LESSON 2-6

Ready to Go On? Skills Intervention

Adding and Subtracting with Unlike Denominators

You can add or subtract fractions with unlike denominators by first finding a common denominator. There are two methods you can use to find the common denominator.

Method 1: Multiply one denominator by the other denominator.

Method 2: Find the **least common denominator (LCD)** by finding the least common multiple of the denominators.

Adding Fractions with Unlike Denominators

Add. $\frac{3}{5} + \frac{1}{7}$

To add two fractions, you need to have a **common denominator**.

Multiply 5 × 7 to get a common denominator of **35**.

$= \frac{3}{5}\left(\frac{7}{7}\right) + \frac{1}{7}\left(\frac{5}{5}\right)$ Multiply by fractions equal to **1**.

$= \frac{21}{35} + \frac{5}{35}$ Rewrite with common denominators.

$= \frac{26}{35}$ Add the **numerators** and keep the **denominators** the same.

Evaluating Expressions with Rational Numbers

Evaluate $n - \frac{3}{5}$ for $n = -\frac{1}{7}$.

$n - \frac{3}{5}$

$= \frac{-1}{7} - \frac{3}{5}$ Substitute $-\frac{1}{7}$ for n.

$= \left(-\frac{1}{7}\right)\left(\frac{5}{5}\right) - \frac{3}{5}\left(\frac{7}{7}\right)$ Multiply by fractions equal to **1**.

$= -\frac{5}{35} - \frac{21}{35}$ Rewrite with a common denominator.

$= -\frac{26}{35}$ Subtract. Is the answer positive or negative? **negative**

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SECTION 2A

Ready to Go On? Quiz

2-1 Rational Numbers

Simplify.

1. $\frac{10}{24}$ $\frac{5}{12}$
2. $\frac{21}{48}$ $\frac{7}{16}$
3. $\frac{22}{77}$ $\frac{2}{7}$
4. $\frac{13}{117}$ $\frac{1}{9}$

2-2 Comparing and Ordering Rational Numbers

Write the numbers in order from least to greatest.

5. $4\frac{3}{4}$, 0.3, $3\frac{2}{5}$, 0.27 — $0.27, 0.3, 3\frac{2}{5}, 4\frac{3}{4}$
6. −1.3, $\frac{2}{3}$, 0.5, $-\frac{3}{4}$ — $-1.3, -\frac{3}{4}, 0.5, \frac{2}{3}$
7. 3.53, $2\frac{11}{12}$, $\frac{33}{8}$, 2.7 — $2.7, 2\frac{11}{12}, 3.53, \frac{33}{8}$
8. 2.6, $\frac{27}{100}$, 0.028 — $0.028, \frac{27}{100}, 2.6$

Write the numbers in order from greatest to least.

9. 0.275, $2\frac{5}{8}$, 0.15, $3\frac{6}{7}$ — $3\frac{6}{7}, 2\frac{5}{8}, 0.275, 0.15$
10. $2\frac{18}{25}$, 2.45, $\frac{7}{15}$, 3.2 — $3.2, 2\frac{18}{25}, 2.45, \frac{7}{15}$
11. $\frac{25}{6}$, 3.75, $3\frac{8}{9}$, 3.3 — $\frac{25}{6}, 3\frac{8}{9}, 3.75, 3.3$
12. $\frac{3}{4}$, $\frac{4}{5}$, $\frac{7}{8}$, 0.79 — $\frac{7}{8}, \frac{4}{5}, 0.79, \frac{3}{4}$

2-3 Adding and Subtracting Rational Numbers

Evaluate each expression for the given value of the variable.

13. 75.8 + x for x = 32.35 — 108.15
14. $-\frac{4}{7} + y$ for $y = 4\frac{2}{7}$ — $3\frac{5}{7}$
15. $2\frac{4}{5} + z$ for $z = -1\frac{3}{5}$ — $1\frac{1}{5}$

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SECTION 2A

Ready to Go On? Quiz continued

2-4 Multiplying Rational Numbers

Multiply. Write each answer in simplest form.

14. $2\left(3\frac{3}{4}\right)$ — $7\frac{1}{2}$
15. $-3\frac{2}{5}\left(1\frac{7}{10}\right)$ — $-5\frac{39}{50}$
16. $-4\frac{3}{5}\left(-3\frac{1}{7}\right)$ — $14\frac{16}{35}$
17. $\frac{8}{35}\left(-5\frac{4}{9}\right)$ — $-1\frac{11}{45}$

18. Devon is making 8 loaves of bread. Each loaf of bread needs $3\frac{3}{4}$ cups of flour. How much flour does Devon need to make the bread? **30 cups**

2-5 Dividing Rational Numbers

Divide. Write each answer in simplest form.

19. $\frac{4}{5} \div \frac{7}{10}$ — $1\frac{1}{7}$
20. 3.2 ÷ 0.8 — 4
21. $-\frac{5}{11} \div 3$ — $-\frac{5}{33}$
22. 45.62 ÷ 0.02 — 9,124

2-6 Adding and Subtracting with Unlike Denominators

Add or subtract.

23. $\frac{3}{5} + \frac{1}{4}$ — $\frac{17}{20}$
24. $2\frac{3}{7} - 1\frac{1}{2}$ — $\frac{13}{14}$
25. $\frac{22}{9} + 3\frac{5}{6}$ — $6\frac{15}{18}$
26. $7\frac{2}{5} - 4\frac{1}{3}$ — $3\frac{1}{15}$
27. $1\frac{7}{10} + 2\frac{1}{8}$ — $3\frac{33}{40}$
28. $3\frac{8}{9} - \frac{2}{3}$ — $3\frac{2}{9}$
29. $3\frac{5}{8} + \frac{1}{2}$ — $4\frac{1}{8}$
30. $2\frac{7}{8} - \frac{2}{3}$ — $2\frac{5}{24}$

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SECTION 2A

Ready to Go On? Enrichment

Guess the Operation

If you are given a problem without the operation symbol, you can use number sense to help you figure out what operation was used.

A. $\frac{1}{2} \square \frac{1}{3} = 1\frac{1}{2}$

The answer is **greater** than the first number.

The second number is **positive**.

So, it is not subtraction because the answer would have to be **less** than the first number.

What is $1\frac{1}{2}$ as an improper fraction? $\frac{3}{2}$

What is the reciprocal of the second number? **3**

What operation uses reciprocals? **division**

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

B. 0.08 □ 0.007 = 0.00056

The answer is **less** than the first number.

The second number is **positive**.

So, it is not addition because the sum of two positives is **greater** than either number.

How many decimal places are in the answer? **5**

How many in the first number? **2** The second? **3**

What operation has you add the number of decimal places in each number? **multiplication**

0.08 × 0.007 = 0.00056

Use number sense to figure out what operation is being performed in each problem.

1. 0.25 − 0.5 = −0.25
2. 1.5 ÷ 0.3 = 5
3. 0.7 + 0.9 = 1.6
4. 2.7 × 1.11 = 2.997
5. $\frac{2}{5} + \frac{8}{5} = 2$
6. $\frac{2}{3} \times \frac{1}{4} = \frac{1}{6}$
7. $\frac{3}{8} \div \frac{1}{2} = \frac{3}{4}$
8. $\frac{9}{10} - \frac{2}{5} = \frac{1}{2}$
9. −0.6 + 0.95 = 0.35
10. $\frac{4}{7} \div \frac{3}{4} = \frac{16}{21}$
11. $\frac{7}{8} - \frac{1}{4} = \frac{5}{8}$
12. 0.06 × 0.03 = 0.0018

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SECTION 2B

Ready to Go On? Quiz

2-7 Solving Equations with Rational Numbers

Solve.

1. $x - 3.5 = 1.2$ — $x = 4.7$
2. $y + \frac{4}{5} = \frac{2}{8}$ — $y = -\frac{11}{20}$
3. $2t = -5.7$ — $t = 2.85$
4. $\frac{9}{24}h = -\frac{36}{8}$ — $h = -12$
5. $-9 = \frac{m}{2.7}$ — $m = -24.3$
6. $k - \frac{3}{8} = \frac{13}{22}$ — $k = \frac{85}{88}$
7. $\frac{s}{5.3} = 2.6$ — $s = 13.78$
8. $4.5 + p = -6.4$ — $p = -10.9$
9. $\frac{12}{15} = w - \frac{3}{5}$ — $w = 1\frac{2}{5}$

10. Joe just moved into his new apartment. It takes him $5\frac{1}{4}$ hours to paint one bedroom. His apartment has 4 bedrooms. How many hours will Joe need to paint all the bedrooms of his new apartment?

    21 hours

11. Katie and Ann are going to make cornbread for the bake sale at school. The recipe calls for $2\frac{3}{4}$ cups of cornmeal for 1 loaf of cornbread. How many cups of cornmeal will they need to make 12 loaves of cornbread?

    33 cups

12. A bag of dried cherries had 387.9 total calories. There are 4.5 servings per bag. How many calories are in each serving of dried cherries?

    86.2 calories per serving

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SECTION 2B

Ready to Go On? Quiz continued

2-8 Solving Two-Step Equations

Solve.

13. $4w - 7.5 = 2.7$ — $w = 2.55$
14. $\frac{x-2}{4} = -3.75$ — $x = -13$
15. $5t + 5.7 = 9.2$ — $t = 0.7$
16. $\frac{s+8}{25} = -\frac{12}{5}$ — $s = -68$
17. $-11 = \frac{m}{0.3} - 18.3$ — $m = 2.19$
18. $8h - \frac{6}{7} = \frac{2}{3}$ — $h = \frac{4}{21}$
19. $65.3 - \frac{k}{12.7} = 25.3$ — $k = 508$
20. $6.9 + 8p = -12.3$ — $p = -2.4$
21. $\frac{11}{15} = \frac{8}{35}y + \frac{3}{7}$ — $y = 1\frac{1}{3}$

22. Judy sells stamps for her grandmother. She earns $27 per week, plus $2.25 for each stamp that she sells. Last week, Judy earned $60.75. How many stamps did Judy sell that week?

    15 stamps

23. The local ice skating rink charges $8 for admission. Skate rental costs $5.50 per pair. On Friday night, one half of the people who paid for admission also rented skates. The rink made $1,333 that night. How many people went to the skating rink Friday night?

    124 people

24. A digital cable company charges $56.65 per month for cable and high speed internet service. After the first 100 minutes of internet use, the cable company charges $0.11 for each additional minute. A family's cable bill was $128.37 last month. How many total minutes did the family use high speed internet?

    752 minutes

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SECTION 2B

Ready to Go On? Enrichment

Combining Like Terms

When an equation has multiple terms that include a variable, you must get all the variables on one side of the equation and all the numbers on the other side.

$8x + 5 = 6x - 7$ $\underline{-5 \quad -5}$ $8x = 6x - 12$	First, get all the numbers on one side of the equation. Subtract 5 from both sides.
$\underline{-6x \quad -6x}$ $2x = -12$ $x = -6$	Now subtract $6x$ from both sides. Divide both sides by 2.
$8(-6) + 5 = 6(-6) - 7$	Check your answer by substituting the x-value into the original equation.
$-48 + 5 = -36 - 7$ $-43 = -43$	Simplify. The equation is true when $x = -6$.

Simplify each equation so that all the variables are on one side.

1. $7x + 4 = 2x - 8$ — $5x = -12$
2. $2a + 6 = 3a + 2$ — $-1a = -4$
3. $6f - 3 = 12f + 4$ — $-6f = 7$
4. $4t + 9 = 6t + 7$ — $-2t = -2$
5. $3m - 2 = 4m + 1$ — $-1m = 3$
6. $8r - 4 = 12r + 6$ — $-4r = 10$
7. $5j + 2 = 4j - 7$ — $1j = -9$
8. $6w + 3 = 2w - 8$ — $4w = -11$

Solve.

9. $3y + 5 = 4y + 8$ — $y = -3$
10. $4b - 1 = -3b + 6$ — $b = 1$
11. $5g - 4 = 3g + 9$ — $g = \frac{13}{2}$ or $6\frac{1}{2}$
12. $2s + 3 = 8s - 2$ — $s = \frac{5}{6}$
13. $2m - 2 = 4m + 1$ — $m = -\frac{3}{2}$ or $-1\frac{1}{2}$
14. $3s + 6 = s - 2$ — $s = -4$
15. $3k - 10 = 7k + 3$ — $k = -\frac{13}{4}$ or $-3\frac{1}{4}$
16. $10z + 5 = 7z - 9$ — $z = -\frac{14}{3}$ or $-4\frac{2}{3}$

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LESSON 3-1

Ready to Go On? Skills Intervention

Ordered Pairs

An **ordered pair** is one way to express a solution to an equation.

Vocabulary
ordered pair

Deciding Whether an Ordered Pair Is a Solution of an Equation

Determine whether this ordered pair is a solution of $y = 6x - 4$.

(3, 14)

$y = 6x - 4$	What number do you substitute for x?
$14 \stackrel{?}{=} 6(\underline{3}) - 4$	What number do you substitute for y?
$14 \stackrel{?}{=} 14$	Evaluate the right side of the equation.

Is (3, 14) a solution of the equation? Why? yes; 14 = 14

Creating a Table of Ordered Pair Solutions

Use the given values to make a table of solutions. $y = 2x + 2$ for $x = 0, 1, 2, 3$

Substitute each value of x into the equation. Fill in the missing values to complete the table.

x	$2x + 2$	y	(x, y)
0	2(0) + 2	2	(0, 2)
1	2(1) + 2	4	(1, 4)
2	2(2) + 2	6	(2, 6)
3	2(3) + 2	8	(3, 8)

Recreation Application

When renting a bike at City Park, Joe must first pay a deposit and then pay a charge per hour. If the per hour fee is $5 and the deposit is $15, then the cost c of renting the bike for h hours can be determined using the equation: $c = 5h + 15$.

A. How much will it cost Joe to rent the bike for 4 hours?

$c = 5h + 15$

$c = 5(\underline{4}) + 15$	What number do you substitute for h?
$c = \underline{35}$	Evaluate.

It will cost Joe $ 35 to rent the bike for 4 hours.

The solution can be written as (4, 35).

B. How much will it cost Joe to rent the bike for 6 hours?

$c = 5h + 15$

$c = 5(\underline{6}) + 15$	What number do you substitute for h?
$c = \underline{45}$	Evaluate.

It will cost Joe $ 45 to rent the bike for 6 hours.

The solution can be written as (6, 45).

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