

Adding and Subtracting Polynomials

Like terms are terms that have the same variable with the same exponent.

Example 1: Adding Polynomials

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

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

2 has no like term to combine with.

$2x^2$ has no like term to combine with.

$$5x^3 + 3x^3 = 8x^3$$

$$-3x + 5x = 2x$$

Putting the terms in order from highest degree to lowest:

$$\text{Solution: } 8x^3 + 2x^2 + 2x + 2$$

***Remember that when we are adding or subtracting, we do not change exponents.

Example 2: Adding Polynomials

$$(3x^2 - 4x + 8) + (2x - 7x^2 - 5)$$

$$3x^2 + -7x^2 = -4x^2 \quad -4x + 2x = -2x \quad 8 + -5 = 3$$

$$\text{Solution: } -4x^2 - 2x + 3$$

Example 3: Adding Polynomials

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

$$5x^2 + -3x^2 = 2x^2 \quad -3x + 6x = 3x \quad 4 + -3 = 1$$

$$\text{Solution: } 2x^2 + 3x + 1$$

Example 4: Subtracting Polynomials

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

We are going to treat the negative between the parenthesis like it is a negative one to be distributed.

$$(6x^5 - 3x) - 1(-4x^5 + 2x - 5)$$

$$6x^5 - 3x + 4x^5 - 2x + 5$$

$$6x^5 + 4x^5 = 10x^5 \quad -3x - 2x = -5x \quad 5 \text{ has no term to combine with}$$

$$\text{Solution: } 10x^5 - 5x + 5$$

Example 5: Subtracting Polynomials

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

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

$$4x^3 + 2x^3 = 6x^3 \quad -3x^2 - x^2 = -4x^2 \quad 6x \text{ has no term to combine with} \quad -4 + 2 = -2$$

$$\text{Solution: } 6x^3 - 4x^2 + 6x - 2$$

Example 6: Adding and Subtracting Polynomials

$$(5x^3 - 2x + 1) - (2x^2 + 4x) + (x^3 + 5x^2 - 8x)$$

If there is a negative in front of parenthesis, distribute a negative one. Otherwise, you can get rid of the parenthesis.

$$5x^3 - 2x + 1 - 2x^2 - 4x + x^3 + 5x^2 - 8x$$

$$5x^3 + x^3 = 6x^3 \quad -2x^2 + 5x^2 = 3x^2 \quad -2x - 4x - 8x = -14x \quad 1$$

$$\text{Solution: } 6x^3 + 3x^2 - 14x + 1$$

Video Link: <http://algebra.flippedmath.com/101-add-and-subtract-polynomials.html>