

## 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	A number in front of a variable ex: $2x^2 + 5x - 8$ Coefficients: 2, 5
Constant	A number added or subtracted without a variable ex: $2x^2 + 5x - 8$ Constant: -8
Term	A coefficient with a variable, or a constant, usually separated by + or - ex: $2x^2 + 5x - 8$ Terms: 3
Polynomial	An expression with multiple terms ex: $2x^2 + 5x - 8$
Degree	The highest exponent of an expression ex: $2x^2 + 5x - 8$ Degree: 2

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

degree and the number of terms.

Degree 0: Constant - no variable

Degree 1: Linear $x$
Degree 2: Quadratic $x^2$
Degree 3: Cubic $x^3$
Degree 4+: $x^4$ degree, $x^5$ degree, etc.

One term: Monomial
Two terms: Binomial
Three terms: Trinomial
Four or more terms: Polynomial

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

a.  $-10b(-1)$   
Coefficients: -10

Constants: -1

Number of terms: 2

Degree: 1

\* Classification: Linear binomial

\* Same as "Type" on HW

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

Coefficients: -6, -8, 5, -10

Constants: -10

Number of terms: 4

Degree: 5

Classification: 5<sup>th</sup> degree polynomial

\* sign is attached to coefficient

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

Coefficients: -2, -2

Constants: 7

Number of terms: 3

Degree: 2

Classification: Quadratic trinomial

d.  $8y$

Coefficients: 8

Constants: 0

Number of terms: 1

Degree: 1

Classification: Linear monomial

★ Standard form - written in order from highest exponent to lowest exponent (constant at end)

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.

A step to simplifying is to combine **like terms**, meaning you can combine the terms that have same variable & same exponent.

\* sign is attached to coefficient

2) Simplify each expression.

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

$$2x^2 - 6x + 13$$

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

$$m^2 - 7m + 14$$

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

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

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

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

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.

Write all answers in standard form

3) Simplify each expression.

a.  $9(1 - 8x)$

$$9 - 72x$$

$$\boxed{-72x + 9}$$

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

$$4 - 54a + 24$$

$$\boxed{-54a + 28}$$

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

$$4p + 12 - 10p + 6$$

$$\boxed{-6p + 18}$$

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

$$-81n - 72$$

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

$$56 + 56k + 1$$

$$\boxed{56k + 57}$$

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

$$15 - 35x - 1 + 6x$$

$$\boxed{-29x + 14}$$