

Lesson 5-7

Example 1 Add Unlike Fractions

Find $\frac{2}{5} + \frac{1}{4}$.

$$\begin{aligned}\frac{2}{5} + \frac{1}{4} &= \frac{2}{5} \cdot \frac{4}{4} + \frac{1}{4} \cdot \frac{5}{5} \\ &= \frac{8}{20} + \frac{5}{20} \\ &= \frac{13}{20}\end{aligned}$$

Use $4 \cdot 5$ or 20 as the common denominator.

Rename each fraction with the common denominator.

Add the numerators.

Example 2 Add Fractions

Find $\frac{5}{12} + \frac{3}{8}$. Estimate: $\frac{1}{2} + \frac{1}{2} = 1$

$$\begin{aligned}\frac{5}{12} + \frac{3}{8} &= \frac{5}{12} \cdot \frac{2}{2} + \frac{3}{8} \cdot \frac{3}{3} \\ &= \frac{10}{24} + \frac{9}{24} \\ &= \frac{19}{24}\end{aligned}$$

The LCD of 12 and 8 is 24.

Rename each fraction with the LCD.

Add the numerators.

Example 3 Add Mixed Numbers

Find $2\frac{3}{4} + 1\frac{1}{6}$. Write the sum in simplest form. Estimate: $3 + 1 = 4$

$$\begin{aligned}2\frac{3}{4} + 1\frac{1}{6} &= \frac{11}{4} + \frac{7}{6} \\ &= \frac{11}{4} \cdot \frac{3}{3} + \frac{7}{6} \cdot \frac{2}{2} \\ &= \frac{33}{12} + \frac{14}{12} \\ &= \frac{47}{12} \text{ or } 3\frac{11}{12}\end{aligned}$$

Write the mixed numbers as improper fractions.

Rename $\frac{11}{4}$ and $\frac{7}{6}$ using the LCD, 12.

Simplify.

Add the numerators and simplify.

Example 4 Subtract Fractions**Find** $\frac{2}{9} - \frac{11}{18}$.

$$\frac{2}{9} - \frac{11}{18} = \frac{2}{9} \cdot \frac{2}{2} - \frac{11}{18}$$

The LCD is 18.

$$= \frac{4}{18} - \frac{11}{18}$$

Rename $\frac{2}{9}$ using the LCD, 18.

$$= -\frac{7}{18}$$

Subtract the numerators.

Example 5 Subtract Mixed Numbers**Find** $5\frac{3}{8} - 2\frac{1}{2}$. Write in simplest form.

$$5\frac{3}{8} - 2\frac{1}{2} = \frac{43}{8} - \frac{5}{2}$$

Write the mixed numbers as improper fractions.

$$= \frac{43}{8} - \frac{5}{2} \cdot \frac{4}{4}$$

Rename the fraction using the LCD.

$$= \frac{43}{8} - \frac{20}{8}$$

Simplify.

$$= \frac{23}{8} \text{ or } 2\frac{7}{8}$$

Subtract.

Example 6 Use Fractions to Solve a Problem**HIKING** Peter hiked $1\frac{3}{4}$ miles east, $\frac{5}{8}$ mile south, and then $\frac{1}{2}$ mile west. How far did Peter hike in all?**Explore** You know the distance of each part of the hike.**Plan** Add the distances to find the total distance of the hike. Estimate your answer.

$$2 + \frac{1}{2} + \frac{1}{2} = 3$$

$$\text{Solve} \quad 1\frac{3}{4} + \frac{5}{8} + \frac{1}{2} = 1\frac{6}{8} + \frac{5}{8} + \frac{4}{8}$$

Rename fractions with the LCD, 8.

$$= 1\frac{15}{8}$$

Add the like fractions.

$$= 2\frac{7}{8}$$

Simplify.

Peter hiked a total of $2\frac{7}{8}$ miles.**Examine** Since $2\frac{7}{8}$ is close to 3, the answer is reasonable.