

CHAPTER  
3

# Fractions and Mixed Numbers

## Lesson 3.1 Adding Unlike Fractions

Find two equivalent fractions for each fraction.

1.  $\frac{1}{4} = \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

2.  $\frac{2}{3} = \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

3.  $\frac{4}{9} = \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

4.  $\frac{3}{5} = \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

5.  $\frac{6}{7} = \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

6.  $\frac{5}{8} = \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

Shade and label each model to show the fractions. Then complete the addition sentence.

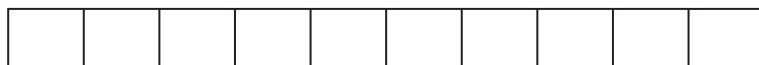
7.  $\frac{2}{3}, \frac{1}{4}$



$$\frac{2}{3} + \frac{1}{4} = \underline{\hspace{2cm}} + \underline{\hspace{2cm}}$$

$$= \underline{\hspace{2cm}}$$

8.  $\frac{2}{5}, \frac{1}{2}$



$$\frac{2}{5} + \frac{1}{2} = \underline{\hspace{2cm}} + \underline{\hspace{2cm}}$$

$$= \underline{\hspace{2cm}}$$

Name: \_\_\_\_\_

Date: \_\_\_\_\_

**Estimate each sum by rounding the fractions to 0,  $\frac{1}{2}$ , or 1. Then find the actual sum. Express each sum in simplest form.**

**9.**  $\frac{2}{5} + \frac{3}{8}$

**10.**  $\frac{1}{3} + \frac{1}{10}$

**11.**  $\frac{7}{10} + \frac{3}{4}$

**12.**  $\frac{4}{5} + \frac{2}{3}$

**13.**  $\frac{7}{8} + \frac{1}{6}$

**14.**  $\frac{6}{7} + \frac{3}{4}$

## Lesson 3.2 Subtracting Unlike Fractions

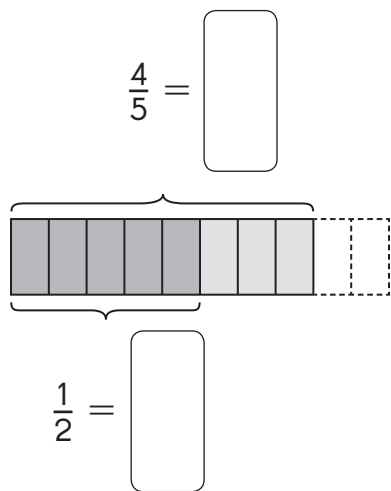
Fill in the blanks.

1. Rewrite the two fractions as like fractions with the same denominator.

$$\begin{array}{c} \times \square \\ \begin{array}{c} \curvearrowright \\ \frac{4}{5} = \frac{\square}{\square} \\ \curvearrowleft \end{array} \\ \times \square \end{array}$$

$$\begin{array}{c} \times \square \\ \begin{array}{c} \curvearrowright \\ \frac{1}{2} = \frac{\square}{\square} \\ \curvearrowleft \end{array} \\ \times \square \end{array}$$

Using the equivalent fractions, complete the model and the subtraction sentence.



$$\begin{array}{l} \frac{4}{5} - \frac{1}{2} = \square - \square \\ = \square \end{array}$$

Name: \_\_\_\_\_

Date: \_\_\_\_\_

2. Rewrite the two fractions as like fractions with the same denominator. Then complete the model and the subtraction sentence.

$$\frac{4}{9} = \boxed{\phantom{000}}$$

$$\frac{1}{6} = \boxed{\phantom{000}}$$



$$\frac{4}{9} - \frac{1}{6} = \underline{\hspace{2cm}} - \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$$

**Estimate each difference by rounding the fractions to 0,  $\frac{1}{2}$ , or 1. Then find the actual difference. Express each difference in simplest form.**

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

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

5.  $\frac{8}{9} - \frac{7}{8}$

6.  $\frac{7}{12} - \frac{1}{4}$

7.  $\frac{5}{6} - \frac{3}{8}$

8.  $\frac{8}{9} - \frac{1}{2}$

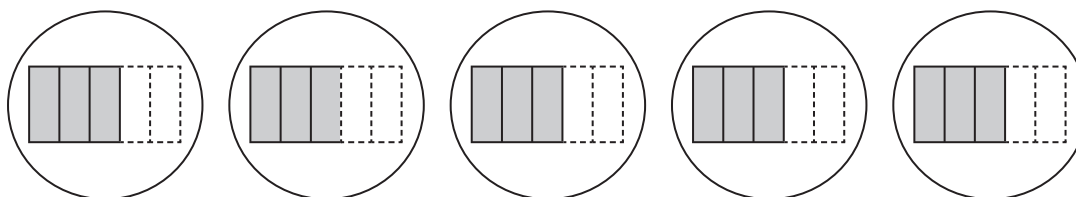
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Date: \_\_\_\_\_

## Lesson 3.3 Fractions, Mixed Numbers, and Division Expressions

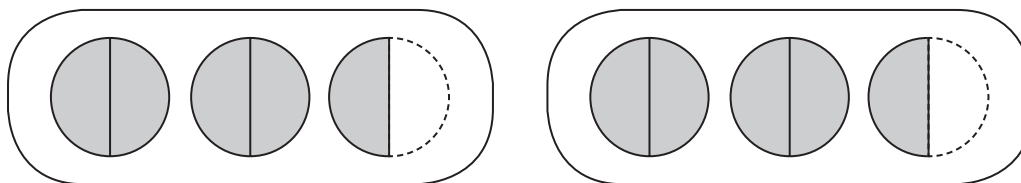
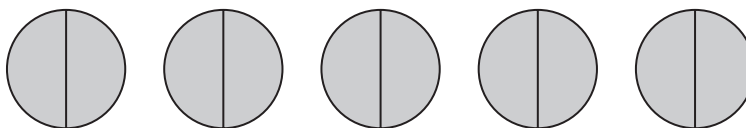
Look at each model. Then write each division expression as a fraction and as a mixed number if appropriate.

1.



$$3 \div 5 = \frac{\square}{\square}$$

2.



$$5 \div 2 = \frac{\square}{\square} = \square \frac{\square}{\square}$$

Name: \_\_\_\_\_

Date: \_\_\_\_\_

**Write each division expression as a fraction or mixed number in simplest form.**

**3.**  $3 \div 25$

**4.**  $4 \div 38$

**5.**  $54 \div 7$

**6.**  $48 \div 9$

**Express each fraction as a mixed number in simplest form.**

**7.**  $\frac{18}{4}$

**8.**  $\frac{20}{6}$

**9.**  $\frac{44}{8}$

**10.**  $\frac{42}{9}$

Name: \_\_\_\_\_

Date: \_\_\_\_\_

## Lesson 3.4 Expressing Fractions, Mixed Numbers, and Division Expressions as Decimals

Rewrite each fraction as a decimal.

1.  $\frac{9}{10}$

2.  $\frac{4}{5}$

3.  $\frac{3}{20}$

4.  $\frac{9}{25}$

5.  $\frac{23}{10}$

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

7.  $\frac{11}{4}$

8.  $\frac{18}{5}$

Name: \_\_\_\_\_

Date: \_\_\_\_\_

**Express each division expression as a decimal.**

9.  $17 \div 25$

10.  $15 \div 4$

**Express each mixed number as a decimal.**

11.  $2\frac{3}{5}$

12.  $3\frac{7}{8}$

13.  $4\frac{7}{20}$

14.  $5\frac{3}{4}$

**Solve. Show your work.**

15. Rayza buys 6 similar notebooks for \$15. How much does she pay for each notebook?



Name: \_\_\_\_\_

Date: \_\_\_\_\_

## Lesson 3.5 Adding Mixed Numbers

**Add. Express each sum in simplest form.**

1.  $3\frac{3}{8} + 2\frac{1}{2}$

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

3.  $1\frac{2}{3} + 3\frac{7}{8}$

4.  $1\frac{5}{9} + 1\frac{3}{4}$

5.  $2\frac{11}{12} + 4\frac{7}{8}$

6.  $3\frac{2}{3} + 2\frac{7}{10}$

Name: \_\_\_\_\_

Date: \_\_\_\_\_

**Estimate each sum by rounding to the nearest half or whole number.**

**7.**  $1\frac{4}{5} + 1\frac{1}{2}$

**8.**  $4\frac{3}{4} + 5\frac{7}{10}$

**9.**  $1\frac{3}{8} + 2\frac{1}{7}$

**10.**  $2\frac{2}{3} + 4\frac{5}{7}$

**11.**  $3\frac{7}{12} + 2\frac{5}{6}$

**12.**  $9\frac{2}{9} + 10\frac{2}{11}$

Name: \_\_\_\_\_

Date: \_\_\_\_\_

## Lesson 3.6 Subtracting Mixed Numbers

**Subtract. Express each difference in simplest form.**

1.  $3\frac{8}{9} - 1\frac{1}{3}$

2.  $5\frac{5}{6} - 4\frac{7}{12}$

3.  $4\frac{1}{4} - 1\frac{9}{10}$

4.  $6\frac{1}{8} - 1\frac{11}{12}$

5.  $2\frac{1}{3} - 1\frac{5}{7}$

6.  $4\frac{2}{9} - 2\frac{5}{6}$

Name: \_\_\_\_\_

Date: \_\_\_\_\_

**Estimate each difference by rounding to the nearest half or whole number.**

**7.**  $3\frac{1}{2} - 1\frac{2}{3}$

**8.**  $10\frac{1}{2} - 5\frac{4}{5}$

**9.**  $7\frac{1}{6} - 6\frac{5}{8}$

**10.**  $3\frac{1}{2} - 1\frac{5}{9}$

**11.**  $4\frac{3}{7} - 2\frac{1}{4}$

**12.**  $5\frac{9}{10} - 4\frac{5}{11}$

Name: \_\_\_\_\_

Date: \_\_\_\_\_

## Lesson 3.7 Real-World Problems: Fractions and Mixed Numbers

**Solve. Show your work.**

1. It takes 28 minutes to play 8 songs on a radio. Every song is played for the same length of time. How long does it take to play 1 song?  
Express your answer as
  - a. a mixed number
  - b. a decimal

2. At a parade,  $\frac{1}{4}$  of the participants have red hair,  $\frac{1}{6}$  of them have brown hair, and the rest of the participants have black hair.  
What fraction of the participants have black hair?

Name: \_\_\_\_\_

Date: \_\_\_\_\_

- 3.** Rashan buys  $3\frac{7}{10}$  pounds of flour and Diego buys  $2\frac{3}{4}$  pounds of flour. They use  $4\frac{3}{5}$  pounds of flour to bake bread. How much flour is left? Express your answer as a decimal.

- 4.** Maria uses  $2\frac{3}{4}$  meters of cloth to make a dress and  $\frac{5}{8}$  meter less cloth to make a blouse. How much cloth does she use in all? Express your answer as a decimal.

**Name:** \_\_\_\_\_

**Date:** \_\_\_\_\_

- 5.** A carton contains  $1\frac{8}{9}$  liters of apple juice. Rosalia drinks  $\frac{1}{6}$  liter of the juice every day. How much apple juice is left in the carton after a week?

- 6.** Leena bakes a loaf of bread. She eats  $\frac{1}{8}$  of the loaf and gives  $\frac{1}{6}$  of it to each of her 3 friends. What fraction of the loaf of bread is left?

Name: \_\_\_\_\_

Date: \_\_\_\_\_

- 7.** Thomas reads  $\frac{2}{9}$  of a book on Monday and  $\frac{1}{6}$  of it on Tuesday. He reads twice as many pages on Wednesday as on Tuesday. What fraction of the book is not read?
- 8.** In a day, Jamal spent  $1\frac{2}{3}$  hours watching television,  $1\frac{4}{5}$  hours taking an afternoon nap, and  $\frac{7}{8}$  hour helping his mother with housework.
- a.** How much time did Jamal spend on watching television and helping with housework?
  - b.** How much more time did Jamal spend taking the nap than helping with housework?



**Name:** \_\_\_\_\_

**Date:** \_\_\_\_\_

- 9.** Madison buys  $2\frac{3}{5}$  pounds of meat. Her neighbor buys  $\frac{3}{4}$  pound more meat than Madison. How many pounds of meat do they buy altogether?

- 10.** Box A weighs  $1\frac{7}{10}$  pounds. Box B weighs  $\frac{1}{4}$  pound less than Box A. What is the total weight of the two boxes?

Name: \_\_\_\_\_

Date: \_\_\_\_\_

**11.** The length of a storeroom is  $4\frac{3}{5}$  meters. The storeroom's width is  $\frac{3}{4}$  meter shorter than its length. What is the perimeter of the storeroom?

**12.** John poured  $2\frac{1}{2}$  liters of water into a tank. Then he poured out  $3\frac{2}{5}$  liters of water from the tank, leaving  $4\frac{1}{5}$  liters of water in the tank. How much water was in the tank at first?



Name: \_\_\_\_\_

Date: \_\_\_\_\_

3. Andrew found that  $\frac{4}{5}$  of his savings is equal to  $\frac{1}{2}$  of Malik's savings. What fraction of Malik's savings is Andrew's savings?

4. Find the value of:

$$\frac{1}{100} + \frac{2}{100} + \frac{3}{100} + \cdots + \frac{97}{100} + \frac{98}{100} + \frac{99}{100}$$

$$\frac{1}{100} + \frac{99}{100} = 1$$



Name: \_\_\_\_\_

Date: \_\_\_\_\_

5. Find the value of:

$$\frac{1}{99} + \frac{2}{99} + \frac{3}{99} + \dots + \frac{8}{99} + \frac{9}{99} + \frac{10}{99}$$

6. Find the value of:

$$\frac{1}{1 \times 2} + \frac{1}{2 \times 3} + \frac{1}{3 \times 4} + \dots + \frac{1}{28 \times 29} + \frac{1}{29 \times 30}$$

$$\frac{1}{1 \times 2} = \frac{1}{2}$$
$$\frac{1}{2 \times 3} = \frac{1}{6}$$



Name: \_\_\_\_\_

Date: \_\_\_\_\_

7. In a class where there are as many girls as boys,  $\frac{2}{5}$  of the boys and  $\frac{1}{2}$  of the girls went to a fun fair. What fraction of the students in the class did not go to the fun fair?
8. Alvin has some marbles in a box. He keeps  $\frac{1}{3}$  of them and gives the remainder to Joyce and Sean. Joyce gets  $\frac{5}{8}$  of the remainder. What fraction of the marbles does Sean get?