Hmwk: pg 235 #1, 2ai,b, e, 3, 4a, 5abd, 6abd, 8, 9, 12, (14), (15)

**Rates of Change in Polynomial Functions**

Recall:

 

over the interval  at , where 

Example 1

a) Create a quartic function that has x-intercepts at x = -3, -1, 1, 3 and has a y-intercept of -5. Sketch the function.

b) Is this an even or odd function? Explain your reasoning.

c) On the interval from x = -2 to x = 0, do you expect the average rate of change to be positive or negative?

Draw a secant on your graph and calculate the rate of change over that interval.

Example 2

Consider the function f(x) = 2x3 - 14x2 + 30x - 18.

a) Create a sketch of this function.

b) Draw a tangent at x = 1. Do you expect the instantaneous rate of change to be positive or negative at this point?

Calculate the IROC at x = 1.

The Derivative (Extension)

The derivative is a function that is used to determine the IROC at any point on a graph. The derivative of a polynomial function is determined by following these steps:

1. Create a new coefficient by multiplying each coefficient by the

 exponent on x.

2. Drop each exponent by 1.

Example 3

Determine the derivative of the function in example 2 and use it to verify your answer for the IROC when x = 1.

Bonus: Determine the coordinates of the local maximum by setting the derivative equal to zero and solving for x.