

# 3-6 Study Guide and Intervention

## Adding and Subtracting Unlike Fractions

**Add Unlike Fractions** Fractions with different denominators are called **unlike fractions**. To add fractions with unlike denominators, rename the fractions with a common denominator. Then add and simplify.

**Example 1** Find  $\frac{4}{7} + \frac{1}{3}$ . Write in simplest form.

$$\frac{4}{7} + \frac{1}{3} = \frac{4}{7} \cdot \frac{3}{3} + \frac{1}{3} \cdot \frac{7}{7}$$

Use  $7 \cdot 3$  or 21 as the common denominator.

$$= \frac{12}{21} + \frac{7}{21}$$

Rename each fraction with the common denominator.

$$= \frac{19}{21}$$

Add the numerators.

**Example 2** Find  $-5\frac{5}{6} + 3\frac{5}{8}$ . Write in simplest form.

$$-5\frac{5}{6} + 3\frac{5}{8} = \frac{-35}{6} + \frac{29}{8}$$

Write the mixed numbers as improper fractions.

$$= \frac{-35}{6} \cdot \frac{4}{4} + \frac{29}{8} \cdot \frac{3}{3}$$

The LCD for 6 and 8 is 24.

$$= \frac{-140}{24} + \frac{87}{24}$$

Rename each fraction using the LCD 24.

$$= \frac{-53}{24} \text{ or } -2\frac{5}{24}$$

Simplify.

### Exercises

Find each sum. Write in simplest form.

1.  $\frac{8}{9} + \frac{2}{5}$

2.  $-\frac{2}{3} + \frac{1}{4}$

3.  $\frac{7}{8} + \frac{1}{4}$

4.  $\frac{1}{6} + \left(-\frac{3}{4}\right)$

5.  $-\frac{7}{12} + \left(-\frac{3}{5}\right)$

6.  $-\frac{1}{3} + \frac{5}{7}$

7.  $6\frac{7}{10} + \left(-\frac{2}{3}\right)$

8.  $-2\frac{1}{8} + \left(-\frac{3}{4}\right)$

9.  $-6\frac{2}{7} + \frac{2}{5}$

10.  $3\frac{1}{5} + 2\frac{3}{4}$

11.  $7\frac{5}{6} + \left(-3\frac{1}{3}\right)$

12.  $6\frac{3}{4} + 3\frac{1}{2}$

13.  $7\frac{4}{9} + 9\frac{1}{6}$

14.  $-7\frac{1}{2} + \left(-3\frac{2}{9}\right)$

15.  $-10\frac{1}{7} + 6\frac{1}{4}$

**3-6 Study Guide and Intervention** *(continued)***Adding and Subtracting Unlike Fractions**

**Subtract Unlike Fractions** To subtract fractions with unlike denominators, rename the fractions with a common denominator. Then subtract and simplify.

**Example 1** Find  $\frac{4}{9} - \frac{2}{3}$ . Write in simplest form.

$$\frac{4}{9} - \frac{2}{3} = \frac{4}{9} - \frac{2}{3} \cdot \frac{3}{3}$$

The LCD is 9.

$$= \frac{4}{9} - \frac{6}{9}$$

Rename using LCD.

$$= -\frac{2}{9}$$

Simplify.

**Example 2** Find  $9\frac{2}{9} - 8\frac{5}{6}$ . Write in simplest form.

$$9\frac{2}{9} - 8\frac{5}{6} = \frac{83}{9} - \frac{53}{6}$$

Write the mixed numbers as improper fractions.

$$= \frac{83}{9} \cdot \frac{2}{2} - \frac{53}{6} \cdot \frac{3}{3}$$

Rename fractions using the LCD, 18.

$$= \frac{166}{18} - \frac{159}{18}$$

Simplify.

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

Subtract the numerators.

**Exercises**

Find each difference. Write in simplest form.

1.  $\frac{7}{15} - \frac{3}{10}$

2.  $-\frac{6}{11} - \frac{6}{11}$

3.  $\frac{13}{15} - \frac{2}{5}$

4.  $\frac{3}{8} - \frac{1}{12}$

5.  $-\frac{7}{9} - \frac{4}{5}$

6.  $\frac{5}{12} - \left(-\frac{3}{8}\right)$

7.  $\frac{5}{6} - \frac{7}{10}$

8.  $-\frac{2}{5} - \frac{6}{8}$

9.  $\frac{7}{10} - \frac{3}{4}$

10.  $4\frac{3}{10} - \left(-2\frac{4}{5}\right)$

11.  $4\frac{1}{6} - 3\frac{1}{8}$

12.  $5\frac{8}{9} - \left(-2\frac{1}{3}\right)$

13.  $5\frac{1}{10} - 3\frac{2}{3}$

14.  $-6\frac{3}{5} - \left(-2\frac{1}{4}\right)$

15.  $10\frac{5}{6} - \left(-5\frac{2}{3}\right)$