

Lesson 5-5

Example 1 Add Fractions

Find $\frac{4}{9} + \frac{7}{9}$. Write the sum in simplest form. Estimate: $0 + 1 = 1$

$$\frac{4}{9} + \frac{7}{9} = \frac{4+7}{9} \quad \text{The denominators are the same. Add the numerators.}$$

$$= \frac{11}{9} \quad \text{Simplify.}$$

$$= 1\frac{2}{9} \quad \text{Rename } \frac{11}{9} \text{ as a mixed number.}$$

Example 2 Add Mixed Numbers

Find $3\frac{4}{15} + 6\frac{8}{15}$. Write the sum in simplest form. Estimate: $3 + 7 = 10$

$$3\frac{4}{15} + 6\frac{8}{15} = (3 + 6) + \left(\frac{4}{15} + \frac{8}{15}\right) \quad \text{Add the whole numbers and the fractions separately.}$$

$$= 9 + \frac{4+8}{15} \quad \text{Add the numerators.}$$

$$= 9\frac{12}{15} \text{ or } 9\frac{4}{5} \quad \text{Simplify.}$$

Example 3 Subtract Fractions

Find $\frac{7}{12} - \frac{11}{12}$. Write the difference in simplest form. Estimate: $\frac{3}{4} - 1 = -\frac{1}{4}$

$$\frac{7}{12} - \frac{11}{12} = \frac{7-11}{12} \quad \text{The denominators are the same. Subtract the numerators.}$$

$$= \frac{-4}{12} \text{ or } -\frac{1}{3} \quad \text{Simplify.}$$

Example 4 Subtract Mixed Numbers

Evaluate $x - y$ if $x = 7\frac{7}{8}$ and $y = 4\frac{2}{8}$. Estimate: $8 - 4 = 4$

$$x - y = 7\frac{7}{8} - 4\frac{2}{8} \quad \text{Replace } x \text{ with } 7\frac{7}{8} \text{ and } y \text{ with } 4\frac{2}{8}.$$

$$= \frac{63}{8} - \frac{34}{8} \quad \text{Write the mixed numbers as improper fractions.}$$

$$= \frac{29}{8} \quad \text{Subtract the numerators.}$$

$$= 3\frac{5}{8} \quad \text{Simplify.}$$

Example 5 Add Algebraic Fractions

Find $\frac{3p}{11} + \frac{p}{11}$. Write the sum in simplest form.

$$\frac{3p}{11} + \frac{p}{11} = \frac{3p+p}{11} \quad \text{The denominators are the same. Add the numerators.}$$

$$= \frac{4p}{11} \quad \text{Simplify.}$$