BE-1A | WEDNESDAY 1-5-11

Simplify:

① $\frac{57}{3}$ ② $\frac{621}{9}$ ③ $\frac{86}{3}$

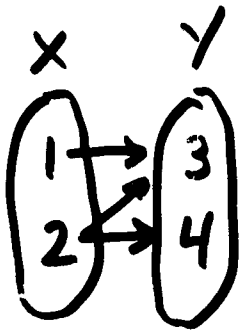
④ Define a function.

⑤ Identify whether the following are functions or not, if not, why?

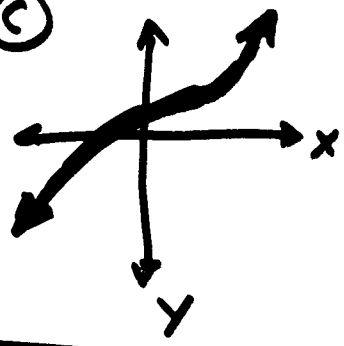
Ⓐ

x	y
1	4
2	4
3	4

Ⓑ



Ⓒ



- Homework Review Pg. 228-229 # 3-9

Because "equations" are the basic tool of algebra, and because it is so important to know if the relation expressed by the equation is a function, mathematicians have a way of writing equations to show they are functions, this is called "function notation" and this writing way of writing equation has other advantages as you will see shortly.

FUNCTION NOTATION - lets say you have AN EQUATION with two VARIABLES, x AND y, that you KNOW is A FUNCTION.

↑ domain ↑ range

For example: $y = 2x + 3$

IN FUNCTION NOTATION you would WRITE THIS $y = f(x) = 2x + 3$

READ: "y EQUALS A FUNTION of x WHICH EQUALS $2x + 3$."

THE VARIABLE here $f(x)$ is ALWAYS the independent VARIABLE, this is the DOMAIN.

Often, the y is left off AS "understood" AND you see $f(x) = 2x + 3$

read "f of x equals $2x + 3$"

Read these expressions:

$y = f(x) = 3x^2 - 2$

$y = f(x) = 2x$

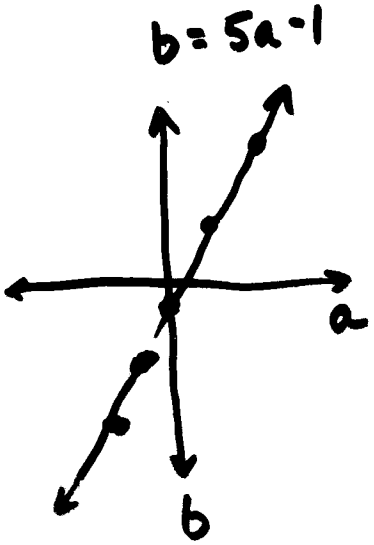
$f(x) = 3$

$b = f(a) = 5a - 1$

Which is the domain and which is the range in the above equation.

How would you set up the "T-Table" to graph $b = f(a) = 5a - 1$

a	$5a - 1 = b$	(a, b)
-2	$5(-2) - 1 = -11$	(-2, -11)
-1	$5(-1) - 1 = -6$	(-1, -6)
0	$5(0) - 1 = -1$	(0, -1)
1	$5(1) - 1 = 4$	(1, 4)
2	$5(2) - 1 = 9$	(2, 9)



Another very useful feature of function notation is that it allows you to ask for any (x, y) pair that you get in a T-Table in a very efficient way.

In the function $y = 4x + 2$ for example, if you need to know the (x, y) pair at $x = -2$, all you need to write is $f(-2)$ this means, find y when $x = -2$ using your "f" function which in this case is $y = f(x) = 4x + 2$ TIP LINE UP!!

$y = f(-2) = 4(-2) + 2 = -6$ $\therefore$ $(-2, -6)$ is a point on the graph of this function.

Ex) $f(x) = 2x + 5$

(A) find $f(-2)$

$f(x) = 2x + 5$

$f(-2) = 2(-2) + 5 = 1$

$\therefore (-2, 1)$ is a point on the graph of this function.

$\boxed{f(-2) = 1}$

(b) find $f(0)$

$f(x) = 2x + 5$

$f(0) = 2(0) + 5 = 5$

$\boxed{f(0) = 5}$

You can find and use $f(x)$ in calculations.

(c) find $f(1) + 4$

$f(x) = 2x + 5$

$f(1) = 2(1) + 5 = 7$

$f(1) + 4 = 7 + 4 = \boxed{11}$

---

* This is Ex. 3 on Pg 227 in Ch 4-6

"f" is just the name of the function, if you are dealing with more than one function at a time it is common to use "g" and "h" as the next two names. Here is how it works:

(EX) $f(x) = x + 6$

$g(x) = 2x - 5$

$h(x) = x^2$

find: $f(-1)$, $g(2)$, and $h(4)$

$f(x) = x + 6$

$f(-1) = (-1) + 6$

$\boxed{f(-1) = 5}$

$g(x) = 2x - 5$

$g(2) = 2(2) - 5$

$\boxed{g(2) = -1}$

$h(x) = x^2$

$h(4) = 4^2$

$\boxed{h(4) = 16}$

Points on graph $(-1, 5)$ $(2, -1)$ $(4, 16)$

You can even use variables as the domain in function notation, use parentheses for your substitution!

(Ex) $y = f(x) = 3x - 1$

Find $f(2x)$

$f(x) = 3x - 1$

$f(2x) = 3(\ ) - 1$

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

$\boxed{f(2x) = 6x - 1}$

This means a point on the graph is: $(2x, 6x-1)$

($2x$: domain; $6x-1$: range)

Homework: Pg 229 # 10-15

Pg 230 # 32-38