

Unit 1.2: 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	Number in front of a variable
Constant	Number by itself
Term	Coefficient & variable, constant * separated by +/-
Polynomial	Combination of terms
Degree	Highest exponent of a polynomial

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

One term: Monomial	Degree 1: Linear
Two terms: Binomial	Degree 2: Quadratic
Three terms: Trinomial	Degree 3: 3rd degree (cubic)
Four terms: Polynomial	Degree 4: 4th degree

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

a. $-10b^1 - 1$

Coefficients: -10

Constants: -1

Number of terms: 2

Degree: 1

Classification: **Linear binomial**

* If an exponent is not written, we put an exponent of 1

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

Coefficients: $-2, -2$

Constants: 7

Number of terms: 3

Degree: 2

Classification: **Quadratic trinomial**

* Classification (or type) is written as degree then number of terms

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

Coefficients: -6, -8, 5

Constants: -10

Number of terms: 4

Degree: 5

Classification: 5th degree polynomial

d. $8y$

Coefficients: 8

Constants: 0

Number of terms: 1

Degree: 1

Classification: Linear monomial

* If there is no constant, then the constant is 0

* If there are no variables, then there are no coefficients

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 terms with the same variable and same exponent.

* Write in order from highest to lowest exponent with constant at the end

2) Simplify each expression.

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

min. $2x^2 - 4x + 13$

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.

3) Simplify each expression.

a. $9(1 - 8x)$

$9 - 72x$ $-72x + 9$

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

$4 - 54a + 24$
 $-54a + 28$

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

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

$-81n - 72$

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

$56 + 56k + 1$

$56k + 57$

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

$15 - 35x - 1 + 6x$

$-29x + 14$

Distribute, then combine like terms