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Complex Fractions and Unit Rates – L1-2

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. (Fractions within a fraction)

Example 1

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

A fraction can also be written as a division problem.

$\frac{2}{\frac{3}{4}} = 2 \div \frac{3}{4} = \frac{2}{1} \div \frac{3}{4}$ — Write the complex fraction as a division problem.

$= \frac{2}{1} \div \frac{3}{4} \rightarrow \frac{2}{1} \times \frac{4}{3}$ — Evaluate the division problem. (Multiply by the reciprocal)

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

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

YOUR TURN

Simplify.

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

$\frac{3}{1} \times \frac{3}{1} = \frac{9}{1} = \boxed{9}$

2. $\frac{\frac{2}{9}}{3}$ $\frac{2}{9} \div \frac{8}{3}$

$\frac{2}{9} \times \frac{3}{8} = \frac{6}{72}$

$\frac{6 \div 6}{72 \div 6} = \boxed{\frac{1}{12}}$

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

$\frac{4}{5} \times \frac{4}{1} = \frac{16}{5}$

$= \boxed{3\frac{1}{5}}$

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

$\frac{18}{5} \div \frac{4}{3}$

$\frac{18}{5} \times \frac{3}{4} = \frac{54 \div 2}{20 \div 2} = \frac{27}{10}$

$\boxed{2\frac{7}{10}}$

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

$\frac{1}{1} \times \frac{5}{4} = \frac{5}{4}$

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

6. $\frac{\frac{1}{7}}{10}$ $\frac{1}{7} \div \frac{10}{1}$

$\frac{1}{7} \times \frac{1}{10} = \boxed{\frac{1}{70}}$

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