Name_____

Topic/objective: Introduction to functions

Homework: yes

Words I need to know……..

Function	Function notation
Domain	Independent variable
Range	Dependent variable
Output	Relation
Input	Vertical Line Test

Let's start with function

A Function when each input is paired with exactly one output

A Function consists of:

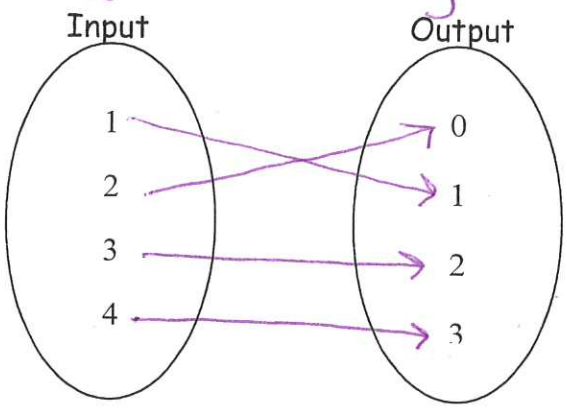
Domain All x-values, Also called input

Range All y-values, Also called output

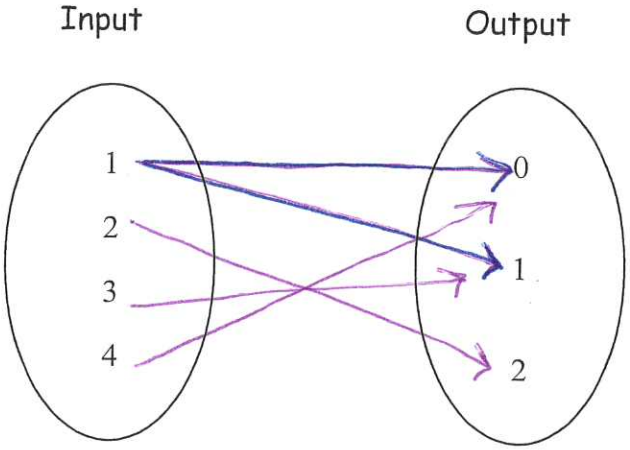
Four Ways to Represent a Function

1.)Mapping Diagram

Domain x Range y

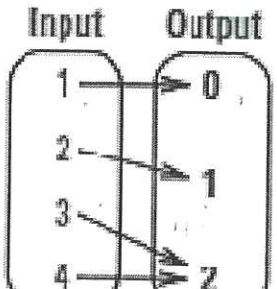


A mapping diagram shows a function if each element of the domain maps to only one element of the Range



A mapping diagram Does not show a function if ONE element of the Domain maps to more than one Range

Notice an output may be paired with more than one input, but no input is paired with more than one output



2.)Ordered Pairs

D R
x y
{(2, 4), (-8, 0), (1, 5), (3, 1)}

Ordered pairs show a function if the Domain Values DO NOT REPEAT

{(2, 4), (-8, 0), (1, 5), (1, 3)}

Ordered pairs Does not show a function if the Domain values DO REPEAT

3.)Table of Values

Domain
Range

input x	-2	-8	1	3
output y	4	0	5	1

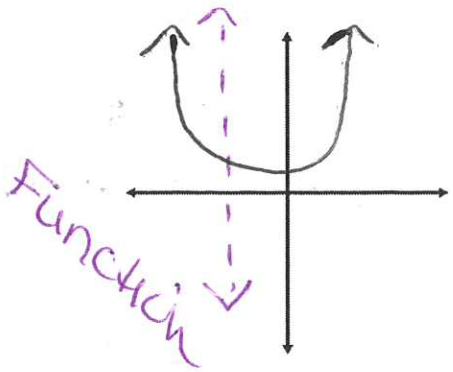
A table of values shows a function if the X-Values **do NOT** Repeat

input	-2	-8	1	1
output	4	0	1	3

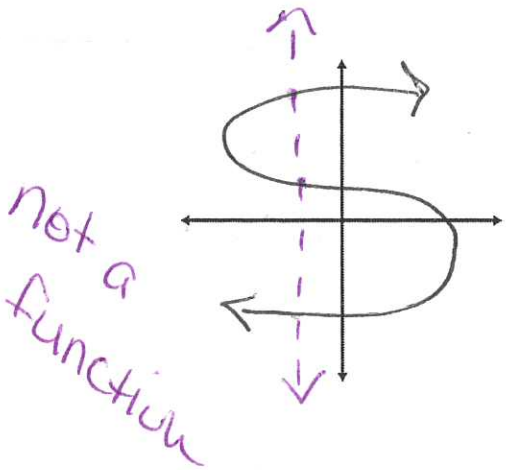
A table of values Does not show a function ***function*** if the X- Values Repeat

4.)Graph

A graph shows a function if it passes the vertical line test (passes once)



A graph does not show a function if it fails the vertical line test



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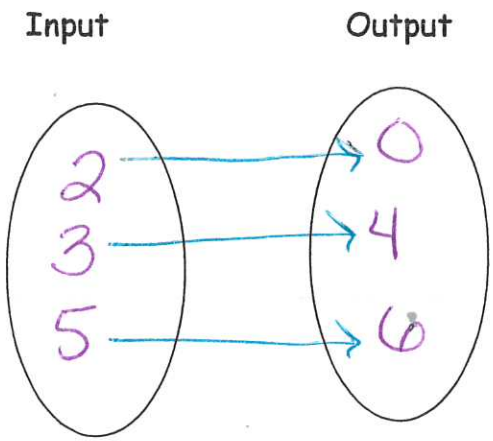
(1)

Identify the Domain and Range

Input	Output
0	0
1	2
4	8
6	12



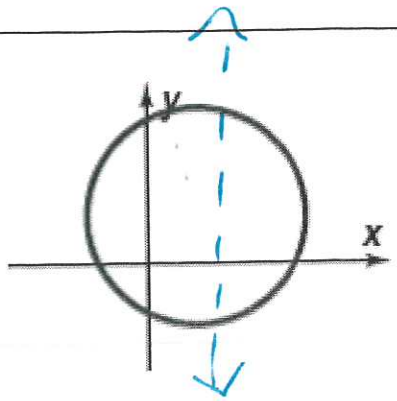
D: {0, 1, 4, 6}

R: {0, 2, 8, 12}

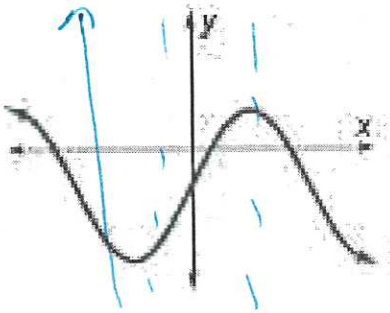
D: {2, 3, 5}

R: {0, 4, 6}

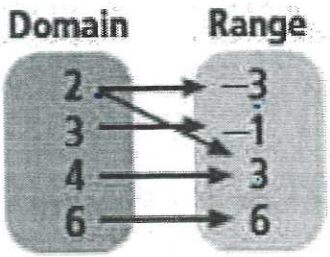
Are the Following Functions?



not a function



function



not a function

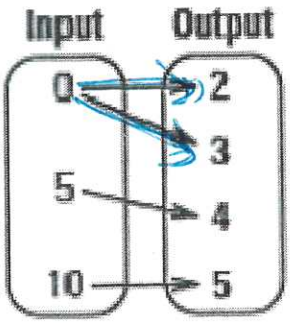
Tell whether the pairing is a function and explain.

This pairing (is/) is not a function. Why?

Input	Output
0	0
1	2
4	8
6	12

each input is paired to exactly one output

This pairing is/ (is not) a function. Why?



the input zero has two different output

Indicate whether the following pairings are functions:

a.) (-1, 5), (0, 5), (2, 4), (6, -1): Function? (yes / no) _____

Why? the Domains do not repeat

b) (-2, 10), (0, 1), (2, 8), (-2, -10): Function? (yes / no) _____

Why? Domains Repeated

Make a table for a Function

The domain of the function $y = 2x$ *is* $0, 2, 5, 7$ *and* 8. Make a table for the function, then identify the range.

x	y
0	2(0) = 0
2	2(2) = 4
5	2(5) = 10
7	2(7) = 14
8	2(8) = 16

$y = 2x$

Range: {0, 4, 10, 14, 16}

Try on your own...

Make an input-output table for the function $y = 5x + 1$ *with a domain of* $0, 1, 2, 3$ and give the Range.

$y = 5x + 1$

D: 0, 1, 2, 3

x	y
0	$5(0)+1 = 1$
1	$5(1)+1 = 6$
2	$5(2)+1 = 11$
3	$5(3)+1 = 16$

R: {1, 6, 11, 16}

Is This a Function? yes

Function rules: may be represented using a rule that relates one variable to another. The input variable is the independent variable and the output variable is the dependent variable, since its value is dependent on the value of the input.

☆ Whatever you put in (x- independent) will depend on what gets put out (y-dependent)

Write a rule for the function represented by the table below:

D, x

R, y

Input	0	1	2	4	6	10
Output	2	3	6	8	12	

Let x be the independent variable and y be the dependent variable.
Each output is 2 more than the input.

So the rule is y = $2 + x$

On your own...

Write a Rule for the function. Identify the Domain and the Range.

Time(Hours)	1 · 8	2 · 8	3 · 8	4 · 8
Pay(Dollars)	8	16	24	32

Time is the x / y Value: x value also known as the Input / Output: Input

Pay is the x / y Value y value also known as the Input / Output: Output

Each output is 8 times the input

So the Rule is: $y = 8x$