Adding and Subtracting Polynomials

Adding and subtracting polynomials is quite easy as long as you remember that you can only add like variables with other like variables. What are like variables? Like variables are the same if the variable in each term has the same exponent. Once you decide what terms are the same, you can then add or subtract the coefficients, keeping the variable term the same.

$7x + 8x$	$2x^2 + 5x^2$	$4x - 3x^3 - x + 7x^3$
$15x$	$7x^2$	$3x + 4x^3$

You also need to follow your sign rules when adding or subtracting polynomials.

$$(8x^3 - 5x^2 + 4) + (2x^3 + 6x^2 - 7x - 1)$$

$$8x^3 - 5x^2 + 4 + 2x^3 + 6x^2 - 7x - 1$$

$$10x^3 + x^2 - 7x + 3$$

We can drop the parentheses here since we are adding the polynomials. The like terms have been highlighted in the same color to easily identify them. We can combine the coefficients of each like term to arrive at our answer. Notice that the -7x is the only x term and cannot be added to anything.

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

$$3x^4 - 2x^3 + x - 1 - x^4 + 5x^3 + 4x^2 - 9$$

$$3x^4 - 2x^3 + x - 1 - x^4 + 5x^3 + 4x^2 - 9$$

$$2x^4 + 3x^3 + 4x^2 - 10$$

For this subtraction problem, you first have to take care of the subtraction sign outside the parentheses. You can look at the subtraction sign as a -1 and multiply everything in the parentheses by -1. This will change the signs of all the terms that are inside the parentheses to their opposite. Once that is done, you can then add the like terms together.

If the term of the polynomial is x^2y^3z, they can only be added to other terms <u>with the exact same variables and exponents.</u>