

3.4

Dividing Fractions

To divide by a fraction, multiply by its multiplicative inverse (reciprocal/"opposite").

"Keep it. Change it. Flip it."

Keep the 1st fraction the same.

Change division to multiplication.

Flip the last fraction.

Example: Evaluate each expression.

$$\frac{-1}{5} \div \frac{7}{4}$$
$$= \frac{-1}{5} \cdot \frac{4}{7} = \boxed{\frac{-4}{35}}$$

Example: Evaluate each expression.

$$\frac{-1}{2} \div \frac{5}{4}$$

$$\frac{-1}{2} \cdot \frac{4}{5} = \boxed{\frac{-2}{5}}$$

Example: Evaluate each expression.

$$\frac{1}{2} \div \frac{8}{7}$$

$$\frac{1}{2} \cdot \frac{7}{8} = \boxed{\frac{7}{16}}$$

Example: Evaluate each expression.

$$\frac{-3}{2} \div \frac{-10}{7}$$

$$\frac{-3}{2} \cdot \frac{7}{-10} = \frac{+21}{+20} = \boxed{\frac{21}{20}} \text{ or } 1\frac{1}{20}$$

Example: Evaluate each expression.

$$\frac{-9}{5} \div \frac{2}{1}$$

$$\frac{-9}{5} \cdot \frac{1}{2} = \boxed{\frac{-9}{10}}$$

Example: Evaluate each expression.

$$-3\frac{5}{9} \div \frac{3}{1}$$

$$-\frac{32}{9} \div \frac{3}{1}$$

$$-\frac{32}{9} \cdot \frac{1}{3} = \boxed{\frac{-32}{27} \text{ or } -1\frac{5}{27}}$$

Example: Evaluate each expression.

$$\frac{1}{9} \div -1\frac{1}{3}$$

$$\frac{1}{9} \div \frac{-4}{3}$$

$$\frac{1}{9} \cdot \frac{3}{-4} = \boxed{\frac{1}{-12}}$$

Example: Evaluate each expression.

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

$$\frac{-2}{1} \div \frac{-19}{5}$$

$$\frac{-2}{1} \cdot \frac{5}{-19} = \frac{+10}{+19} = \boxed{\frac{10}{19}}$$

Example: Evaluate each expression.

$$1\frac{6}{7} \div 5\frac{3}{4}$$

$$\frac{13}{7} \div \frac{23}{4}$$

$$\frac{13}{7} \cdot \frac{4}{23} = \boxed{\frac{52}{161}}$$

Example: Evaluate each expression.

$$-3\frac{+7}{\times 10} \div 2\frac{+1}{\times 4}$$

$$\frac{-37}{10} \div \frac{9}{4}$$

$$\frac{-37}{10} \cdot \frac{4}{9} = \frac{-74}{45} \text{ or } -1\frac{29}{45}$$