Advanced Functions

Polynomial Functions

$x \to -\infty,\ f(x) \to \infty$

$g(x) = a(x-1)(x+2)^2(2x+3)$

Lead Coefficient

$h(2) = -7$

Factors

You are expected to know:

From Section 2.1 – Introduction to Polynomial Functions
- The definition of a polynomial function
- How the leading term (with its order and the sign of the lead coefficient) defines the end behaviour of a poly fn.
- How to use finite differences to determine the order of a polynomial given a list of functional values.

From Section 2.2 – Characteristics of Polynomial Functions
- How the maximum and minimum number of zeros and turning points is related to the leading term of a poly fn.
- How to determine intervals of increase and decrease from a sketch of a graph of a poly fn.
- Whether a poly fn has a global max/min, and what local max/mins are.

From Section 2.3 – Zeros of Polynomial Functions
- That **FACTORED FORM IS YOUR FRIEND**
- What a repeated root/zero is.
- How to distinguish, both graphically and algebraically between order 1, order 2 and order 3 zeros.
- How to "write" a family of Polynomial Functions (see example 2.3.2 on pg. 42).
- How to use end behaviour and zeros to sketch possible graphs of a given polynomial function (in factored form).
- Read Example 2.3.5!

From Section 2.4 (both a and b)
- How to divide a polynomial by a linear 'factor' using both Long Division and Synthetic Division.
- The Remainder Theorem

From Section 2.5 – The Factor Theorem
- The Factor Theorem.
- How to use the factor theorem to **fully** factor a polynomial.
- How to use the "rational zero test" (see example 2.**4**.5).

From Section 2.6 – Factoring Sums and Differences of Cubes
- The patterns

Practice Problems from the text:
Pg. 184 – 185 #1 – 3, 5, 6, 10 – 12 (note: I won't ask question like 12 on the test, but it's a good question to sharpen your understanding!), 13 – 17.