LESSON 5.1

Name _____ Date _____

Study Guide

For use with pages 219–224

GOAL **Add and subtract fractions.**

Adding or Subtracting Fractions with Different Denominators

1. Rewrite the fractions using the LCD.
2. Add or subtract the numerators.
3. Write the result over the LCD.
4. Simplify if possible.

EXAMPLE 1 Adding Fractions

$\frac{3}{10} + \frac{5}{10} = \frac{3+5}{10}$ Write sum of numerators over common denominator.

$= \frac{8}{10}$ Simplify numerator.

$= \frac{4}{5}$ Simplify fraction.

Exercises for Example 1

Add. Write the answer in simplest form.

1. $\frac{5}{6} + \frac{1}{6}$
2. $\frac{2}{9} + \frac{4}{9}$
3. $\frac{7}{11} + \frac{8}{11}$

EXAMPLE 2 Subtracting Fractions

$\frac{6}{7} - \frac{2}{7} = \frac{6-2}{7}$ Write the difference of numerators over common denominator.

$= \frac{4}{7}$ Simplify numerator.

Exercises for Example 2

Subtract. Write the answer in simplest form.

4. $\frac{8}{9} - \frac{7}{9}$
5. $\frac{5}{8} - \frac{3}{8}$
6. $\frac{7}{12} - \frac{1}{12}$

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EXAMPLE 3 Adding Fractions

You use $\frac{3}{5}$ cup of milk on a bowl of cereal. Your friend uses $\frac{7}{8}$ cup of milk on another bowl of cereal. How much milk is used for both bowls of cereal?

Solution

To find how much milk is used, add $\frac{3}{5}$ and $\frac{7}{8}$.

$\frac{3}{5} + \frac{7}{8} = \frac{24}{40} + \frac{35}{40}$ Rewrite fractions using LCD of $\frac{3}{5}$ and $\frac{7}{8}$.

$= \frac{24 + 35}{40}$ Write sum of numerators over common denominator.

$= \frac{59}{40}$, or $1\frac{19}{40}$ Simplify.

Answer: You and your friend use $1\frac{19}{40}$ cups of milk for two bowls of cereal.

Exercises for Example 3

Add. Write the answer in simplest form.

7. $\frac{3}{8} + \frac{7}{12}$ **8.** $\frac{13}{18} + \frac{1}{6}$ **9.** $\frac{3}{20} + \frac{8}{15}$

EXAMPLE 4 Subtracting Fractions

$\frac{11}{6} - \frac{10}{9} = \frac{33}{18} - \frac{20}{18}$ Rewrite fractions using the LCD of $\frac{11}{6}$ and $\frac{10}{9}$.

$= \frac{33 - 20}{18}$ Write the difference of numerators over common denominator.

$= \frac{13}{18}$ Simplify numerator.

Check: You can use estimation to check that your answer is reasonable. Because $\frac{11}{6}$ is about 2 and $\frac{10}{9}$ is a little more than 1, the difference of $\frac{11}{6}$ and $\frac{10}{9}$ should be less than 1.

Exercises for Example 4

Subtract. Write the answer in simplest form.

10. $\frac{8}{9} - \frac{2}{3}$ **11.** $\frac{11}{16} - \frac{13}{24}$ **12.** $\frac{6}{7} - \frac{3}{5}$

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Practice A

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Find the LCD of the numbers.

1. 4, 12 **2.** 7, 9 **3.** 6, 14

Write the pair of fractions so that they have the same denominator.

4. $\frac{2}{5}, \frac{7}{10}$ **5.** $\frac{1}{2}, \frac{2}{3}$ **6.** $\frac{8}{9}, \frac{4}{15}$

Find the sum or difference. Write the answer in simplest form.

7. $\frac{2}{5} + \frac{1}{5}$ **8.** $\frac{4}{7} - \frac{1}{7}$ **9.** $\frac{8}{15} + \frac{2}{15}$

10. $\frac{5}{8} - \frac{4}{8}$ **11.** $\frac{1}{10} + \frac{4}{10}$ **12.** $\frac{5}{6} - \frac{1}{6}$

Complete the addition or subtraction of fractions.

13. $\frac{1}{12} + \frac{3}{4} = \frac{1}{12} + \frac{?}{12} = \frac{1 + ?}{12} = \frac{?}{12} = \frac{?}{?}$

14. $\frac{7}{10} - \frac{3}{5} = \frac{7}{10} - \frac{?}{10} = \frac{7 - ?}{10} = \frac{?}{?}$

Find the sum or difference. Write the answer in simplest form.

15. $\frac{1}{3} + \frac{4}{9}$ **16.** $\frac{9}{10} - \frac{2}{5}$ **17.** $\frac{5}{8} - \frac{1}{6}$

18. A muffin recipe calls for $\frac{1}{4}$ teaspoon cinnamon for the batter and $\frac{1}{4}$ teaspoon cinnamon for the streusel topping. How much cinnamon do you need altogether?

19. Carriage bolts are sold in a variety of lengths. Two carriage bolt lengths are $\frac{1}{4}$ inch and $\frac{3}{8}$ inch. How much longer is the $\frac{3}{8}$-inch bolt than the $\frac{1}{4}$-inch bolt?

20. You are estimating the total distance of a road trip by measuring the distance on a map. On the map, the first leg of the trip measures $\frac{13}{16}$ inch and the last leg of the trip measures $\frac{3}{8}$ inch. What is the total distance of the trip on the map?

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Practice B

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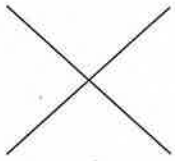
Find the sum or difference. Write the answer in simplest form.

1. $\frac{3}{10} + \frac{4}{10}$
2. $\frac{5}{8} - \frac{3}{8}$
3. $\frac{6}{11} + \frac{2}{11}$
4. $\frac{4}{5} - \frac{1}{5}$
5. $\frac{5}{16} - \frac{1}{16}$
6. $\frac{17}{30} - \frac{11}{30}$
7. $\frac{3}{4} + \frac{5}{8}$
8. $\frac{7}{10} - \frac{1}{2}$
9. $\frac{2}{3} + \frac{5}{12}$
10. $\frac{1}{2} + \frac{3}{5}$
11. $\frac{6}{7} - \frac{1}{4}$
12. $\frac{4}{15} + \frac{5}{12}$

13. Describe and correct the error in finding the sum $\frac{3}{5} + \frac{4}{9}$.



$$\frac{3}{5} + \frac{4}{9} = \frac{15}{45} + \frac{36}{45} = \frac{51}{45} = 1\frac{2}{15}$$

Evaluate the expression when $x = \frac{1}{3}$ and $y = \frac{2}{5}$.

14. $x + \frac{1}{7}$
15. $\frac{5}{6} - y$
16. $x + y$

Use mental math to solve the equation.

17. $\frac{7}{8} = \frac{5}{8} + x$
18. $x + \frac{5}{11} = \frac{9}{11}$
19. $\frac{5}{6} - x = \frac{2}{6}$

Complete the statement using <, >, or =.

20. $\frac{3}{5} + \frac{4}{7}$? 1
21. $\frac{3}{8} + \frac{7}{18}$? 1
22. $\frac{25}{51} + \frac{10}{17}$? 1

23. Carriage bolts are sold in a variety of lengths. Two carriage bolt lengths are $\frac{3}{8}$ inch and $\frac{1}{2}$ inch. How much longer is the $\frac{1}{2}$-inch bolt than the $\frac{3}{8}$-inch bolt?

24. You are estimating the total distance of a road trip by measuring the distance on a map. On the map, the legs of the trip measure $\frac{11}{16}$ inch, $\frac{5}{8}$ inch, and $\frac{1}{4}$ inch, respectively. What is the total distance of the trip on the map?

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