Name: _____ Date: _____

Functions and Relations

Terms to Know:

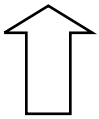
- Relation: Any set of ordered pairs. Example: (2, 3) (4, 7) (5, 9) (4, 1)
- Function: A relation such that ***every single input has exactly one output.*** This means that every x-value has its own y-value. One x-value can't have 2 different y-values. Example: (2, 3) (4, 7) (5, 9) (7, 11)

Here are a few examples:

- Input the number of seconds after the starting gun in a race to get an output of the number of meters the runner has covered.

Race Chart - function

Number of Seconds (input)	1	4	7	8
Meters Covered (output)	5	20	35	40



Notice that each input is different.

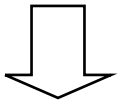


Table - function

x (input)	-3	0	7	8
y (output)	-9	-6	1	2

- The rule about only **<u>one output</u>** each time is crucial and must not be violated.

Not a Function

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

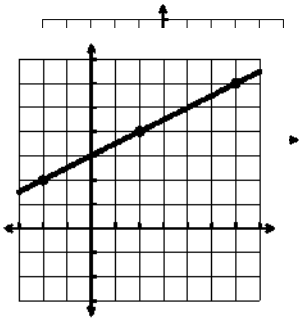
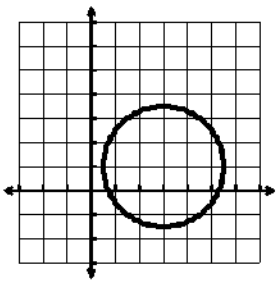
Notice that there are 2 x-values of 3.

Why is this not a function? _____

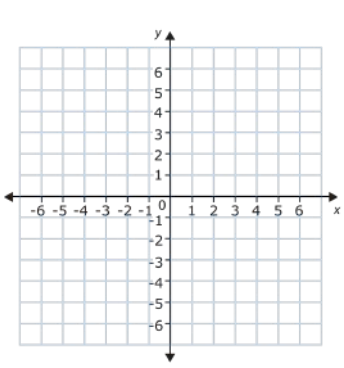
How do I determine if a relation is a function?

- Each input must have _____ output.
- Look at the graph….The vertical line test: **No** vertical line can pass through more than one point on the graph.

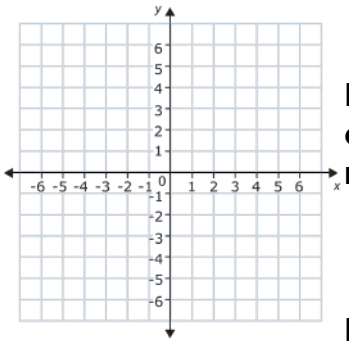
Examples: Are these relations functions? Use the vertical line test!

1. $\{(3,2),(4,3),(5,4),(6,5)\}$
2.
3.
4. 
5. 

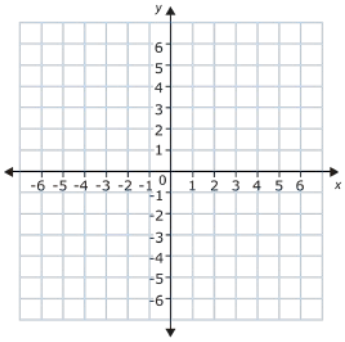
Use the coordinate planes below and draw a graph that will meet the requirements.



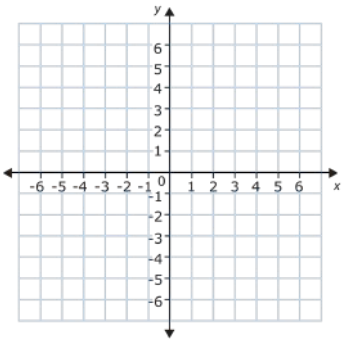
Not a function



Function



Not a function



So…one more time…

What is a function?

How can we tell if a relation is a function?