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CHAPTER 3

Fractions and Mixed Numbers

Lesson 3.1 Adding Unlike Fractions

Find two equivalent fractions for each fraction.

1. $\frac{1}{4} = \_\_\_\_ = \_\_\_\_$

2. $\frac{2}{3} = \_\_\_\_ = \_\_\_\_$

3. $\frac{4}{9} = \_\_\_\_ = \_\_\_\_$

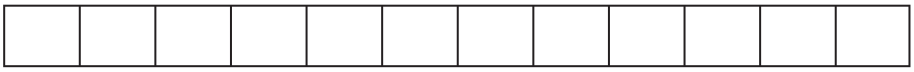
4. $\frac{3}{5} = \_\_\_\_ = \_\_\_\_$

5. $\frac{6}{7} = \_\_\_\_ = \_\_\_\_$

6. $\frac{5}{8} = \_\_\_\_ = \_\_\_\_$

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

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



$\frac{2}{3} + \frac{1}{4} = \_\_\_\_ + \_\_\_\_$

$= \_\_\_\_$

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

$\frac{2}{5} + \frac{1}{2} = \_\_\_\_ + \_\_\_\_$

$= \_\_\_\_$

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

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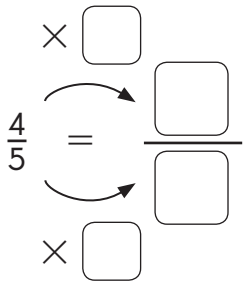
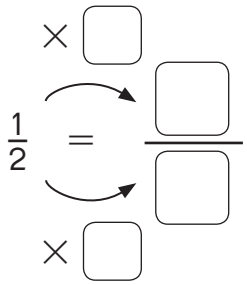
Lesson 3.2 Subtracting Unlike Fractions

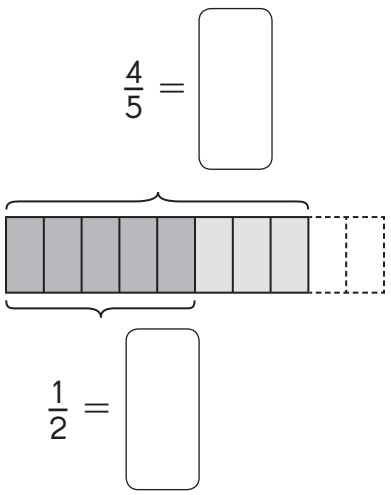
Fill in the blanks.

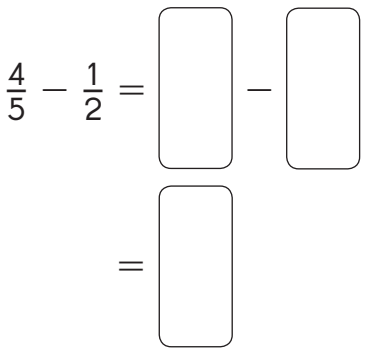
1. Rewrite the two fractions as like fractions with the same denominator.





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





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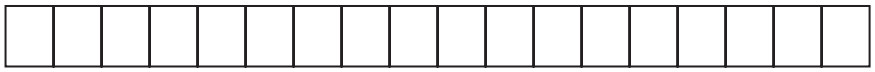
2. Rewrite the two fractions as like fractions with the same denominator. Then complete the model and the subtraction sentence.

$\frac{4}{9} = \square$ $\frac{1}{6} = \square$



$\frac{4}{9} - \frac{1}{6} =$ _____ $-$ _____ $=$ _____

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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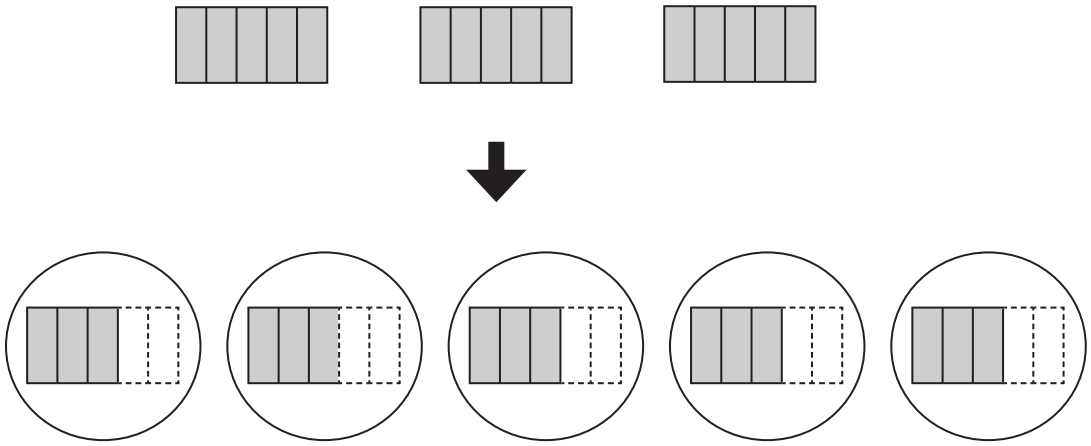
Lesson 3.3 Fractions, Mixed Numbers, and Division Expressions

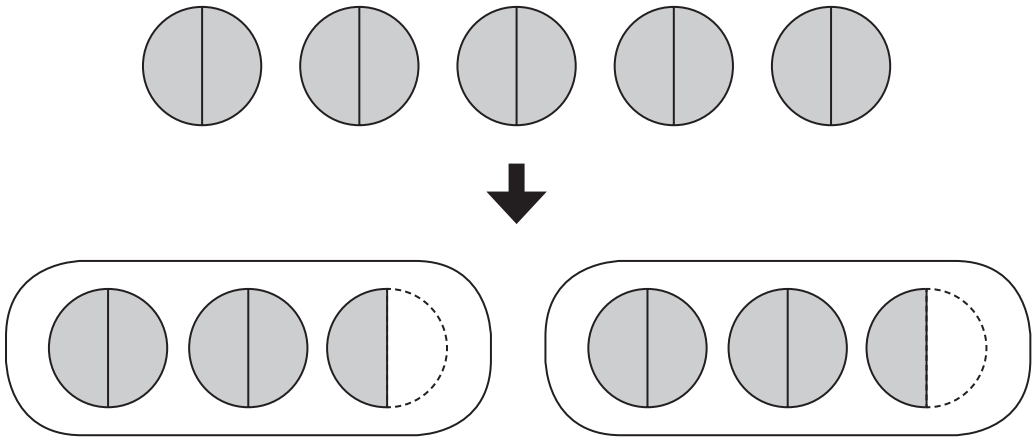
Look at each model. Then write each division expression as a fraction and as a mixed number if appropriate.

1.



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

2.



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

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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. $\frac{42}{9}$

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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. $\frac{18}{5}$

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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?

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

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

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

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

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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?

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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.

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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?

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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?

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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?

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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?

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Put on Your Thinking Cap!

Solve. Show your work.

1. Two ropes, P and Q, are each cut into 3 equal pieces. Each piece cut from rope Q is $\frac{2}{5}$ meter longer than each piece cut from rope P. If rope P is 2 meters long, what is the length of rope Q?

2. Lionel has $\frac{3}{4}$ as much money as Gary. Gary has $\frac{1}{3}$ as much money as Vivian. How many times Lionel's amount of money is Vivian's amount of money?

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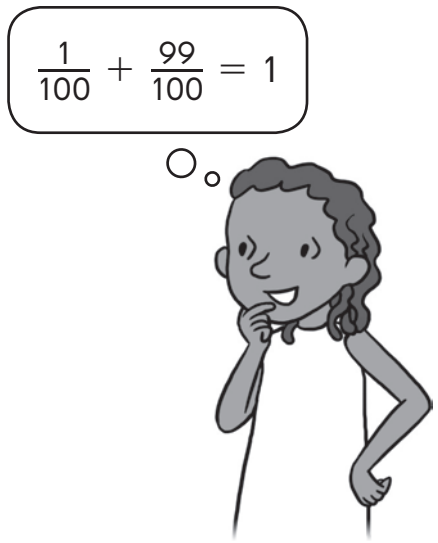
3. Andrew found that $\frac{4}{5}$ of his savings is equal to $\frac{1}{2}$ of Malik's savings. What fraction of Malik's savings is Andrew's savings?

4. Find the value of:

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



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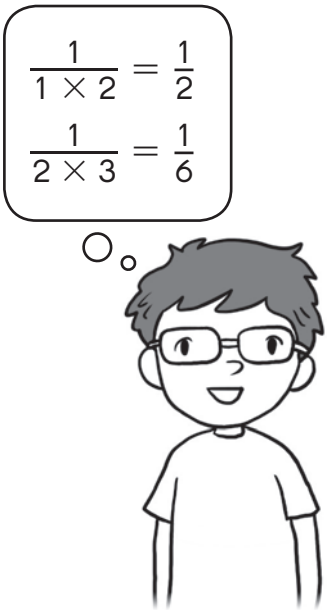
5. Find the value of:

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

6. Find the value of:

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



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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?