

FUNCTIONS

RELATION: A relation is a set of ordered pairs. The first coordinate of each ordered pair belongs to the “domain” of the relation. The second coordinate of each ordered pair belongs to the “range” of the relation.

FUNCTION: A function is a set of ordered pairs in which no pairs have the same first coordinate. Functions are relations but not all relations are functions.

Examples of functions:

$$f(x) = 2x + 3$$

Some of this function's ordered pairs are
 $(-1,1), (0,3), (1,5), (2,7)$

$$f(x) = 5$$

Some of this function's ordered pairs are
 $(-2,5), (-1,5), (0,5), (1,5), (2,5)$

These are not functions:

$$\{(7,11), (7,2), (7,-4)\}$$

$$y = \pm\sqrt{x}$$

Some of this relation's ordered pairs are
 $(1,1), (1,-1), (4,2), (4,-2)$

VERTICAL LINE TEST: Graph the equation. If a line parallel to the y -axis intersects the graph at more than one point, the equation is not a function.

FINDING THE VALUE OF A FUNCTION is the same thing as evaluating the function with the desired value of x , or substituting the value for x and simplifying.

Example:

Find $f(2)$ for the function, $f(x) = 2x^2 - 5x + 3$

$$f(2) = 2(2)^2 - 5(2) + 3$$

$$f(2) = 8 - 10 + 3$$

$$f(2) = 1$$