Homework: pg 10 # 1, 2, 3, 4ac, 6, 7, 8, 9, 11

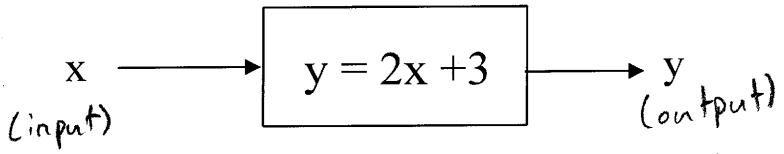
What is a Function?

Function – is a relationship such that for each input value there is at most only one output value; typically, we designate the input value as 'x' and output value as 'y'.

A relationship can be classified as a function by examining the equation, the table of values, a mapping of inputs and outputs, or the graph.

Equation

Consider the equation $y = 2x + 3$:

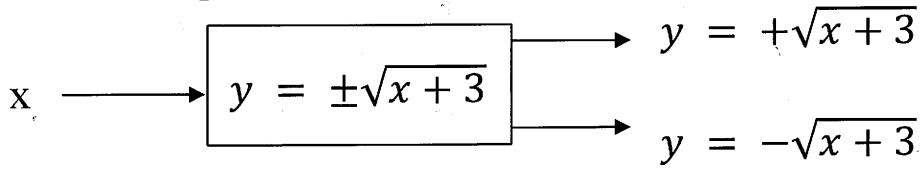


For this example, if we randomly assign the value x = 6, we get…

$$y = 2x + 3$$
$$y = 2(6) + 3$$
$$y = 15$$

The relationship y = 2x + 3 (is/is not) a function since it has at most one output for any input.

Consider the equation $y = \pm\sqrt{x+3}$:



For this example, if we randomly assign the value x = 6, we get…

$$y = \pm\sqrt{x+3}$$
$$y = \pm\sqrt{6+3}$$
$$y = \pm 3$$

The relationship $y = \pm\sqrt{x+3}$ (is/is not) a function since it has more than one output for some inputs.

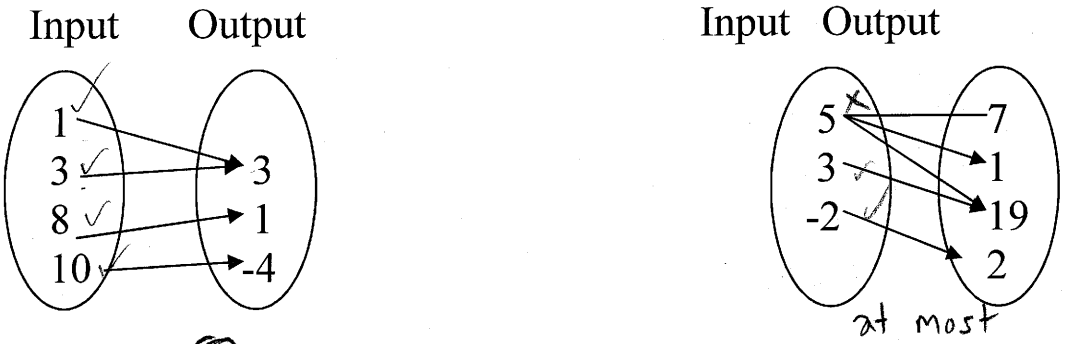
Table of Values

x	y
1	4
2	6
2	8
5	13

x	y
-5	4
-2	4
1	7
3	9

The first table (is/is not) a function since when x = 2, y can be multiple values.
The second table (is/is not) a function since each value of x has ~~only~~ one output.
at most

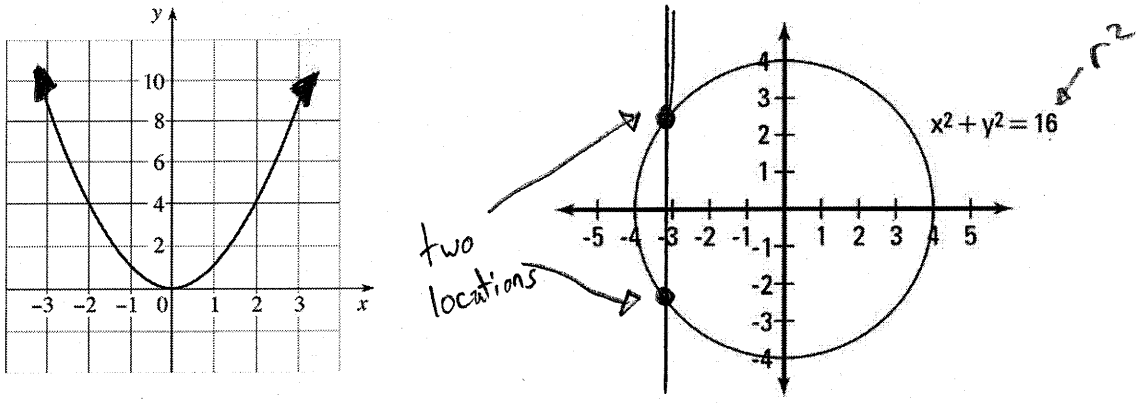
Mapping



The first relation (is/is not) a function since each input maps to one output.
The second relation (is/is not) a function since some inputs map to multiple outputs.

Vertical Line Test with Graph (VLT)

The vertical line test is conducted by visualizing a vertical line moving across the Cartesian grid from left to right. A relationship is considered to be a function if the vertical line never intersects the graphed relationship at more than one point at any instant.



The relation $y = x^2$ (is/is not) a function since the vertical line never crosses the graphed relationship at more than one point.
The relation $x^2 + y^2 = 16$ (is/is not) a function since the vertical line often crosses more than one point on the graph.