

## 2-4 Dividing Rational Numbers

Multiplicative Inverse

Two numbers that when multiplied equal 1.

$$\frac{\cancel{3}}{\cancel{4}} \cdot \frac{\cancel{4}}{\cancel{3}} = 1$$

$$\frac{4}{1} \cdot \frac{1}{4} = 1$$

Reciprocal = Mult. Inverse

$$-5 \frac{2}{3} = -\frac{17}{3} \cdot \left(-\frac{3}{17}\right) = 1$$

Instead of dividing, multiply by the reciprocal.

$$\frac{7}{8} \div \frac{3}{4} = \frac{7}{8} \times \frac{4}{3} = \frac{7}{6} = 1\frac{1}{6}$$

$$\frac{2}{5} \div 5 = \frac{2}{5} \div \frac{5}{1} = \frac{2}{5} \times \frac{1}{5} = \frac{2}{25}$$

$$-\frac{4}{5} \div \frac{6}{7} =$$
$$\overset{-2}{\cancel{-4}} \frac{1}{5} \times \frac{7}{\cancel{6}_3} = \left( \frac{-14}{15} \right)$$

Steps.

1. First # stays the same
2. change divide to multiply
3. Reciprocal of the 2nd #
4. Reduce - Simplify

Instead of dividing, multiply by the reciprocal.

$$\frac{3}{4} \div \frac{1}{2} = \frac{3}{4} \cdot \frac{2}{1} = \frac{3}{2} \left( \frac{1}{2} \right)$$

$$\frac{3}{5} \div (6)$$
$$\frac{3}{5} \cdot \frac{1}{6} = \left(\frac{1}{10}\right)$$



$$\frac{1}{3} \div \left(\frac{1}{9}\right) = \frac{1}{3} \cdot \left(\frac{9}{1}\right) = \frac{10}{9} = \left(\frac{1}{9}\right)$$

$$4\frac{2}{3} \div (-3\frac{1}{2})$$

$$\frac{14}{3} \div \left(-\frac{7}{2}\right)$$

$$\frac{14}{3} \times \frac{2}{\cancel{7}_1} = \frac{4}{3} \quad \left(-1\frac{1}{3}\right)$$

$$\begin{aligned} 2\frac{3}{4} &\div 2\frac{1}{5} \\ \frac{11}{4} \times \frac{5}{5} &= \frac{55}{20} = \frac{11}{4} \end{aligned}$$

$$\begin{aligned} 1\frac{1}{2} &\div 2\frac{1}{3} \\ \frac{3}{2} \div \frac{7}{3} &= \frac{9}{14} \end{aligned}$$

$$-3\frac{1}{2} \div -\frac{1}{4}$$
$$-\frac{7}{2} \times \frac{4}{1} = \frac{14}{1} \text{ (24)} \text{ (25)}$$

## Dimensional Analysis

Units (labels) also cancel

Labels cancel too!

$$\frac{20 \text{ feet}}{1} \div \frac{1}{3} \frac{\text{ribbon}}{\text{ft.}}$$

$$\frac{20 \cancel{\text{ft.}}}{1} \cdot \frac{3 \text{ ribbons}}{1 \cancel{\text{ft.}}} = 60 \text{ ribbons}$$