

## 3.3

## Multiplying Fractions

To multiply fractions, multiply the numerators and multiply the denominators. The denominators cannot be zero.

Simply the fraction, if needed.

There are two methods to multiplying fractions: either multiply the numerators and multiply the denominators or simplify a numerator & denominator before multiplying (if you can).

Example: Solve each equation.

$$-\frac{5}{4} \cdot \frac{1}{3} = \boxed{\frac{-5}{12}}$$

Example: Solve each equation.

$$\frac{8}{7} \cdot \frac{7}{10} = \frac{56 \div 7}{70 \div 7} = \frac{8 \div 2}{10 \div 2} = \boxed{\frac{4}{5}}$$

Handwritten diagram showing the cancellation of 7 in the numerator and denominator of the first fraction, and 2 in the numerator and denominator of the second fraction. The result is  $\boxed{\frac{4}{5}}$ .

Example: Solve each equation.

$$-\frac{2}{3} \cdot \frac{5}{4} = \frac{-10 \div 2}{12 \div 2} = \boxed{\frac{-5}{6}}$$

Handwritten diagram showing the cancellation of 2 in the numerator of the first fraction and the denominator of the second fraction. The result is  $\boxed{\frac{-5}{6}}$ .

Example: Solve each equation.

$$\frac{\cancel{4}}{9} \cdot \frac{7}{\cancel{4}} = \boxed{\frac{7}{9}}$$

Example: Solve each equation.

$$\frac{-2}{1} \cdot \frac{3}{7} = \boxed{\frac{-6}{7}}$$

Example: Solve each equation.

$$-2\frac{+2}{\times 3} \cdot 4\frac{+1}{\times 10}$$

$$\frac{-8}{3} \cdot \frac{41}{10} = \frac{-164}{15}$$

OR  $-10\frac{14}{15}$

Example: Solve each equation.

$$-1\frac{+1}{\times 4} \cdot 9$$

$$\frac{-5}{4} \cdot \frac{9}{1} = \frac{-45}{4}$$

OR  $-11\frac{1}{4}$

Example: Solve each equation.

$$-2\frac{+1}{\times 5} \cdot -1\frac{+3}{\times 4}$$

$$\frac{-11}{5} \cdot \frac{-7}{4} = \boxed{\begin{array}{l} \frac{77}{20} \text{ or} \\ 3\frac{17}{20} \end{array}}$$

Example: Solve each equation.

$$-1\frac{+5}{\times 7} \cdot -2\frac{+1}{\times 2}$$

$$\frac{-12}{7} \cdot \frac{-5}{7} = \boxed{\begin{array}{l} \frac{30}{7} \text{ or} \\ 4\frac{2}{7} \end{array}}$$

*Note: A red circle highlights the multiplication of the numerators (-12 and -5) to get 30, and a red arrow points from the -6 above the 7 to the 12 in the numerator.*

Example: Solve each equation.

$$-2\frac{+3}{\times 8} \cdot 2\frac{+1}{\times 2}$$

$$\frac{-19}{8} \cdot \frac{5}{2} = \boxed{\begin{array}{l} -\frac{95}{16} \text{ OR} \\ -5\frac{15}{16} \end{array}}$$