

## SIMPLIFYING RATIONAL (FRACTION) EXPRESSIONS (Addition & Subtraction) ~~(5.4)~~

Get Least Common Denominator. Factor denominators where necessary to be able to determine the Least Common Denominator. Multiply each term by an equivalent of 1 to "create" proper common denominator and keep each expression Equal to the step before. Then add numerators together (and simplify) over the common denominator. Leave denominator in Factored Form.

**Complex Fractions:** Apply the above method to the "Big numerator" and "Big denominator", so that you have a "single fraction" over a "single fraction". The fraction bar is the same as "divided by". So we have a fraction divided by a fraction. To complete, you invert the "Bottom" fraction and multiply the two together.

**Remember:** Multiplying Fractions is done "straight across": numerator times numerator over denominator times denominator. Look for common factors in numerator and denominator that can cancel.

**Warning:** I have seen some students doing a kind of "cross-multiplication" when division of fractions was indicated. I don't know where this got started, but it is a very bad idea! I will admit that sometimes the student will get the correct answer using this method, but it is unlikely that he has an understanding of the problem. Furthermore, there are 2 other problems: First, if you "cross" the wrong direction, you get totally the wrong answer; and second, by not writing the step down where the two fractions are multiplied by one another, you miss the opportunity to make cancellations and simplify the problem as you go. This can cause a great deal of trouble in finally getting a simplified answer. (True and correct "Cross Multiplication" will be discussed along with 5.6.)

**WARNING:** Added (or subtracted) terms can NOT be cancelled from numerator to denominator. For example:  $\frac{x+3}{x+5}$  does NOT equal  $\frac{3}{5}$

**WARNING:** Do NOT confuse this with SOLVING RATIONAL EQUATIONS.