



## Working with Fractions

### ADDITION AND SUBTRACTION OF FRACTIONS

For fractions having the same denominator:

- Add or subtract the numerators.
- Keep the same denominator.

For fractions having **different denominators**:

- Convert to equivalent fractions having their LCD.
- Add or subtract the numerators of the new fractions.
- Keep the LCD as the denominator.

For problems involving **mixed numerals**:

- Add or subtract the fraction parts of the numbers, as above.

If you need to borrow:

- Subtract one from the whole number part of the top number.
  - Add 1 (i.e.,  $\frac{10}{10}$ ) to the fraction part of the top number.
  - Continue with the problem.
- Add or subtract the whole numbers in the problem.
  - Add the two results at the end.

### MULTIPLICATION OF FRACTIONS

To multiply a fraction by a **whole number**:

- Multiply the numerator by the whole number.
- Write the result over the denominator.

To multiply a fraction by **another fraction**:

- Multiply the numerators.
- Multiply the denominators.

When a multiplication problem involves a **mixed numeral**, convert it to an improper fraction\* first.

### DIVISION OF FRACTIONS

To divide with fractions, or fractions and whole numbers:

- Invert the divisor. Remember that whole numbers can be written as fractions over 1.
- Multiply the fractions.

Example 1:

$$\frac{1}{6} + \frac{3}{6} = \frac{4}{6} = \frac{2}{3}$$

Example 2:

$$\begin{array}{r} \frac{3}{4} = \frac{6}{8} \\ + \frac{5}{8} = \frac{5}{8} \\ \hline \frac{11}{8} = 1\frac{3}{8} \end{array}$$

Example 3:

$$\begin{array}{r} 3\frac{1}{3} = 3\frac{5}{15} = 2\frac{20}{15} \\ - 1\frac{2}{5} = 1\frac{6}{15} = 1\frac{6}{15} \\ \hline 1\frac{14}{15} \end{array}$$

Example 4:

$$\frac{3}{5} \times 8 = \frac{24}{5} = 4\frac{4}{5}$$

Example 5:

$$\frac{1}{2} \times \frac{7}{8} = \frac{7}{16}$$

Example 6:

$$\frac{4}{9} \times \frac{6}{5} = \frac{4}{9} \times \frac{6}{5} = \frac{24}{45} = \frac{8}{15}$$

Example 7:

$$\frac{2}{3} \div 8 = \frac{2}{3} \times \frac{1}{8} = \frac{2}{24} = \frac{1}{12}$$

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