**Adding and Subtracting Fractions**

TO ADD OR SUBTRACT FRACTIONS, WE MUST HAVE **COMMON DENOMINATORS**

If denominators are the same: Add or subtract the numerators and use the same denominator.

Examples:

 What if the denominators are different? What is + ?

What does + = ?

Since one rectangle is divided into halves and the other into thirds, we cannot add.   
Both rectangles must be divided into the same number of sections:

 The number of sections we have now divided the boxes into represents the common denominator. We renamed each fraction to have a common denominator in order to add them. We look for the **least** common denominator (LCD) which is the same as the least common multiple (LCM).

The LCD can be found by:

• listing method

• prime factorization method

For details on above methods, see the page on least common denominators.

Example:The LCD of 2 and 4 is the least common multiple of 2 and 4. This means the smallest number that is divisible by 2 and 4 (note: we are not finding the factors of 2 and 4, we are finding a multiple of 2 and 4).

The LCD of 2 and 4 is 4.

Now we must rename ½ so that it has a denominator of 4. The new fraction must be equivalent to ½. Multiplying the numerator and denominator by the same number will result in an equivalent fraction. We multiply the numerator and denominator each by 2 because 2 x 2 = 4

• = Multiplying by is the same as multiplying by 1. Thus has the same value as .

It is not necessary to rename ¼ since it already has a denominator of 4.

Add the numerators. Do not add the denominators. Reduce answer to lowest terms, if possible.