1.1 Classifying Polynomials and Distribution

This year will be focused a lot on polynomials. In order to fully define a polynomial, there are some other terms that we will need to know as well.

Word	Definition
Coefficient	The number in front of the variable $2x \cdot 3x$ x (coefficient $= 1$)
Constant	Just a number (no variable)
Term ex: $2x^3$, 3	number, variable, exponent * easy way to identify they're separated by + or −; any one or all equal a term
Polynomial	many terms
Degree	Highest exponent in the expression ex: $3x^4 + x + 2x^3$ (4 → Degree)

Polynomials come in many forms. In order to classify a polynomial, we look at two things: the number of terms and the Degree.

* When writing classifications (type) Degree first, # of terms Second

One term: monomial	Degree 1: x or x^1 Linear
Two terms: binomial	Degree 2: x^2 Quadratic
Three terms: trinomial	Degree 3: x^3 Cubic
Four terms: polynomial and above	Degree 4: 4th Degree Degree 5 - 5th degree etc.

1) Identify the information for each polynomial. Then classify the polynomial.

a. $-10b - 1$

Coefficients: -10

Constants: -1

Number of terms: 2 "Binomial"

Degree: Linear

Classification: Linear, binomial

b. $-2a^2 - 2a + 7$

Coefficients: $-2, -2$

Constants: 7

Number of terms: 3 or trinomial

Degree: Quadratic or 2nd power

Classification: Quadratic, trinomial

c. $-6x^5 - 8x^4 + 5x^3 - 10$

Coefficients: $-6, -8, 5$

Constants: -10

Number of terms: 4 (polynomial)

Degree: 5 or 5th degree

Classification: 5th degree, polynomial

d. $8y$

Coefficients: 8

Constants: No constant

Number of terms: 1 (mononomial)

Degree: 1 (linear)

Classification: linear, mononomial

Something that you will be asked to do a lot is to **simplify** an expression. Simplifying basically means that we are going to make the expression look nicer.

step to simplifying is to combine **like terms**, meaning Same variable and Same exponent.

★ Standard form - largest degree first → to smallest and constant is always last

2) Simplify each expression.

a. $5x^2 + 2x - 3x^2 - 6x + 13$

$2x^2 - 4x + 13$

b. $k^4 + 12k - 4k^3 + 5k + k$

$k^4 - 4k^3 + 18k$

c. $6 - 7m + 8 + m^2$

$m^2 - 7m + 14$

d. $15n + 2n^2 - 8n - n^3 + 7$

$2n^2 - n^3 + 7n + 7$

$-n^3 + 2n^2 + 7n + 7$

Another tool to help us simplify is called **the distributive property**. To distribute a term is to multiply it by each term inside the parentheses.

3) Simplify each expression.

a. $9(1 - 8x)$

$9 - 72x$

$-72x + 9$

b. $-9(9n + 8)$

$-81n - 72$

c. $4 - 6(9a - 4)$

$4 - 54a + 24$

$-54a + 28$

d. $7(8 + 8k) + 1$

$56 + 56k + 1$

$56k + 57$

e. $4(p + 3) - 2(5p - 3)$

$4p + 12 - 10p + 6$

$-6p + 18$

f. $5(3 - 7x) - (1 - 6x)$

$15 - 35x - 1 + 6x$

$-29x + 14$