

FRACTION RULES

Multiplying and Dividing Fractions:

1. Common denominators are NOT needed.
2. Always change mixed numbers to improper fractions.
3. CANCEL (reduce) between any numerator and any denominator if you can, **but cancel only when a multiplication sign is present: Never cancel when you have a division sign.**
4. **TO MULTIPLY:** Multiply numerator times numerator, denominator times denominator. Reduce answer to a mixed number in lowest terms. (In Math 105, answers are often left in improper form)
5. **TO DIVIDE:** Change the divide sign to a multiplication sign, then invert the second fraction and multiply as in Step 4.

Examples:

$$\frac{2}{3} \times \frac{4}{5} =$$

Answers:

$$\left(\frac{8}{15}\right)$$

$$3\frac{1}{5} \times 2\frac{3}{4} =$$

$$\left(\frac{44}{5} = 8\frac{4}{5}\right)$$

$$4 \times \frac{3}{8} =$$

$$\left(\frac{3}{2} = 1\frac{1}{2}\right)$$

$$\frac{3}{10} \div \frac{2}{9} =$$

$$\left(\frac{27}{20} = 1\frac{7}{20}\right)$$

$$5\frac{1}{4} \div 4\frac{2}{3} =$$

$$\left(\frac{9}{8} = 1\frac{1}{8}\right)$$

$$7 \div \frac{1}{3} =$$

$$(21)$$

$$\frac{3}{4} \div 5 =$$

$$\left(\frac{3}{20}\right)$$

$$\frac{2}{3} \times \frac{5}{7} \times \frac{9}{20} =$$

$$\left(\frac{3}{14}\right)$$

$$\frac{0}{35} =$$

$$(0)$$

$$\frac{35}{0} =$$

$$(\text{undefined})$$

FRACTION RULES

Adding and Subtracting Fractions:

1. Common (like) denominators are necessary, so change all unlike fractions to equivalent fractions with like denominators. To make equivalent fractions, multiply the numerator and denominator by the same number.
2. Keep mixed numbers; DO NOT change mixed numbers into improper fractions.
3. Add (or subtract) the numerators, put the numerator answer over the common denominator. If any improper fractions arise in the answer, change the improper portion to a mixed number. (In Math 105, answers are often left in improper form)

Examples:

$$\begin{array}{r} \frac{7}{8} \\ + \frac{5}{8} \\ \hline \end{array}$$

$$\begin{array}{r} 3\frac{2}{5} \\ + 6\frac{1}{5} \\ \hline \end{array}$$

$$\begin{array}{r} 11\frac{4}{7} \\ + 15\frac{5}{7} \\ \hline \end{array}$$

Answers:

$$\left(\frac{3}{2}, 9\frac{3}{5}, 27\frac{2}{7} \right)$$

$$\begin{array}{r} \frac{5}{8} \\ - \frac{1}{3} \\ \hline \end{array}$$

$$\begin{array}{r} 11\frac{3}{4} \\ - 8\frac{5}{12} \\ \hline \end{array}$$

$$\begin{array}{r} 6\frac{7}{12} \\ - 4\frac{3}{8} \\ \hline \end{array}$$

$$\frac{7}{24}, 3\frac{1}{3}, 2\frac{5}{24}$$

$$\begin{array}{r} \frac{2}{3} \\ \frac{3}{4} \\ + \frac{1}{6} \\ \hline \end{array}$$

$$\begin{array}{r} \frac{3}{8} \\ \frac{1}{3} \\ + \frac{5}{6} \\ \hline \end{array}$$

$$\frac{19}{12}, \frac{37}{24}$$