

Lesson 12-8

Example 1 Mixed Expression to Rational Expression

Simplify $\frac{m-2}{5m} + 1$.

$$\begin{aligned}\frac{m-2}{5m} + 1 &= \frac{m-2}{5m} + \frac{1(5m)}{5m} \\ &= \frac{m-2+5m}{5m} \\ &= \frac{6m-2}{5m}\end{aligned}$$

The LCD is $5m$.

Add the numerators.

Simplify.

Example 2 Complex Fraction Involving Numbers

Kathryn's is planning a barbeque. She bought 336 ounces of hamburger to make hamburgers. If each burger takes $\frac{1}{4}$ pound of hamburger, how many burgers can she make?

$$\frac{336 \text{ ounces}}{\frac{1}{4} \text{ pounds}} = \frac{336 \text{ ounces}}{\frac{1}{4} \text{ pounds}} \cdot \frac{1 \text{ pound}}{16 \text{ ounces}}$$

Convert ounces to pounds.

$$= \frac{336}{\frac{1}{4} \cdot 16}$$

Divide by common units.

$$= \frac{336}{\frac{1}{4} \cdot 16}$$

Express each term as an improper fraction.

$$= \frac{336}{\frac{1}{16}}$$

Multiply in the denominator.

$$= \frac{336}{4}$$

Simplify the numerator and the denominator.

$$= 84$$

Simplify.

Kathryn can make 84 hamburgers.

Example 3 Complex Fraction Involving Monomials

Simplify $\frac{\frac{rs}{2}}{\frac{r^3s}{3}}$.

$$\frac{\frac{rs}{2}}{\frac{r^3s}{3}} = \frac{rs}{2} \div \frac{r^3s}{3} \quad \text{Rewrite as a division sentence.}$$

$$= \frac{rs}{2} \cdot \frac{3}{r^3s} \quad \text{Multiply by the reciprocal.}$$

$$= \frac{rs}{2} \cdot \frac{3}{r^3s} \quad \text{Divide by common factors } r \text{ and } s.$$

$$= \frac{3}{2r^2} \quad \text{Simplify.}$$

Example 4 Complex Fraction Involving Polynomials

Simplify $\frac{\frac{x^2-x}{x^2-x+12}}{\frac{x-1}{2x-8}}$.

$$\frac{\frac{x^2-x}{x^2-x+12}}{\frac{x-1}{2x-8}} = \frac{\frac{x(x-1)}{(x-4)(x+3)}}{\frac{x-1}{2(x-4)}} \quad \text{Factor.}$$

$$= \frac{x(x-1)}{(x-4)(x+3)} \div \frac{x-1}{2(x-4)} \quad \text{Rewrite as a division sentence.}$$

$$= \frac{x(x-1)}{(x-4)(x+3)} \cdot \frac{2(x-4)}{x-1} \quad \text{Multiply by the reciprocal.}$$

$$= \frac{x(x-1)}{(x-4)(x+3)} \cdot \frac{2(x-4)}{x-1} \quad \text{Divide by the GCF, } (x-4)(x-1).$$

$$= \frac{2x}{x+3} \quad \text{Simplify.}$$