Functions and Relations

A mathematical relation is made up of inputs and outputs called the domain and range.

Domain: The input, or x-values independent

Range: The output, or y-values. dependent

Relation: Any pairing of numbers. It can be shown as an ordered pair (x,y), a graph, or as an equation with two variables (y=2x+3).

A relation may or may not follow a rule.

Ex.

Which of the following relations shows a rule?

Candy Palace	Sweet Factory
(2 candy bars, $1.50)	(1 candy bar, $0.75)
(2 candy bars, $3.50)	(2 candy bars, $1.50)
(3 candy bars, $5.00)	(3 candy bars, $2.25)

Function: A special type of relation in which a rule assigns every input exactly one output.

Candy	Price
1	$0.75
2	$1.50
3	$2.25
4	$3.00

What is the input and output of this relation?

I: Candy Output: $

Is there a rule that assigns a specific output to each input?

Yes

Would it be possible to have two of the same inputs with different outputs?

No

Determine if each relationship is a function.

1.

Input	0	1	3	7	9
Output	2	6	8	10	10

Function?: Yes

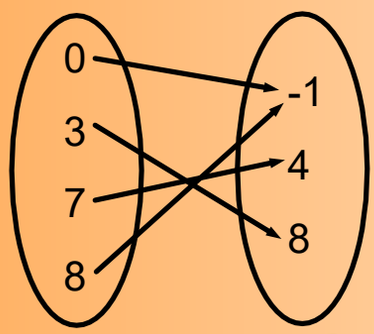
Domain: 0, 1, 3, 7, 9

Range: 2, 6, 8, 10

2. {(-3, 1), (-1, 4), (1, 7), (2, 9), (5, 14)}

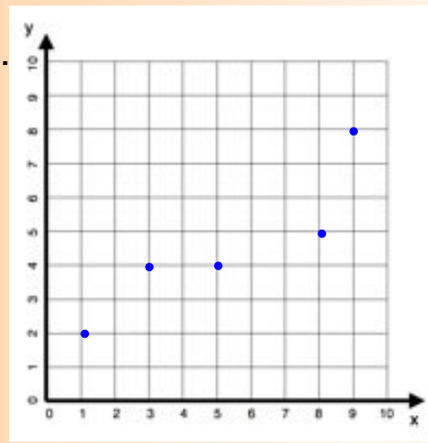
Function? Yes

3.



Function? Yes

4.



Function? Yes

Determine if the relationship is a function

5. {(2, 5), (3, 7), (-2, 4), (5, 2)}

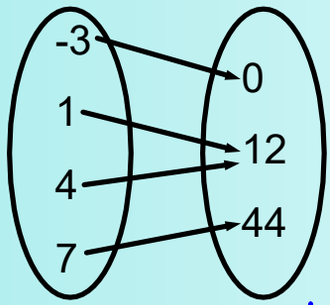
Function? Yes

6.

x	-3	-1	0	2	2
y	-10	-6	-3	0	3

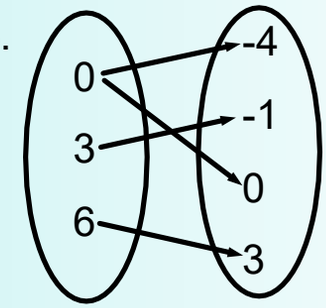
Function? No

7.



Function? Yes

8.



Function? No

Analyze Data

Five schools are competing in the long jump portion of a track meet. The distances of the players with the best jump on each team are as follows: Team 1, 20.6 feet; Team 2, 21.5 feet; Team 3, 20.9 feet; Team 4, 19.4 feet; Team 5, 20.2 feet.

a. Make a table to represent this information.

Team	1	2	3	4	5
Distance	20.6	21.5	20.9	19.4	20.2

b. Determine the domain and range.

D: 1, 2, 3, 4, 5

R: 19.4, 20.2, 20.6, 20.9, 21.5

c. Determine whether the relation is or is not a function.

Yes

Madison took 5 quizzes this semester. Her scores on the quizzes are as follows: Quiz 1, 86; Quiz 2, 92; Quiz 3, 78; Quiz 4, 86; Quiz 5, 84.

a. Determine the domain and range

D: 1, 2, 3, 4, 5

R: 78, 84, 86, 92

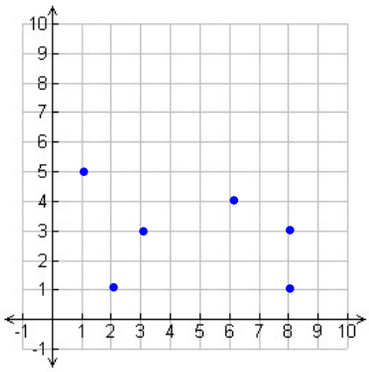
b. Is this relation a function?

Yes

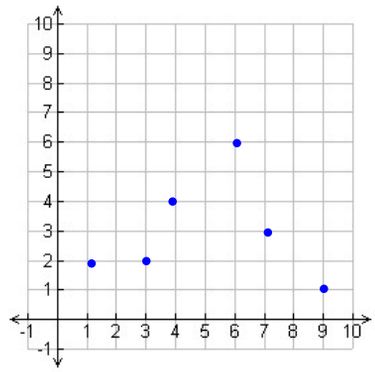
Determining if a graph is a function

Remember, if its a function, the x-values cannot repeat

How will this effect a graph?

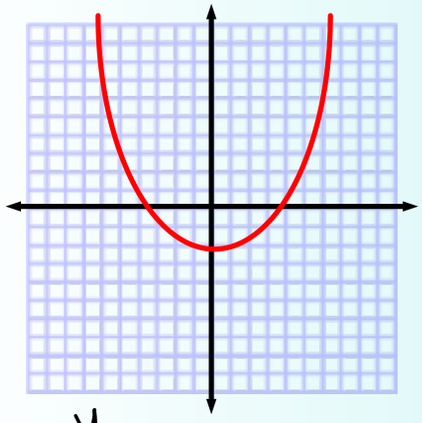


Which one of these graphs shows a function?



State the graphs domain and range then determine if they display a function

9.

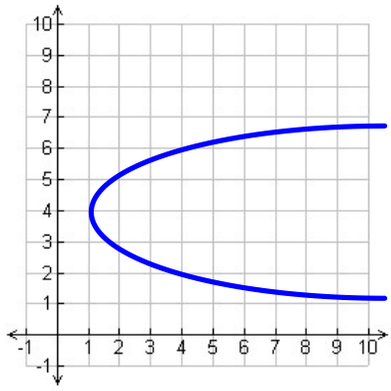


Yes

D: All Reals

R: $y \geq -2$

10.



No

D: $x \geq 1$

R: $\mathbb{R}$