever touches the graph more than once on the same line, the graph is **not a function**
 - If the vertical line touches the graph only once, it **is** a function.



Once you know you have a function...try the horizontal line test!

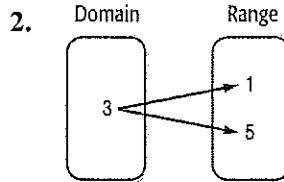
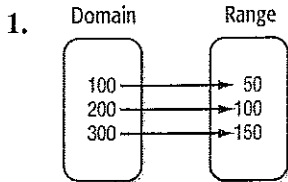
- Run an imaginary horizontal line across your graph
 - If the horizontal line ever touches the graph more than once at the same time, the graph is **not one-to-one**.
 - If it passes the graph only once, it is **one-to-one**.

one-to-one: every domain and range value is being used only once
not one-to-one: domain is used once, range is used more than once

2-1 Skills Practice

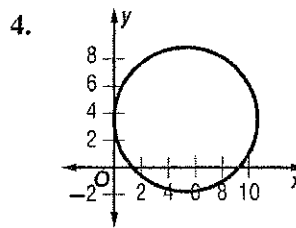
Relations and Functions

State the domain and range of each relation. Then determine whether each relation is a *function*. If it is a function, determine if it is *one-to-one*, *onto*, *both* or *neither*.



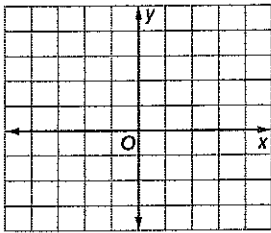
3.

x	y
1	2
2	4
3	6

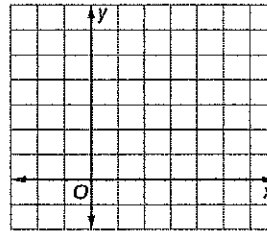


Graph each relation or equation and determine the domain and range. Determine whether the equation is a *function*, is *one-to-one*, *onto*, *both*, or *neither*. Then state whether it is discrete or continuous.

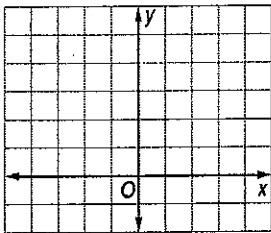
5. $\{(2, -3), (2, 4), (2, -1)\}$



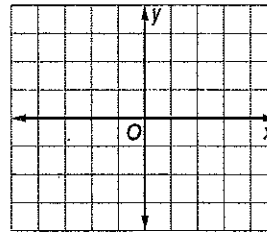
6. $\{(2, 6), (6, 2)\}$



7. $\{(-3, 4), (-2, 4), (-1, -1), (3, -1)\}$



8. $x = -2$



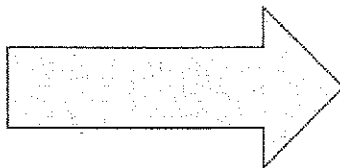
How to determine if something is a function or not

Remember: a function is a relation where each input/x-coordinate has only one output/y-coordinate.

FROM POINTS	FROM GRAPH
<ul style="list-style-type: none">• Look at all of your x-values• If any x-values are repeated, check to see if it's the same y-value each time• If those repeated x-values are matched to different y-values, then it's not a function!	Use the vertical line test!

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Guided Notes: Evaluating Functions

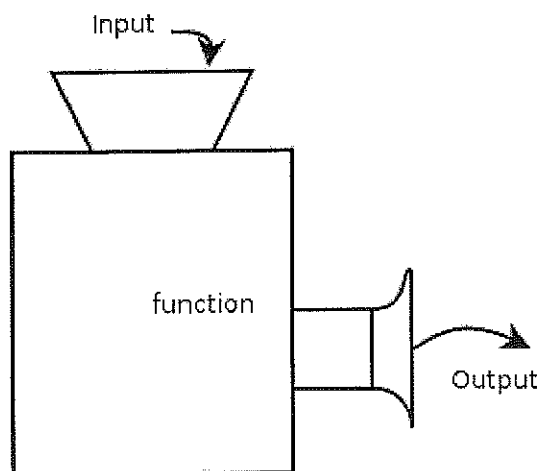


Function Machines and Function Notation

A function can be thought of as a _____ that assigns one _____ to every _____.

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

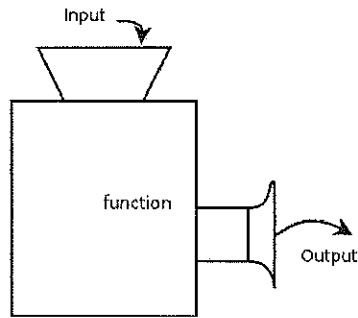
Find and illustrate $f(2)$ and $f(-1)$ using the function machine below.



Using the Function Machine...

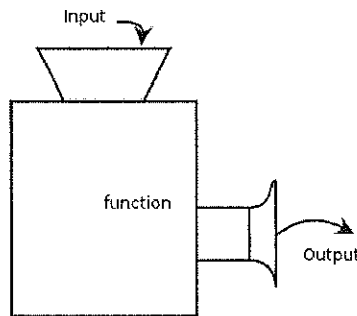
$f(x) = 2x + 3$

Input	Function/Rule	Output



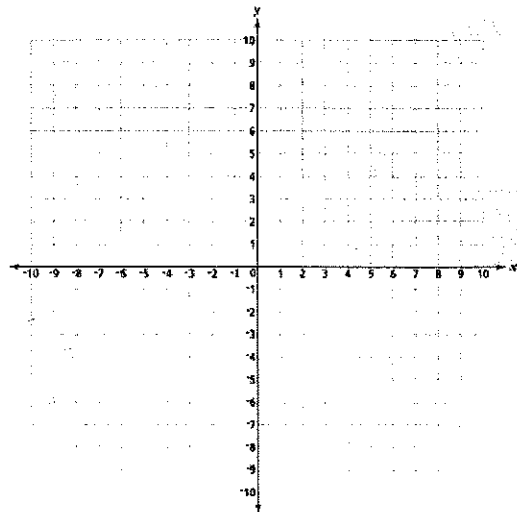
$f(x) = x^2 + 3$

Input	Function/Rule	Output



Complete the table:

Input	Function/Rule	Output	Ordered Pair
x	-2x - 3	y	(x,y)
-2			
0			
1			
5			
-2			



Function? Why or Why not? _____

Name: _____

Algebra 1: Relations and Functions—Day 2

Learning Target: I can evaluate functions.

1. Let $g(x) = x^2 - 5x + 2$. Find the following:

a. $g(-1)$

b. $g(-2)$

c. $g(0)$

d. $g(5)$

2. Let $f(x) = 2x^2 + 2$. Find each of the following:

a. $f(-3)$

b. $f(6)$

c. $f(-1)$

d. $f(4)$

3. Let $g(x) = x^2 + 4x - 1$. Find the following:

a. $g(-4)$

b. $g(8)$

c. $g(-1)$

d. $g(1)$

4. Let $f(x) = 3x^2 - 5x$. Find each of the following:

a. $f(2)$

b. $f(-8)$

c. $f(7)$

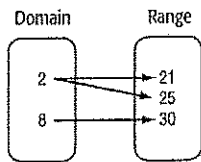
d. $f(-1)$

Learning Targets:

- I can identify the domain and range.
- I can use the vertical line test.
- I can graph a relation.

State the domain and range of each relation. Then determine whether each relation is a *function*.

1.



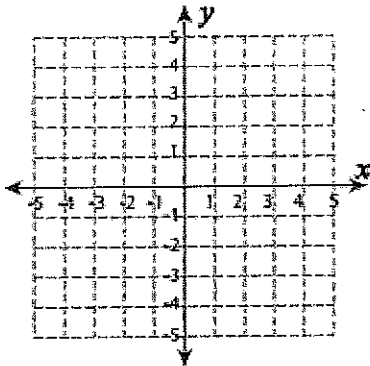
2.

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

Compute the function table. Draw the graph of each function.

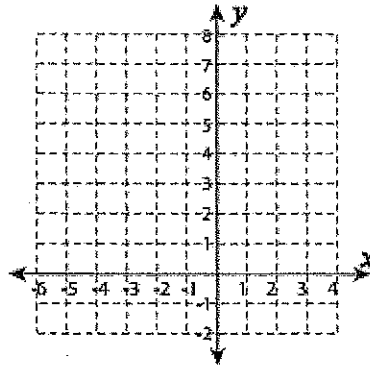
1) $f(x) = 2x + 1$

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



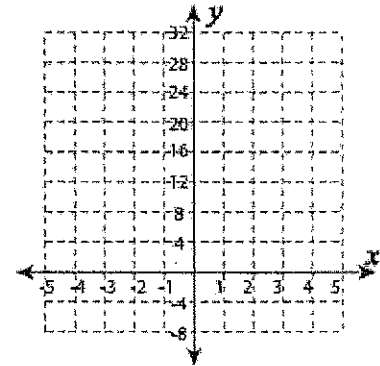
2) $f(x) = x + 5$

x	-6	-5	-3	1	3
f(x)					



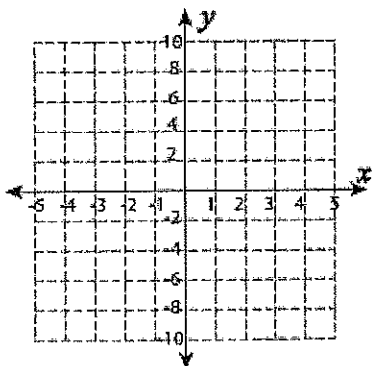
3) $f(x) = 4 - 8x$

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



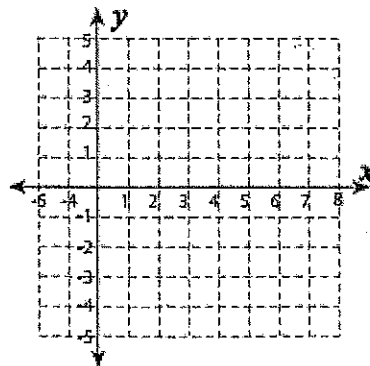
4) $f(x) = 2x$

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



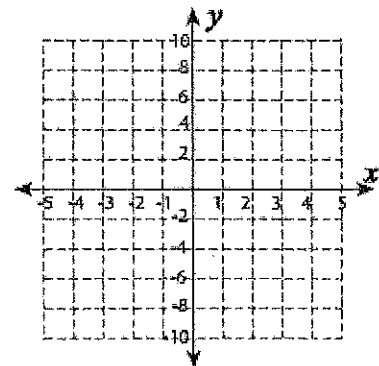
5) $f(x) = x - 9$

x	4	5	6	7	8
f(x)					



6) $f(x) = 2x + 4$

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



Guided Notes: Linear Functions

So far, we've talked about relations and functions, as well as evaluating functions. Functions can be classified into multiple different categories, such as exponential, quadratic, polynomial, logarithmic. Those you will learn about later on (Mostly in Chapter 5, and in Algebra 2)

For now, we are going to focus on **linear functions and equations**.

Linear function: _____

Linear equations can be written in multiple different forms. We'll explore these more in depth later in the chapter.

$$y = mx + b$$

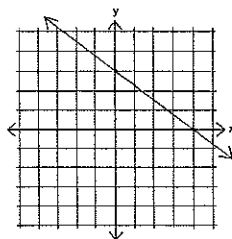
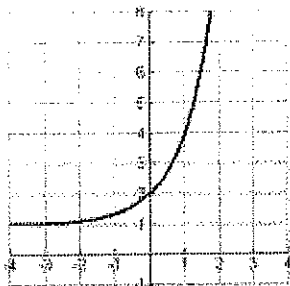
$$Ax + By = C$$

$$y - y_1 = m(x - x_1)$$

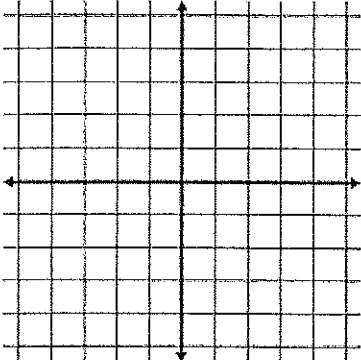
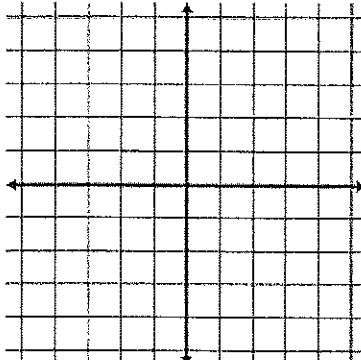
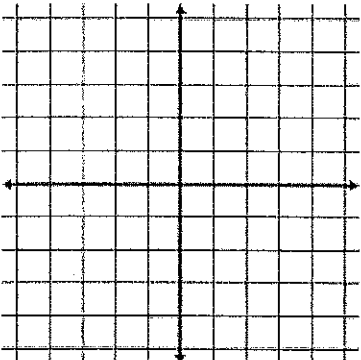
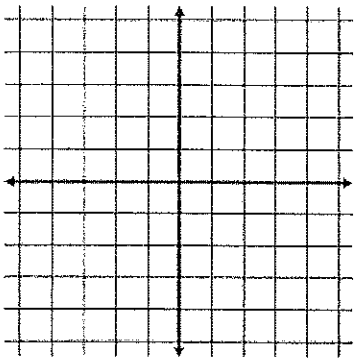
You can easily determine if a function is linear based upon the set of ordered pairs, or by the graph.

FROM A GRAPH	FROM A FUNCTION
If you graph your function and it is a _____, then the function is linear.	Make a table of consecutive x-coordinates, and plug them into your function. If your y-values increase or decrease by a _____ amount, then your function is linear.

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



$$4x - 5y = 16$$

<u>Linear</u>		<u>Non-Linear</u>	
$y = x + 1$		$y = x^2$	
	Why is it linear?		Why is it not linear?
$y = 8 - 2x$		$y = \frac{2}{x}$	
	Why is it linear?		Why is it not linear?