Functions and Relations Notes

Relation: any set of ordered pairs.

Function: a rule that shows a relationship between two quantities.

If a relation is a function then,

1) each input (x) has exactly one output (y)
2) passes the vertical line test on a graph

Function Notation: $f(x) = 2x + 1$ is the same as $y = 2x + 1$

f(x), g(x), h(x), etc all mean "*y*" when talking about functions

Does this relation represent a function?

1)

Age (x)	Height (y)
1 yr	20 in
2 yr	24 in
3 yr	33 in
4 yr	40 in
5 yr	52 in

yes.
Every x has only 1 y

2)

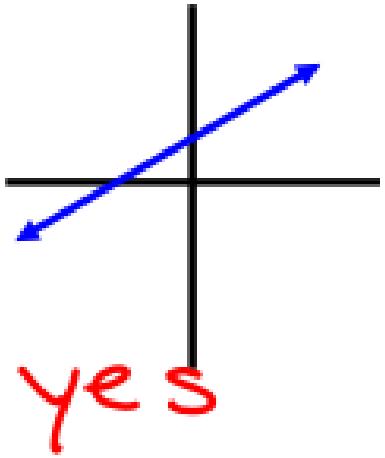
Time (x)	Score (y)
15 min	24 pts
20 min	30 pts
25 min	30 pts
15 min	20 pts
10 min	8 pts

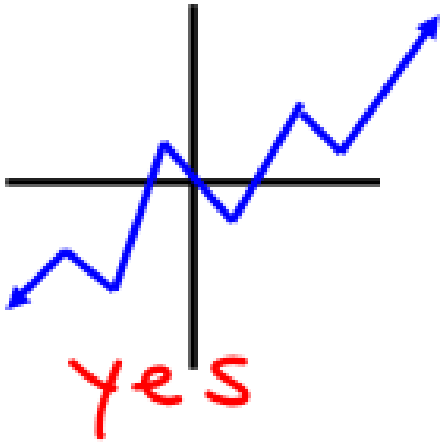
No
Input 15 has 2 outputs

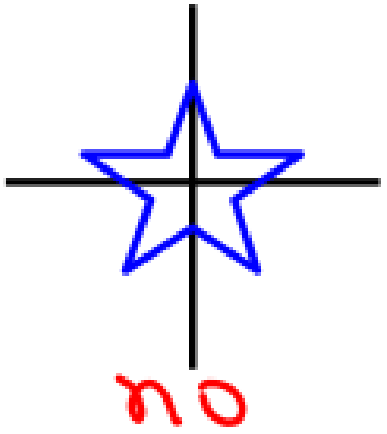
Vertical Line Test

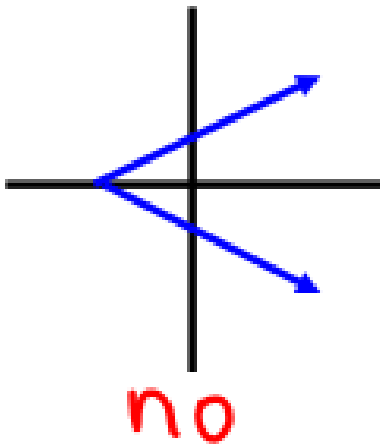
Graph is a function if and only if each vertical line passes through no more than one point on the graph.

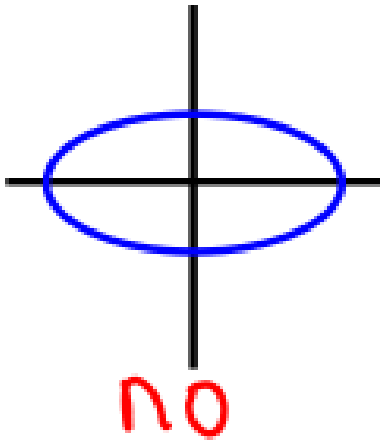
Are these functions, yes or no?

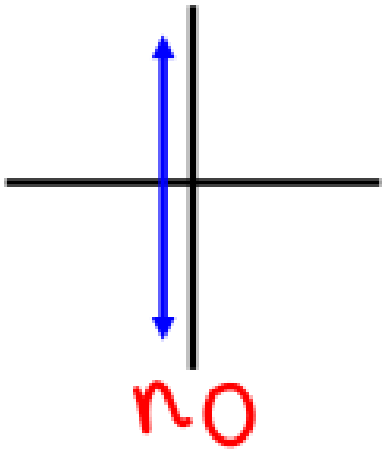












Evaluate the function when $x = 2$, $x = 0$, and $x = -3$

1) $f(x) = -4x + 1$

x	$f(x)$
2	-7
0	1
-3	13

Explanation of Function Notation

f (2) = 3 ; means when x = 2, then y = 3 (2 , 3)

1) What does *f (-1/2) = 0* mean?

$(-\frac{1}{2}, 0)$ when $x = -\frac{1}{2}$, the $f(x) = 0$

2) Find the slope of the function. *f (6) = -1* and *f (3) = 8*

$(6, -1)$
$(3, 8)$

$m = \frac{-1-8}{6-3} = \frac{-9}{3} = \frac{-3}{1}$

3) Find the slope of the function. *f (-1) = 2* and *f (3) = 2*

$(-1, 2)$
$(3, 2)$

$m = \frac{2-2}{-1-3} = \frac{0}{-4} = 0$

1) Graph $h(x) = -2/3x + 6$

$f(3) = 4$

$f(6) = 2$

Slope = -2/3
y-intercept = (0, 6)