Fractions Review

COMMON FRACTIONS = $\frac{numerator}{denominator}$

IMPROPER FRACTIONS - have a numerator larger than the denominator. Example: $\frac{17}{5}$

PROPER FRACTIONS - have a numerator smaller than the denominator. Example: $\frac{2}{3}$

EQUIVALENT FRACTIONS - may look different but they have the same value. Example: $\frac{1}{2}$, $\frac{2}{4}$, and $\frac{5}{10}$

MIXED NUMBERS - have a whole number part and a fraction part. Example: $2\frac{1}{3}$

REDUCE - to convert the fraction to the lowest equivalent fraction. Example: $\frac{4}{8}$ reduces to $\frac{1}{2}$

INVERT - to turn upside down. Example: $\frac{2}{3}$ inverts to $\frac{3}{2}$

<u>MULTIPLICATION</u>:

1. Change all mixed numbers to improper fractions. Example: $1\frac{1}{2}$ to $\frac{3}{2}$
2. Multiply the numerators to get the numerator of the answer.
3. Multiply the denominators to get the denominator of the answer.
4. Reduce the answer if possible.

Example: $\frac{3}{4} \times \frac{5}{8} = \frac{15}{32}$

Example: $5 \times 2\frac{1}{4} = \frac{5}{1} \times \frac{9}{4} = \frac{45}{4} = 11\frac{1}{4}$

<u>DIVISION:</u>

1. Change all mixed numbers to improper fractions.
2. Invert the divisor. $\frac{3}{7} \div \frac{2}{5}$
3. Multiply. $\frac{3}{7} \times \frac{5}{2} = \frac{15}{14} = 1\frac{1}{14}$
4. Reduce the answer if possible. $\frac{7}{8} \div 3\frac{2}{3} = \frac{7}{8} \div \frac{11}{3} = \frac{7}{8} \times \frac{3}{11} = \frac{21}{88}$

ADDITION: To add, fractions must have the same denominator.

1. If they have the same denominator, add the numerators and place the sum over the denominator.

$$\begin{array}{r} \frac{4}{9} \\ +\ \frac{1}{9} \\ \hline \frac{5}{9} \end{array}$$ same denominator

2. If they have different denominators, change the fraction(s) to equivalent fractions with a common denominator. Then add together as in step 1 above.

$$\begin{array}{r} \frac{1}{2} \rightarrow \frac{3}{6} \\ +\ \frac{1}{3} \rightarrow \frac{2}{6} \\ \hline ?\quad \frac{5}{6} \end{array}$$ same denominator

3. If you have mixed numbers to add, add the fractions and then add this to the sum of the whole numbers.

$$\begin{array}{r} 2\frac{2}{3} \rightarrow 2\frac{4}{6} \\ +\ 1\frac{1}{2} \rightarrow 1\frac{3}{6} \\ \hline ?\quad 3\frac{7}{6} = 4\frac{1}{6} \end{array}$$

4. Reduce the answer if possible.

$$\begin{array}{r} \frac{4}{9} \\ +\ \frac{2}{9} \\ \hline \frac{6}{9} = \frac{2}{3} \end{array}$$

SUBTRACTION: To subtract, fractions must have the same denominator (similar to addition).

1.

$$\begin{array}{r} \frac{4}{9} \\ -\ \frac{1}{9} \\ \hline \frac{3}{9} = \frac{1}{3} \end{array}$$

2.

$$\begin{array}{r} \frac{1}{2} \rightarrow \frac{3}{6} \\ -\ \frac{1}{3} \rightarrow \frac{2}{6} \\ \hline ?\quad \frac{1}{6} \end{array}$$

3.

$$\begin{array}{r} 2\frac{2}{3} \rightarrow 2\frac{4}{6} \\ -\ 1\frac{1}{2} \rightarrow 1\frac{3}{6} \\ \hline ?\quad \frac{1}{6} \end{array}$$

Just as in whole number subtraction, you may have to 'borrow' when subtracting mixed numbers.

4.

$$\begin{array}{r} 7\frac{1}{3} \\ -\ 1\frac{2}{3} \\ \hline ? \end{array}$$

Trying to subtract $\frac{1}{3} - \frac{2}{3}$ creates a problem, so we must borrow '1' from '7' as follows:

$$7\frac{1}{3} = 6 + 1\frac{1}{3} = 6\frac{4}{3}$$

Remember: $1 = \frac{3}{3}$

$$\begin{array}{r} 7\frac{1}{3} \rightarrow 6\frac{4}{3} \\ -\ 1\frac{2}{3} \rightarrow 1\frac{2}{3} \\ \hline ?\quad 5\frac{2}{3} \end{array}$$