Lesson 1.3 Objective: SWBAT evaluate functions using expressions.

Kickoff

For f(x) = 3x -2 find f(-3)

$3(-3)-2$

-11

Evaluate normally!! (pretend the expression is a number!)

Ex: When $f(x) = 5x - 2$ find $f(3x)$

$5(3x)-2$

$15x-2$

Difference quotient: $\frac{f(x+h)-f(x)}{h}$

* general form for average rate of change

Work Sheet!

LEFT COLUMN FIRST!!

$g(x) = 2x^2 - x$

1) $g(2)$

$2(2)^2 - 2$

$8 - 2 = 6$

2) $g(2x)$

$2(2x)^2 - (2x)$

$2(4x^2) - 2x$

$8x^2 - 2x$

3) $g(x+2)$

$2(x+2)^2 - (x+2)$

$2(x+2)(x+2) - x - 2$

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

$2x^2 + 8x + 8 - x - 2$

$2x^2 + 7x + 6$

$g(x) = 2x^2 - x$

4) $g(5x-1)$ $2(5x-1)^2 - (5x-1)$

$2(5x-1)(5x-1) - 5x + 1$

$2(25x^2 - 5x - 5x + 1) - 5x + 1$

$50x^2 - 10x - 10x + 2 - 5x + 1$

$50x^2 - 25x + 3$

5) $g(x+h)$ $2x^2 - x$

$2(x+h)^2 - (x+h)$

$2((x+h)(x+h)) - x - h$

$2(x^2 + xh + hx + h^2) - x - h$

$2(x^2 + 2hx + h^2) - x - h$

$2x^2 + 4hx + 2h^2 - x - h$

6) $g(x+h) - g(x)$

$2x^2 + 4hx + 2h^2 - x - h - [2x^2 - x]$

$2x^2 + 4hx + 2h^2 - x - h - 2x^2 + x$

$4hx + 2h^2 - h$

7) $\frac{g(x+h)-g(x)}{h}$

$\frac{4hx + 2h^2 - h}{h}$

$4x + 2h - 1$

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

1) $h(-3)$

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

$-9 - 9$

-18

2) $h(-3x)$

$-(-3x)^2 + 3(-3x)$

$-9x^2 - 9x$

3) $h(x-3)$

$-(x-3)^2+3(x-3)$

$-(x-3)(x-3)+3x-9$

$-(x^2-3x-3x+9)+3x-9$

$-x^2+3x+3x-9+3x-9$

$-x^2+9x-18$

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

4) $h(2x-7)$ $-(2x-7)^2+3(2x-7)$

$-(2x-7)(2x-7)+6x-21$

$-(4x^2-14x-14x+49)+6x-21$

$-4x^2+14x+14x+49+6x-21$

$-4x^2+34x+28$

5) $h(x+h)$

$-(x+h)^2+3(x+h)$

$-(x+h)(x+h)+3x+3h$

$-(x^2+2xh+h^2)+3x+3h$

$-x^2-2xh-h^2+3x+3h$

6) $h(x+h)-h(x)$

$(-x^2-2hx-h^2+3x+3h)+(-x^2+3x)$

$-2hx-h^2+3h$

7) $\frac{g(x+h)-g(x)}{h}$

$\frac{-2xh-h^2+3h}{h}$

$-2x-h+3$

Evaluate the difference quotient using the following:

1) x^2-4x $f(x)$

$\frac{f(x+h)-f(x)}{h}$

$\frac{[(x+h)^2-4(x+h)]-[x^2-4x]}{h}$