Functions and Relations

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

Domain: The input, or x-values

Range: The output, or y-values.

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.

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

Ex.

Which of the following relations shows a function?

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)

This is a function!

Determine if the following are functions

1.

x	y
2	7
4	9
8	-1
2	5

No

2. {(5, -7) (6, -7) (-8, -1) (0, -1)}

Yes

3.

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

Yes

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

Yes

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

Yes

6.

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

No

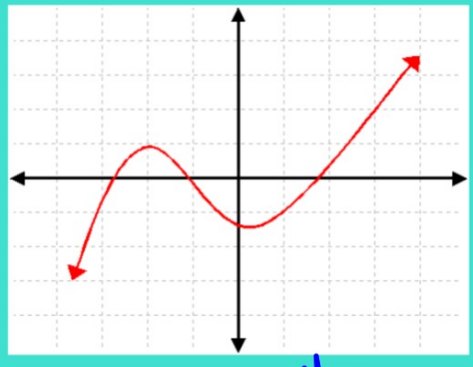
Determining if Graphs are Functions

We use the Vertical Line Test

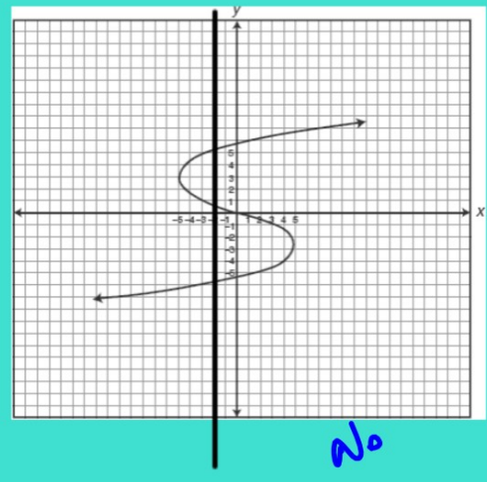
Use your pencil as the vertical line to pass it left to right across the graph. A function will never touch your vertical line in more than one place at a time.

Examples

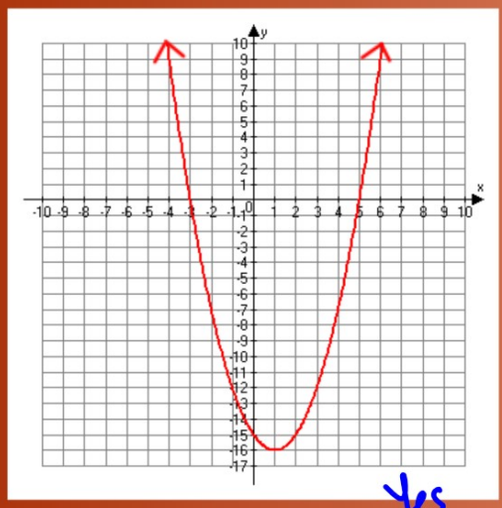
Use the Vertical Line Test to determine which graph is a function



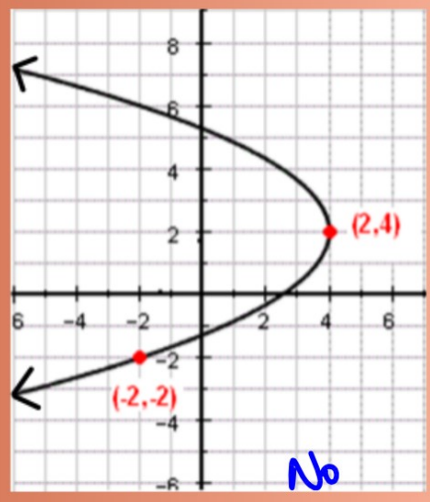
Yes



No



Yes



No