

TO BE OR NOT TO BE...A FUNCTION

Definition of a Function: for a set of given ordered pairs, for every y-value there is a distinct x-value.

- the x-values don't repeat
- passes the vertical line test on a graph

Vertical Line Test: if a vertical line intersects the graph only once, no matter where the vertical line is placed, then the graph is a function.

Examples of Functions:

- 1) $g(x) = \{(9,3), (2,4)\}$ and $f(x) = \{(5,6), (3,6)\}$ are functions
- 2) any linear equation (except vertical lines)
For example, $2x + 5y = -8$
- 3) any polynomial equation (where y is degree one)
For example, $y = 3x^2 - 10x - 4$ or $y = x^3$
- 4) any absolute value equation (where y is degree one)
For example, $y = |x + 2|$

Examples of NON-Function Equations:

- 1) $h(x) = \{(3,4), (3,9), (1,5)\}$ is NOT a function since the x-value 3 is repeated
- 2) when the y variable is raised to an even exponent, the x-values repeat
For example, $x = y^2 + 3$

x	y
12	3
12	-3

- 3) when the y variable is within absolute value bars, the x-values repeat
For example, $x = |y + 3|$

x	y
11	8
11	-14

- 4) when there are inequalities involved, the x-values repeat
For example, $x < y$

x	y
3	5
3	4

Vertical Line Test

This is a function

This is a function

This is NOT a function