

Algebra 1

Lesson 9.1

Add and Subtract Polynomials

Warm-Up

Simplify each of the following expressions.

(a) $5x + 4(2x + 7)$

$$5x + 8x + 7$$

$$13x + 7$$

(b) $-2(x - 4) + 5x$

$$-2x + 8 + 5x$$

$$3x + 8$$

(c) $9x - 6(x + 2) + 3$

$$9x - 6x - 12 + 3$$

$$3x - 9$$

Monomial - Number, variable, or the product of a number and one or more variables with whole number exponents

Polynomial - a monomial or a sum of monomials (each is called a term)

Binomial - A polynomial with two terms

Trinomial - A polynomial with three terms

Leading Coefficient - The coefficient of the first term when a polynomial is written so that the exponents of a variable decrease

FROM LEFT TO RIGHT

DEGREE OF A POLYNOMIAL
GREATEST DEGREE OF ITS
TERMS

Example 1. Rewriting Polynomials

Polynomials should be written with exponents in decreasing order.

Write each of the following polynomials this way and identify the degree of the polynomial and leading coefficient.

(a) $3x^2 + 4x^3 + 7$

$$4x^3 + 3x^2 + 7$$

Degree: 3

L.C.: 4

(b) $2b^3 - 5b^4 + b - 3b^2$

$$-5b^4 + 2b^3 - 3b^2 + b$$

Degree: 4

L.C.: -5

(c) $y^3 + 9 + 2y^2 - 4y$

$$y^3 + 2y^2 - 4y + 9$$

Degree: 3

L.C.: 1

Degree of Polynomials:

0 degree - Constant -6

1st degree - Linear $2x + 3$

2nd degree - Quadratic $3x^2 + 4x - 1$

3rd degree - Cubic $2x^3 - 8$

4th degree - Quartic $x^4 - 2x^3 + 6$

Example 2. Identifying and Classifying Polynomials

Tell whether the expression is a polynomial. If it is, rewrite the polynomial so exponents are in decreasing order, find its degree and classify it as a binomial (2 terms) or trinomial (3 terms).

Expression	Is it a polynomial?	Rewritten	Degree and number of terms
$5x$	yes	$5x$	1 : MONOMIAL
$\frac{4}{m}$	NO		
$2x + x^2 - 8$	yes	$x^2 + 2x - 8$	2 : TRINOMIAL
14	yes	14	0 : MONOMIAL
$2b^{-2} + 3b^3$	NO		

Example 3. Adding Polynomials

Find the sum by combining like terms.

(a) $(2x^2 + 3x + 5) + (3x^2 - 4x - 2)$

$$5x^2 - x + 3$$

(b) $(4x^3 + 2x - 7) + (-2x^3 + x^2 + 9)$

$$2x^3 + x^2 + 2x + 2$$

Example 4. Subtracting Polynomials

Find the difference by combining like terms.

(a) $(2d^2 - 8) - (3d^2 + 4d + 1)$

$$-d^2 - 4d - 9$$

(b) $(5y^2 + 2y - 4) - (y^2 - 7y + 2)$

$$4y^2 + 9y - 6$$

Try It!

Find the sum or difference.

(a) $(5a^2 - 3) + (8a^2 - 1)$

$$13a^2 - 4$$

(b) $(4x^2 - 7x) - (5x^2 + 4x - 9)$

$$-x^2 - 11x + 9$$

(c) $(6c^2 + 3c + 9) - (3c - 5)$

$$6c^2 + 14$$

(d) $(5x^3 + 4x - 2x) + (4x^2 + 3x^3 - 6)$

$$8x^3 + 4x^2 + 2x - 6$$

Assignment

New: Pgs. 557 - 558 #4 - 34 (evens), 38

Review:

Simplify.

1. $-(-x^2)(x^3)(-x)^5$

2. $\frac{x^{-6}}{x^{-12}}$

3. $\left(\frac{2}{3}\right)^{-2}$

4. $\frac{(x^2y^{-2})^1}{xy^4}$