Algebra II

Lesson 4: Function Notation

Mrs. Snow, Instructor

You have already been using function notation and it has shown up in previous lessons. Function notation is the most accurate way to represent a function. The basic form is $f(x)$, the stuff inside parentheses is called the argument of the function. Recognize that **x** is the **input.** Whatever **x** is completely determines the output; hence, a functional relationship in terms of x (for this example). When we see an equation written in function form we know that the relationship is a function.

What makes a function?

each element x is related to exactly 1 y; indepent variable has no repeaters. Passes vertical line test.

Solve for y; if y = only one outcome then function $y^2 + x = 3$ NO $y = \pm\sqrt{3-x}$ 2 y's for each x

Example 1... Are the following relations functions? Why or why not?

a. $\{(0,4), (-2,3), (-1,3), (-2,2), (1,-3)\}$ NO repeater x

b. $y = x^2 + 5$ Quad y = 1 outcome yes

c. $3xy + x^2 = 6$ $3xy = -x^2+6$ $y = \frac{-x^2+6}{3x}$ yes

Instead of just using "$y =$ " function notation uses any letter of the alphabet, and specifies what's going to be the variable in the equation. Write some examples below.

So $y = \frac{x^2-7x+3}{(2x+1)(x-5)}$ function? don't know but! $f(x) = \frac{x^2-7x+3}{(2x+1)(x-5)}$ SAYS Function! :)

When you see function notation with a number in the parentheses, the number is the value of the independent variable or your input. When you evaluate $f(x)$ for some *x*, the answer is the dependent variable or output. In other words, substitute the number for every independent variable.

Example 2... Given the functions $f(x) = |x+1|$ and $h(t) = t^2 + 2t - 1$, evaluate the following.

Sub

a. $f(2)$ Sub 2 in for every x

$f(2) = |2+1| = |3| = 3$

b. $h(3)$

$h(3) = 3^2 + 2(3) - 1$

$= 9 + 6 - 1$

$= 14$

c. $h(-1) + f(8)$

$= 1^2 + (2)(-1) + |8+1|$

$= 1 - 2 + 9$

$= 8$

d. $2f(-5) - 3h(1)$ Do 1st

$2(|-5+1|) - 3(1+2(1)-1)$

$2|-4| - 3(2) = 2(4) - 6 = 8 - 6$

$= 2$

e. $f(c+1)$

$f(c+1) = |c+1+1| = |c+2|$

Solve inside of Abs Val 1st

Now, let's try evaluation from a table or a graph.

Example 2... Given each table or graph, state the domain and range, determine if the relation is a function and whether it is continuous or discrete. Then evaluate it for $f(-2), f(0)$, and $f(3)$.

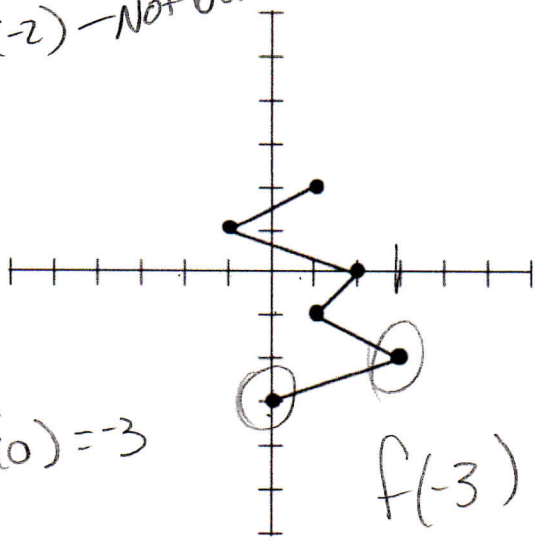
x	*f(x)*
-2	13
-1	12
0	11
1	10
2	9

$f(-2) = 13$
$f(0) = 11$
$f(3) =$ not given

x	*f(x)*
-3	4
-2	7
1	4
2	-1
3	-8

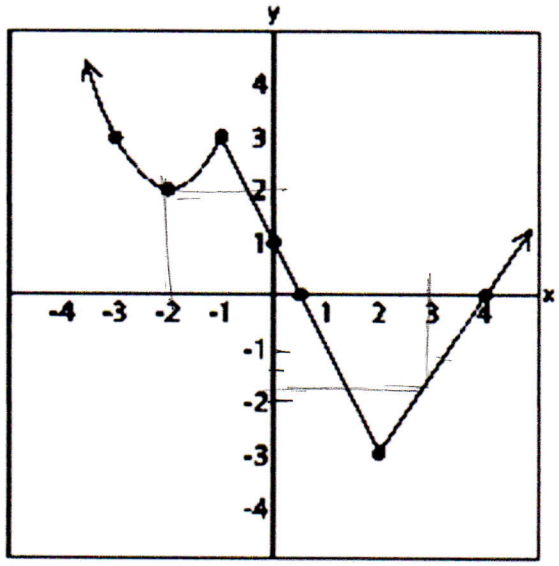
$f(-2) = 7$
$f(0) = -8$

$f(-2)$ – Not given



$f(0) = -3$

$f(-3) = -2$



$f(0) = 1$
$f(-2) = 2$
$f(3) \approx 1.75$