

Concept: Relations, Equations and Functions

Name: _____

COMPUTER COMPONENT

Instructions: In  follow the **Content Menu** path:

Graphing > Relations, Equations, and Functions



Work through all Sub Lessons of the following Lessons **in order**:

- *In This Topic*
- *Relations*
- *Functions*
- *Vertical Line Test*
- *Function Notation*
- *Patterns to Words to Equations*



As you work through the computer exercises, you will be prompted to make notes in your notebook/math journal.

NOTES

- In mathematics, a **relation** is a _____
- It shows how _____
- These sets of ordered pairs can be drawn on a _____ or listed in a _____
- Another way to display the ordered pairs is by using a _____ (*draw one below*)

- The **DOMAIN** of a relation is the set of all _____ numbers of the ordered pairs.
- The **RANGE** of a relation is the set of all _____ numbers of the _____
- A **function** is a relation in which each element () of the _____ is mapped to exactly _____ element () of the _____.

- A useful test we can use on a graph to see if the graph is a function is called the _____ Test. *Explain, in your own words, how this test works.*

(a) *How do we read $f(x)$ if we are saying it out loud?* _____

(b) *What is $f(4)$ asking for?* _____

(c) Design your own “*Patterns to Words to Equations*” Example (*similar to Examples 1,2,3,4*)

OFF COMPUTER EXERCISES

1. The following shows how grass growth in millimeters (G) is related to rainfall in millimeters (R).

G	R	Ordered Pair (G,R)
1	5	
2	6	
3	7	
4	8	

- (a) Fill in the ordered pairs in the chart.
- (b) Place the results from the chart into a mapping.

(c) *The Domain of the Relation is* _____

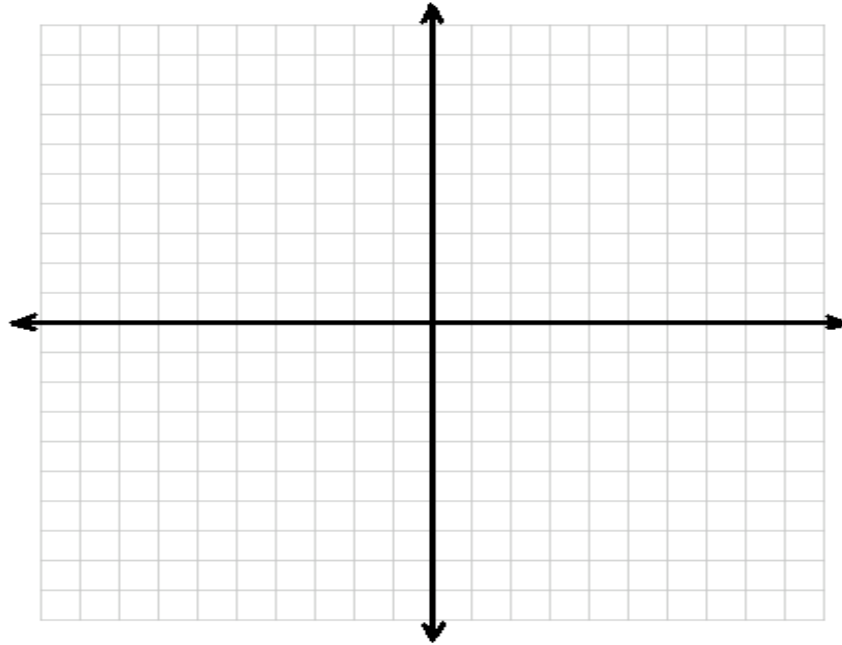
(d) *The Range of the Relation is* _____

(e) **Predict** how many millimeters of rain are needed for the grass to grow 5 millimeters.

2. Note the following chart:

x	y	Ordered Pair (x,y)
-3		
-2		
-1		
0		
1		
2		

- (a) The equation rule for this relation is $y = x^2$. *Fill in the y column.*
- (b) Fill in the ordered pair column.
- (c) *The Domain is* _____
- (d) *The Range is* _____
- (e) Graph this relation here.



3. Examine the charts below and decide whether the relation is a *function* or a *non-function*. (Drawing a mapping in this exercise may help you.)

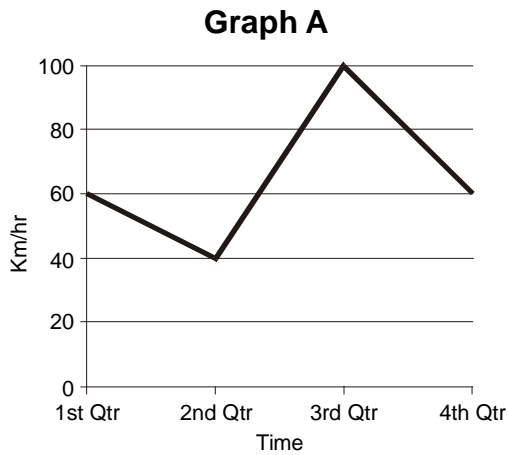
(a)

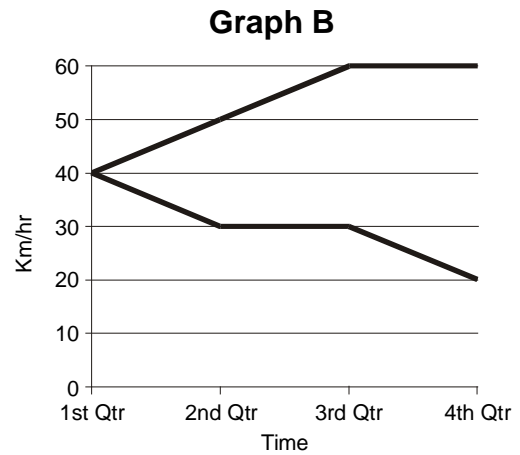
x	y	(x,y)
1	4	(1,4)
5	7	(5,7)
-1	5	(-1,5)
5	2	(5,2)
0	0	(0,0)

(b)

S	T	(S,T)
0	6	(0,6)
2	4	(2,4)
4	2	(4,2)
-2	4	(-2,4)

4. Determine from these graphs if the relations are functions or non-functions.





5. Given the equation rule $y = 4x + 1$ and the x values,

x	y
-2	
-1	
0	
1	
2	

(a) Fill in the y values on the chart.

(b) Give the equation $y = 4x + 1$ in function notation. _____

(c) What is $f(4)$ asking for? _____

(d) Find $f(4)$. _____

6. (a) Find the pattern and give the equation formed from the function below.

x	y	
-4	8	
-1	2	
0	0	
2	-4	
4	-8	

Equation- _____

(b) Note the pattern. *Write it in words.*

(c) Write the equation using function notation. _____

(d) Create a third column on the right side of the chart above.

Add 3 to each y value and place this new value in the third column.

(d) Find the equation for the new y values. _____

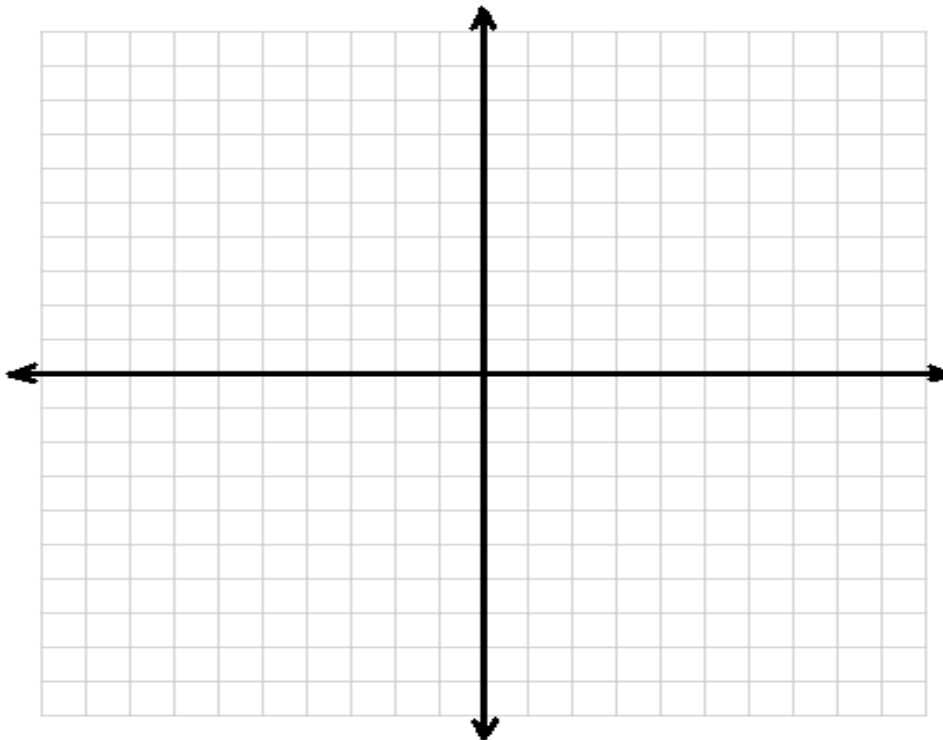
(e) Write this new equation in function notation. _____

5. Given the equation rule $y = x^2 - 2$,

(a) Fill in the y column and the ordered pair column in the chart.

x	y	(x,y)
-3		
-2		
-1		
0		
1		
2		
3		

(b) Graph this relation on the graph below.



(c) Is this relation a function? *Why or why not?* _____

(d) Find $f(2.5)$ _____