

6.4 Adding and Subtracting with Polynomials

The **sum** of two or more polynomials is found by combining like terms.

1. Add the following polynomials by combining like terms.

$$(4x^3-5x^2+15x-10) + (-7x^2-2x+3) + (4x^2+9)$$

2. Add the following polynomials by combining like terms.

$$(2x^2-5x+3) + (x^2-7) + (2x+10)$$

The opposite of a polynomial can be indicated by writing a negative sign in front of a polynomial. The opposite of an entire polynomial indicates that the sign of every term in the polynomial is changed. For example,

$$-(5x^2-6x-1) = -5x^2+6x+1$$

Another approach is to think of this type of expression as indicating multiplication by -1 and use the distributive property as follows:

$$\begin{aligned} -(5x^2-6x-1) &= -1(5x^2)-1(6x)-1(-1) \\ &= -5x^2+6x+1 \end{aligned}$$

The answer is the same either way. In effect, using the distributive property and multiplying every term by -1 gives the same result as changing every term in the polynomial.

3. Find the indicated difference.

$$(-2x^3+5x^2+8x-1) - (2x^3-x^2-6x+13)$$

4. Subtract the polynomials.

$$(8x^4+2x^3-5x^2+0x-7) - (3x^4+5x^3-x^2+6x-11)$$

5. Simplify

$$3(-2a^2+5) - (-5a^2-7)$$

6. Simplify.

$$5x-[2x+3(4-x)+1]-9$$

7. Simplify.

$$2[a^2- 3(a - 3)] +5(a^2+ 2a)$$

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