Key Terms

Relation – Any set of inputs that has an output; (a set of ordered pairs)

Function – Is a relation that every single input has exactly one output

Domain – list of x-coordinates or inputs

Range – list of y-coordinates or outputs

Unit 3 - Functions

Essential Question:

How can we tell if a relation is a function?

Today's Question:

What is a function?

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

Domain: all the inputs (1, 4, 7, 8)

Range: all the outputs (5, 20, 35, 40)

$y = x - 6$, where x is the place holder (also called a variable) for the input and y is the place holder for the output.

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

Domain:

Range:

The rule about only **one output** each time is crucial and must not be violated.

NOT A FUNCTION				
x(input)	**3**	**2**	**0**	**3**
y (output)	**4**	**-1**	**2**	**-3**

Why is this not a function?

How do I know if it's a function?

Look at the input and output table – ***Each input must have exactly one output.***

Look at the Graph – The Vertical Line test = ***NO vertical line can pass through two or more points on the graph***

Example 1:

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

Is this relation a function?

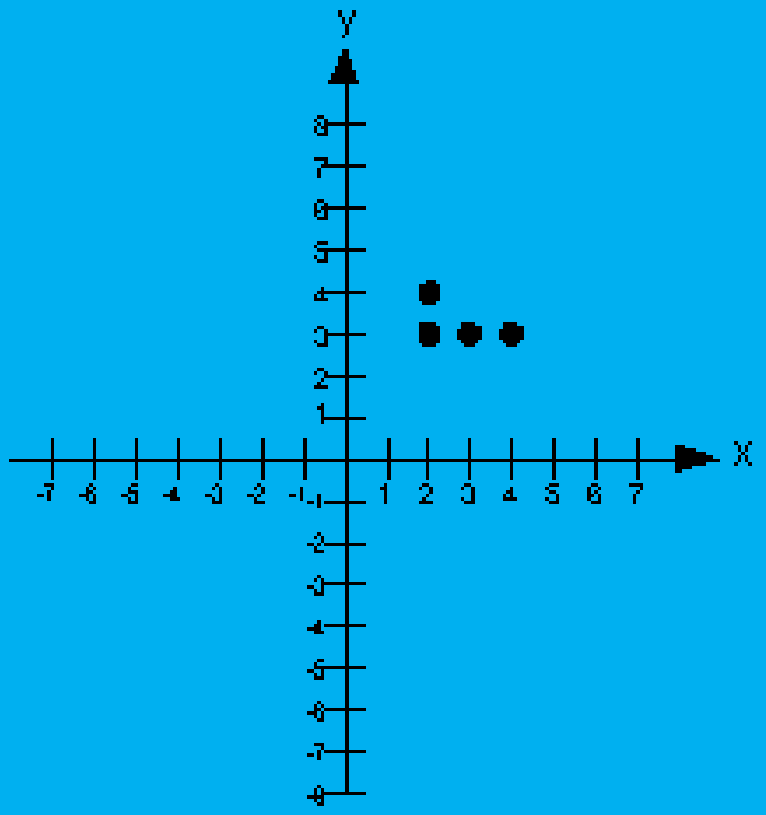
How do you know?

Example 2:

Reading the ordered pairs:

(2, 3), (2, 4),

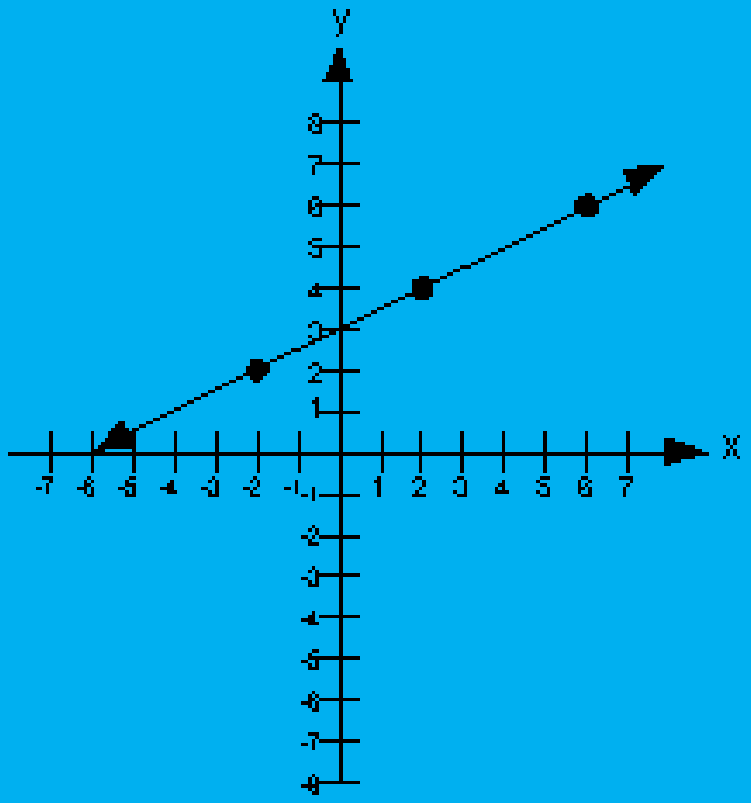
(3, 3), (4, 3)



Is this relation a function?

How do you know?

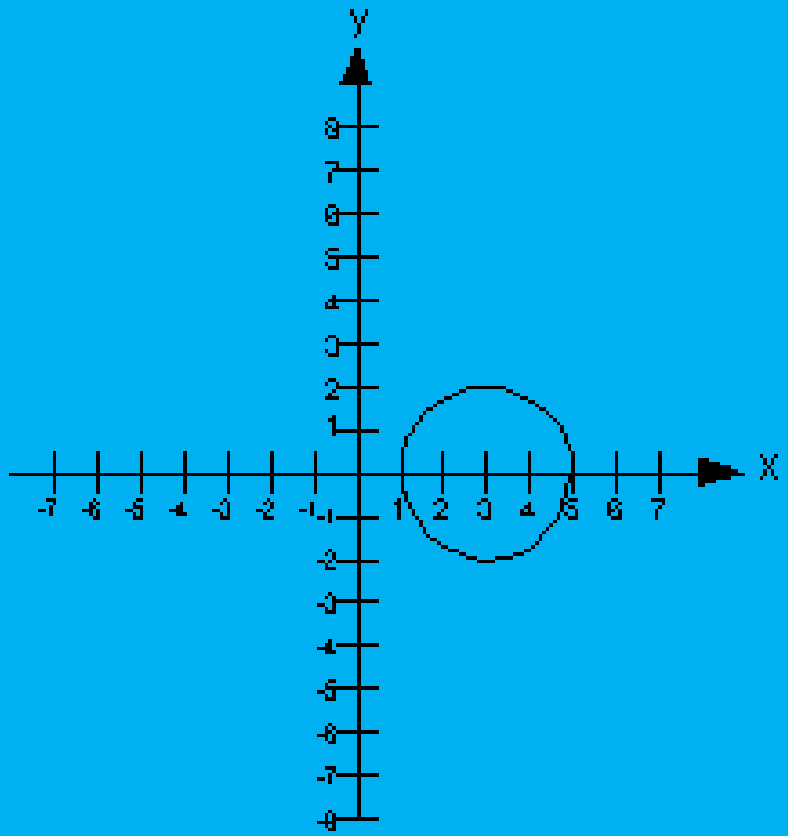
Example 3:



Is this relation a function?

How do you know?

Example 4:

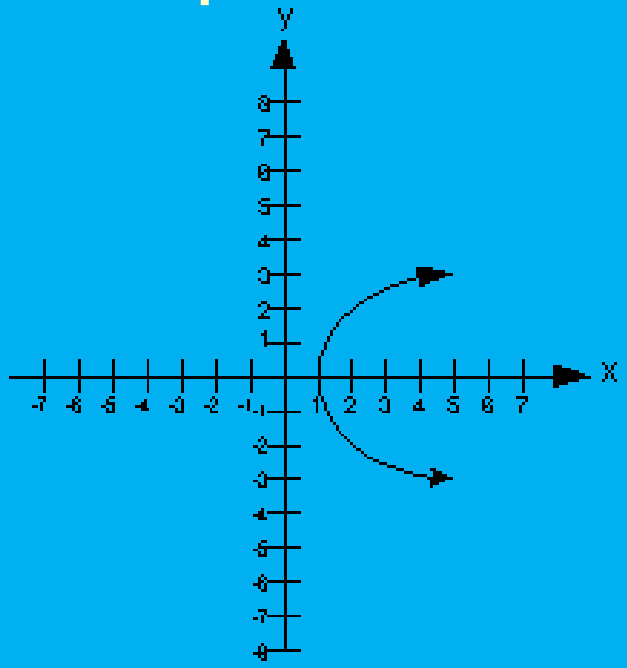


Is this relation a function?

NO!

How do you know?

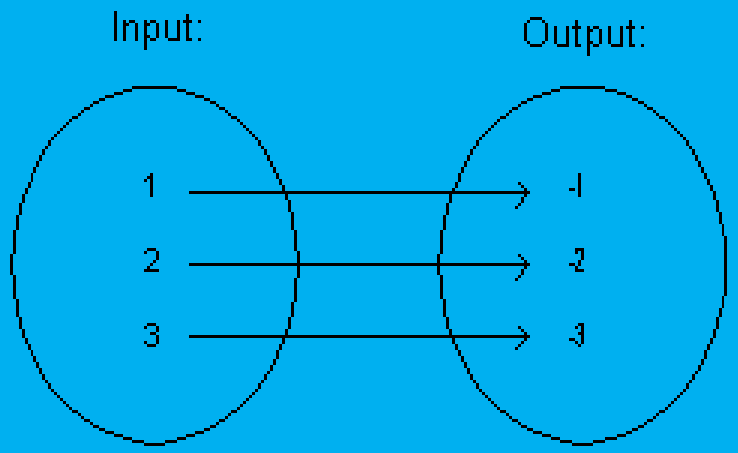
Example 5:



Is this relation a function?

How do you know?

Example 6:



Is this relation a function?

How do you know?

Function Notation

By naming a function f, you can write it using **function notation:** f(x) = mx + b

- Function notation is a way to name a function. It is pronounced **"f of x"** .

f(x) is a fancy way of writing "y" in an equation.

f(x)=2x+4 is the same as y=2x+4

Function Notation	X-Y Notation
f(x) = 5x + 2	
	y = -3x - 7

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