

Lesson 1-2 Complex Fractions and Unit Rates

Fractions like $\frac{\frac{2}{3}}{\frac{4}{4}}$ are called complex fractions. **Complex fractions** are fractions with a numerator, denominator, or both that are also fractions.

Example 1

Simplify $\frac{\frac{2}{3}}{\frac{3}{4}}$.

A fraction can also be written as a division problem.

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

Write the complex fraction as a division problem.

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

Multiply by the reciprocal of $\frac{3}{4}$, which is $\frac{4}{3}$.

$$= \frac{8}{3} \text{ or } 2\frac{2}{3}$$

Simplify.

So, $\frac{\frac{2}{3}}{\frac{3}{4}}$ is equal to $2\frac{2}{3}$.

*WE DO NOT DIVIDE BY A FRACTION
WE MULTIPLY BY THE RECIPROCAL*

Exercises

Simplify.

1. $\frac{\frac{3}{1}}{\frac{1}{3}}$

2. $\frac{\frac{5}{3}}{\frac{3}{7}}$ *NUMERATOR = $\frac{5}{1}$* *$\frac{5}{1} \div \frac{3}{7}$*
DENOMINATOR = $\frac{3}{7}$ *$\frac{5}{1} \cdot \frac{7}{3} = \frac{35}{3} = 11\frac{2}{3}$*

3. $\frac{\frac{4}{1}}{\frac{1}{5}}$

4. $\frac{\frac{2}{4}}{\frac{4}{9}}$ *NUMERATOR = $\frac{2}{1}$* *$\frac{2}{1} \div \frac{4}{9}$*
DENOMINATOR = $\frac{4}{9}$ *$\frac{2}{1} \cdot \frac{9}{4} = \frac{9}{2} = 4\frac{1}{2}$*

5. $\frac{\frac{1}{4}}{\frac{4}{5}}$

6. $\frac{\frac{10}{7}}{\frac{7}{8}}$

7. $\frac{\frac{3}{5}}{\frac{3}{7}}$

8. $\frac{\frac{1}{6}}{\frac{5}{6}}$ *NUMERATOR = $\frac{1}{6}$* *$\frac{1}{6} \div \frac{5}{6}$*
DENOMINATOR = $\frac{5}{6}$ *$\frac{1}{6} \cdot \frac{6}{5} = \frac{1}{5}$*

9. $\frac{\frac{4}{5}}{\frac{9}{10}}$

10. $\frac{\frac{3}{5}}{\frac{3}{10}}$