1.6: Represent Functions as Rules and Tables

- **Goals:** *Identify whether a pairing as a function
 - *Identify domain and range of a function
 - *Identify dependent and independent variables
 - *Make tables for functions
 - *Write rules for functions

<u>Function</u> : a relationship between _2 variables calledinput and	
output	
**EACH INPUT CAN HAVE EXACTLYONEOUTPUT	!!
Domain: the set of allinput values	
<u>Range</u>: the set of alloutput values	

<u>Ex</u>: Tell whether each pairing is a function. If yes, state the domain and range. If no, say why.



No, 0 has two outputs

C)

Input	Output
3	1
6	2
9	2
12	1

Yes, each input has one output Domain: 3, 6, 9, 12 Range: 1, 2 **B**)

Input	Output
0	0
1	2
4	8
6	12

Yes, each input has 1 output Domain: 0, 1, 4, 6 Range: 0, 2, 8, 12

D)

Input	2	2	4	7
Output	0	1	2	3

No, 2 has two outputs.

*You can represent a function in 3 ways:

a)	Verbal Rule	b)	Equation		c) Te	able			
"The	output is 3 more than the inpu	ıt"	y = 3 + x]	x	0	1	2	3
				-	у	3	4	5	6

For the following functions, make a table and identify the range.

Ex: Function is y = 2x with a domain of 0, 2, 5, 7, 8

x	0	2	5	7	8
у	0	4	10	14	16

Range: 0, 4, 10, 14, 16

Ex: Function is y = x - 5 with a domain of 10, 12, 15, 18, 29

x	10	12	15	18	29
У	5	7	10	13	24

Range:	5, 7,	10,	13,	24
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To write a rule for a function:

- 1. Start with _____y =_____
- 2. Find out what is happening to <u>x</u> to get <u>y</u>
- 3. Check that it works for all ____inputs_____!

Write a rule for each function.

Ex:

Input (x)	0	1	4	6	10
Output (y)	2	3	6	8	12

y = x + 2

Ex:

Time (hrs)	1	2	3	4	0
Pay (\$)	8	16	24	32	y = 8x

Ex:

Input	1	2	4	7	9
Output	0	1	3	6	8

y = x - 1

<u>Writing a rule for a function:</u> (*don't forget all functions start with: __y =__)

 Δ is the Greek letter **Delta**. In math, it means <u>change</u> <u>in</u>

Ex: ΔT would mean to find: If it was 59° this morning and it is 65° now, what is ΔT ? $\Delta T = 6°$

- **1. Find** Δx "how much does <u>x</u> change by each time?"
- **2.** Find Δy "how much does y change by each time?"
- 3. Set up a fraction: $\frac{\Delta y}{\Delta x}$ Simplify if possible. DO NOT MAKE A DECIMAL!
- 4. This number (the one you get from the fraction) becomes the <u>coefficient</u> of x in your function. (This mean it <u>multiplies</u> x)
- 5. Check to see if your function works by putting in <u>inputs</u> and seeing if you get the correct <u>output</u>. If not, adjust your function by adding or subtracting.

Write a rule for each function, using the steps provided.

Ex:		
	x	у
	0	1
	2	5
	4	9
	6	13

 $\Delta x = 2$ $\Delta y = 4$

-2

 $\frac{4}{2} = 2$ so in your function, 2 will be the coefficient (multiplier of x)

y = 2x If you put in the first input of 0, you would get out a 0, but you want a 1, so adjust your function by adding 1. Then check for all other inputs.

y = 2x + 1

Ex:					
x	1	4	7	10	y = 3x
у	1	10	19	28	