

METHODS AND MEANINGS

Functions

A relationship between inputs and outputs is a **function** if there is at most one output for each input. We often write a function as $y = \text{some expression involving } x$, where x is the input and y is the output. The following is an example of a function.

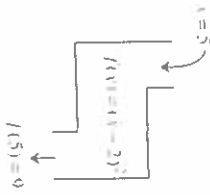
input (x)	-2	-1	0	1	2	3	4	5
output (y)	16	9	4	1	0	1	4	9



In the example above, the value of y depends on x , so x is called the **dependent variable** and y is called the **independent variable**.

Another way to write a function is by using the notation " $f(x) = \dots$ " instead of " $y = \dots$ ". The function named " f " has input x and output $f(x)$.

In the example at right, $f(5) = 9$. The input is 5 and the output is 9. You read this as, "7 of 5 equals 9".



The set of all inputs for which there is an output is called the **domain**. The set of all possible outputs is called the **range**. In the example above, notice that you can input any x value into the function and get an output. The domain of this function is "all real numbers" because any number can be an input. The outputs are all greater than or equal to 0. The range is $y \geq 0$.

$x^2 + y^2 = 1$ is not a function because there are two y -values (outputs) for some x -values, as shown below.

input (x)	-1	0	0	1
output (y)	0	-1	1	0

