Chapter 9 Topic Breakdown

To ADD polynomials → drop parentheses, and combine like terms! THAT'S IT!

To SUBTRACT polynomials →

1. rewrite what's in the 1st set of parentheses
2. Distribute the negative to what's inside the 2nd set of parentheses
3. Combine like terms! And you're done!

To MULTIPLY BY DISTRIBUTING a monomial × a polynomial → 1. draw arrows from the monomial to each term inside of the parentheses – when you draw the arrow, multiply these terms!!

Remember: When we multiply, we ADD the exponents

To MULTIPLY BY DISTRIBUTING a polynomial × a polynomial →

1. Start with the 1st term in the 1st set of parentheses
2. Using arrows, multiply that term by each term in the 2nd set of parentheses
3. Now, look at the 2nd term in the 1st set of parentheses
4. Using arrows, multiply that term by each term in the 2nd set of parentheses
5. Combine like terms, and you're done!!

To FACTOR BY PULLING OUT THE GCF →

1. Write each of the numbers down and list their factors
2. Find the biggest factor that they both have in common (GCF)
3. Determine what the largest amount of x's is that both terms have in common – that's the GCF of your x's
4. Put the two GCFs together & write them outside of a set of parentheses
5. Ask yourself what you need to multiply by your GCF to get the terms in the original problem. These terms go inside of your new set of parentheses – and that's it!

To FACTOR A POLYNOMIAL INTO 2 SETS OF PAENTHESES → (when the leading coefficient is 1)

1. Find the factors of the constant (last # in the polynomial)
2. Pick a pair of these factors that ADD up to equal the # in the 2nd term

3. Take each number and place it inside a set of parentheses in these blanks (x_____)(x_____) making sure to write the correct sign of the #, and THAT'S IT!

↑ What if the directions say "FACTOR, THEN SOLVE" →

1. Factor just like we did above
2. Split in half – set the binomial in each set of parentheses equal to zero and solve for x (get x by itself on one side)

To FACTOR A POLYNOMIAL INTO 2 SETS OF PARENTHESES → (when the leading coefficient is bigger than 1)

1. Draw lines to multiply the leading coefficient & the constant term (1st and last number)
2. Find factors of the product you found in step 1
3. Using these factors, rewrite the polynomial, using these factors as "x" terms (will look like we didn't combine like terms yet)
4. Factor by grouping (see below for factoring by grouping)

To FACTOR A PERFECT SQUARE BINOMIAL →

1. Make sure each term is written as a term that is squared
2. Make 2 sets of parentheses, write the 1st term that is squared first, write the 2nd term that was squared second. One set of parentheses should have a + sign in the middle and one set should have a – sign

To FACTOR BY GROUPING →

1. Draw parentheses around 2 terms at a time
2. Rewrite the polynomial by first taking out the GCF of the #s and/or x's from each set of parentheses and write this GCF outside of a new set of parentheses
3. Ask yourself what you need to multiply by your GCF to get the terms in the original problem. These terms go inside of your new set of parentheses – and that's it!

THINGS TO REMEMBER*

- If the directions ask you to factor – think "f" for factor is next to "e" for expand in the alphabet -> the result is something bigger/ expended
- When we multiply polynomials, we add their exponents -> ex) $(x^3)(x^5) = x^8$
- "Solving for x" just means "get x by itself on one side"

-ALWAYS CHECK YOUR ANSWER AT THE END!!!!!!!!!! BEST WAY TO ENSURE YOU DID THE PROBLEM CORRECTLY