Algebra 3/4 Name _____

HW: Function Notation

Function notation is a useful way in mathematics to identify different equations. We use it as a formal way to show whether to EVALUATE (find the value) of a function, or SOLVE (for a variable).

Part 1: Use the following functions to answer the problems below:

$f(x) = 2x - 3$	$g(x) = \frac{-12}{x}$	$m(x) = x^2$	$d(x) = 2(x - 3)$

Here we will practice EVALUATING.

Example 1: Find $f(-3)$.

$f(-3) = 2(-3) - 3$
$f(-3) = -6 - 3$
$f(-3) = -9$

Example 2: Find $d(6)$.

$d(6) = 2(6 - 3)$
$d(6) = 2(3)$
$d(6) = 6$

You Try:

1. Find $f(5)$.
2. Find $g(-2)$.
3. Find $d(-5)$.
4. Find $m(5)$.
5. Find $m(-5)$.
6. Find $g(6)$.
7. Find $f(-4)$.
8. Find $d(11)$.
9. Find $m(-11)$.

Part 2: Now, we will practice SOLVING using the following functions to answer the problems below:

$f(x) = 2x - 3$	$g(x) = \frac{-12}{x}$	$d(x) = 2(x - 3)$

Example 1: Solve $f(x) = -11$

$2x - 3 = -11$
$2x = -8$
$x = -4$

Example 2: Solve $g(x) = 6$.

$\frac{-12}{x} = 6$
$-12 = 6x$
$-2 = x$

You Try:

1. Solve $d(x) = -18$
2. Solve $f(x) = 15$.
3. Solve $g(x) = 3$.
4. Solve $d(x) = -22$.

Part 3: More Challenging Mixed Practice:

5. If $m(x) = x^2$, solve $m(x) = 144$

6. If $h(x) = x^2 - 5x + 3$, find $h(-7)$.

7. If $p(x) = \frac{2x-5}{3}$, find $p(18)$.

8. If $p(x) = \frac{2x-5}{3}$, solve $p(x) = -5$.

Part 4: Finding & Checking Inverses:

$f(x) = 2x - 3$	$g(x) = \frac{-3x+2}{5}$	$h(x) = -3 + 2(x+1)^3$	$k(x) = 3\sqrt{x+4} - 2$

To find an inverse, you set the function equal to "y" and solve for "x" using SADMEP. Swap the "x" and "y" of the final result to write the inverse as a function. To check if two functions are inverses, look at a table of values to see that the domain and range are switched[1].

Example: Find the inverse of f(x), i.e. find $f^{-1}(x)$

$y = 2x - 3$
$y + 3 = 2x$
$\frac{y+3}{2} = x$
$f^{-1}(x) = \frac{x+3}{2}$

x	0	-3	1.5	-9
$f(x)$	-3	-9	0	-21
$f^{-1}(x)$	1.5	0	2.25	-3

Explain how the table supports the fact that the two functions are inverses

Practice:

1. Find $g^{-1}(x)$ and check with a table

2. Find $h^{-1}(x)$ and check with a table

3. Find $k^{-1}(x)$ and check with a table

[1] Later this unit we will use **composition of functions** to check more formally if two functions are inverses. If this worksheet is going easily for you, please ask Maurer about **function composition.**