Foundations of Algebra Unit 5: Linear Functions Notes

Day 2: Function Notation & Evaluation

The following problems are written in **function notation**. ©MrsETeachesMath

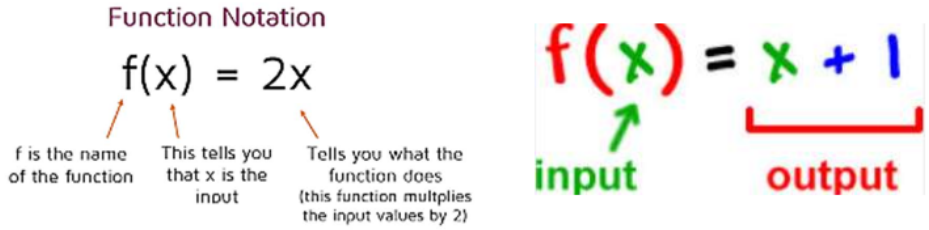
$f(x) = 3x + 1$ $f(x) = x^2 + 3x - 1$ $f(x) = 2x^2 + x - 1$

input output

$f(a) = 3a + 1$ $f(\heartsuit) = \heartsuit^2 + 3\heartsuit - 1$ $f(3) = 2(3)^2 + (3) - 1$

What do you think function notation means? x y

If x is the independent variable and y is the dependent variable, then function notation for y is f(x), which is read "f of x," where *f* names the function. When an equation is in two variables and it describes a function, you can use function notation to write it:



Ex. Convert the following equations into function notation.

a. y = 5x + 7 b. g = 8h – 2 c. b = -4d

$f(x) = 5x + 7$ $f(h) = 8h - 2$ $f(d) = -4d$

Evaluating Functions

When you want to know the output of a function, you can use your input values by substituting them into your function for the independent variable.

Evaluating Functions

$F(x) = x + 1$

$F(2) = 2 + 1$

x = 2

Ex. Evaluate f(x) = 3x when x = 2 and x = -8

$f(x) = 3x$

$f(2) = 3(2)$

$f(2) = 6$ (2, 6)

$f(x) = 3x$

$f(-8) = 3(-8)$

$f(-8) = -24$

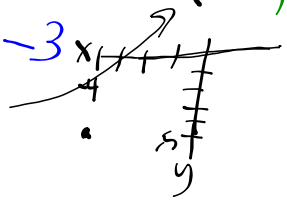
Ex. Evaluate g(x) = ½x – 3 when x = -4 and x = 8

$g(x) = \frac{1}{2}x - 3$

$g(-4) = \frac{1}{2}(-4) - 3$ (-4, -5)

$g(-4) = -2 - 3$

$g(-4) = -5$



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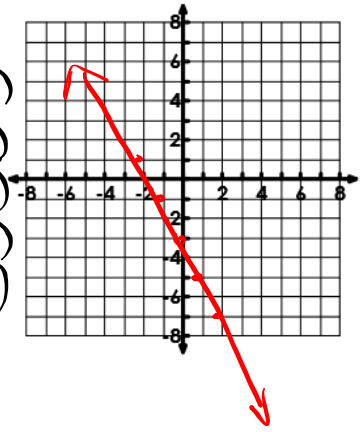
Input and Output Tables and Graphing Functions

You can also evaluate functions to create input and output tables that can be used to graph the function.

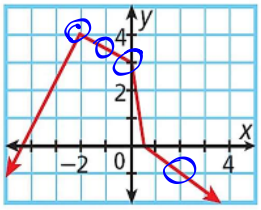
Ex. Using the values of -2, -1, 0, 1, and 2, complete the input/output table and graph.

Input	f(x) = -2x - 3	Output
-2	$f(-2) = -2(-2) - 3$	1
-1	$= -2(-1) - 3$	-1
0	$-2(0) - 3$	-3
1	$-2(1) - 3$	-5
2	$-2(2) - 3$	-7

(-2, 1) (-1, -1) (0, -3) (1, -5) (2, -7)



Evaluating a Function from a Graph

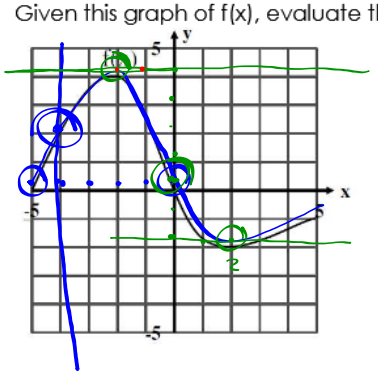


Can you figure out what this notation means?

$f(-2) = 4$ $f(0) = 3$

$f(-1) = 3.5$ $f(2) = -1$

Given this graph of f(x), evaluate the following:



a. f(-4) = 2

b. f(0) = 0

c. f(-5) = 0

d. f(2) = -2

e. f(0) = 0

f. f(-2) = 4