Secondary Math 3H Polynomial Review Notes

WORDS TO KNOW

closure	a system is closed, or shows closure, under an operation if the result of the operation is within the system
coefficient	the number multiplied by a variable in an algebraic expression
constant term	a term whose value does not change
degree of a one-variable polynomial	the greatest exponent of the variable in a polynomial
descending order	polynomials ordered by the power of the variables, with the largest power listed first and the constant last
exponential expression	an expression that contains a base raised to a power/ exponent
factor	one of two or more numbers or expressions that when multiplied produce a given product
leading coefficient	the coefficient of the term with the highest power
like terms	terms that contain the same variables raised to the same power
polynomial	an expression that contains variables, numeric quantities, or both, where variables are raised to integer powers greater than or equal to 0
polynomial function	a function of the general form $f(x) = a_n x^n + a_{n-1} x^{n-1} + \cdots + a_2 x^2 + a_1 x + a_0$, where a_1 is a rational number, $a_n \neq 0$, and n is a nonnegative integer and the highest degree of the polynomial
term	a number, a variable, or the product of a number and variable(s)

Examples:

1. Identify the terms in the expression $5a^2 - a + 7$. What is the highest power of the variable?

2. Identify the terms in the expression $-2x^8 + 3x^2 - x + 18$. Note the coefficient, variable, and power of each term.

3. Write a polynomial function in descending order that contains the terms $-x, 10x^5, 4x^3, and - x^7$. Determine the degree of the polynomial function.

4. Simplify the following expressions

a. $(7a^4 - a + 8a^3) + (3a - a^3 - 4a^2)$

b. $(5n^2 + 5 + n^3) - (8n - 8 + 4n^3)$

c. $7x^2(8x + 5)$

d. $(2a + 8)(5a - 5)$

e. $(4k^2 - 4k - 2)(k - 5)$