Foundations of Algebra   Unit 5: Linear Functions   Notes

Name: _____

Unit 5: Linear Functions

Learning Target #1: Creating and Evaluating Functions
- Determine if a relation is a function
- Identify the domain and range of a function
- Evaluate a function
- Create an input and output table
- Create a rule to describe a table, graph, or context

Learning Target #2: Graphs and Characteristics of Linear Functions
- Graph a function in slope intercept or standard form
- Convert between standard and slope intercept forms
- Calculate the slope in multiple representations
- Identify the y-intercept from multiple representations
- Identify the domain and range, x and y intercepts, intervals of increase and decrease, maximums and minimums, end behavior, and positive and negative areas from a graph

Mon, 10/21	Tues, 10/22	Wed, 10/23	Thurs, 10/24	Fri, 10/25
	4.2 Assessment Day 1: Function Notation	Day 2: Function Notation	Day 3: Creating Functions Rules	Day 4: Slope
Mon, 10/28 Day 5: Slope	Tues, 10/29 Day 6: Y-intercept	Wed, 10/30 Day 7: Graphing Linear Functions	Thurs, 10/31 Day 8: Graphing Linear Functions & Matching Graphs and Equations	Fri, 11/1 Day 9: Writing Equations of Lines
Mon, 11/4 Day 10: Writing Equations of Lines	Tues, 11/5 No School *STUDY*	Wed, 11/6 Day 11: **5.1 Assessment;** Characteristics of Linear Functions	Thurs, 11/7 Day 12: Characteristics of Linear Functions	Fri, 11/8 Day 13: Standard Form
Mon, 11/11 Day 14: Standard vs Slope Intercept Form	Tues, 11/12 Day 15: Comparing Linear Functions	Wed, 11/13 Day 16: Comparing Linear Functions	Thurs, 11/14 Day 17: Remediation/Extra Day	Fri, 11/15 Day 18: **5.2 Assessment**
Mon, 11/18 Cumulative Exam Review	Tues, 11/19 **Cumulative Exam #2**	Wed. 11/20	Thurs, 11/21	Fri. 11/22

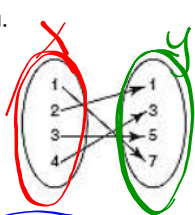|	Monday	Tuesday	Wednesday	Thursday	Friday
AM	NONE	Mrs. Jackson 7:45 – 8:15 Room 1210	Mr. Webb 7:45 – 8:15 Room 1205	Mr. Watson 7:45 – 8:15 Room 1208	Mr. Watson 7:45 – 8:15 Room 1208
PM	Mrs. Petersen 3:30 – 4:30 Room 1210	Mr. Webb 3:30 – 4:30 Room 1205	NONE	Mrs. Jackson 3:30 – 4:30 Room 1210	NONE

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Day 1 – Functions

In 8th grade, you learned to express mathematical relationships using a coordinate graph. Relationships can also be represented by a set of ordered pairs, which is called a **relation**. Relations can be represented using tables, graphs, or mappings.

A **function** maps each input to one and only one output, which means a function has no input with more than one output (No x-values going to two different y-values). Each of the below representations are relations. The first coordinate of an ordered pair in a relation in the **input**, and the second coordinate is the **output**. We refer to the set of all inputs as the **domain** and the set of all outputs as the **range**.

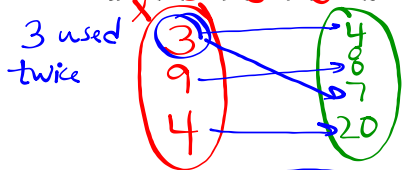Determine if the following are functions. Then state the domain and range:

a.

b. {(3, 4), (9, 8), (3, 7), (4, 20)}

3 used twice

c. {(15, -10), (10, -5), (5, 2), (10, 5), (15, 10)}

X-values used more than once

Function or Not a Function
X: Domain: {1, 2, 3, 4}
y: Range: {1, 3, 5, 7}

Function or **Not a Function**
X Domain: {3, 9, 4}
y Range: {4, 8, 7, 20}

Function or **Not a Function**
X: Domain: {15, 10, 5}
y Range: {-10, -5, 2, 5, 10}

d.

Input	Output
−10	20
−5	10
0	0
5	10
10	20

Function or Not a Function
X: Domain: {-10, -5, 0, 5, 10}
y: Range: {20, 10, 0}

e.
Input   Output
-8 → 0
24 → 20
32 → 32

Function or Not a Function
Domain: {-8, 24, 32}
Range: {0, 20, 32}

f.
Input   Output
1 → 2
5 → 7
  → 10
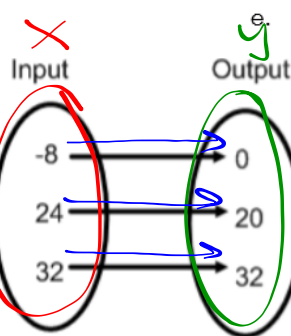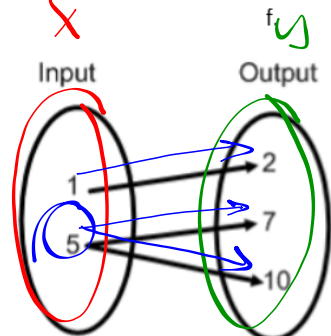
Function or **Not a Function**
Domain:
Range:

g. (telephone number, person)

770-613-2173
770-713-2434
404-291-5245

Bob
Carol
Suzy
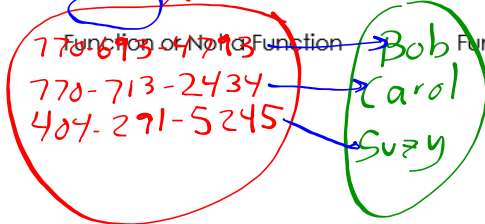
Function or Not a Function

h. (person, car)

Mrs P

Jeep
Toyota
Nissan
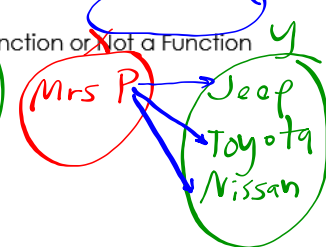
Function or **Not a Function**

i. (shirt color, student)

gray
blue

Judson
Shalon
Miles
Gabby
Court

Function or Not a Function

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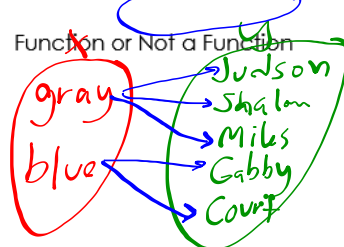
Testing if a Function is a Function (Vertical Line Test)

Another way to tell if a relation is a function is the **Vertical Line Test**. The Vertical Line Test is used with graphs of relations. To use the Vertical Line Test, consider all of the vertical lines that could be drawn on the graph of the relation. If any of the vertical lines intersect the graph of the relation at more than one point, then the relation is not a function.

Vertical = up + down   Horizontal

Ex. Use the Vertical Line Test to determine if the graphs of the relations are functions.

A.   x = 1

$x: \{1\}$
$y: \{-4, 4\}$

NOT a function   1 → -4, 4

B.

x y
1 → 1

yes

C.

NOT a function

x y
1 → 1.2, 1.2

Different Meanings of Domain and Range Organizer

D	Domain	R	Range
I	Input	O	Output
X	X-value	Y	y-value
I	Independent Variable	D	Dependent Variable

$$(\; x \; , \; y \;)$$

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