Complex Fractions and Unit Rates

STANDARD FRACTION → $\frac{3}{5}$ ← NUMERATOR = 3, DENOMINATOR = 5

$3 \div 5$

COMPLEX FRACTION → $\frac{\frac{1}{2}}{5}$ ← NUMERATOR = $\frac{1}{2}$, DENOMINATOR = 5

$\frac{1}{2} \div \frac{5}{1} = \frac{1}{2} \cdot \frac{1}{5} = \frac{1 \times 1}{2 \times 5} = \frac{1}{10}$

$\frac{\frac{2}{3}}{\frac{1}{6}}$ ← NUMERATOR = $\frac{2}{3}$, DENOMINATOR = $\frac{1}{6}$

$\frac{2}{3} \div \frac{1}{6} = \frac{2}{\cancel{3}_{1}} \cdot \frac{\cancel{6}^{2}}{1} = \frac{2 \times 2}{1 \times 1} = \frac{4}{1} = 4$

NAME _____ DATE _____ PERIOD _____

Lesson 1-2 Complex Fractions and Unit Rates

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

Example 1

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

A fraction can also be written as a division problem.

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

$= \frac{8}{3}$ or $2\frac{2}{3}$ Simplify.

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

Exercises

Simplify.

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

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

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

4. $\frac{2}{\frac{4}{9}}$

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

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

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

8. $\frac{\frac{1}{6}}{\frac{5}{6}}$

9. $\frac{\frac{4}{5}}{\frac{9}{10}} = \frac{4}{5} \div \frac{9}{10} = \frac{4}{5} \cdot \frac{10}{9} = \frac{4 \times 2}{1 \times 9} = \frac{8}{9}$

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

Lesson 1-2 Complex Fractions and Unit Rates **Skills Practice**

Simplify.

1. $\dfrac{1}{\frac{2}{5}}$

2. $\dfrac{\frac{4}{5}}{8}$

3. $\dfrac{4}{\frac{3}{8}}$

4. $\dfrac{10}{\frac{5}{12}}$

7. $\dfrac{\frac{2}{5}}{\frac{4}{9}}$

8. $\dfrac{\frac{8}{9}}{20}$

9. $\dfrac{\frac{5}{6}}{12}$

10. $\dfrac{\frac{3}{8}}{\frac{7}{12}}$

13. $\dfrac{\frac{8}{11}}{\frac{4}{5}}$

14. $\dfrac{30}{\frac{5}{7}}$

15. $\dfrac{\frac{6}{7}}{21}$

16. $\dfrac{15}{\frac{5}{9}}$

17. $\dfrac{\frac{1}{3}}{\frac{8}{9}}$

18. $\dfrac{\frac{2}{3}}{\frac{24}{25}}$