

Introduction to Functions

Function Notation

We have been dealing with relations written as " $y =$ " for awhile, such as the equation of a line $y = mx + b$.

Function notation is very similar, but a little more versatile.

This would be written in function notation as

$$f(x) = mx + b$$

Pronounced " f of x " This just means that the function is named f and contains the independent variable x .

f is the common letter used to represent (name) functions, other common ones are $h(x)$ and $g(x)$, but any letter can be used.

When you're dealing with more than one function, using function notation becomes very important.

It would be very confusing to have 2 functions both labeled $y =$

But with function notation you can call one of them $f(x)$ and the other one $h(x)$.

It can also be more descriptive. If you have a function representing the area of a circle and another one representing the circumference of the circle you can name the area function $A(r)$ and the circumference function as $C(r)$.

Both of them have the same independent variable " r " (the radius). But the A reminds you that this function is for the Area and the C reminds you that it is for the Circumference.

Function Notation Guide

When you first start using this notation it can be confusing. This guide will help you decipher what is expected of you.

$f(x) =$ Means the same thing as " y "

$f(5) =$ Replace x with 5 and evaluate

$f(x) = 5$ Replace $f(x)$ (or y) with 5 and solve for x .

Example: Given $f(x) = 4x - 7$.

$$f(x) = 4x - 7$$

(a) Find $f(3)$

$$\begin{aligned} f(3) &= 4(3) - 7 \\ &= 5 \end{aligned}$$

Function Notation Assignment

Evaluate each function.

1) $g(n) = n^2 - 2n$; Find $g(-10)$

2) $k(x) = 4x + 2$; Find $k(4)$

3) $p(x) = x^2 + 5$; Find $p(-4)$

4) $h(x) = 3x + 1$; Find $h(-2)$

5) $w(x) = x^2 + 5$; Find $w(-3)$

6) $k(x) = -2x + 4$; Find $k(-8)$

7) $k(n) = n^2 - 2 + n$; Find $k(5)$

8) $h(x) = x^2 + 5$; Find $h(7)$

9) $k(t) = 3t - 5$; Find $k(-1)$

10) $w(n) = -2n - 5$; Find $w(10)$

Solve:

11. $f(x) = 4x - 8$, when $f(x) = 8$

12. $g(x) = 2x + 3$, when $g(x) = 5$

13. $h(x) = x^2 - 4$, when $h(x) = 0$

14. $k(x) = 3x^2 - 27$, when $k(x) = 0$

15. Find the initial value of the function $f(x) = x^2 + 2x + 4$

16. Find the zeros of the function $g(x) = 5x^2 - 125$

Answers to Function Notation Assignment

1) 120
5) 14
9) -8

2) 18
6) 20
10) -25

3) 21
7) 28

4) -5
8) 54

11. (4, 8)

12. (1, 5)

13. (2, 0) AND (-2, 0)

14. (3, 0) AND (-3, 0)

15. (0, 4)

16. (5, 0) AND (-5, 0)