

## Adding Fractions

1. If you have a mixed number, add the whole number parts.
2. Find the common denominator and change the fractions if needed.
3. Add the numerators.
4. The denominator stays the same.
5. Reduce if possible.
6. Add the sum of the fraction parts to the sum of the whole parts (if there are any).

Example:

$$\begin{array}{r} 2 \frac{4}{5} \times \frac{2}{2} = \frac{8}{10} \\ + 3 \frac{1}{2} \times \frac{5}{5} = \frac{5}{10} \\ \hline 5 \qquad \frac{13}{10} = 1 \frac{3}{10} \end{array}$$
$$5 + 1 \frac{3}{10} = \left( 6 \frac{3}{10} \right)$$
$$10 \overline{) 13} \begin{array}{r} 1 \\ \underline{10} \\ 3 \end{array}$$

## Subtracting Fractions

1. Find the common denominator and the fractions if needed
2. Subtract the numerators. If needed borrow 1 from the whole number and add it as a fractional form of 1.
3. The denominator stays the same.
4. Reduce if possible
5. Subtract the whole numbers if there are any.

Example:

$$\begin{array}{r}
 \phantom{5} \cancel{6} \frac{1}{2} \times \frac{6}{6} = \frac{6}{12} + \frac{12}{12} = \frac{18}{12} \\
 - \phantom{5} 2 \frac{2}{3} \times \frac{4}{4} = \frac{8}{12} \\
 \hline
 3 \qquad \frac{10}{12} \div \frac{2}{2} = \frac{5}{6} \\
 \textcircled{3 \frac{5}{6}}
 \end{array}$$

## Multiplying Fractions

1. Change any mixed numbers to improper fractions.
2. Write any whole numbers as fractions.
3. Divide out any factors that are common on top and on the bottom.
4. Multiply the numerators.
5. Multiply the denominators.
6. Reduce if possible.

Example:

$$2 \frac{5}{6} \times 9$$

$$\frac{17}{\cancel{6}} \times \frac{\cancel{9}^3}{1} = \frac{51}{2} \quad 2 \overline{) \begin{array}{r} 25 \\ 51 \\ \underline{50} \\ 1 \end{array}}$$

$$\left( 25 \frac{1}{2} \right)$$

## Dividing Fractions

1. Change any mixed numbers to improper fractions.
2. Write any whole numbers as fractions.
3. Invert (flip over) the second fraction and multiply.
4. Divide out any factors that are common on top and on the bottom.
5. Multiply the numerators.
6. Multiply the denominators.
7. Reduce if possible.

Example:

$$2 \frac{5}{8} \div 9$$

$$\frac{21}{8} \div \frac{9}{1}$$

$$\frac{\overset{7}{\cancel{21}}}{8} \times \frac{1}{\underset{\cancel{9}}{3}} = \left( \frac{7}{24} \right)$$