Factoring Cookbook

First pull out what is in common to all the terms (**reverse distribute**). Usually, there will be nothing in common so you just move on to the next step. If however, you miss something in common, you are dead meat. **Always look for what is in common first.**

If there are two terms…

Look for difference of squares (really just reverse FOIL with a 0 in the middle)
$$A^2 - B^2 = (A - B)(A + B)$$
There is no sum of squares
$$A^2 + B^2 = \text{DOES NOT FACTOR}$$
Look for sum of cubes
$$A^3 + B^3 = (A + B)(A^2 - AB + B^2)$$
Look for difference of cubes
$$A^3 - B^3 = (A - B)(A^2 + AB + B^2)$$

The cube formulas are not real common but they must be memorized. You can't get them another way. They are tweaked versions of each other. (Trick for the signs…same, different, always positive)

If there are three terms…

Reverse FOIL. The leading coefficient may or may not be one, the order could be backwards from usual (constant coming first), there could be two different variables. It does not matter. The basic structure is the same and you reverse FOIL.

If there are 4 (or if life really stinks, more) terms

Factor by grouping. Split the terms into two groups and try to play with each group. Try to find something in common between the two groups and reverse distribute it out of the whole thing. You may be in a funky version of the two term world described above. Look for the squares and cubes stuff. Be creative. The same rules apply but they are just working on funky looking objects. The good news is that this is the least used method of factoring.

Remember to look for tricky stuff within the general structure outline above…

$(2x + 5)^2 - 9$ is just $A^2 - B^2$ with $A = 2x + 5$ and $B = 3$

Factoring is a really good meal once you know how to cook it!