Name: _____ Date: _____ Period: _____

Sec 1H Unit 5 Day 1 – What Is a Function? Classwork

1. The Soda Machine

The soda machine in the faculty room offers several types of soda. There are two buttons for your favorite drink, *Blast*, while the other drinks (*Slurp, Lemon Twister*, and *Diet Slurp*) each have one button.

a. What are the input and output of this soda machine? This is called the domain and range.

b. While buying a soda, Ms. Whitney pushed the button for *Lemon Twister* and got a can of *Lemon Twister*. Later she went back to the same machine, but this time pushing the *Lemon Twister* button got her a can of *Blast*. Is the machine functioning consistently? Why or Why not?

c. When Mr. Smith pushed the top button for *Blast* he received a can of *Blast*. Mr. Garcia decided to be different and pushed the second button for *Blast*. He, too, received a can of *Blast*. Is the machine functioning consistently? Why or Why not?

d. When Ms. Call pushed a button for *Slurp*, she received a can of *Lemon Twister*! Later Ms. Webb also pushed the *Slurp* button and received a can of *Lemon Twister*. Still later, Ms. Webb noticed that everyone else who pushed the *Slurp* button received a *Lemon Twister*. Is the machine functioning consistently? Explain why or why not.

e. When a relation is functioning consistently and predictably, we call that relation a function. Write a definition of a function:

There are five different ways to represent a relationship in mathematics:
1. Ordered pairs (points) 2. Table 3. Graph 4. Mapping 5. Equation

Each of these shows the connection between the input (domain) and the output (range).

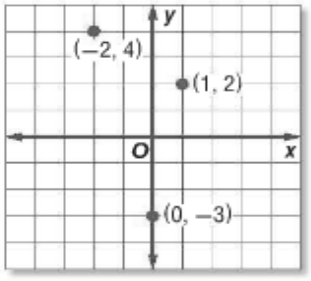
Ordered Pairs

$(1, 2)$
$(-2, 4)$
$(0, -3)$

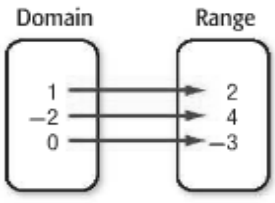
Table

x	y
1	2
−2	4
0	−3

Graph



Mapping



Equation

$y = 3x$

How do you say this notation? $f(x)$
What does it mean?

2. When are ordered pairs NOT a function?

3. When is a table NOT a function?

4. When is a graph NOT a function?

5. When is a mapping NOT a function?

6. When is an equation NOT a function?

The **domain** is the set of **x's** being used in a relation or function. The **range** is the set of **y's**. To write the domain and range, use set-builder notation: curly brackets around the list or the inequality. For example, the domain for this table

x	7	-2	0	4	9	-3	6
y	6	-3	4	2	10	-3	0

could be written as D = {7, -2, 0, 4, 9, -3, 6}.
The range could be written as R = {6, -3, 4, 2, 10, 0}

When writing the domain and range, don't write any duplicates twice. Once is enough. It is also good manners to write the numbers from least to greatest in the list.

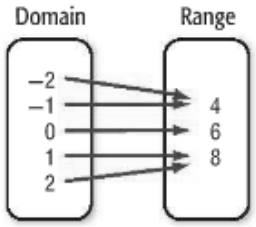
7. Examine each of the relations below. With each relationship, properly state the domain and range. Compare the inputs and the outputs and determine if the relation is a function.

a.

x	3	-1	2	0	1	2	9
y	4	-5	9	7	4	-8	2

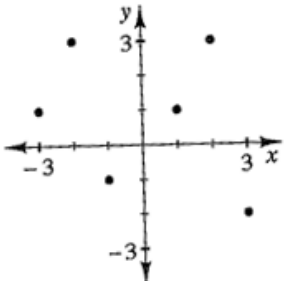
Domain:
Range:
Function (Y/N):

b.



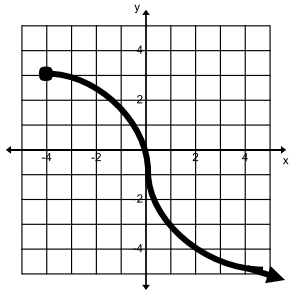
Domain:
Range:
Function (Y/N):

c.



Domain:
Range:
Function (Y/N):

d.



Domain:
Range:
Function (Y/N):

e.
(1, 2) (-2, 4) (3, 2)

Domain:
Range:
Function (Y/N):

9. If $g(m) = 3m - 5$, give the value for each problem listed below.

a. g(-2)= b. g(4)= c. g(6)= d. g(x)