A rational expression is a fraction. A fraction is the same as a division – the numerator (top) divided by the denominator (bottom).

Lowest common denominator means the smallest number that all denominators will divide into. Do not confuse this with greatest common factor, which is the smallest factor the divides into all terms.

You can get a common denominator by multiplying all denominators together.

You must have a common denominator before adding or subtracting terns.

When multiplying two fractions, multiply the numerators (top) together then multiply the denominators (bottom) together.

When dividing two fractions, flip the second then multiply them.

A compound fraction occurs when you have:

1. Multiple terms in the numerator (top), one or more of the terms is a fraction.
2. Multiple terms in the denominator (bottom), one or more of the terms is a fraction.
3. Both 1 and 2.

For compound fractions, work the numerator (top) and denominator (bottom) separately to make single terms top and bottom, and then proceed as if it were a division problem.

Rationalizing the numerator or denominator involves multiplying the top and bottom of the fraction by the conjugate of what you are rationalizing (numerator or denominator). Conjugates can only occur when there are two terms. You get the conjugate by changing the sign between the terms.

Common Errors With Addition

$(a+b)^2 \neq a^2+b^2$	This is really (a+b)(a+b) – FOIL it out.
$\sqrt{a+b} \neq \sqrt{a}+\sqrt{b}$	Must add first before taking the root.
$\sqrt{a^2+b^2}=a+b$	Must square a, square b, add, then take the root.
$\frac{1}{a}+\frac{1}{b} \neq \frac{1}{a+b}$	Must have a common denominator. Keep the common denominator and add the numerators.
$\frac{a+b}{a} \neq b$	Can only cancel factors.
$a^{-1}+b^{-1} \neq (a+b)^{-1}$	This is really $\frac{1}{a}+\frac{1}{b}$, you need common denominators to add.