Lesson 1.4- SWBAT evaluate polynomial functions with function notation.

Kickoff- Evaluate each of the following expressions

1) $a^2 - (ac - b)$ *when* $a = -2, b = 3, c = -4$

$(-2)^2 - ((-2)(-4) - (3))$

-1

2) $\frac{2}{6}x^2 - \frac{1}{2}x + 1$ *– when* $x = -2$

$\left(\frac{2}{6}(-2)^2 - \frac{1}{2}(-2) + 1\right)$

$\frac{10}{3}$

$3.33333\overline{3}$

A **function** is a relationship or expression between input and output values also known as x and y.

In function notation $y = 3x + 7$ is written as $f(x) = 3x + 7$ however, they both are **the same function**!

y and $f(x)$ are different symbols that represent the same thing! (the output value or **answer** like the kickoff!)

When you evaluate with this notation **the number inside the parenthesis** is the number that you replace the variable with!

Examples: Evaluate each of the following functions.

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

$2(3)^2 - 1$

17

2) $f(x) = 3 - 4x$ find $f(-2)$

$3 - 4(-2)$

11

Evaluate each of the following functions.

3) Given $f(x) = 3x + 2$ evaluate $f(-1)$

$3(-1) + 2$

-1

4) Given $r(x) = x^3 + 3x^2 - 5x - 6$ find $r(-2)$

$r(x) = (-2)^3 + 3(-2)^2 - 5(-2) - 6$

8

5) Let $q(r) = 2r^3 + 5r^2 - 6$ find $q(-3)$

$2(-3)^3 + 5(-3)^2 - 6$

$-9 - 6 = -15$

6) If $f(z) = z^2 + z$ find $f(-4)$

$(-4)^2 + (-4)$

12

7) Given $f(x) = x^2 - 3x$ find $f(-8)$

$(-8)^2 - 3(-8)$

88

8) Let $p(a) = -2a + 1$ find $p(10)$

$-2(10) + 1$

-19

Practice: Evaluate each of the following functions.

9) Given $f(n) = 4n + 2$ find $f(3)$

10) If $g(n) = n^3 - 5n^2$ find $g(-2)$

11) Let $p(a) = a^3 - 5$ find $f(0)$

12) If $f(x) = 2x^2 - 1$ find $f(-3)$

13) When $f(x) = \frac{x^2+1}{3+x}$ find $f(2)$

14) Given $h(x) = 3^2 + 2x - 2$ find $h(-6)$

15) If $p(x) = -x - 2$ evaluate $f(-1)$

16) When $h(t) = t^3 - 5t$ find $f(7)$

17) Let $f(x) = \frac{1}{x} + 2x^2$ find $f(5)$

18) Given $m(t) = \frac{x}{2} + 4x^3$ evaluate $f(-8)$