

PreCalculus Review Lesson 2a
Relations & Functions

Relations
Functions

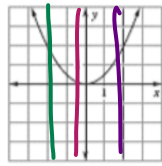
Relation: A pairing of input and output values..
Function: A relation in which there is exactly one output for each input. (x cannot repeat)

Domain: the set of input values (x-coordinates)
Range: the set of output values (y-coordinates)

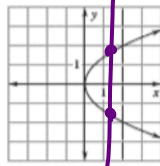
VERTICAL LINE TEST

A relation is a function if and only if no **vertical** line intersects the graph of the relation at more than **one point**

Function



Not a function



REPRESENTING RELATIONS

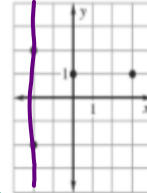
NOT a function

A relation can be represented in the following ways:

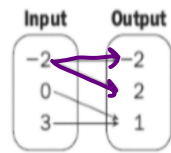
Ordered Pairs

- (-2, 2)
- (-2, -2)
- (0, 1)
- (3, 1)

x	y
-2	2
-2	-2
0	1
3	1



Mapping Diagram



-2 is paired with two outputs

x-value repeats

Function Notation:

$f(x)$ or "f of x" = y

f is the notation for the function which associates the domain element x to the range element, $f(x)$

Implicit form: When the function is given as an equation in terms of x and y , such as: $2x + y = 6$

Explicit form: when the function is given as y in terms of x , such as $f(x) = 6 - 2x$.

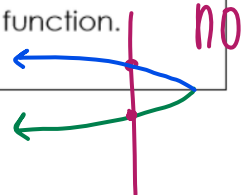
Example Determine if the equation is a function:

$y^2 + 2x = 3$

$y = \pm \sqrt{-2x + 3}$

Rule: If y is squared, then the relation is not a function.

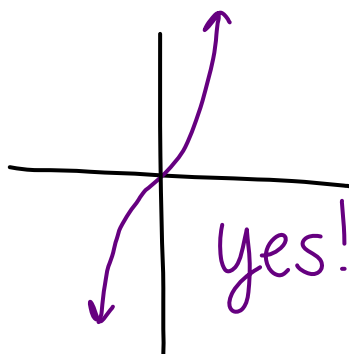
$y^2 = -2x + 3$



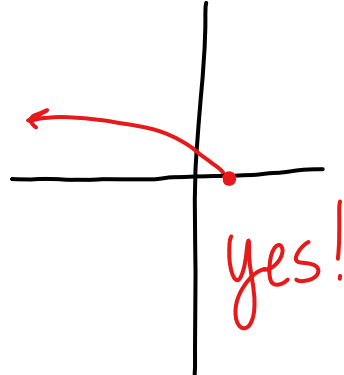
PRACTICE

Determine whether each equation is a function.

1) $y = x^3$



2) $y = \sqrt{-2x + 1}$



3) $x + y^2 = 1$

