Chapter 6 Resource Masters

Includes:

Chapter Resources
- Graphic Organizer
- Student-Built Glossary
- Family Letter
- Anticipation Guide
- Game

Leveled Lesson Resources
- Reteach
- Skills Practice
- Homework Practice
- Problem-Solving Practice
- Enrich

Assessment Resources
- Individual Progress Checklist
- Chapter Diagnostic Test
- Chapter Pretest
- 3 Quizzes
- Mid-Chapter Test
- Vocabulary Test
- Oral Assessment
- Chapter Project Rubric
- Foldables Rubric
- 6 Chapter Tests
- Extended Response Test
- Student Recording Sheet
- Cumulative Standardized Test Practice
- Answer Pages
- Chapter 6 Assessment Line-up
- Answer Keys

All Answers Included
## Grade 5 Chapter 6
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Teacher’s Guide to Using the
Chapter 6 Resource Masters

The Chapter 6 Resource Masters includes the core materials needed for Chapter 6. These materials include worksheets, extensions, and assessment options. The answers for these pages appear at the back of this booklet.

All of the materials found in this booklet are included for viewing and printing on the TeacherWorks Plus™ CD-ROM.

Chapter Resources

Graphic Organizer (page 1) This master is a tool designed to assist students with comprehension of grade-level concepts. While the content and layout of these tools vary, their goal is to assist students by providing a visual representation from which they can learn new concepts.

Student-Built Glossary (page 2) This master is a study tool that presents the key vocabulary terms from the chapter. You may suggest that students highlight or star the terms they do not understand. Give this list to students before beginning Lesson 6–1. Remind them to add these pages to their mathematics study notebooks.

Anticipation Guide (page 6) This master is a survey designed for use before beginning the chapter. You can use this survey to highlight what students may or may not know about the concepts in the chapter. There is space for recording how well students answer the questions before they complete the chapter. You may find it helpful to interview students a second time, after completing the chapter, to determine their progress.

Game (page 7) A game is provided to reinforce chapter concepts and may be used at appropriate times throughout the chapter.

Resources for Computational Lessons

Reteach Each lesson has an associated Reteach worksheet. In general, the Reteach worksheet focuses on the same lesson content but uses a different approach, learning style, or modality than that used in the Student Edition. The Reteach worksheet closes with computational practice of the concept.

Skills Practice The Skills Practice worksheet for each lesson focuses on the computational aspect of the lesson. The Skills Practice worksheet may be helpful in providing additional practice of the skill taught in the lesson.

Homework Practice The Homework Practice worksheet provides an opportunity for additional computational practice. The Homework Practice worksheet includes word problems that address the skill taught in the lesson.

Problem-Solving Practice The Problem-Solving Practice worksheet presents additional reinforcement in solving word problems that apply both the concepts of the lesson and some review concepts.

Enrich The Enrich worksheet presents activities that extend the concepts of the lesson. Some Enrich materials are designed to widen students’ perspectives on the mathematics they are learning. These worksheets are written for use with all levels of students.

Resources for Problem-Solving Strategy and Problem-Solving Investigation Lessons In recognition of the importance of problem-solving strategies, worksheets for problem-solving lessons follow a slightly different format. For problem-solving lessons, a two-page Reteach worksheet offers a complete model for choosing a problem-solving strategy. For each Problem-Solving Strategy lesson, Reteach and Homework Practice worksheets offer reinforcement of
the strategy taught in the Student Edition lesson. In contrast, the Problem-Solving Investigation worksheets include a model strategy on the Reteach worksheets and provide problems requiring several alternate strategies on the Homework Practice and Skills Practice worksheets.

**Assessment Options** The assessment masters in the *Chapter 6 Resource Masters* offer a wide variety of assessment tools for monitoring progress as well as final assessment.

**Individual Progress Checklist** This checklist explains the chapter’s goals or objectives. Teachers can record whether a student’s mastery of each objective is beginning (B), developing (D), or mastered (M). The checklist includes space to record notes to parents as well as other pertinent observations.

**Chapter Diagnostic Assessment** This one-page test assesses students’ grasp of skills that are needed for success in the chapter.

**Chapter Pretest** This one-page quick check of the chapter’s concepts is useful for determining pacing. Performance on the pretest can help you determine which concepts can be covered quickly and which specific concepts may need additional time.

**Quizzes** Three free-response quizzes offer quick assessment opportunities at appropriate intervals in the chapter.

**Mid-Chapter Review** This one-page chapter test provides an option to assess the first half of the chapter. It includes both multiple-choice and free-response questions.

**Vocabulary Test** This one-page test focuses on chapter vocabulary. It is suitable for all students. It includes a list of vocabulary words and questions to assess students’ knowledge of the words.

**Oral Assessment** This two-page test consists of one page for teacher directions and questions and a second page for recording responses. Although this assessment is designed to be used with all students, the interview format focuses on assessing chapter content assimilated by ELL students.

**Chapter Project Rubric** This one-page rubric is designed for use in assessing the chapter project. You may want to distribute copies of the rubric when you assign the project and use the rubric to record each student’s chapter project score.

**Foldables Rubric** This one-page rubric is designed to assess the Foldables graphic organizer. The rubric is written to the students, telling them what you will be looking for as you evaluate their completed Foldables graphic organizer.

**Leveled Chapter Tests**

- **Form 1** assesses basic chapter concepts through multiple-choice questions.
- **Form 2A** is primarily for those who may have missed the Form 1 test. It may be used as a retest for students who received additional instruction following the Form 1 test.
- **Form 2B** is designed for students with a below-level command of the English language.
- **Form 2C** is a free-response test.
- **Form 2D** is written for students with a below-level command of the English language.
- **Form 3** is a free-response test.
- **Extended-Response Test** is an extended response test.

**Student Recording Sheet** This one-page recording sheet is for the standardized test in the Student Edition.

**Cumulative Standardized Test Practice**

This three-page test, aimed at on-level students, offers multiple-choice questions and free-response questions.

**Answers**

The answers for the Anticipation Guide and Lesson Resources are provided as reduced pages with answers appearing in black. Full size line-up answer keys are provided for the Assessment Masters.
Use this graphic organizer to take notes on **Chapter 6: Multiplying and Dividing Decimals and Fractions**

Fill in the missing information.

<table>
<thead>
<tr>
<th>Vocabulary Word</th>
<th>Definition</th>
<th>Examples</th>
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<tbody>
<tr>
<td>Compatible Numbers</td>
<td></td>
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<td>Reciprocal</td>
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<td>Scientific Notation</td>
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<td>Factor</td>
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<tr>
<td>Numerator</td>
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<tr>
<td>Denominator</td>
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</table>
This is an alphabetical list of new vocabulary terms you will learn in **Chapter 6: Multiplying and Dividing Decimals and Fractions.** As you study the chapter, complete each term’s definition or description. Remember to add the page number where you found the term. Add this page to your math study notebook to review vocabulary at the end of the chapter.

<table>
<thead>
<tr>
<th>Vocabulary Term</th>
<th>Found on Page</th>
<th>Definition/Description/Example</th>
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<tr>
<td>compatible numbers</td>
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<td></td>
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<tr>
<td>denominator</td>
<td></td>
<td></td>
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<tr>
<td>factor</td>
<td></td>
<td></td>
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<tr>
<td>numerator</td>
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<td></td>
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Student-Built Glossary  (continued)

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
<th>Example</th>
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<td>power</td>
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<tr>
<td>quotient</td>
<td></td>
<td></td>
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<tr>
<td>reciprocals</td>
<td></td>
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<tr>
<td>scientific notation</td>
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</table>
Dear Family,

Today my class started Chapter 6: Multiplying and Dividing Decimals and Fractions. I will be learning to multiply and divide decimals and fractions. I will also be learning to multiply and divide mixed numbers. Here are my vocabulary words and an activity that we can do together.

Sincerely, _________________________

Key Vocabulary

Compatible numbers  Numbers in a problem or related numbers that are easy to work with mentally. Example: 720 and 90 are compatible numbers for division because 72 ÷ 9 = 8.

Reciprocals  Two numbers whose product is 1. Example: The reciprocal of \( \frac{3}{5} \) is \( \frac{5}{3} \).

Scientific notation  Expressing a number as the product of two factors where the first factor is at least 1 but less than 10 and the second factor is a power of 10. Example: 786 = 7.86 × 10^2

Factor  A number that divides into a whole number evenly. Also a number that is multiplied by another number.

Quotient  The solution to a division problem. Example: In the problem 8 ÷ 2 = 4, 4 is the quotient.

Power  A number expressed using exponents. Example: 3^2

Numerator  The number above the bar in a fraction; the part of the fraction that tells how many of the equal parts are being used. Example: \( \frac{2}{4} \); 2 is the numerator.

Denominator  The bottom number in a fraction. Example: \( \frac{5}{6} \); 6 is the denominator.

Activity

Place a book, a CD, and a DVD on a table. Use stickers to label them with prices. $5.87 for the book, $10.87 for the CD, and $14.99 for the DVD. If you wanted to buy 2 books and 2 CDs, how much would it cost? Practice with other sale combinations.

Books to Read

Math Man  
by Teri Daniels

The Phantom Tollbooth  
by Norton Juster

Gator Pie  
by Louise Mathews
Estimada familia:

Hoy mi clase comenzó el Capítulo 6: Multiplica y divide decimales y fracciones. Aprenderé a multiplicar y a dividir decimales y fracciones. También aprenderé a multiplicar y a dividir números mixtos. A continuación, están mis palabras del vocabulario y una actividad que podemos realizar juntos.

Sinceramente, ________________

Vocabulario clave

**Números compatibles** Números en un problema o números relacionados con los cuales es fácil trabajar mentalmente.

**Recíproco** Número que se obtiene a partir de un número dado intercambiando su numerador y su denominador.

**Notación científica** Expresar un número como el producto de dos factores donde el primer factor está entre 1 y 10 y el segundo factor es una potencia de 10. Ejemplo: 786 = 7.86 ¥ 10

**Factor** Número que divide exactamente a otro número entero. También un número que se multiplica por otro número

**Cociente** El resultado de un problema de división.

**Potencia** Número expresado con exponentes. Ejemplo: 32

**Numerador** Número que está encima de la barra de fracción; la parte de la fracción que indica cuántas partes iguales se están usando. Ejemplo: $\frac{2}{4}$, 2 es el numerador

**Denominador** El número inferior en una fracción. Ejemplo: $\frac{5}{6}$, 6 es el denominador

**Actividad**

Coloquen un libro, un CD y un DVD sobre una mesa. Usen etiquetas engomadas para rotular los con precios. $5.87 para el libro, $10.87 para el CD y $14.99 para el DVD. Si quisieran comprar 2 libros y 2 CD, ¿cuánto costarían? Practiquen con otras combinaciones de rentas.

Libros recomendados

**Math Man** de Teri Daniels

**The Phantom Tollbooth** de Norton Juster

**Gator Pie** de Louise Mathews
**STEP 1**

**Before you begin Chapter 6**
- Read each statement.
- Decide whether you agree (A) or disagree (D) with the statement.
- Write A or D in the first column OR if you are not sure whether you agree or disagree, write NS (not sure).

<table>
<thead>
<tr>
<th>STEP 1 A, D, or NS</th>
<th>Statement</th>
<th>STEP 2 A or D</th>
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<td>1.</td>
<td>Compatible numbers are numbers in a problem or related numbers that are easy to work with mentally.</td>
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<tr>
<td>2.</td>
<td>720 and 90 are compatible numbers for division.</td>
<td></td>
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<tr>
<td>3.</td>
<td>A reciprocal is a number obtained from a given number by interchanging its numerator and denominator.</td>
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<td>4.</td>
<td>The reciprocal for $\frac{3}{5}$ is $\frac{5}{6}$.</td>
<td></td>
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<tr>
<td>5.</td>
<td>The reciprocal for $\frac{4}{5}$ is $\frac{5}{4}$.</td>
<td></td>
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<tr>
<td>6.</td>
<td>Scientific notation is expressing a number as the product of two factors where the first factor is at least 1 but less than 10 and the second factor is a power of 10.</td>
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<tr>
<td>7.</td>
<td>$786 = 7.86 \times 10^2$ is an example of scientific notation.</td>
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<tr>
<td>8.</td>
<td>A factor does not divide into a whole number evenly.</td>
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<tr>
<td>9.</td>
<td>In the fraction $\frac{7}{12}$, 12 is the denominator.</td>
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<td>10.</td>
<td>In the fraction $\frac{9}{10}$, 9 is the numerator.</td>
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**STEP 2**

**After you complete Chapter 6**
- Reread each statement and complete the last column by entering an A (agree) or a D (disagree).
- Did any of your opinions about the statements change from the first column?
- For those statements that you mark with a D, use a separate sheet of paper to explain why you disagree. Use examples, if possible.
Game
Make it Big!

You will need:
• A pair of number cubes for each player
• Paper and pencil

Give each player a pair of number cubes, a piece of paper, and a pencil.

GO!

1. Toss the pair of number cubes and record the numbers.
2. Toss the pair of number cubes a second time and record the numbers again.
3. Create two fractions that are both less than 1.
4. Multiply the two fractions together.
5. Compare the answers. The player with the greatest product wins the round.
6. Continue tossing and multiplying. The first player to win 5 rounds is the winner.
Reteach

Multiplying Decimals by Whole Numbers

To multiply a whole number by a decimal, multiply as you would with whole numbers. Then count the number of decimal places in each factor. Write the same number of decimal places in the product.

- Multiply: $7 \times 3.28$
- Estimate: $7 \times 3 = 21$

\[
3.28 \leftarrow 2 \text{ decimal places} \times 7 \rightarrow 22.96 \leftarrow 2 \text{ decimal places}
\]

- Compare the actual product and the estimated product:
  - 22.96 is close to 21, so 22.96 is a reasonable answer.

- Multiply: $3 \times 0.09$
- Estimate: $3 \times 0 = 0$

\[
0.09 \leftarrow 2 \text{ decimal places} \times 3 \rightarrow 0.27 \leftarrow 2 \text{ decimal places}
\]

- Compare the actual product and the estimated product:
  - 0.27 is close to 0, so 0.27 is a reasonable answer.

Write the number of decimal places. Multiply.

1. $0.9 \leftarrow \underline{\text{decimal place(s)}} \times 9 \rightarrow \underline{\text{decimal place(s)}}$
2. $3.92 \leftarrow \underline{\text{decimal place(s)}} \times 5 \rightarrow \underline{\text{decimal place(s)}}$
3. $3.79 \leftarrow \underline{\text{decimal place(s)}} \times 8 \rightarrow \underline{\text{decimal place(s)}}$
4. $21.8 \leftarrow \underline{\text{decimal place(s)}} \times 4 \rightarrow \underline{\text{decimal place(s)}}$

Multiply.

5. $7.2 \times 6$
6. $0.67 \times 2$
7. $1.75 \times 7$
8. $68.7 \times 4$
9. $98.5 \times 8$
10. $8.5 \times 3$
11. $1.08 \times 9$
12. $7.9 \times 41$
13. $2.6 \times 72$
14. $23.54 \times 5$
### Skills Practice

**Multiplying Decimals by Whole Numbers**

**Multiply.**

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<tr>
<td></td>
<td>× 10</td>
<td>× 42</td>
<td>× 85</td>
<td>× 4</td>
<td>× 2</td>
</tr>
</tbody>
</table>

11. \(0.8 \times 5 = \) __________________________

12. \(6 \times \$1.79 = \) __________________________

13. \(2.46 \times 10 = \) __________________________

14. \(10.4 \times 1,000 = \) __________________________

15. \(2.3 \times 38 = \) __________________________

16. \(57 \times 5.18 = \) __________________________

**Write each number in standard form.**

<p>| | | | | | |</p>
<table>
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<tbody>
<tr>
<td>17</td>
<td>6.1 ( \times 10^2 )</td>
<td></td>
<td>18</td>
<td>1.184 ( \times 10^2 )</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>2.495 ( \times 10^2 )</td>
<td></td>
<td>20</td>
<td>5.267 ( \times 10^3 )</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>3.205 ( \times 10^3 )</td>
<td></td>
<td>22</td>
<td>1.2 ( \times 10^1 )</td>
<td></td>
</tr>
</tbody>
</table>

23. Each Sunday during his nine-week summer vacation, Ray buys a newspaper. The Sunday paper costs $1.85. How much did Ray spend on the Sunday newspaper during his vacation?

_________________________________________________________________

24. One Sunday, Ray weighed the newspaper. It weighed 2.7 lb. If each Sunday newspaper weighs the same, how many pounds of newspaper will Ray recycle if he buys the Sunday paper for 50 weeks?

_________________________________________________________________
Multiplying Decimals by Whole Numbers

1. \(4.7 \times 4\) 
2. \(2.9 \times 7\) 
3. \(8 \times 0.5\) 
4. \(6 \times 0.02\) 
5. \(0.09 \times 6\) 
6. \(0.011 \times 5\)

Write each number in standard form.

7. \(6 \times 10^4\) 
8. \(5 \times 10^2\) 
9. \(1.45 \times 10^3\) 
10. \(8.2 \times 10^5\) 
11. \(0.067 \times 10^8\) 
12. \(2.6 \times 10^1\)

Solve. (Lesson 1–3)

13. \(4 \times 7 - 8\) 
14. \(10 \times 6 + 24\)

Add or subtract. (Lesson 5–7)

15. \(\frac{3}{5} + \frac{3}{8}\) 
16. \(9 + 4\frac{1}{2}\) 
17. \(16 - 5\frac{3}{5}\)
Solve.

1. Andrea earns $32.00 a day. What will she earn if she works 10 days?

2. Constantino cooked 5.2 lbs of beef. Each pound is 16 oz. How many ounces of beef did he cook?

3. Kasi is traveling in the United States. If the exchange rate is 58 rupees for every American dollar, how many rupees does it take to purchase a meal that costs $12.98?

4. A school receives $14.00 for every 1,000 labels they collect from certain products. How much money will they make if students collect 3,000 labels?

5. Kevin is studying Spanish, and he learns about 5.3 new words each school day. Lisa is studying French, and she learns about 4.9 new words each school day. About how many more words will Kevin learn than Lisa in 4 weeks?

6. An amusement park charges $35.50 for admission. On one day, 6,789 people visited the park. The park employed 779 people that day and paid each of them an average of $86.00 for the day. The park also paid $17,295.00 for electricity, maintenance of the rides, and supplies. How much money did the park make that day?
Enrich

Decimals on the Move

Can you see a pattern in these multiplications?

\[
\begin{align*}
5.931 \times 10 &= 59.310 \\
5.931 \times 100 &= 593.100 \\
5.931 \times 1,000 &= 5,931.000
\end{align*}
\]

When you multiply a number by 10, 100, or 1,000, the product contains the same digits as the original number. However, the decimal point “moves” according to these rules.

- multiply by 10 → move to the right one place
- multiply by 100 → move to the right two places
- multiply by 1,000 → move to the right three places

Many people use this fact as a mental math strategy.

Find each product mentally.

1. \(10 \times 7.402\) ______

2. \(100 \times 7.402\) ______

3. \(1,000 \times 7.402\) ______

4. \(1,000 \times 0.5362\) ______

5. \(100 \times 3.83\) ______

6. \(24.07 \times 10\) ______

7. \(1.918 \times 1,000\) ______

8. \(0.075 \times 100\) ______

Estimate by rounding one number to 10, 100, or 1,000.

9. \(6.57 \times 9\) ______

10. \(1,225 \times 3.548\) ______

11. \(0.6214 \times 11.05\) ______

12. \(98.04 \times 26.331\) ______

13. **CHALLENGE** Find the product \(1,000 \times 16.5\) mentally. How is this different from the other exercises on this page?
Multiply: $4.7 \times 2.63$

Estimate: $5 \times 3 = 15$

$2.63 \leftarrow 2$ decimal places
$\times 4.7 \leftarrow 1$ decimal places
$1841$
$\pm 10520$
$12.361 \leftarrow 3$ decimal places

Compare the product and the estimate. 12.361 is close to 15, so 12.361 is a reasonable answer.

Write the number of decimal places. Multiply.

1. $0.9 \leftarrow _____$ decimal place(s)
   $\times 0.5 \leftarrow _____$ decimal place(s)
   $\leftarrow _____$ decimal place(s)

2. $0.89 \leftarrow _____$ decimal place(s)
   $\times 0.9 \leftarrow _____$ decimal place(s)
   $\leftarrow _____$ decimal place(s)

Multiply. Estimate to check if your answer is reasonable.

3. $0.8 \times 0.7$
4. $2.5 \times 0.6$
5. $3.67 \times 0.49$
6. $8.73 \times 0.5$
7. $9.2 \times 6.1$
8. $54.06 \times 0.2$
9. $7.13 \times 1.9$
10. $9.23 \times 4.8$
Multiply.

1. \(0.6 \times 0.8\)  
2. \(0.5 \times 0.6\)  
3. \(1.7 \times 0.9\)  
4. \(2.61 \times 0.4\)  
5. \(2.09 \times 0.3\)  
6. \(5.18 \times 2.7\)  
7. \(6.09 \times 8.6\)  
8. \(37.24 \times 3.1\)  
9. \(218.7 \times 4.8\)  
10. \(432.1 \times 1.2\)

11. \(0.9 \times 0.7 = \)  
12. \(0.16 \times 0.6 = \)

13. \(7.4 \times 0.4 = \)  
14. \(3.47 \times 0.9 = \)

15. \(4.35 \times 1.7 = \)  
16. \(58.2 \times 6.8 = \)

17. \(3.06 \times 9.1 = \)  
18. \(94.2 \times 2.5 = \)

19. \(17.64 \times 3.2 = \)  
20. \(41.38 \times 9.7 = \)

Find the number that makes each problem true.

21. \(39.8 \div 0.7 = \)
22. \(46.87 \div 0.5 = \)
23. \(2.3 \div 1.8 = \)
24. \(57.8 \div 0.7 = \)

27. \(6\)  
28. \(35\)  
29. \(.14\)  
30. \(.46\)

Problem Solving

25. Beth works as a lifeguard at a city park. She earns $9.50 per hour and works 7.5 hours each day. How much does she earn each day?

26. The cost of renting a pedal boat at the city park is $6.25 per hour. Jason rented a boat for 1.5 hours. To the nearest cent, how much did the pedal boat rental cost?
Multiply.

1. $0.7 \times 0.8$ 
2. $2.9 \times 7.5$ 
3. $8.8 \times 0.5$

4. $7.3 \times 0.02$ 
5. $0.011 \times 6.3$ 
6. $0.071 \times 5.5$

Evaluate each expression if $a = 9.4$ and $b = 0.76$ and $c = 2.78$

7. $7.5a$ 
8. $5.33b$ 
9. $1.8c$

10. $0.037 + 4.45a$ 
11. $ab + c$ 
12. $5.84a$

13. $16 - 4c$ 
14. $10 \times 8 + ab$ 
15. $bc + a$

16. If you pay 20 cents a pound for bananas, and you buy 6 pounds of bananas, what is the total amount?

Spiral Review

Multiply. (Lesson 6–1)

17. $7 \times 4.5$ 
18. $4.9 \times 5$

19. $7.1 \times 2$ 
20. $9 \times 3.2$
6–2

Problem-Solving Practice

Multiplying Decimals

Solve.

1. Christopher walks 1.8 hours at a rate of 3.2 mi/hr. How many miles does he walk?

2. Kristin can ride her bike 6.2 miles in an hour. How far can she ride in 2.94 hours?

3. Anna works in a bakery and makes an average of 2.7 pies an hour. Her normal workday is 7.5 hours. How many pies does she make in an average day?

4. Michael multiplies $1.7 \times 28.2$ and says that the answer is 4.794. The numbers are correct, but the decimal point is in the wrong place. Use estimation to find what the answer should actually be.

5. Jimmy works in a factory. He has to produce 23.9 car parts in an hour to make the number of parts required in a 7.5-hour workday. How many parts is he supposed to make in a day? One day he works faster than usual, producing 30.8 car parts per hour. How many parts does he make?

6. Heather can read an average of 62.7 pages in an hour. She finished her homework and has 2.87 hours to read before she has to go to sleep. Will she be able to read a 200-page book that evening? Explain your answer.
Enrich

A Logic Puzzle

Here is a puzzle that will help you brush up on your logical thinking skills.

The product $3.3 \times 8.1$ is in both the circle and the triangle, but not in the square. Place the product in the diagram at the right.

\[
\begin{array}{c}
8.1 \\
\times 3.3 \\
\hline \\
243 \\
26.73 \\
\end{array}
\]

Write 26.73 in the correct region of the diagram.

Use the given information to place the product in the diagram above.

1. The product $14.19 \times 1.3$ is in both the triangle and the square, but not in the circle.
2. The product $0.08 \times 2.7$ is in the triangle, but not in the circle or the square.
3. The product $1.24 \times 0.16$ is not in the circle, the square, or the triangle.
4. The product $2.2 \times 0.815$ is in both the square and the circle, but not in the triangle.
5. The product $0.02 \times 0.03$ is in the circle, but not the triangle or the square.
6. The product $21.7 \times 0.95$ is in the circle, the square, and the triangle.
7. The product $2.5 \times 12.8$ is in the square, but not the circle or triangle.
8. If you did all the calculations correctly, the sum of all the numbers in the diagram should be a “nice” number. What is the sum?
Check for Reasonableness

Erica takes a package of two paperback books to the post office. The package weighs 16 ounces. Erica estimates that the package weighs about 300 pounds. Is her estimate reasonable?

<table>
<thead>
<tr>
<th>Step 1 Understand</th>
<th>Be sure you understand the problem.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• What facts do you know? You know how many ounces the package weighs.</td>
</tr>
<tr>
<td></td>
<td>• What do you need to find? You need to know whether Erica's estimate is reasonable.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Step 2 Plan</th>
<th>Make a plan.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>You want to compare the weight of the package to something that you know weighs about 300 pounds.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Step 3 Solve</th>
<th>Carry out your plan.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A professional football player might weigh between 200 and 300 pounds. So, 300 pounds is much heavier than a package of two books. Therefore, the estimate is not reasonable.</td>
</tr>
<tr>
<td></td>
<td>Erica multiplied to change a smaller unit to a larger one.</td>
</tr>
<tr>
<td></td>
<td>She should have divided. $16 \div 16 = 1$ ← Remember: 1 pound $= 16$ ounces.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Step 4 Check</th>
<th>Check for Reasonableness</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Does your answer make sense?</td>
</tr>
<tr>
<td></td>
<td>• Did you answer the question? Yes. Erica's estimate was not reasonable. You found the mistake she made.</td>
</tr>
</tbody>
</table>

Is each estimate reasonable? Explain.

1. Jerry measures the hallway and finds that it is 240 feet long. He estimates that he will need a carpet that is 20 inches long in order to cover the hallway. Is Jerry's estimate reasonable? (Hint: 1 foot equals 12 inches)
2. Leslie's computer weighs 165 ounces. She estimates that it weighs about 10 pounds. Is Leslie's estimate reasonable?

3. Rocky measures his bedroom and finds that it is 10 feet wide and 14 feet long. He thinks he can easily fit a desk that is 75 inches long in his room. Is this a reasonable guess?

4. Haruko wants to make a dress. The pattern she is using called for 2 yards of material. Haruko estimates that she will need to buy 2 feet of material. Is her estimate reasonable? (Hint: 1 yard equals 3 feet)

5. Eli weighs 900 ounces. He guesses that he can get on a ride at the amusement park that allows children from 30 to 80 pounds. Is his estimate reasonable?
Check for Reasonableness
Is each estimate reasonable? Explain.

1. Sandra needs to buy a phone cord that will reach a distance of at least 12 yards. At the store, all of the packages are marked in feet. Sandra estimates that the package with 40 feet of cord will be enough. Is her estimate reasonable? (Hint: 1 yard equals 3 feet)

2. Kyle and Julie are watching a television program on weightlifting. A man is going to lift 210 pounds. Julie comments that he is going to lift 4,000 ounces. Is her estimate reasonable? (Hint: 1 pound equals 16 ounces)

3. Ryan and Tyler are going to the pet shop to buy 12 cans of dog food. They are trying to decide whether they should take their wagon to help carry the dog food home. The cans weigh 15 ounces each. They estimate that the dog food will weigh 10 pounds. Is the estimate reasonable?

4. Nicole is trying out a new recipe. The recipe calls for 4 pints of broth. Nicole has only a 1-cup measuring cup. She estimates that she will need 16 cups of broth. Is her estimate reasonable? (Hint: 1 pint equals 2 cups)
Homework Practice
Problem-Solving Strategy

Solve. Use the check for reasonableness strategy.

1. Jamil volunteers once a week. He works for 3.5 hours at a time. How many hours does he work in 10 weeks?

2. Gamal collects cards. If he buys 4 cards a week, how many total cards will he have after 3 months?

3. Kim invited 5 friends over to swim. They took turns on the 3 rafts. If they each lay on a raft for 30 minutes at a time, how long would it take for all 5 friends to have their turn?

4. Ling ordered 3 hamburgers, 2 fries, and 3 drinks. If he paid with three 10-dollar bills, how much change will he get back?

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hamburger</td>
<td>$3.50</td>
</tr>
<tr>
<td>Fries</td>
<td>$2.90</td>
</tr>
<tr>
<td>Drink</td>
<td>$3.95</td>
</tr>
</tbody>
</table>

Multiply. (Lesson 6–2)

5. $5 \times 2.8$ _____
6. $3.7 \times 7$ _____
7. $8 \times 4.6$ _____
8. $6.2 \times 3.4$ _____
9. $8.1 \times 6.4$ _____
10. $5.3 \times 2.9$ _____
Play this game with a partner. Take turns.
You will need a number cube and counters.

**How to Play**
- Place your counter on Start. Roll the number cube and move the number of spaces rolled.
- Determine which item is the better buy. Have your partner check your answer.
- If you are wrong, you must go back 2 spaces.

The first person to get to the Finish square is the winner.
Dividing Decimals by Whole Numbers

Dividing decimals is similar to dividing whole numbers, except that you don’t write a remainder in the quotient. You may have to write one or more zeros in the dividend and keep dividing.

Divide $5.1 \div 4$.

\[
\begin{array}{c}
4)5.1 \\
-4 \\
\hline
11 \\
-8 \\
\hline
3 \\
\end{array}
\]

Place the decimal point in the quotient. Divide as with whole numbers. The remainder is not 0, so keep dividing.

\[
\begin{array}{c}
4)5.100 \\
-4 \\
\hline
110 \\
-80 \\
\hline
30 \\
-28 \\
\hline
20 \\
-20 \\
\hline
0 \\
\end{array}
\]

Write zeros in the dividend and keep dividing until the remainder is 0.

Multiply to check.

\[
\frac{1.275 \times 4}{5.100 = 5.1}
\]

Divide. Multiply to check.

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</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>6</td>
<td>.</td>
<td>2</td>
<td>0</td>
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<td></td>
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</tbody>
</table>

Check:

\[
\begin{array}{c}
\times \quad 4 \\
\hline
\end{array}
\]

1. \(4 \, 6.2 \, 0\)

2. \(8 \, 1.8\)

3. \(5 \, 1 \, 2.0\)

4. \(8 \, 45.6\)

5. \(6 \, 21.3\)

6. \(4 \, 18\)

7. \(34 \, 7.82\)

8. \(15 \, 34.65\)

9. \(56 \, 47.6\)
Skills Practice

Dividing Decimals by Whole Numbers

Divide. Round each quotient to the nearest hundredth if necessary.

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>3)2.19</td>
<td>2.</td>
</tr>
<tr>
<td>4.</td>
<td>8)18.2</td>
<td>5.</td>
</tr>
<tr>
<td>7.</td>
<td>8)16.8</td>
<td>8.</td>
</tr>
<tr>
<td>10.</td>
<td>23)32.2</td>
<td>11.</td>
</tr>
</tbody>
</table>

| 13. | 8.01 ÷ 9 = _____ | 14. | 6.48 ÷ 40 = _____ |
| 15. | 13.64 ÷ 7 = _____ | 16. | 240.5 ÷ 64 = _____ |
| 17. | 627 ÷ 100 = _____ | 18. | 30.87 ÷ 4 = _____ |

Solve.

19. Twelve students each ordered a different meal from a fast-food restaurant as part of a science project. When they finished eating, they weighed all the packaging. They found that the packaging weighed a total of 2.88 lb. What was the average weight of the packaging from each meal?

20. Later in the year, the students repeated the experiment exactly. The total weight of the packaging this time was 2.06 lb. To the nearest hundredth of a pound, what was the new average weight of the packaging?

_______
Divide. Round to the nearest tenth if necessary.

1. \(4.79 \div 3\) 
2. \(9.99 \div 7\) 
3. \(0.55 \div 5\) 
4. \(6.95 \div 6\) 
5. \(55.35 \div 52\) 
6. \(72.9 \div 4\) 
7. \(853.7 \div 25\) 
8. \(457.4 \div 32\) 
9. \(158.6 \div 45\) 
10. \(64.3 \div 6\) 
11. \(49.7 \div 4\) 
12. \(74.2 \div 2\)

Find the mean for each set of data. Round to the nearest tenth.

13. \(25.8, 26.9, 24.2, 23.9, 25.4\) 
14. \(2.56, 1.72, 2.85, 3.10, 2.65\)

Solve. Is each answer reasonable? Explain. (Lesson 6–3)

15. Laura thinks that a horse weighs 750 ounces. Is her estimate reasonable? (Hint: 1 pound equals 16 ounces)

16. Vito’s living room is 13 feet wide and 10 feet long. Will 2 yards of carpet cover the floor? (Hint: 1 yard equals 3 feet)

17. Esse has a recipe that calls for 2 quarts of tomato sauce. Will 8 cups be enough? (Hint: 1 quart equals 4 cups)
Name ___________________________ Date __________________

6–4

Problem-Solving Practice

Dividing Decimals by Whole Numbers

Solve.

1. Pablo paid $14.75 for 5 identical items. How much did each item cost?

2. Marianne measured the rainfall in her area for a year. Her readings totaled 34.56 in. What is the average rainfall per month?

3. Silvia is learning Spanish in school. At the end of the 9-month school year, she had learned 422 new words. To the nearest tenth, how many words did she learn each month?

4. Lon earned $242.88 doing yard work. He owed his brother some money and was paying him back $25 at a time. To the nearest whole number, how many payments could he make from the money he earned?

Solve. Round to the nearest tenth if necessary.

5. Harry’s mother makes cakes for a local restaurant. She buys flour and sugar in large amounts. The last time she shopped, she bought 157.86 lb of flour and 82.69 lb of sugar. If she uses 15 lb of flour and 8 lb of sugar in a day, how many days will the flour last?

6. The Weston Laundry washes all the linens for local hotels. In 7 days, they washed 2,853.8 lb of towels and 3,534.7 lb of sheets. How many pounds of laundry did they wash each day?

How many days will the sugar last?

How many pounds of laundry did they wash each day?
**Enrich**

**Unit Pricing**

The unit price of an item is the cost of the item given in terms of one unit of the item. The unit might be something that you count, like jars or cans, or it might be a unit of measure, like ounces or pounds. You can find a unit price using this formula.

\[
\text{unit price} = \frac{\text{cost of item}}{\text{number of units}}
\]

For example, you find the unit price of the tuna in the ad at the right by finding the quotient \(0.89 \div 6\). The work is shown below the ad. Rounding the quotient to the nearest cent, the unit price is \$0.15 per ounce.

\[
\begin{array}{c}
\text{TUNA} \\
89\sigma \\
6 \text{ ounce can} \\
\hline
0.148 \\
6)0.890 \\
-6 \\
29 \\
-24 \\
50 \\
-48 \\
2
\end{array}
\]

**Find a unit price for each item.**

1. 5-pound bag CARROTS $1.29

2. 18-ouncer jar PEANUT BUTTER $2.49

3. Grade A Jumbo EGGS Dozen $1.59

**Give two different unit prices for each item.**

4. Frozen BURRITOS 5-ounce pkg 2 for $1.39

5. Purr-fect CAT FOOD 3/$1 3-ounce can

6. Old Tyme SPAGHETTI SAUCE 12-ounce jars 2/$3

**Circle the better buy.**

7. Mozarella Cheese 3/$4 10-pound pkg

8. Dee-light Chicken Wings $9.99 5-pound bag

Top Q Chicken Wings $2.29 18-ounce bag
Dividing by Decimals

To divide when the divisor is a decimal, multiply the divisor by the least power of ten that will make it a whole number. Then multiply the dividend by the same power of ten.

Divide $3.66 \div 0.6$.

Multiply the divisor by the power of 10 that makes it a whole number.

$$\begin{array}{c|c}
0.6 & 10 \\
\hline
3.66 & \text{becomes 6.}
\end{array}$$

Multiply the dividend by the same number. Rewrite the problem.

$$\begin{array}{c|c}
0.6 & 10 \\
\hline
3.66 & \rightarrow 6|36.6 \\
\hline
3.66 & \text{becomes 36.6.}
\end{array}$$

Divide as with whole numbers. Place the decimal point above its new position in the dividend.

$$\begin{array}{c|c}
6.1 & \\
\hline
6|36.6 & \text{so, } 3.66 \div 0.6 = 6.1 \\
36 & \\
\hline
06 & \\
\hline
6 & \\
\hline
0 & \\
\end{array}$$

Divide.

1. $0.08 \overline{3.684}$
2. $0.4 \overline{26}$
3. $0.25 \overline{10}$
4. $0.12 \overline{6.6}$
5. $1.2 \overline{0.312}$
6. $0.35 \overline{8.4}$
7. $0.8 \overline{548}$
8. $0.001 \overline{0.8}$
9. $0.42 \overline{14.7}$
Skills Practice
Dividing by Decimals

Divide.

1. 3.4)12.92  
2. 0.8)26.08  
3. 0.67)3.618  
4. 0.03)0.294

5. 82.65 ÷ 9.5 =  
6. 0.48 ÷ 0.6 =  
7. 34.281 ÷ 0.09 =  

8. 7.224 ÷ 0.08 =  
9. 224 ÷ 0.7 =  
10. 5.1 ÷ 0.003 =  

11. 0.07)0.868  
12. 0.046)3.0084  
13. 2.5)8.79  
14. 1.3)99.06

Divide.

15. 1.44 ÷ 0.45 =  
16. 0.3904 ÷ 0.061 =  

17. 0.5341 ÷ 0.49 =  
18. 42 ÷ 0.06 =  

19. 12 ÷ 0.005 =  
20. 32.2 ÷ 0.46 =  

21. 63.96 ÷ 7.8 =  
22. 242 ÷ 0.55 =  

23. $8.46 ÷ 1.2 =  
24. 134.13 ÷ 5.1 =  

25. 41.07 ÷ 0.5 =  
26. $36.12 ÷ 3.5 =  

Solve.

27. One type of motor-driven camera can take a picture every 0.06 second. While taking some action pictures, a photographer let the camera run for 3.6 seconds. How many pictures did the camera take?
Homework Practice

Dividing by Decimals

Divide.

1. \(14.57 \div 3.1\)  
2. \(9.7 \div 2.5\)  
3. \(8.8 \div 0.5\)

4. \(9.3 \div 0.03\)  
5. \(8.3 \div 0.010\)  
6. \(35.2 \div 6.4\)

7. \(5.9 \div 0.04\)  
8. \(3.066 \div 0.73\)  
9. \(3.4 \div 0.4\)

10. \(10.22 \div 1.4\)  
11. \(1.3425 \div 8.95\)  
12. \(111.36 \div 17.4\)

13. If you pay $2.70 for corn, and you buy 5 pounds of corn, what is the cost per pound?

14. \(14.8 \div 6\)  
15. \(76.2 \div 4\)

16. \(2.31 \div 8\)  
17. \(11.2 \div 16\)

18. \(254.9 \div 7\)  
19. \(1.5 \div 3\)

20. If you buy dirt for your garden for $104.40 and you buy 58 pounds of dirt, what is the cost per pound?
Divide. Round your answer to the nearest tenth if necessary.

1. Zachary’s pet snake eats 18 meals in 5.5 weeks. How many meals does the snake eat in 1 week?

2. The Garcia family drove 234.8 miles for a family reunion and used 9.4 gallons of gas. How many miles did they get per gallon?

3. Marco loves to jog. He jogs 3.2 miles every day. How many days would it take Marco to jog 96 miles?

4. A can of tomatoes weighs 16.5 ounces. A grocery store receives a box of canned tomatoes that weighs 412.5 ounces. How many cans of tomatoes are in the box?

5. At the school store, pencils are on sale for $0.17 each. Mara spends $1.36 on pencils. How many pencils did she buy?

6. A cheetah can sprint at a speed of 70 miles per hour. A very fast human can sprint at a speed of 14.7 miles per hour. How many times faster is the cheetah than a human?

7. Ming is making cereal bars for her school bake sale. She uses 0.3 box of cereal for each batch of bars. If Ming has 3.6 boxes, how many batches can she make?
Enrich

It’s in the Cards

Below each set of cards, a quotient is given. Use the digits on the cards to form a division sentence with that quotient. Use as many zeros as you need to get the correct number of decimal places. For example, this is how to find a division sentence for the cards at the right.

You know that \(24 \div 3 = 8\).

So, one division is \(0.0024 \div 3 = 0.0008\).

1. \(\begin{array}{ccc}4 & 5 & 6 \end{array}\) Quotient: 0.009

2. \(\begin{array}{ccc}1 & 2 & 3 \end{array}\) Quotient: 0.04

3. \(\begin{array}{ccc}3 & 5 & 7 \end{array}\) Quotient: 0.0005

4. \(\begin{array}{ccc}3 & 5 & 7 \end{array}\) Quotient: 0.0074

5. \(\begin{array}{ccc}1 & 2 & 3 \end{array}\) Quotient: 0.0155

6. \(\begin{array}{ccc}1 & 2 & 3 \end{array}\) Quotient: 0.0025

7. \(\begin{array}{ccc}1 & 2 & 4 & 8 \end{array}\) Quotient: 0.0004

8. \(\begin{array}{ccc}1 & 4 & 6 & 8 \end{array}\) Quotient: 0.03

9. \(\begin{array}{ccc}1 & 3 & 5 & 6 \end{array}\) Quotient: 0.005

10. \(\begin{array}{ccc}1 & 2 & 3 & 4 \end{array}\) Quotient: 20.65

11. \(\begin{array}{ccc}2 & 3 & 4 & 6 \end{array}\) Quotient: 0.0208

12. \(\begin{array}{ccc}3 & 4 & 5 & 6 \end{array}\) Quotient: 0.08

13. **CHALLENGE** Use the cards at the right. Write four different divisions that have the quotient 0.4.
Choose the Best Strategy

Dominique made invitations on her computer for a party. She distributed $\frac{1}{2}$ of the invitations, while her friend gave out 11. There are 5 more invitations that need to be delivered. How many invitations were there to begin with?

<table>
<thead>
<tr>
<th><strong>Step 1</strong></th>
<th><strong>Step 2</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Understand</td>
<td>Plan</td>
</tr>
<tr>
<td>Read carefully.</td>
<td>Choose a Strategy</td>
</tr>
<tr>
<td>What facts do you know?</td>
<td>Make an organized list</td>
</tr>
<tr>
<td>• Dominique distributed _____ of the invitations.</td>
<td>• Determine reasonable answers</td>
</tr>
<tr>
<td>• Her friend gave out _____ invitations.</td>
<td>• Use logical reasoning</td>
</tr>
<tr>
<td>• There are _____ invitations that still need to be delivered.</td>
<td></td>
</tr>
<tr>
<td>What do you need to find?</td>
<td>Make a plan.</td>
</tr>
<tr>
<td>• The __________________ there were to begin with.</td>
<td>Choose a strategy.</td>
</tr>
<tr>
<td></td>
<td>You can work backward to solve the problem.</td>
</tr>
<tr>
<td></td>
<td>Start with the number of invitations that still need to be delivered. Add the number of invitations that Dominique’s friend gave out.</td>
</tr>
<tr>
<td></td>
<td>Double the sum to find the number of invitations there were to begin with.</td>
</tr>
</tbody>
</table>
## Problem-Solving Investigation

### Step 3

**Solve**

**Carry out your plan.**

Add the number of invitations that still need to be delivered and the number of invitations that Dominique’s friend gave out.

\[
\text{______ + ______} = \text{_______}
\]

So, there were ______ invitations left after Dominique distributed her invitations.

Think: Dominique distributed ____ of the invitations. If there are ______ left over, they are the other half.

Add the number of invitations that Dominique distributed to the number of invitations left after she distributed hers.

\[
\text{______ + ______} = \text{_______}
\]

How many invitations were there to begin with?

### Step 4

**Check**

**Is the solution reasonable?**

Reread the problem.

How can you check your answer by working forward?

### Practice

1. The coach gives uniforms to \(\frac{1}{2}\) of the players on a soccer team. Brad helps out, giving uniforms to 3 players. James gives the remaining uniforms to 5 players. How many players are on the soccer team?

2. Leslie is \(\frac{1}{2}\) as old as Carey. Carey is 2 years older than Jennifer. Jennifer is 18 years old. How old is Leslie?

\[
\text{______}
\]
Solve. Use any strategy.

1. Matt bought a tennis racket that usually costs $73.95. He had a coupon for a discount of \(d\) dollars. The net price of the racket with the discount was \(c\) dollars. Write an equation that represents the relationship between the net price and the discount.

2. Use the equation you wrote for exercise 1 to find the net price if the discount was $7.50.

3. Brooke is making a necklace in which the first, fifth, ninth, and thirteenth beads are blue and the rest of the first 15 beads are not blue. If the necklace continues this pattern and has 50 beads in all, how many of them will be blue?

4. Create a problem that you could solve by making an organized list. Share your work with others.

5. Ms. Gonzaga ordered a bookcase that cost $89.45. The delivery fee was \(f\) dollars. The cost with the delivery fee was \(t\) dollars. Write an equation that represents the relationship between the delivery fee and the cost with the delivery fee.

6. Use the equation you wrote for exercise 5 to find the total cost if the delivery fee was $29.95.

7. A salesman spends $89 per night for 5 nights at a hotel, $219.49 for transportation, and $137.71 for food. What are his total travel expenses?

Strategy:
Solve. Use any strategy to solve.

1. Hoshi attends her ballet class each week. At class, the students dance for 2.3 hours at a time. How many hours does she dance at class in 20 weeks?

2. Seki had her friends over to play. They played a board game for 45 minutes and then played cards for 30 minutes. They built a fort for 45 minutes and painted for another 30 minutes. How long were her friends over to play?

3. Jack ordered 3 drums, 2 blankets, and 3 pairs of pants. If he paid with eight 20-dollar bills, how much change will he get back?

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blanket</td>
<td>$15.95</td>
</tr>
<tr>
<td>Pants</td>
<td>$12.99</td>
</tr>
<tr>
<td>Drum</td>
<td>$24.95</td>
</tr>
</tbody>
</table>

Divide. Round to the nearest tenth if necessary. (Lesson 6–5)

4. \(8.4 \div 0.6\) ______
5. \(0.792 \div 2.1\) ______
6. \(34.87 \div 3.8\) ______
7. \(0.19 \div 0.07\) ______
8. If you buy rocks for your garden for $2.80 a pound, how much will it be for 150 pounds?

9. If you buy the same rocks and need 3.8 times that many, how much will you pay?
Suppose that you are meeting a friend for lunch and come across the sale advertised at the right. For weeks, you have wanted to buy a set of CDs that is regularly priced at $31.98. Here is how compatible numbers can help you find the sale price of the set.

• $\frac{1}{4}$ of $31.98$ is about $\frac{1}{4}$ of $32$, or $8$.

• “$\frac{1}{4}$ off” means that you pay $1 - \frac{1}{4}$, or $\frac{3}{4}$.

• Since $\frac{1}{4}$ of $32 = 8$, $\frac{3}{4}$ of $32 = 24$.

The sale price is about $24.

Each exercise gives the regular price of one or more items. Use the information at the right to estimate the sale price.

1. video game: $23.95

2. CD: $15.95

3. headphones: $10.98

4. three packs of TRUE-CELL batteries; $5.98 per pack

5. one CD: $20.95
   one video game: $27.99

6. one set of headphones: $15.79
   two video games: $17.55 and $15.50

7. one CD: $16.95
   one set of headphones: $14.50
   one DVD: $19.98
Estimating Products of Fractions

To estimate a fraction of a whole number or mixed number, you can round the whole number or mixed number to a multiple of the denominator.

Estimate \( \frac{5}{6} \times 44 \).

Think: \( \frac{5}{6} \times 42 \)

Round the whole number to the closest multiple of the denominator.

42 is close to 44.

So, \( \frac{5}{6} \times 44 \) is about 35.

Estimate each product.

1. \( \frac{1}{5} \times 27 \)
   Denominator of fraction: ______
   Multiples of denominator: _______, _______, _______, _______, _______, _______, _______
   Estimate: \( \frac{1}{5} \times \) _______ = _______

2. \( 30 \times \frac{7}{8} \)

3. \( \frac{2}{3} \times 17 \)

4. \( 43 \times \frac{3}{5} \)

5. \( \frac{1}{6} \times 28 \)

6. \( \frac{3}{4} \times 37 \)

7. \( 29 \times \frac{3}{8} \)

8. \( \frac{4}{5} \times 34 \)

9. \( \frac{5}{6} \times 43 \)

10. \( \frac{9}{10} \times 28 \)

11. \( 39 \times \frac{7}{8} \)

12. \( \frac{2}{3} \times 20 \)

13. \( \frac{1}{3} \times 44 \)
Estimate each product.

1. \( \frac{1}{2} \times 13 \)

2. \( 7 \times \frac{3}{4} \)

3. \( \frac{4}{7} \times \frac{8}{9} \)

4. \( \frac{5}{6} \times 23 \)

5. \( \frac{21}{9} \times \frac{5}{12} \)

6. \( 17 \times \frac{2}{5} \)

7. \( 2 \frac{1}{6} \times 9 \frac{3}{4} \)

8. \( 13 \frac{7}{8} \times \frac{3}{8} \)

9. \( 6 \times 8 \frac{4}{5} \)

10. \( 31 \times \frac{2}{3} \)

11. \( \frac{2}{5} \times 24 \frac{1}{4} \)

12. \( 3 \frac{5}{6} \times 4 \frac{2}{3} \)

13. \( \frac{7}{8} \times 62 \)

14. \( 1 \frac{11}{12} \times 9 \frac{1}{5} \)

15. \( 34 \times \frac{1}{6} \)

Estimate to compare. Write >, < or =.

16. \( 34 \times \frac{3}{4} \) \( 59 \frac{5}{6} \times \frac{4}{9} \)

17. \( \frac{3}{8} \times 33 \) \( \frac{5}{8} \times 10 \frac{1}{4} \)

Solve.

18. Teresa rode \( 6 \frac{7}{10} \) miles on her bike in one hour. If she continues at this pace, about how far could she ride in 5 hours?

19. Chan is riding his bike on a 48-mile cross-country course. He knows that \( \frac{2}{5} \) of the course is uphill. About how many miles will Chan have to ride uphill?
Estimate each product.

1. \(36 \times \frac{1}{5}\) _____
2. \(\frac{5}{8} \times 100\) _____

3. \(\frac{1}{3} \times 23\) _____
4. \(\frac{2}{3} \times 76\) _____

5. \(\frac{5}{7} \times \frac{1}{8}\) _____
6. \(\frac{4}{5} \times \frac{7}{8}\) _____

Estimate the area of the rectangle.

7. The length is \(4\frac{6}{8}\) feet and the width is \(7\frac{2}{8}\) feet.

8. The width is \(24\frac{3}{5}\) feet and the length is \(8\frac{2}{3}\) feet.

9. A garden measures \(5\frac{1}{3}\) feet by \(10\frac{2}{3}\) feet.

Spiral Review

Use any strategy shown below to solve. (Lesson 6–6)

- Make an organized list.
- Determine reasonable answers.
- Use logical reasoning.

10. If you pay 25 cents a pound for apples, and you buy 12 pounds of apples, what is the total amount?

11. You buy a shirt online that costs $39.30. Shipping and handling was \(d\) dollars. Write an equation that represents the relationship between the delivery fee and the total cost.
Estimating Products of Fractions

Estimate each product.

1. The baseball team practices $1 \frac{3}{4}$ hours after school. About how many hours do they practice each week?

2. Tyra has 6 bricks. Each brick is $8 \frac{1}{4}$ inches long. She lays them end-to-end to make a border in her garden. About how long is the border?

3. A living room measures $23 \frac{3}{4}$ feet wide by $23 \frac{1}{4}$ feet long. Estimate the area of the room. [Hint: To find the area, multiply the width times the length.]

4. Casey and his brother plan to baby-sit for $44 \frac{1}{2}$ hours this month. His brother plans to do $\frac{1}{5}$ of the baby-sitting. About how much time will Casey’s brother spend baby-sitting?

5. Neesa has 98 pictures from her trip to Mexico. She will take $\frac{3}{4}$ of the best shots and put them into a scrapbook. Each page can hold 4 or 5 pictures. About how many pages will she use if she puts 4 pictures on each page? If she puts 5 pictures on each page?

6. Chang has 288 baseball cards of players from his favorite teams. About one third of them are Boston players, about one sixth are Oakland players, and about one twelfth are Texas players. About how many cards do not represent players from these teams?
Mixed Numbers and Mental Math

Sometimes you can multiply a whole number and a mixed number in your head. Think of the mixed number in two parts—the whole number and the fraction.

Find each product mentally.

Example

Think: \(3 \times 10\)  
Think: \(\frac{1}{2} \) of 10

\[3\frac{1}{2} \times 10 = 30 + 5 = 35\]

1. \(7\frac{1}{2} \times 6 = \quad \quad + \quad \quad = \quad\)
2. \(4 \times 9\frac{1}{2} = \quad \quad + \quad \quad = \quad\)
3. \(4\frac{1}{3} \times 6 = \quad \quad + \quad \quad = \quad\)
4. \(5\frac{1}{4} \times 8 = \quad \quad + \quad \quad = \quad\)
5. \(15 \times 2\frac{1}{5} = \quad \quad + \quad \quad = \quad\)

Now you can use this mental math technique to make better estimates. Here’s how.

Estimate the product: \(4\frac{1}{2} \times 11\frac{7}{9}\)

\[4\frac{1}{2} \times 11\frac{7}{9} \rightarrow 4\frac{1}{2} \times 12\]

So, \(4\frac{1}{2} \times 11\frac{7}{9}\) is about 54.

\[4\frac{1}{2} \times 12 = 4 \times 12 + \frac{1}{2} \text{ of } 12\]

\[= 48 + 6\]

\[= 54\]

Estimate each product.

6. \(6\frac{1}{2} \times 4\frac{2}{11}\)
7. \(5\frac{1}{3} \times 8\frac{9}{10}\)
8. \(11\frac{15}{16} \times 2\frac{1}{4}\)
9. \(5\frac{7}{10} \times 4\frac{1}{6}\)
Reteach

Multiplying Fractions

To multiply a fraction by a fraction, multiply the numerators and the denominators. Then simplify the product.

\[
\frac{2}{3} \times \frac{5}{8} = \frac{2 \times 5}{3 \times 8} = \frac{10}{24} = \frac{10 \div 2}{24 \div 2} = \frac{5}{12}
\]

When the numerator and denominator of either fraction have a common factor, you can simplify before you multiply. Divide the numerator and the denominator by their GCF (greatest common factor).

Look at the numerator, 2, and the denominator, 8. Their GCF is 2, so divide both 2 and 8 by 2.

Look at the other numerator, 5, and the other denominator, 3. Their GCF is 1, so dividing won’t change the answer.

Now multiply. The product is already in simplest form.

\[
\frac{2}{3} \times \frac{5}{8} = \frac{1 \times 5}{3 \times 4} = \frac{5}{12}
\]

Multiply. Write in simplest form.

1. \( \frac{3}{5} \times \frac{1}{4} = \frac{3 \times 1}{5 \times 4} = \)

2. \( \frac{4}{7} \times \frac{5}{6} = \frac{4 \times 5}{7 \times 6} = \)

3. \( \frac{5}{6} \times \frac{9}{10} = \frac{5 \times 9}{6 \times 10} = \)

4. \( \frac{4}{5} \times \frac{5}{8} = \frac{4 \times 5}{5 \times 8} = \)

5. \( \frac{1}{2} \times \frac{3}{4} = \)

6. \( \frac{1}{6} \times \frac{4}{5} = \)

7. \( \frac{3}{8} \times \frac{5}{6} = \)

8. \( \frac{2}{9} \times \frac{3}{10} = \)

9. \( \frac{1}{12} \times \frac{1}{3} = \)

10. \( \frac{5}{16} \times \frac{2}{5} = \)
Multiply. Write in simplest form.

1. \( \frac{1}{2} \times \frac{3}{8} = \) _____
2. \( \frac{7}{12} \times \frac{4}{5} = \) _____
3. \( \frac{3}{4} \times \frac{1}{9} = \) _____
4. \( \frac{4}{9} \times \frac{5}{6} = \) _____
5. \( \frac{3}{4} \times \frac{1}{3} = \) _____
6. \( \frac{5}{8} \times \frac{3}{10} = \) _____
7. \( \frac{2}{9} \times \frac{1}{2} = \) _____
8. \( \frac{3}{5} \times \frac{3}{8} = \) _____
9. \( \frac{8}{9} \times \frac{5}{16} = \) _____
10. \( \frac{1}{5} \times \frac{7}{12} = \) _____
11. \( \frac{3}{10} \times \frac{1}{4} = \) _____
12. \( \frac{5}{7} \times \frac{7}{9} = \) _____
13. \( \frac{9}{20} \times \frac{2}{3} = \) _____
14. \( \frac{3}{5} \times \frac{7}{12} = \) _____
15. \( \frac{1}{16} \times \frac{8}{9} = \) _____
16. \( \frac{2}{3} \times \frac{3}{5} = \) _____
17. \( \frac{2}{7} \times \frac{13}{20} = \) _____
18. \( \frac{4}{5} \times \frac{7}{16} = \) _____

Evaluate each expression if \( a = \frac{1}{4} \) and \( b = \frac{2}{5} \).

19. \( ab \) _____
20. \( 4a \) _____
21. \( 8b \) _____
22. \( \frac{6}{7} a \) _____
23. \( 15b \) _____
24. \( \frac{5}{6} b \) _____

25. Each year the Gardners plant \( \frac{7}{8} \) of an acre with tomatoes. They sell half of what they grow at a roadside stand. What part of an acre do the Gardners use for the tomatoes they sell?

26. The Wilsons’ garden covers \( \frac{5}{8} \) acre. One fourth of the garden is planted with flowers. The rest is vegetables. What part of an acre is planted with flowers? With vegetables?
Multiply. Write in simplest form.

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

Evaluate each expression if $a = \frac{1}{2}$, $b = \frac{3}{8}$, and $c = \frac{4}{5}$.

7. $5a$
8. $15c$
9. $\frac{1}{3}c$
10. $\frac{3}{4}a + \frac{2}{3}c$
11. $ab + c$
12. $\frac{4}{7}b$

13. You pay $\frac{1}{6}$ the price for apples as compared to grapefruit. If the grapefruit is $2.99 per pound, how much do you pay for apples per pound?

Spiral Review

Estimate each product. (Lesson 6–7)

14. $\frac{6}{7} \times \frac{1}{4}$
15. $\frac{1}{5} \times 31$
16. $\frac{2}{3} \times 61$
17. $11 \frac{1}{4} \times 7 \frac{1}{10}$
18. $\frac{1}{3} \times 28$
19. $2 \frac{7}{9} \times 6 \frac{1}{4}$
Problem-Solving Practice

Multiplying Fractions

Solve.

1. Renee wants to make a $\frac{1}{4}$ batch of muffins. If the full recipe calls for $\frac{1}{2}$ cup of milk, how much milk must she use for this smaller batch?

2. Rob spends $\frac{1}{2}$ hour each day caring for his pets. He spends $\frac{1}{2}$ of the time taking care of his birds. How much time does Rob spend taking care of his birds?

3. It will take Jordan $\frac{1}{2}$ a day to do the yard work around the house. He decides to spend $\frac{1}{3}$ of that time mowing the lawn. How much time does Jordan spend doing other yard work?

4. Anya needs to divide $\frac{2}{3}$ gallon of milk equally between her two friends. How much milk will each friend get?

5. Two-fifths of Troy’s card collection are postcards. Of these postcards, one-third are from Boston and one-sixth are from New York. What fraction of Troy’s cards are from Boston and New York?

6. If Troy decides to give one-fourth of his baseball cards to his brother and one-sixth of his baseball cards to his cousin, what fraction of his cards will he have left?
Sometimes an operation involves both fractions and decimals. To perform the operation, you need to express all the numbers in the same form. Here are two examples.

\[
\frac{1}{5} \div 0.3 = \frac{1}{5} \div \frac{3}{10} \quad \Leftarrow \text{Express the decimal as a fraction}
\]
\[
= \frac{1}{5} \times \frac{10}{3} = \frac{2}{3}
\]

\[
\frac{3}{4} + 0.115 = 0.75 + 0.115 \quad \Leftarrow \text{Express the fraction as a decimal}
\]
\[
= 0.865
\]

Perform the operation. Express the answer as a fraction in simplest form.

1. \(\frac{5}{16} \div 0.25\)  
2. \(0.6 \div 7\)  
3. \(0.125 \times \frac{4}{11}\)  
4. \(1 \frac{1}{5} \times 0.3\)  
5. \(0.8 - \frac{3}{5}\)  
6. \(1 \frac{3}{8} - 0.875\)

Perform the operation. Express the answer as a decimal.

7. \(0.34 \div \frac{1}{5}\)  
8. \(\frac{1}{8} \div 0.005\)  
9. \(0.001 \times \frac{3}{5}\)  
10. \(6.39 + \frac{7}{8}\)  
11. \(9.1 - \frac{1}{4}\)  
12. \(\frac{3}{8} + 0.709 + \frac{2}{5}\)

13. Kevin is making one recipe that calls for \(1 \frac{1}{4}\) pounds of hamburger and another that calls for 2 pounds. In the store, he finds a family pack of hamburger that is labeled 3.75 pounds. Is this more or less than he needs? How much more or less?

14. Daneesha needs \(1 \frac{1}{2}\) yards of material to make a jacket and \(1 \frac{3}{4}\) yards of material to make a skirt. The material costs $7.50 per yard. What is the total cost of the material for the skirt and jacket? Round your answer to the nearest cent.
Reteach

Multiplying Mixed Numbers

When you multiply with mixed numbers, write the mixed numbers as improper fractions. Then multiply as with fractions.

Multiply $2 \frac{4}{5} \times 1 \frac{2}{3}$.

Write the mixed numbers as fractions.

\[
\begin{align*}
2 \frac{4}{5} & \times 1 \frac{2}{3} \\
\downarrow & \quad \downarrow \\
\frac{14}{5} & \times \frac{5}{3}
\end{align*}
\]

Divide a numerator and a denominator by their GCF, if possible. Then multiply and simplify the product.

\[
\frac{14}{5} \times \frac{5}{3} = \frac{14 \times 1}{1 \times 3} = \frac{14}{3} = 4 \frac{2}{3}
\]

Multiply. Write in simplest form.

1. $2 \frac{3}{4} \times 2 \frac{1}{3}$

\[
\begin{array}{c}
\frac{4}{3} \times \frac{3}{1} = \frac{4 \times 3}{3} = \frac{12}{3} = 4
\end{array}
\]

2. $2 \frac{1}{6} \times \frac{3}{4}$

\[
\begin{array}{c}
\frac{7}{6} \times \frac{3}{4} = \frac{7 \times 3}{6 \times 4} = \frac{21}{24} = \frac{7}{8}
\end{array}
\]

3. $1 \frac{7}{9} \times 1 \frac{3}{4}$

\[
\begin{array}{c}
\frac{16}{9} \times \frac{7}{4} = \frac{16 \times 7}{9 \times 4} = \frac{112}{36} = \frac{28}{9} = 3 \frac{1}{3}
\end{array}
\]
Skills Practice

Multiplying Mixed Numbers

Multiply. Write in simplest form.

1. \(2 \frac{1}{3} \times 5 \frac{2}{5} = \) 
2. \(3 \frac{1}{9} \times 4 \frac{5}{6} = \) 
3. \(3 \frac{3}{4} \times 4 \frac{5}{6} = \)

4. \(1 \frac{3}{10} \times 3 \frac{1}{6} = \)
5. \(4 \frac{1}{2} \times 6 \frac{1}{3} = \)
6. \(6 \frac{7}{10} \times \frac{1}{4} = \)

7. \(8 \frac{5}{8} \times 7 \frac{3}{5} = \)
8. \(3 \frac{1}{6} \times 4 \frac{5}{6} = \)
9. \(4 \frac{2}{9} \times 3 \frac{1}{6} = \)

10. \(3 \frac{2}{3} \times 2 \frac{1}{2} = \)
11. \(3 \frac{3}{4} \times 2 \frac{2}{5} = \)
12. \(1 \frac{1}{8} \times 1 \frac{3}{10} = \)

13. \(8 \frac{5}{6} \times 7 \frac{1}{9} = \)
14. \(6 \frac{1}{5} \times 3 \frac{3}{4} = \)
15. \(5 \frac{3}{5} \times 6 \frac{3}{7} = \)

16. \(2 \frac{7}{10} \times 4 \frac{1}{9} = \)
17. \(12 \frac{1}{2} \times 7 \frac{3}{5} = \)
18. \(6 \frac{3}{4} \times 8 \frac{7}{8} = \)

19. \(10 \frac{9}{10} \times \frac{1}{3} = \)
20. \(6 \frac{7}{9} \times \frac{1}{4} = \)
21. \(4 \frac{3}{8} \times 17 \frac{1}{2} = \)

Solve.

22. The Parks Department uses \(1 \frac{3}{4}\) gallons of paint for each picnic shelter. At the end of the first day, the workers had painted \(2 \frac{1}{2}\) shelters. How much paint had they used that day?

23. While cleaning up around the picnic shelters, the workers filled \(6 \frac{1}{2}\) plastic bags with trash. If the average weight of a bag was \(3 \frac{3}{4}\) pounds, how many pounds of trash were collected?
Multiply. Write in simplest form.

1. \( \frac{1}{2} \times 5\frac{1}{4} \)  
2. \( \frac{3}{5} \times 2\frac{2}{3} \)  
3. \( 4\frac{3}{4} \times 2 \)  
4. \( \frac{4}{9} \times 3\frac{2}{8} \)  
5. \( \frac{1}{2} \times 4\frac{2}{3} \times \frac{3}{5} \)  
6. \( 1\frac{1}{3} \times \frac{5}{8} \times 9\frac{3}{4} \)  

Evaluate each expression if \( x = 3\frac{1}{3} \), \( y = \frac{2}{3} \), and \( z = 2\frac{3}{5} \).

7. \( 5y \)  
8. \( 3z \)  
9. \( \frac{1}{3}z \)  
10. \( \frac{3}{4} \times 2\frac{2}{3} \times \frac{6}{7} \)  
11. \( \frac{1}{2} \times 5\frac{6}{7} \times 4\frac{6}{7} \)  

12. You pay \( \frac{1}{6} \) the price for apples as compared to mangoes. If mangoes are $4.99 per pound, how much do you pay for apples per pound?

Spiral Review

Multiply. Write in simplest form. (Lesson 6–8)

13. \( \frac{1}{3} \times \frac{1}{2} \)  
14. \( \frac{1}{5} \times 50 \)  
15. \( \frac{2}{5} \times \frac{5}{13} \)  
16. \( \frac{3}{4} \times \frac{2}{3} \)  
17. \( \frac{1}{8} \times 56 \)  
18. \( \frac{7}{9} \times \frac{2}{3} \)
Problem-Solving Practice

Multiplying Mixed Numbers

Multiply. Write in simplest form.

1. Erin usually walks $6\frac{3}{5}$ blocks for exercise. One day, she walks $1\frac{4}{11}$ times as far. How far did she walk?

   ______ blocks

2. Felix collected $4\frac{3}{8}$ bags of trash along the highway. His friend Kenji picked up $2\frac{1}{5}$ times as much. How much trash did Kenji collect?

   ______ bags

3. Aaron built a model of his favorite airplane. The length of the model is $1\frac{1}{4}$ times its width. If its width is $7\frac{1}{2}$ inches, how long is the model?

   ______ inches

4. Mr. Craig moved to a new house. He drove $4\frac{1}{8}$ miles to his job from his old house. From his new house, he has to drive $1\frac{3}{5}$ times as far. How far does he have to drive to work now?

   ______ miles

5. Chris collects rocks. She has 54 different types. Her friend Jenny has $1\frac{1}{3}$ times as many rocks as Chris has, and their friend Julie has $1\frac{1}{4}$ times as many as Jenny has. How many rocks does Julie have?

   ______ rocks

6. David is planting an L-shaped vegetable garden. He measures the length and width of each section and draws the sketch below. Use his diagram to find the area of the garden. (Remember that area is found by multiplying length and width.)

   ______ square feet
Rewrite the recipe for a new serving size.

Pancakes (serves 6)

- $3\frac{3}{4}$ cups flour
- $1\frac{1}{2}$ tsp. salt
- 4 eggs
- $1\frac{3}{4}$ cups milk
- $1\frac{3}{4}$ T baking powder
- $\frac{1}{2}$ cup sugar
- $1\frac{1}{2}$ T canola oil

Pancakes (serves 8)

- _____ cups flour
- _____ T baking powder
- _____ tsp. salt
- _____ cup sugar
- _____ eggs
- _____ T canola oil
- _____ cups milk
Dividing Fractions

Dividing by a fraction is the same as multiplying by its reciprocal.

Divide $\frac{7}{8} \div \frac{3}{4}$.

**Step 1:** Find the reciprocal of the divisor. The divisor is $\frac{3}{4}$.

The reciprocal of $\frac{3}{4}$ is $\frac{4}{3}$.

**Step 2:** Multiply by the reciprocal of the divisor.

$$\frac{7}{8} \times \frac{4}{3} = \frac{7}{6}$$

**Step 3:** Simplify.

$$\frac{7}{6} = 1\frac{1}{6}$$

Divide $\frac{5}{8} \div 3$.

**Step 1:** Find the reciprocal of the divisor. The divisor is $\frac{3}{1}$, or $\frac{3}{1}$.

The reciprocal of $\frac{3}{1}$ is $\frac{1}{3}$.

**Step 2:** Multiply by the reciprocal of the divisor.

$$\frac{5}{8} \times \frac{1}{3} = \frac{5}{24}$$

**Divide. Write each quotient in simplest form.**

1. $\frac{3}{4} \div \frac{7}{8}$
   $$\frac{3}{4} \times \frac{8}{7} = \frac{24}{28} = \frac{6}{7}$$

2. $\frac{1}{2} \div \frac{3}{5}$
   $$\frac{1}{2} \times \frac{5}{3} = \frac{5}{6}$$

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

4. $8 \div \frac{1}{3}$
   $$8 \div \frac{1}{3} = 8 \times 3 = 24$$
Find the reciprocal of each number.

1. \( \frac{2}{3} \)  
2. \( \frac{3}{5} \)  
3. \( \frac{1}{7} \)  
4. \( \frac{5}{6} \) 
5. 3  
6. \( \frac{7}{8} \)  
7. \( \frac{1}{4} \)  
8. \( \frac{11}{12} \)  
9. 5  
10. 2  
11. \( \frac{5}{4} \)  
12. 8  

Divide. Write in simplest form.

13. \( \frac{1}{3} \div \frac{1}{4} = \)  
14. \( \frac{1}{2} \div \frac{4}{5} = \)  
15. \( \frac{2}{3} \div 8 = \)  
16. \( \frac{8}{9} \div \frac{2}{3} = \)  
17. \( \frac{5}{8} \div \frac{3}{4} = \)  
18. \( \frac{3}{4} \div \frac{2}{5} = \)  
19. \( \frac{5}{6} \div 5 = \)  
20. \( \frac{2}{5} \div \frac{4}{5} = \)  
21. \( \frac{1}{3} \div 9 = \)  
22. \( \frac{5}{8} \div \frac{1}{4} = \)  
23. \( \frac{4}{5} \div 7 = \)  
24. \( \frac{1}{3} \div \frac{2}{3} = \)  
25. \( 6 \div \frac{1}{4} = \)  
26. \( \frac{7}{9} \div 2 = \)  
27. \( \frac{3}{8} \div \frac{1}{2} = \)  

28. It takes \( \frac{7}{8} \) inch of wire to make a small paper clip. How many small paper clips can be made from a piece of wire that is 14 inches long?
Find the reciprocal of each number.

1. \( \frac{2}{3} \)  
2. \( \frac{7}{8} \)  

Divide. Write in simplest form.

3. \( \frac{1}{2} ÷ \frac{3}{4} \)  
4. \( \frac{3}{5} ÷ \frac{2}{3} \)  
5. \( \frac{3}{4} ÷ 2 \)  
6. \( \frac{4}{9} ÷ \frac{2}{8} \)  
7. \( \frac{2}{3} ÷ \frac{2}{5} \)  
8. \( \frac{1}{3} ÷ \frac{5}{8} \)  

Evaluate each expression if \( x = \frac{2}{3} \), \( y = \frac{1}{4} \), and \( z = \frac{3}{4} \).

9. \( y ÷ x \)  
10. \( z ÷ y \)  
11. \( 3x ÷ z \)  

12. You pay \( \frac{1}{3} \) the price for beans as compared to pineapple. If pineapple is $5.99 per pound, how much do you pay for beans per pound?

\[
\text{You pay } \frac{1}{3} \times 5.99 = \frac{5.99}{3} \text{ per pound.}
\]

Spiral Review

Multiply. Write in simplest form. (Lesson 6–9)

13. \( \frac{1}{2} \times 2 \frac{3}{4} \)  
14. \( \frac{1}{8} \times 2 \frac{1}{2} \)  
15. \( \frac{3}{4} \times 2 \frac{5}{6} \)  
16. \( 6 \frac{1}{5} \times 3 \frac{3}{4} \)  
17. \( \frac{3}{5} \times 2 \frac{2}{3} \)  
18. \( 3 \frac{4}{5} \times 4 \frac{1}{3} \)  

Evaluate each expression if \( a = 1 \frac{1}{4} \), \( b = 3 \frac{1}{3} \), and \( c = 2 \frac{1}{2} \).

19. \( \frac{3}{4}b \)  
20. \( \frac{1}{2}a \)  
21. \( ac \)
Divide. Write in simplest form.

1. Lynn made several pans of lasagna. Each piece is \( \frac{1}{12} \) of a pan. How many pieces were in five pans of lasagna?

   
   ______ pieces

2. Chi feeds his cat \( \frac{3}{4} \) cup of food each day. How many days can he feed his cat with 6 cups of food?

   
   ______ days

3. Zane made a recipe for a cake that requires 2 teaspoons of cinnamon. The only measuring spoon he had measures \( \frac{1}{4} \) teaspoon. How many times must he use this measuring spoon to get the correct amount of cinnamon?

   
   ______ times

4. Leigh is planning a birthday party for her little sister. She bought 5 pounds of candy to fill a piñata. If each child at the party receives \( \frac{1}{6} \) pound of candy, how many children will be at the party?

   
   ______ children

5. Steve made a fruit salad for dinner. The recipe called for 4 cups of apples, \( 2\frac{1}{2} \) cups of nuts, 2 cups of celery, and \( \frac{1}{2} \) cup of raisins. If each person eats \( \frac{1}{2} \) cup of the salad, how many people will the salad serve?

   
   ______ people

6. Anita is placing mulch around her trees and shrubs. She bought 20 pounds of mulch. If each tree or shrub requires \( \frac{2}{3} \) pound of mulch, how many trees and shrubs can she mulch?

   
   ______ shrubs and trees
Modeling Division of Fractions on a Ruler

How many half-inch lengths are in 4 inches? When you look at a ruler, it is easy to see that the answer is 8.

So, this diagram is also a model for the division, \(4 \div \frac{1}{2} = 8\).

Write the division that is modeled in each diagram.

1.

2.

3.

4.

5. Use the ruler below. Create a model for the division \(4 \frac{2}{3} \div \frac{2}{3} = 7\).
Divide $5\frac{1}{3} \div 2\frac{2}{5}$.

**Step 1** Write each mixed number as an improper fraction.

$5\frac{1}{3} \div 2\frac{2}{5} = \frac{16}{3} \div \frac{12}{5}$

**Step 2** Find the reciprocal of the divisor.

$\frac{12}{5} \rightarrow \frac{5}{12}$

**Step 3** Multiply $\frac{16}{3}$ by the reciprocal.

$\frac{16}{3} \div \frac{12}{5} = \frac{16}{3} \times \frac{5}{12} = \frac{20}{9} = 2\frac{2}{9}$

So, $5\frac{1}{3} \div 2\frac{2}{5} = 2\frac{2}{9}$.

Divide. Write in simplest form.

1. $\frac{1}{5} \div \frac{1}{3} = \underline{\hspace{1cm}}$
2. $\frac{8}{9} \div \frac{2}{3} = \underline{\hspace{1cm}}$
3. $45 \div 2\frac{1}{2} = \underline{\hspace{1cm}}$
4. $15\frac{1}{2} \div 2 = \underline{\hspace{1cm}}$
5. $52 \div 3\frac{1}{4} = \underline{\hspace{1cm}}$
6. $12 \div 3\frac{1}{3} = \underline{\hspace{1cm}}$
7. $32 \div 5\frac{1}{3} = \underline{\hspace{1cm}}$
8. $2\frac{1}{5} \div 2\frac{1}{2} = \underline{\hspace{1cm}}$
9. $6\frac{1}{2} \div \frac{1}{4} = \underline{\hspace{1cm}}$
10. $1\frac{3}{4} \div 4\frac{3}{8} = \underline{\hspace{1cm}}$
11. $2\frac{2}{5} \div 7\frac{1}{5} = \underline{\hspace{1cm}}$
12. $1\frac{1}{4} \div \frac{9}{10} = \underline{\hspace{1cm}}$
13. $2\frac{5}{8} \div 1\frac{3}{4} = \underline{\hspace{1cm}}$
14. $1\frac{3}{4} \div 3\frac{7}{8} = \underline{\hspace{1cm}}$
15. $1\frac{3}{10} \div 2\frac{3}{5} = \underline{\hspace{1cm}}$
Skills Practice

Dividing Mixed Numbers

Solve.

1. \( \frac{2}{5} \div \frac{1}{8} = \frac{2}{5} \times = = \)
2. \( \frac{3}{4} \div \frac{3}{7} = \frac{3}{4} \times = = \)
3. \( \frac{3}{5} \div 5 = \frac{3}{5} \times = \)
4. \( \frac{2}{3} \div \frac{3}{19} = \frac{2}{3} \times = = \)

Divide. Write in simplest form.

5. \( \frac{3}{10} \div \frac{4}{5} = \)
6. \( \frac{3}{8} \div 3 = \)
7. \( 3 \div 1 \frac{4}{5} = \)
8. \( 2 \frac{1}{5} \div 1 \frac{5}{6} = \)
9. \( 1 \frac{1}{2} \div \frac{3}{6} = \)
10. \( \frac{1}{4} \div \frac{1}{8} = \)
11. \( 1 \frac{7}{8} \div 5 \frac{8}{8} = \)
12. \( 1 \frac{3}{4} \div 1 \frac{16}{16} = \)
13. \( 3 \div \frac{3}{8} = \)
14. \( \frac{4}{5} \div \frac{4}{7} = \)
15. \( \frac{7}{8} \div \frac{7}{9} = \)
16. \( 6 \frac{1}{2} \div 2 \frac{1}{6} = \)

Evaluate each expression if \( a = \frac{1}{2}, \ b = \frac{4}{5}, \) and \( c = \frac{3}{4} \).

17. \( ab \div c = \)
18. \( (c \div a) \times b = \)
19. \( c \div b = \)
20. \( a \div b = \)
21. \( 8c \div a = \)
22. \( ab \div \frac{1}{5} = \)

Problem Solving

23. Joe had a piece of string \( 8 \frac{3}{4} \) feet long. He cut it into small pieces. Each piece is \( 1 \frac{3}{4} \) feet long. How many pieces did he cut?

24. Brenda had \( 5 \frac{1}{4} \) quarts of paint. She used the paint for 3 art projects. She used the same amount of paint for each art project. How much paint did she use for each art project?
Divide. Write in simplest form.

1. \( \frac{2}{3} \div \frac{7}{8} \)  
2. \( \frac{7}{8} \div \frac{1}{3} \)  
3. \( 8 \div \frac{3}{4} \)  
4. \( 5 \frac{3}{5} \div \frac{2}{3} \)  
5. \( 12 \div \frac{3}{4} \)  
6. \( \frac{4}{9} \div \frac{1}{8} \)  
7. \( 3 \frac{1}{2} \div \frac{2}{3} \)  
8. \( 3 \frac{1}{3} \div 4 \frac{5}{8} \)  

Evaluate each expression if \( x = 6 \), \( y = 3 \frac{4}{5} \), and \( z = 1 \frac{1}{2} \).

9. \( y \div x \)  
10. \( x \div z \)  
11. \( \frac{1}{3}z \)  

12. How many full \( \frac{7}{8} \) pound jars of jelly can Alexa make from \( 9 \frac{12}{13} \) pounds of jelly?

Spiral Review

Divide. Write in simplest form. (Lesson 6–10)

13. \( \frac{3}{4} \div \frac{1}{2} \)  
14. \( \frac{3}{5} \div \frac{7}{8} \)  
15. \( \frac{1}{8} \div \frac{4}{5} \)  

Find the value of each expression if \( a = \frac{1}{4} \), \( b = \frac{1}{2} \), and \( c = \frac{2}{5} \).

16. \( c \div a \)  
17. \( a \div b + c \)  
18. \( b \div c \)
1. You are making bags of oranges. You have 3 baskets of oranges and each basket holds $2\frac{1}{8}$ pounds of oranges. How many bags can you make that are $\frac{1}{2}$ pound?

2. A farmer harvests $75\frac{5}{6}$ pounds of beans a day. The farmer works $8\frac{1}{3}$ hours each day. How many pounds of beans does he harvest each hour?

3. If you are laying out a photo page and have each photo cut to $3\frac{2}{5}$ inches wide, how many can you fit in a row that is $27\frac{1}{5}$ inches long? There are no spaces between the photos.

4. If you cut blankets from a piece of fleece that is $2\frac{1}{4}$ yards long, how many $\frac{3}{4}$ yard pieces will you cut?

5. How many $8\frac{3}{4}$ ounce steaks can you make from $61\frac{1}{4}$ ounces of meat?

6. If you drive $240\frac{1}{2}$ miles on your trip in $10\frac{3}{4}$ hours, how many miles per hour did you travel? Write in simplest form.
Riddle: What do the emu, the cassowary, and the ostrich have in common?

To find out, find the following quotients. Then, find the quotients at the bottom of the page and put the letter of each above the answer.

F. \( \frac{8}{3} = \) ______

Y. \( \frac{3}{4} \div \frac{3}{5} = \) ______

D. \( \frac{5}{8} \div 9 = \) ______

A. \( \frac{7}{12} \div \frac{5}{9} = \) ______

E. \( \frac{5}{9} \div 15\frac{5}{9} = \) ______

L. \( \frac{3}{16} \div \frac{7}{8} = \) ______

I. \( 26 \div 7\frac{2}{9} = \) ______

---

\[ 3\frac{1}{2}, 49, \frac{1}{28}, \frac{5}{24}, 1\frac{1}{20}, 20\frac{1}{4}, \frac{1}{28}, 27, 40, 3\frac{3}{5}, 20\frac{1}{4}, \frac{5}{72}, \frac{1}{72} \]

---

\[ 3\frac{1}{2}, 49, 1\frac{1}{20}, 3\frac{1}{2}, \frac{7}{27}, 1\frac{1}{20}, 2\frac{7}{9}, 3\frac{1}{2}, 12, \frac{3}{14}, \frac{5}{24} \]
## Individual Progress Checklist

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<td>estimate and find the product of decimals and whole numbers</td>
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<tr>
<td></td>
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<td>multiply and divide decimals</td>
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<td>estimate products of fractions using compatible numbers and rounding</td>
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<td>multiply and divide fractions and mixed numbers</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>solve problems by determining reasonable answers</td>
<td></td>
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### Notes

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Chapter Diagnostic Assessment

Multiply.
1. $23 \times 15 =
2. $43 \times 21 =
3. $52 \times 99 =
4. $33 \times 21 =
5. $743 \times 34 =
6. The average child gets 10 hours of sleep each night. How many total hours of sleep does the average child get in one year (365 days)?

Divide.
7. $1,360 \div 16 =
8. $820 \div 20 =
9. $1,240 \div 62 =
10. $1,000 \div 50 =
11. $816 \div 24 =
12. Four friends went to a concert together. They spent $228 on tickets. If they split the cost evenly, how much did each person spend?

Write each number as an improper fraction.
13. $1 \frac{1}{15}$
14. $1 \frac{3}{5}$
15. $3 \frac{1}{5}$
16. Angie practiced her clarinet for $2 \frac{3}{4}$ hours last week. Write this time as an improper fraction.

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Multiply or divide.

1. $6 \times 1.5 = $
2. $14.08 \times 3 = $
3. $0.005 \times 5 = $
4. $\$199.90 \times 4 = $
5. $165.8 \div 2 = $
6. $35.6 \div 4 = $
7. $0.33 \div 0.22 = $
8. $0.65 \div 0.05 = $

Estimate each product.

9. $\frac{4}{10} \times 50 = $
10. $10 \times 4\frac{3}{11} = $
11. $3\frac{5}{6} \times 6\frac{1}{12} = $
12. $8\frac{3}{4} \times \frac{1}{3} = $

Multiply or divide. Write in simplest form.

13. $\frac{5}{7} \times \frac{2}{3} = $
14. $2\frac{3}{8} \times 5\frac{1}{2} = $
15. $\frac{8}{9} \div \frac{1}{3} = $
16. $1\frac{1}{4} \div 5\frac{2}{3} = $
Multiply.

1. $6 \times 4.7$

2. $2.9 \times 9$

3. $7 \times 7.2$

4. $8.2 \times 2.4$

5. $4.3 \times 3.4$

6. $2.8 \times 6.9$

7. $4.7 \times 2.7$

8. $4.5 \times 1.9$

Solve. Determine whether the answer is reasonable.

9. You spend $39.45 on school supplies, and you pay with four 10-dollar bills. Is it reasonable to say you will receive about $0.50 as change? If not, write a reasonable answer.

10. If you have a room that is 12 feet wide and 11 feet long. Is it reasonable to say that your room has an area of about 23 square feet? If not, write a reasonable answer.
Quiz 2  (Lessons 6–4 through 6–6)

**Divide.**

1. \(18 \div 0.15\)
2. \(7 \div 0.35\)
3. \(49 \div 3.5\)
4. \(6.84 \div 1.9\)
5. \(3.60 \div 18\)
6. \(90.39 \div 6.9\)
7. \(300.235 \div 74.5\)
8. \(68.88 \div 12.3\)

**Solve.**

9. If you walk 2 miles 3 times a week, how many miles do you walk in 12 weeks?

10. You have 5 boards that are each 10 feet long. You cut each board into 5-foot shelves. How many shelves do you have?

11. Find the mean of 6.5, 5.4, 4.8, and 5.7.
Multiply or divide. Write in simplest form.

1. \( \frac{1}{3} \times \frac{1}{4} \)
2. \( \frac{5}{6} \times \frac{4}{7} \)
3. \( 2 \frac{2}{3} \times 4 \)
4. \( 4 \frac{1}{9} \div \frac{1}{3} \)
5. \( 6 \div 3 \frac{7}{9} \)
6. \( 2 \frac{4}{5} \div \frac{2}{15} \)

Find the value of each expression if \( a = 3 \frac{5}{6}, b = \frac{2}{3}, \) and \( c = 1 \frac{5}{9} \).

7. \( a \div b \)
8. \( bc \)
9. \( \frac{a}{c} \)

Solve.

10. If you run \( \frac{4}{5} \) mile a day, how many miles do you run in 10 days?
11. Lavinia is feeding birds from a 10-pound bag of seed. If each bird gets \( \frac{1}{5} \) pound, how many birds can she feed with one bag?
12. How many \( \frac{1}{8} \)-pound meatballs can be made from \( 2 \frac{1}{2} \) pounds of ground meat?
Divide. Round to the nearest hundredth if necessary.

1. \( 9 \times 1.5 \)
   - A. 135
   - B. 13.5
   - C. 1.35
   - D. 0.14
   1. ____

2. \( 3.9 \times 7 \)
   - F. 21.3
   - G. 21.6
   - H. 24.6
   - J. 27.3
   2. ____

3. \( 0.6 \times 4.7 \)
   - A. 28.2
   - B. 2.92
   - C. 2.82
   - D. 2.42
   3. ____

4. \( 4.4 \div 2.2 \)
   - F. 2
   - G. 2.2
   - H. 4
   - J. 4.4
   4. ____

5. \( 7.3 \div 3.4 \)
   - A. 0.21
   - B. 2.15
   - C. 21.47
   - D. 214.71
   5. ____

6. \( 2.8 \div 0.24 \)
   - F. 0.09
   - G. 0.67
   - H. 11.66
   - J. 11.96
   6. ____

Evaluate each expression if \( a = 47.8 \), \( b = 2.3 \), and \( c = 4.56 \). Round your answer to the nearest hundredth if necessary.

7. \( ab \)
   7. ____

8. \( c \div b \)
   8. ____

9. \( \frac{bc}{a} \)
   9. ____

Solve.

10. Find the mean of 74.6, 78.2, 75.5, 79.1.
    10. ____

11. You spend $110 on school clothing and a jacket, and you pay with six $20-bills. How much change will you receive?
    11. ____

12. If you have a garden that is 10.5 feet wide and 22.5 feet long, what is the area of your garden?
    12. ____
Match each word to its definition. Write your answers on the lines provided.

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. compatible numbers</td>
<td>2. reciprocals</td>
<td>3. scientific notation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. factor</td>
<td>5. numerator</td>
<td>6. denominator</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. quotient</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A.</strong> A number that divides into a whole number evenly.</td>
<td><strong>B.</strong> The number above the bar in a fraction; the part of the fraction that tells how many of the equal parts are being used.</td>
</tr>
<tr>
<td><strong>C.</strong> The bottom number in a fraction.</td>
<td><strong>D.</strong> The result of a division problem.</td>
</tr>
<tr>
<td><strong>E.</strong> Two numbers whose product is 1.</td>
<td><strong>F.</strong> Expressing a number as the product of two factors where the first factor is between 1 and 10 and the second factor is a power of 10.</td>
</tr>
<tr>
<td><strong>G.</strong> Numbers in a problem or related numbers that are easy to work with mentally.</td>
<td></td>
</tr>
</tbody>
</table>
Oral Assessment

Place a few highlighters, books, and glue sticks on the table. Use pieces of paper to label them with prices: $4.87 for the books, $1.87 for the highlighters, and $2.99 for the glue sticks. Have the student act as the storeowner, and you as the customer buying products.

Read each question aloud to the student. Then write the student’s answers on the lines below the question.

1. If I wanted to buy 2 highlighters, how much would it cost?

2. If I wanted to buy 2 books and 2 glue sticks, how much would it cost?

3. If I wanted to buy one of each product, how much would it cost?

4. Tell how you got your answer.

5. If I spent $24.35 on books, how many books did I buy?

6. Tell how you got your answer.
7. On the chalkboard or a piece of paper, write the following price chart:

<table>
<thead>
<tr>
<th>Item</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sandwich</td>
<td>$2.99</td>
</tr>
<tr>
<td>Fruit Slices</td>
<td>$1.75</td>
</tr>
<tr>
<td>Yogurt</td>
<td>$1.25</td>
</tr>
<tr>
<td>Juice Drinks</td>
<td>$1.50</td>
</tr>
<tr>
<td>Muffin</td>
<td>$2.50</td>
</tr>
</tbody>
</table>

8. What is the most expensive item on the menu?

_________________________________________________________

9. Tell how you got your answer.

_________________________________________________________

10. How many juice drinks can you purchase for $10.50?

_________________________________________________________

11. If someone purchased 3 juice drinks and 3 yogurts, how much would it cost?

_________________________________________________________

12. Tell how you got your answer.

_________________________________________________________
## Chapter Project Rubric

<table>
<thead>
<tr>
<th>Score</th>
<th>Explanation</th>
</tr>
</thead>
</table>
| **3** | Student successfully completed the chapter project.  
Student demonstrated appropriate use of chapter information in completing the chapter project. |
| **2** | Student completed the chapter project with partial success.  
Student partially demonstrated appropriate use of chapter information in completing the chapter project. |
| **1** | Student did not complete the chapter project or completed it with little success.  
Student demonstrated very little appropriate use of chapter information in completing the chapter project. |
| **0** | Student did not complete the chapter project.  
Student demonstrated inappropriate use of chapter information in completing the chapter project. |
### Chapter Foldables Rubric

**Multiplying and Dividing Decimals and Fractions**

**Tab Foldables**

<table>
<thead>
<tr>
<th>Score</th>
<th>Explanation</th>
</tr>
</thead>
</table>
| 3     | Student properly assembled Foldables graphic organizer according to instructions.  
       | Student recorded information related to the chapter in the manner directed by the Foldables graphic organizer.  
       | Student used the Foldables graphic organizer as a study guide and organizational tool. |
| 2     | Student exhibited partial understanding of proper Foldables graphic organizer assembly.  
       | Student recorded most but not all information related to the chapter in the manner directed by the Foldables graphic organizer.  
       | Student demonstrated partial use of the Foldables graphic organizer as a study guide and organizational tool. |
| 1     | Student showed little understanding of proper Foldables graphic organizer assembly.  
       | Student recorded only some information related to the chapter in the manner directed by the Foldables graphic organizer.  
       | Student demonstrated little use of the Foldables graphic organizer as a study guide and organizational tool. |
| 0     | Student did not assemble Foldables graphic organizer according to instructions.  
       | Student recorded little or no information related to the chapter in the manner directed by the Foldables graphic organizer.  
       | Student did not use the Foldables graphic organizer as a study guide and organizational tool. |
Chapter Test, Form 1

Read each question carefully. Write your answer on the line provided.

Multiply or divide.

1. $7.56 \times 8 =
   \begin{align*}
   A. & \quad 56.48 \\
   B. & \quad 60.08 \\
   C. & \quad 60.48 \\
   D. & \quad 64.08 \\
   \end{align*}
   1. _____

2. $8.5 \times 3.2 =
   \begin{align*}
   F. & \quad 24 \\
   G. & \quad 24.5 \\
   H. & \quad 25.5 \\
   J. & \quad 27.2 \\
   \end{align*}
   2. _____

3. $6 \times \$5.95 =
   \begin{align*}
   A. & \quad \$36 \\
   B. & \quad \$35.95 \\
   C. & \quad \$35.70 \\
   D. & \quad \$35.30 \\
   \end{align*}
   3. _____

4. $4.7 \times 2.2 =
   \begin{align*}
   F. & \quad 11 \\
   G. & \quad 10.34 \\
   H. & \quad 10.3 \\
   J. & \quad 103.4 \\
   \end{align*}
   4. _____

5. $64.8 \div 9 =
   \begin{align*}
   A. & \quad 7.2 \\
   B. & \quad 7.23 \\
   C. & \quad 72 \\
   D. & \quad 72.3 \\
   \end{align*}
   5. _____

6. $9.3 \div 100 =
   \begin{align*}
   F. & \quad 9,300 \\
   G. & \quad 93 \\
   H. & \quad 0.93 \\
   J. & \quad 0.093 \\
   \end{align*}
   6. _____

7. $\frac{2}{9} \times \frac{3}{5} =
   \begin{align*}
   A. & \quad \frac{1}{8} \\
   B. & \quad \frac{10}{27} \\
   C. & \quad \frac{1}{15} \\
   D. & \quad \frac{2}{15} \\
   \end{align*}
   7. _____

8. $\frac{1}{6} \times \frac{3}{7} =
   \begin{align*}
   F. & \quad \frac{1}{14} \\
   G. & \quad \frac{1}{21} \\
   H. & \quad \frac{2}{21} \\
   J. & \quad \frac{7}{18} \\
   \end{align*}
   8. _____

9. $4\frac{2}{5} \times \frac{3}{10} =
   \begin{align*}
   A. & \quad 2\frac{8}{25} \\
   B. & \quad 2\frac{8}{50} \\
   C. & \quad 1\frac{8}{25} \\
   D. & \quad 1\frac{8}{50} \\
   \end{align*}
   9. _____

10. $\frac{2}{7} \div \frac{1}{2} =
    \begin{align*}
    F. & \quad \frac{6}{7} \\
    G. & \quad \frac{4}{7} \\
    H. & \quad \frac{3}{7} \\
    J. & \quad \frac{1}{7} \\
    \end{align*}
    10. _____
Chapter Test, Form 1  (continued)

11. \(6\frac{1}{3} \div 2\frac{3}{8} = \)
   - A. \(15\frac{1}{24}\)
   - B. \(6\frac{2}{3}\)
   - C. \(2\frac{2}{3}\)
   - D. \(\frac{3}{8}\)

12. \(\frac{4}{7} \div 3\frac{2}{14} = \)
   - F. \(\frac{1}{11}\)
   - G. \(\frac{2}{11}\)
   - H. \(1\frac{1}{11}\)
   - J. \(2\frac{2}{11}\)

13. \(9.7 \times 11.1 = \)
   - A. 107.67
   - B. 115.64
   - C. 117.6
   - D. 128.36

Determine which answer is reasonable.

14. \(\frac{1}{5} \times 46\)
   Which is the best estimate?
   - F. about 7
   - G. about 8
   - H. about 9
   - J. about 12

15. \(6\frac{1}{5} \times \frac{7}{15}\)
   Which is the best estimate?
   - A. about 6
   - B. about 5
   - C. about 4
   - D. about 3

16. Ella and her family are taking a trip. They drive 345.9 miles and use 12.6 gallons of gasoline. Find the number of miles per gallon.
   Round your answer to the nearest hundredth.
   - F. 27.45 miles per gallon
   - G. 27.85 miles per gallon
   - H. 2,358 miles per gallon
   - J. 4,358 miles per gallon

17. Dara earns $24 by helping her father paint walls. She saves \(\frac{1}{3}\) of it in the bank and is allowed to spend the rest. She spends \(\frac{1}{2}\) of it on a book. How much money does Dara have left to spend?
   - A. $12
   - B. $10
   - C. $8
   - D. $6

18. A 5-foot beam of wood is divided into equal-size pieces. Each piece is 5 inches long. How many pieces can be created from the beam?
   - F. 12
   - G. 9
   - H. 6
   - J. 5

19. Ellen earns $8.98 on Monday and $0.57 on Tuesday. About how many times more money did Ellen earn Monday than Tuesday?
   - A. 8
   - B. 10
   - C. 14
   - D. 16
Chapter Test, Form 2A

Read each question carefully. Write your answer on the line provided.

Multiply or divide.

1. 8.56 \times 9 =
   A. 56.48  
   B. 60.08  
   C. 77.04  
   D. 86  
   1. _____

2. 8.2 \times 3.5 =
   F. 28.7  
   G. 24.5  
   H. 25.5  
   J. 12  
   2. _____

3. 7 \times $6.95 =
   A. $36  
   B. $47.95  
   C. $48.65  
   D. $48.00  
   3. _____

4. 3.7 \times 4.2 =
   F. 11  
   G. 15.54  
   H. 10.3  
   J. 15  
   4. _____

5. 64.4 \div 7 =
   A. 9.2  
   B. 9.30  
   C. 72  
   D. 92.9  
   5. _____

6. 8.5 \div 100 =
   F. 8,500  
   G. 85  
   H. 0.085  
   J. 0.00085  
   6. _____

7. \frac{1}{3} \times \frac{1}{5} =
   A. \frac{3}{5}  
   B. \frac{2}{5}  
   C. \frac{1}{15}  
   D. \frac{1}{3}  
   7. _____

8. \frac{1}{9} \times \frac{1}{2} =
   F. \frac{1}{18}  
   G. \frac{1}{8}  
   H. \frac{1}{3}  
   J. \frac{1}{2}  
   8. _____

9. 3\frac{1}{5} \times \frac{1}{10} =
   A. \frac{8}{25}  
   B. \frac{17}{50}  
   C. \frac{31}{50}  
   D. 3\frac{1}{50}  
   9. _____

10. \frac{3}{4} \div \frac{1}{3} =
    F. 2\frac{1}{2}  
    G. 2\frac{1}{4}  
    H. 1\frac{1}{2}  
    J. \frac{1}{3}  
    10. _____
11. \( \frac{7}{12} \div \frac{1}{12} = \)
   
   A. \( \frac{1}{2} \)  
   B. \( \frac{2}{3} \)  
   C. 6  
   D. 7  

   11. _____

12. \( \frac{7}{12} \div 2\frac{5}{8} = \)
   
   F. \( 2\frac{5}{7} \)  
   G. \( 2\frac{44}{63} \)  
   H. \( 3\frac{5}{7} \)  
   J. \( 3\frac{6}{7} \)  

   12. _____

13. \( \frac{5}{6} \div 3\frac{1}{3} = \)
   
   A. \( \frac{1}{4} \)  
   B. \( \frac{1}{12} \)  
   C. \( 1\frac{1}{3} \)  
   D. 7  

   13. _____

Determine which answer is reasonable.

14. \( \frac{1}{6} \times 56 \)
   
   What is the best estimate?
   
   F. about 7  
   G. about 8  
   H. about 9  
   J. about 6  

   14. _____

15. \( 8\frac{1}{6} \times \frac{3}{4} \)
   
   What is the best estimate?
   
   A. about 6  
   B. about 5  
   C. about 4  
   D. about 3  

   15. _____

16. Darlene gets an allowance of \( \$24 \). She saves \( \frac{1}{2} \) of it in the bank and can spend the rest. She spends \( \frac{1}{3} \) of it on a book. How much does Darlene have left to spend?
   
   F. \( \$12 \)  
   G. \( \$10 \)  
   H. \( \$8 \)  
   J. \( \$2 \)  

   16. _____

17. Jim and his family are taking a trip. They drive 431.2 miles and use 15.6 gallons of gasoline. Find the number of miles per gallon. Round your answer to the nearest hundredth.
   
   A. 27.64 miles per gallon  
   B. 27.24 miles per gallon  
   C. 4,726.72 miles per gallon  
   D. 6,726.72 miles per gallon  

   17. _____

18. An 8-foot piece of yarn is divided into equal-size pieces. Each piece is 8 inches long. How many pieces can be created from the original piece of yarn?
   
   F. 12  
   G. 9  
   H. 8  
   J. 5  

   18. _____

19. Krissy earns \( \$10.17 \) on Monday and \( \$1.97 \) on Tuesday. About how many times more money did Krissy earn Monday than Tuesday?
   
   A. 2  
   B. 3  
   C. 4  
   D. 5  

   19. _____
Read each question carefully. Write your answer on the line provided.

Multiply or divide.

1. \(64.4 \div 7 = \)
   A. 9.2  
   B. 9.30  
   C. 72  
   1. ____________

2. \(8.2 \times 3.5 = \)
   F. 28.7  
   G. 24.5  
   H. 25.5  
   2. ____________

3. \(\frac{1}{3} \times \frac{1}{5} = \)
   A. \(\frac{3}{5}\)  
   B. \(\frac{2}{5}\)  
   C. \(\frac{1}{15}\)  
   3. ____________

4. \(3.7 \times 4.2 = \)
   F. 11  
   G. 15.54  
   H. 10.3  
   4. ____________

5. \(\frac{\frac{5}{6}}{3\frac{1}{3}} = \)
   A. \(\frac{1}{4}\)  
   B. \(\frac{1}{12}\)  
   C. \(1\frac{1}{3}\)  
   5. ____________

6. \(\frac{\frac{3}{4}}{\frac{1}{3}} = \)
   F. \(2\frac{1}{2}\)  
   G. \(2\frac{1}{4}\)  
   H. \(1\frac{1}{2}\)  
   6. ____________

7. \(7 \times \$6.95 = \)
   A. \$36  
   B. \$47.95  
   C. \$48.65  
   7. ____________

8. \(8.5 \div 100 = \)
   F. 8500  
   G. 85  
   H. 0.085  
   8. ____________

9. \(3\frac{1}{5} \times \frac{1}{10} = \)
   A. \(\frac{31}{50}\)  
   B. \(\frac{17}{50}\)  
   C. \(\frac{8}{25}\)  
   9. ____________
10. \( \frac{7}{12} \div \frac{1}{12} = \)
   F. \( \frac{1}{2} \) \hspace{1cm} G. \( \frac{2}{3} \) \hspace{1cm} H. \( 7 \)

11. \( \frac{7}{12} \div 2 \frac{5}{8} = \)
   A. \( 2 \frac{5}{7} \) \hspace{1cm} B. \( 2 \frac{44}{63} \) \hspace{1cm} C. \( 3 \frac{5}{7} \)

12. \( 8.56 \times 9 = \)
   F. \( 56.48 \) \hspace{1cm} G. \( 60.08 \) \hspace{1cm} H. \( 77.04 \)

Determine which answer is reasonable.

13. \( 8 \frac{1}{6} \times \frac{3}{4} \)
   What is the best estimate?
   A. about 6 \hspace{1cm} B. about 5 \hspace{1cm} C. about 4

14. \( \frac{1}{6} \times 56 \)
   What is the best estimate?
   F. about 7 \hspace{1cm} G. about 8 \hspace{1cm} H. about 9

15. An 8-foot rope is cut into equal pieces. Each piece is 8 inches long. How many pieces can be made from the original?
   A. 12 \hspace{1cm} B. 8 \hspace{1cm} C. 5

16. Juan’s family drives 431.2 miles and uses 15.6 gallons of gasoline. Find the number of miles per gallon. Round your answer to the nearest hundredth.
   F. 27.64 miles per gallon \hspace{1cm} G. 27.24 miles per gallon \hspace{1cm} H. 6,726.72 miles per gallon

17. La Toya has $24. She spends \( \frac{1}{2} \) on a game. She spends \( \frac{1}{3} \) of what is left on a book. How much does La Toya have left?
   A. $12.00 \hspace{1cm} B. $10.00 \hspace{1cm} C. $8.00

18. Kate earns $10.17 on Monday and $1.97 on Tuesday. About how many times more money did Kate earn Monday than Tuesday?
   F. 2 \hspace{1cm} G. 4 \hspace{1cm} H. 5
Chapter Test, Form 2C

Read each question carefully. Write your answer on the line provided.

Multiply or divide.

1. \(8.56 \times 9 = \)
2. \(3.7 \times 4.2 = \)
3. \(\frac{7}{12} \div \frac{1}{12} = \)
4. \(8.2 \times 3.5 = \)
5. \(\frac{1}{3} \times \frac{1}{5} = \)
6. \(64.4 \div 7 = \)
7. \(8.5 \div 100 = \)
8. \(\frac{1}{9} \times \frac{1}{2} = \)
9. \(7\frac{1}{2} \div 2\frac{5}{8} = \)
10. \(3\frac{1}{5} \times \frac{1}{10} = \)
11. \(\frac{3}{4} \div \frac{1}{3} = \)
12. \(7 \times \$6.95 = \)
13. \(\frac{5}{6} \div 3\frac{1}{3} = \)
Chapter Test, Form 2C  (continued)

Estimate each product.

14. \(8\frac{1}{6} \times \frac{3}{4}\)

15. \(\frac{1}{6} \times 56\)

16. \(7\frac{1}{4} \times \frac{7}{8}\)

Solve.

17. Camille earns $10.17 on Monday and $1.97 on Tuesday. About how many times more money did Camille earn Monday than Tuesday?

18. Ty and his family are taking a trip. They drive 431.2 miles and use 15.6 gallons of gasoline. Find the number of miles per gallon. Round your answer to the nearest hundredth.

19. Matt gets an allowance of $24. He saves \(\frac{1}{2}\) of it in the bank and can spend the rest. He spends \(\frac{1}{3}\) of it on a book. How much does Matt have left to spend?

20. An 8-foot piece of yarn is divided into equal-size pieces. Each piece is 8 inches long. How many pieces can be created from the original piece of yarn?
Read each question carefully. Write your answer on the line provided.

Multiply or divide.

1. $7 \times 6.95 = $
2. $\frac{7}{12} \div \frac{1}{12} = $
3. $8.56 \times 9 = $
4. $8.2 \times 3.5 = $
5. $\frac{5}{6} \div 3\frac{1}{3} = $
6. $64.4 \div 7 = $
7. $8.5 \div 100 = $
8. $3.7 \times 4.2 = $
9. $\frac{3}{4} \div \frac{1}{3} = $
10. $\frac{1}{3} \times \frac{1}{5} = $
11. $\frac{1}{9} \times \frac{1}{2} = $
12. $3\frac{1}{5} \times \frac{1}{10} = $
13. $7\frac{1}{12} \div 2\frac{5}{8} = $
Estimate each product.

14. \(10\frac{2}{7} \times \frac{3}{5}\)

15. \(\frac{1}{6} \times 56\)

16. \(8\frac{1}{6} \times \frac{3}{4}\)

Solve.

17. Jim’s family drives 431.2 miles and uses 15.6 gallons of gasoline. Find the number of miles per gallon. Round to the nearest hundredth.

18. An 8-foot rope is divided into equal pieces. Each piece is 8 inches long. How many pieces can be created from the original piece of yarn?

19. Ali earns $10.17 on Monday and $1.97 on Tuesday. About how many times more money did Ali earn Monday than Tuesday?

20. Megan has $24. She spends \(\frac{1}{2}\) on a game. She spends \(\frac{1}{3}\) of what is left on a book. How much does Megan have left?
Chapter Test, Form 3

Read each question carefully. Write your answer on the line provided.

Find the product or quotient.

1. $80.5 \times 9.02 = $
2. $7.2 \times 3.55 = $
3. $9 \times 8.95 = $
4. $7.9 \times 9.7 = $
5. $81.9 \div 6.3 = $
6. $9.09 \div 100 = $
7. $6\frac{1}{4} \times \frac{3}{5} = $
8. $\frac{7}{12} \times \frac{8}{9} = $

Estimate the product or quotient.

9. $\frac{3}{7} \times 99$
10. $10\frac{1}{6} \div 1\frac{7}{9}$

Evaluate each expression if $a = 3\frac{1}{5}$, $b = 2\frac{2}{7}$, and $c = \frac{1}{35}$.

11. $a \div c$
12. $\frac{bc}{a}$
13. $c + a \div b$
14. $(a + b) \div c$

Find the mean of each set of data.

15. $\frac{5}{6}, 3\frac{1}{3}, 10$
16. $4.54, 5.62, 5.062, 4.67$
Solve.

17. Chang did not do well on his first math quiz—his score was 15.8! Chang’s teacher let him retake the quiz. Chang studied for hours, and his second quiz score was 97.07. About how many times better was Chang’s second quiz score than his first quiz score?

18. Luis and his family are traveling the coast of California. First they drive 381.3 miles from San Francisco to Los Angeles. From Los Angeles, they drive 120.98 miles to San Diego. Luis’s family used a total 19.3 gallons of gasoline. Find the number of miles per gallon. Round your answer to the nearest hundredth.

19. Lori’s grandparents give her $36 for her birthday. She spends \( \frac{1}{3} \) of the money on a shirt, \( \frac{1}{9} \) of the money on a snack, and \( \frac{1}{4} \) of the money on a book. How much money does Lori have left?

20. Zina is creating string bracelets for her friends. She divides a 9-foot piece of string into several pieces of equal length. If each piece is 10 inches long, how long is the piece of string that Zina has left over? Express your answer in inches.
Chapter Extended-Response Test

Demonstrate your knowledge by giving a clear, concise solution to each problem. Be sure to include all relevant drawings and justify your answers. You may show your solution in more than one way or investigate beyond the requirements of the problem. If necessary, record your answer on another piece of paper.

   a. Jawaun and 3 friends ordered a pizza, 4 sodas, and 2 salads. Estimate how much money they will pay. Explain how you found your estimate.
   b. Find the actual amount they will pay for the food and drinks. Show each step you took to find the answer.
   c. Explain two methods of placing the decimal point when finding the product of a decimal and a whole number.

2. Lindsay is making headbands out of ribbon. She needs 0.75 feet of ribbon to make one headband.
   a. If she has a piece of ribbon that is 4.5 feet long, how many headbands can she make? Explain how you found your answer.
   b. If she has a length of velvet ribbon that is 6.9 feet long, how many headbands can she make? Will she have any ribbon left over? Show your work.

3. Richie and his brothers are setting up a makeshift dodge ball court in their backyard. They have used bricks to mark off a rectangular area that is $18\frac{1}{8}$ feet long and $15\frac{1}{2}$ wide.
   a. Estimate the area of the dodge ball court. Explain how you found your estimate.
   b. Find the actual area of the dodge ball court. Show each step.
Use this recording sheet with pages 344–345 of the Student Edition.

Read each question. Then fill in the correct answer.

1. A B C D
2. F G H J
3. A B C D
4. F G H J
5. A B C D
6. F G H J
7. A B C D
8. F G H J
9. A B C D
Test Example

Enrique bought 2 shirts that were originally priced at $23.99 each. Each shirt was on sale for $3.47 off the original price when Enrique bought them. How much did Enrique pay for both shirts?

A. $40.04  B. $41.04  C. $42.04  D. $43.00

Read the Question

You need to find how much Enrique paid for both shirts.

Solve the Question

Step 1
Find the total original cost of both shirts.
$23.99 \times 2 = $47.98

Step 2
Find the total discount.
$3.47 \times 2 = $6.94

Step 3
Subtract the total discount from the original cost.
$47.98 - $6.94 = $41.04

The answer is B.

Read each question carefully. Write your answer on the line provided.

1. Shelley bought 2 pounds of salmon. She saved $2.50 by using a store coupon. How much did she save on each pound of salmon?
   A. $1.25  B. $1.50  C. $2.50  D. $3.00  1. ____

2. You have \(1 \frac{1}{4}\) cups of sugar. If you double the amount, how many cups of sugar do you have?
   F. \(3 \frac{1}{4}\)  G. 3  H. \(2 \frac{3}{4}\)  J. \(2 \frac{1}{2}\)  2. ____
Cumulative Standardized Test Practice

(continued)

3. \( \frac{1}{5} \div \frac{2}{3} \)
   
   A. \( \frac{2}{15} \)  
   B. \( \frac{3}{10} \)  
   C. \( \frac{10}{3} \)  
   D. \( \frac{15}{2} \)  
   3. ____

4. Mrs. Sheppard teaches English to 25 students. One-third of Mrs. Sheppard’s students play soccer after school. About how many of Mrs. Sheppard’s students play soccer after school?
   
   F. about 8 students  
   G. about 5  
   H. about 6  
   J. 9  
   4. ____

5. Find the area of the rectangle.

   \[
   \text{Area} = \text{length} \times \text{width} = 3.4 \text{ yd} \times 7.2 \text{ yd}
   \]

   A. 10.6 \( yd^2 \)  
   B. 21 \( yd^2 \)  
   C. 24.48 \( yd^2 \)  
   D. 25 \( yd^2 \)  
   5. ____

6. Annie has a roll of bread dough that is 2.10 feet long. She wants to cut it exactly in half. How long will each half be?
   
   F. 1 foot  
   G. 1.05 feet  
   H. 1.3 feet  
   J. 2 feet  
   6. ____

7. One week Ortiz walked 10 \( \frac{1}{4} \) miles. The next week he walked 9 \( \frac{2}{3} \) miles. The third week he walked 8 \( \frac{1}{2} \) miles. Find the total number of miles Ortiz walked.
   
   A. 27 \( \frac{2}{5} \)  
   B. 27 \( \frac{3}{4} \)  
   C. 28  
   D. 28 \( \frac{5}{12} \)  
   7. ____

8. Which number line approximately shows 3.50?

   F.  
   G.  
   H.  
   J.  

   8. ____
9. At the grocery store you buy a package of paper towels for $3.19, a bag of apples for $4.23, and batteries for $5.65. What was the total cost of your grocery bill?
   A. $13.07  B. $14.07  C. $15.01  D. $16.07

9. _____________

10. Which is $6\frac{1}{2} \div 2\frac{1}{4}$ in simplest form?
   F. $\frac{52}{18}$  G. $2\frac{8}{9}$
   H. $2\frac{2}{4}$  J. $3\frac{1}{2}$

10. _____________

Estimate each product.

11. $15.5 \times 20.3$

11. _____________

12. $3.7 \times 4.8$

12. _____________

Find the exact product of the decimals.

13. $3.65 \times 4.2$

13. _____________

14. $1.4 \times 0.05$

14. _____________

15. Aisha took her little sister out for lunch. If they each got a turkey sandwich for $3.25 each, juice for $1.25 each, and an apple for $0.50 each, how much money did Aisha spend?

15. _____________

16. Write $\frac{7}{100}$ as a decimal.

16. _____________

17. Write a decimal that equals $\frac{1}{4}$.

17. _____________

18. Jared thinks his back-to-school supplies will cost about $30. He spent $5.35 on notebook paper, $3.75 on ink pens, $2.50 on pencils, $18.25 on a backpack, and $7.50 on a stapler, a ruler, and erasers. Was his estimate close?

18. _____________

19. If the base of a rectangle is 6.5 yd and the height is 4.2 yd, what is the area?

19. _____________

20. $3.5 \div 7 =$

20. _____________
## Graphic Organizer

Use this graphic organizer to take notes on **Chapter 6: Multiplying and Dividing Decimals and Fractions**

Fill in the missing information.

<table>
<thead>
<tr>
<th>Vocabulary Word</th>
<th>Definition</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Compatible Numbers</strong></td>
<td>Numbers in a problem or related numbers that are easy to work with mentally.</td>
<td>720 and 90 are compatible numbers for division because $72 + 9 = 8$.</td>
</tr>
<tr>
<td><strong>Reciprocal</strong></td>
<td>Two numbers whose product is 1.</td>
<td>The reciprocal of $\frac{3}{5}$ is $\frac{5}{3}$.</td>
</tr>
<tr>
<td><strong>Scientific Notation</strong></td>
<td>Expressing a number as the product of two factors where the first factor is at least 1 but less than 10 and the second factor is a power of 10.</td>
<td>$786 = 7.86 \times 10^2$</td>
</tr>
<tr>
<td><strong>Factor</strong></td>
<td>A number that divides into a whole number evenly. Also a number that is multiplied by another number.</td>
<td>Since $24 \div 4 = 6$, 4 is a factor of 24.</td>
</tr>
<tr>
<td><strong>Numerator</strong></td>
<td>The number above the bar in a fraction; the part of the fraction that tells how many of the equal parts are being used.</td>
<td>$\frac{2}{4}$, 2 is the numerator.</td>
</tr>
<tr>
<td><strong>Denominator</strong></td>
<td>The bottom number in a fraction.</td>
<td>$\frac{5}{6}$, 6 is the denominator.</td>
</tr>
</tbody>
</table>

---

## Anticipation Guide

### Multiplying and Dividing Decimals and Fractions

#### Before you begin Chapter 6

- Read each statement.
- Decide whether you agree (A) or disagree (D) with the statement.
- Write A or D in the first column OR if you are not sure whether you agree or disagree, write NS (not sure).

<table>
<thead>
<tr>
<th>Statement</th>
<th>A, D, or NS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Compatible numbers are numbers in a problem or related numbers that are easy to work with mentally.</td>
<td>A</td>
</tr>
<tr>
<td>2. 720 and 90 are compatible numbers for division.</td>
<td>A</td>
</tr>
<tr>
<td>3. A reciprocal is a number obtained from a given number by interchanging its numerator and denominator.</td>
<td>A</td>
</tr>
<tr>
<td>4. The reciprocal for $\frac{2}{5}$ is $\frac{5}{2}$</td>
<td>D</td>
</tr>
<tr>
<td>5. The reciprocal for $\frac{5}{3}$ is $\frac{3}{5}$.</td>
<td>A</td>
</tr>
<tr>
<td>6. Scientific notation is expressing a number as the product of two factors where the first factor is at least 1 but less than 10 and the second factor is a power of 10.</td>
<td>A</td>
</tr>
<tr>
<td>7. $786 = 7.86 \times 10^2$ is an example of scientific notation.</td>
<td>A</td>
</tr>
<tr>
<td>8. A factor does not divide into a whole number evenly.</td>
<td>D</td>
</tr>
<tr>
<td>9. In the fraction $\frac{7}{12}$, 12 is the denominator.</td>
<td>A</td>
</tr>
<tr>
<td>10. In the fraction $\frac{9}{10}$, 9 is the numerator.</td>
<td>A</td>
</tr>
</tbody>
</table>

#### After you complete Chapter 6

- Reread each statement and complete the last column by entering an A (agree) or a D (disagree).
- Did any of your opinions about the statements change from the first column?
- For those statements that you mark with a D, use a separate sheet of paper to explain why you disagree. Use examples, if possible.
Multiply.

1. 1.6
2. 2.83
3. 14.7
4. 3.75
5. 2.09
6. 12.8
7. 12.8
8. 12.8
9. 12.8
10. 12.8

Multiply: $\times$

1. 8
2. 7
3. 24
4. 100
5. 8

Multiply: $\times$

1. 7
2. 42
3. 85
4. 4
5. 2

Estimate:

1. 21
2. 0

Compare the actual product and the estimated product:

1. 22.96 is close to 21,
2. 0.27 is close to 0,
3. 20.49
4. 20.0

Write the number of decimal places. Multiply.

1. 0.9
2. 3.92
3. 3.79
4. 1.75

Write the number of decimal places. Multiply:

1. \( 8.1 \) \( 1 \) decimal place(s)
2. \( 3.79 \) \( 2 \) decimal place(s)
3. \( 30.32 \) \( 2 \) decimal place(s)

Multiply:

1. \( \times 9 \)
2. \( \times 3 \)
3. \( \times 8 \)

Write each number in standard form.

1. \( 6.1 \times 10^2 \)
2. \( 2.495 \times 10^1 \)
3. \( 3.205 \times 10^1 \)

23. Each Sunday during his nine-week summer vacation, Ray buys a newspaper. The Sunday paper costs $1.85. How much did Ray spend on the Sunday newspaper during his vacation?

$16.65

24. One Sunday, Ray weighed the newspaper. It weighed 2.7 lb. If each Sunday newspaper weighs the same, how many pounds of newspaper will Ray recycle if he buys the Sunday paper for 50 weeks?

135 lb

6.10
249.5
526,700
12

To multiply a whole number by a decimal, multiply as you would with whole numbers. Then count the number of decimal places in each factor. Write the same number of decimal places in the product.

- Multiply: 7 \( \times 3.28 \)
- Multiply: 3 \( \times 0.09 \)
- Estimate: 7 \( \times 3 = 21 \)
- Estimate: 3 \( \times 0 = 0 \)

\( 3.28 \rightarrow 2 \) decimal places
\( 0.09 \rightarrow 2 \) decimal places

\( 7 \times 3.28 \)
\( \times 7 \)

\( 22.96 \rightarrow 2 \) decimal places

\( \times 0.09 \)
\( \times 3 \)

\( 20.49 \rightarrow 2 \) decimal places

\( \times 8 \)

\( 16.02 \rightarrow 2 \) decimal places

\( 20.49 \rightarrow 2 \) decimal places

\( \times 8 \)

\( 16.02 \rightarrow 2 \) decimal places
### Name ______________________ Date ________________  5NS2.1

#### 6-1

**Homework Practice**  
*Multiplying Decimals by Whole Numbers*

**Multiply.**

1. \(4.7 \times 4 = 18.8\)
2. \(2.9 \times 7 = 20.3\)
3. \(8 \times 0.5 = 4\)
4. \(6 \times 0.02 = 0.12\)
5. \(0.09 \times 6 = 0.54\)
6. \(0.011 \times 5 = 0.055\)

**Write each number in standard form.**

7. \(6 \times 10^4 = 60,000\)
8. \(5 \times 10^1 = 500\)
9. \(1.45 \times 10^3 = 1,450\)
10. \(8.2 \times 10^5 = 820,000\)
11. \(0.067 \times 10^7 = 6,700,000\)
12. \(2.6 \times 10^1 = 26\)

### 6-1

**Problem-Solving Practice**  
*Multiplying Decimals by Whole Numbers*

**Solve.**

1. Andrea earns $32.00 a day. What will she earn if she works 10 days?  
   \[\$320.00\]
2. Constantino cooked 5.2 lbs of beef. Each pound is 16 oz. How many ounces of beef did he cook?  
   \[83.2\text{ oz}\]
3. Kasi is traveling in the United States. If the exchange rate is 58 rupees for every American dollar, how many rupees does it take to purchase a meal that costs $12.98?  
   \[752.84\text{ rupees}\]
4. A school receives $14.00 for every 1,000 labels they collect from certain products. How much money will they make if students collect 3,000 labels?  
   \[\$42.00\]
5. Kevin is studying Spanish, and he learns about 5.3 new words each school day. Lisa is studying French, and she learns about 4.9 new words each school day. About how many more words will Kevin learn than Lisa in 4 weeks?  
   \[8\text{ more words}\]
6. An amusement park charges $35.50 for admission. On one day, 6,789 people visited the park. The park employed 779 people that day and paid each of them an average of $17,295.00 for electricity, maintenance of the rides, and supplies. How much money did the park make that day?  
   \[\$156,720.50\]

### Spiral Review

**Solve. (Lesson 1–3)**

13. \(4 \times 7 - 8 = 20\)
14. \(10 \times 6 + 24 = 84\)

**Add or subtract. (Lesson 5–7)**

15. \(\frac{3}{5} + \frac{3}{8} = \frac{39}{40}\)
16. \(9 + 4\frac{1}{2} = 13\frac{1}{2}\)
17. \(16 - 5\frac{3}{5} = 10\frac{2}{5}\)
Answers (Lessons 6–1 and 6–2)

6–2 Reteach

Multiplying Decimals

To multiply a decimal by a decimal, multiply as you would whole numbers. Then count the total number of decimal places in both factors. Write the same number of decimal places in the product. Sometimes you have to write zeros to place the decimal in the product.

Multiply: 4.7 × 2.63

Estimate: 5

12.361 3 decimal places

Compare the product and the estimate.
12.361 is close to 15, so 12.361 is a reasonable answer.

Multiply: 0.5 × 0.07

Write a zero to place the decimal in the product.

Write the number of decimal places. Multiply.

1. 0.9 ← 1 decimal place(s)
   × 0.5 ← 1 decimal place(s)
   0.45 ← 2 decimal place(s)

   0.801 ← 3 decimal place(s)

Multiply. Estimate to check if your answer is reasonable.

1. 0.875
   × 0.25
   0.21875

   0.875 is close to 1, so 0.875 is a reasonable answer.

2. 3.67
   × 0.5
   1.835

   3.67 is close to 4, so 3.67 is a reasonable answer.

3. 8.73
   × 4.8
   42.184

   8.73 is close to 10, so 8.73 is a reasonable answer.

4. 5.612
   × 10.812
   59.68824

   5.612 is close to 10, so 5.612 is a reasonable answer.

5. 13.547
   × 44.304
   601.00616

   13.547 is close to 15, so 13.547 is a reasonable answer.
Multiply.

1. \(0.7 \times 0.8 = 0.56\)
2. \(2.9 \times 7.5 = 21.75\)
3. \(8.8 \times 0.5 = 4.4\)
4. \(7.3 \times 0.02 = 0.146\)
5. \(0.011 \times 6.3 = 0.0693\)
6. \(0.071 \times 5.5 = 0.3905\)

Evaluate each expression if \(a = 9.4\) and \(b = 0.76\) and \(c = 2.78\).

7. \(7.5a = 70.5\)
8. \(5.33b = 4.0508\)
9. \(1.8c = 5.004\)
10. \(0.037 + 4.45a = 41.867\)
11. \(ab + c = 9.924\)
12. \(5.84d = 54.896\)

13. \(16 - 4c = 4.88\)
14. \(10 \times 8 + ab = 87.144\)
15. \(bc + a = 11.5128\)

Find the number that makes each problem true.

21. \(39.8 \times 0.7 = 28.06\)
22. \(46.87 \times 0.5 = 23.435\)
23. \(2.3 \times 1.8 = 4.14\)
24. \(57.8 \times 0.7 = 40.066\)

Problem Solving

25. Beth works as a lifeguard at a city park. She earns $9.50 per hour and works 7.5 hours each day. How much does she earn each day?

\[\$71.25\]

26. The cost of renting a pedal boat at the city park is $6.25 per hour. Jason rented a boat for 1.5 hours. To the nearest cent, how much did the pedal boat rental cost?

\[\$9.38\]

If you pay 20 cents a pound for bananas, and you buy 6 pounds of bananas, what is the total amount?

\[\$1.20\]
A Logic Puzzle

Here is a puzzle that will help you brush up on your logical thinking skills.

The product \(2.3 \times 8.1\) is in both the circle and the square, but not in the triangle.

Place the product in the diagram at the right.

\[
\begin{array}{ccc}
8.1 & & \\
2.3 & \times & 8.1 \\
24.3 & & \\
& 26.73 &
\end{array}
\]

Use the given information to place the product in the diagram above.

1. The product \(14.19 \times 1.3\) is in both the triangle and the square, but not in the circle.
2. The product \(0.08 \times 2.7\) is in both the circle and the square, but not in the triangle.
3. The product \(1.24 \times 0.16\) is not in the circle, the square, or the triangle.
4. The product \(2.2 \times 0.0815\) is in both the square and the circle, but not in the triangle.
5. The product \(0.02 \times 0.05\) is not in the circle, the square, or the triangle.
6. The product \(21.7 \times 0.05\) is in the square, but not the circle or triangle.
7. If you did all the calculations correctly, the sum of all the numbers in the diagram should be a "nice" number. What is the sum?

Write 26.73 in the correct region of the diagram.
Check for Reasonableness

Erica takes a package of two paperback books to the post office. The package weighs 16 ounces. Erica estimates that the package weighs about 300 pounds. Is her estimate reasonable?

Step 1 Understand
Be sure you understand the problem.
• What facts do you know? You know how many ounces the package weighs.
• What do you need to find? You need to know whether Erica’s estimate is reasonable.

Step 2 Plan
Make a plan.
You want to compare the weight of the package to something that you know weighs about 300 pounds.

Step 3 Solve
Carry out your plan.
A professional football player might weigh between 200 and 300 pounds. So, 300 pounds is much heavier than a package of two books. Therefore, the estimate is not reasonable.
Erica multiplied to change a smaller unit to a larger one. She should have divided. 16 ÷ 16 = 1 — Remember: 1 pound = 16 ounces.

Step 4 Check
Check for Reasonableness
• Does your answer make sense?
• Did you answer the question? Yes. Erica’s estimate was not reasonable. You found the mistake she made.

Is each estimate reasonable? Explain.

2. Leslie’s computer weighs 165 ounces. She estimates that it weighs about 10 pounds. Is Leslie’s estimate reasonable?

Yes; since there are 16 ounces in 1 pound, 165 ounces is close to 10 pounds.

3. Rocky measures his bedroom and finds that it is 10 feet wide and 14 feet long. He thinks he can easily fit a desk that is 75 inches long in his room. Is this a reasonable guess?

75 inches is roughly 6 feet.
Rocky will be able to fit the desk in his room.

4. Haruko wants to make a dress. The pattern she is using called for 2 yards of material. Haruko estimates that she will need to buy 2 feet of material. Is her estimate reasonable? (Hint: 1 yard equals 3 feet)

No. There are 3 feet in a yard.
Haruko needs at least 4 more feet of material.

5. Eli weighs 900 ounces. He guesses that he can get on a ride at the amusement park that allows children from 30 to 80 pounds. Is his estimate reasonable?

Yes. There are 16 ounces in a pound.
Eli weighs about 56 pounds, so he can safely board the amusement park ride.
**Skills Practice**

**Problem-Solving Strategy**

**Check for Reasonableness**

Is each estimate reasonable? Explain.

1. Sandra needs to buy a phone cord that will reach a distance of at least 12 yards. At the store, all of the packages are marked in feet. Sandra estimates that the package with 40 feet of cord will be enough. Is her estimate reasonable? (Hint: 1 yard equals 3 feet)

   Yes, the cord will be long enough since there are 3 ft in 1 yd and $12 \times 3 = 36$.

2. Kyle and Julie are watching a television program on weightlifting. A man is going to lift 210 pounds. Julie comments that he is going to lift 4,000 ounces. Is her estimate reasonable? (Hint: 1 pound equals 16 ounces)

   No, since there are 16 oz in 1 lb, the estimate should be about 3,300 oz.

3. Ryan and Tyler are going to the pet shop to buy 12 cans of dog food. They are trying to decide whether they should take their wagon to help carry the dog food home. The cans weigh 15 ounces each. They estimate that the dog food will weigh 10 pounds. Is the estimate reasonable?

   Yes, each can weighs almost 1 pound, so 12 cans would weigh about 12 pounds. The estimate is reasonable.

4. Nicole is trying out a new recipe. The recipe calls for 4 pints of broth. Nicole has only a 1-cup measuring cup. She estimates that she will need 16 cups of broth. Is her estimate reasonable? (Hint: 1 pint equals 2 cups)

   No, there are 2 cups in 1 pint, so her estimate is too large.

---

**Homework Practice**

**Problem-Solving Strategy**

Solve. Use the check for reasonableness strategy.

1. Jamil volunteers once a week. He works for 3.5 hours at a time. How many hours does he work in 10 weeks?

   35 hours

2. Gamal collects cards. If he buys 4 cards a week, how many total cards will he have after 3 months?

   48 cards

3. Kim invited 5 friends over to swim. They took turns on the 3 rafts. If they each lay on a raft for 30 minutes at a time, how long would it take for all 5 friends to have their turn?

   1 hour

4. Ling ordered 3 hamburgers, 2 fries, and 3 drinks. If he paid with three 10-dollar bills, how much change will he get back?

   
<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hamburger</td>
<td>$3.50</td>
</tr>
<tr>
<td>Fries</td>
<td>$2.90</td>
</tr>
<tr>
<td>Drink</td>
<td>$3.95</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
   $1.85

---

**Spiral Review**

**Multiply. (Lesson 6-2)**

5. $5 \times 2.8 = 14$

6. $3.7 \times 7 = 25.9$

7. $8 \times 4.6 = 36.8$

8. $6.2 \times 3.4 = 21.08$

9. $8.1 \times 6.4 = 51.84$

10. $5.3 \times 2.9 = 15.37$
Dividing Decimals by Whole Numbers

Dividing decimals is similar to dividing whole numbers, except that you don't write a remainder in the quotient. You may have to write one or more zeros in the dividend and keep dividing.

Divide $5.1 \div 4$.

1. Place the decimal point in the quotient.
2. Divide as with whole numbers. The remainder is not 0, so keep dividing.
3. Write zeros in the dividend and keep dividing until the remainder is 0.
4. Multiply to check.

Divide. Multiply to check.

1. $1.55 \div 4$
2. $0.225 \div 8$
3. $2.4 \div 5$
4. $0.23 \div 8$
5. $3.55 \div 6$
6. $4.5 \div 18$
7. $0.85 \div 9$
8. $2.31 \div 45$
9. $56 \div 7.82$

Check:

1. $1.55 \times 4$
2. $0.255 \times 8$
3. $2.4 \times 5$
4. $0.23 \times 8$
5. $3.55 \times 6$
6. $4.5 \times 18$
7. $0.85 \times 9$
8. $2.31 \times 45$
9. $56 \times 7.82$
Skills Practice
Dividing Decimals by Whole Numbers

Divide. Round each quotient to the nearest hundredth if necessary.

1. \(0.73 \div 4.79\)  
2. \(0.73 \div 9.99\)  
3. \(0.61 \div 7\)  
4. \(6.12 \div 34.1\)  
5. \(6.12 \div 3.67\)  
6. \(6.12 \div 0.52\)  
7. \(8.716.8 \div 2.1\)  
8. \(8.716.8 \div 11.8\)  
9. \(8.716.8 \div 2.37\)  
10. \(23.32.2 \div 1.4\)  
11. \(62.651 \div 10.5\)  
12. \(56.13.5 \div 0.24\)

Divide. Round to the nearest tenth if necessary.

1. \(4.79 \div 3\)  
2. \(9.99 \div 7\)  
3. \(5.55 \div 5\)  
4. \(6.95 \div 6\)  
5. \(55.35 \div 32\)  
6. \(72.9 \div 4\)  
7. \(853.7 \div 25\)  
8. \(457.4 \div 32\)  
9. \(158.6 \div 45\)  
10. \(64.3 \div 6\)  
11. \(49.7 \div 4\)  
12. \(74.2 \div 2\)

Find the mean for each set of data. Round to the nearest tenth.

13. \(25.8, 26.9, 24.2, 23.9, 25.4\)  
14. \(2.56, 1.72, 2.85, 3.10, 2.65\)

Solve. Is each answer reasonable? Explain. (Lesson 6–3)

15. Laura thinks that a horse weighs 750 ounces. Is her estimate reasonable? (Hint: 1 pound equals 16 ounces)
   - No; 750 ounces is only about 50 pounds.

16. Vito’s living room is 13 feet wide and 10 feet long. Will 2 yards of carpet cover the floor? (Hint: 1 yard equals 3 feet)
   - No; 2 yards is only 6 feet.

17. Essie has a recipe that calls for 2 quarts of tomato sauce. Will 8 cups be enough? (Hint: 1 quart equals 4 cups)
   - Yes; 8 cups is equal to 2 quarts.
Problem-Solving Practice
Dividing Decimals by Whole Numbers

Solve.

1. Pablo paid $14.75 for 5 identical items. How much did each item cost? **$2.95**

2. Marianne measured the rainfall in her area for a year. Her readings totaled 34.56 in. What is the average rainfall per month? **2.88** in.

3. Silvia is learning Spanish in school. At the end of the 9-month school year, she had learned 422 new words. To the nearest tenth, how many words did she learn each month? **46.9** words

4. Lon earned $242.88 doing yard work. He owed his brother some money and was paying him back $25 at a time. To the nearest whole number, how many payments could he make from the money he earned? **9** payments

5. Harry’s mother makes cakes for a local restaurant. She buys flour and sugar in large amounts. The last time she shopped, she bought 157.86 lb of flour and 82.69 lb of sugar. If she uses 15 lb of flour and 8 lb of sugar in a day, how many days will the flour last? **10.5** days

6. The Weston Laundry washes all the linens for local hotels. In 7 days, they washed 2,853.8 lb of towels and 3,534.7 lb of sheets. How many pounds of laundry did they wash each day? **912.6** pounds

Solve. Round to the nearest tenth if necessary.

7. Silvia is learning Spanish in school. At the end of the 9-month school year, she had learned 422 new words. To the nearest tenth, how many words did she learn each month? **46.9** words

8. Lon earned $242.88 doing yard work. He owed his brother some money and was paying him back $25 at a time. To the nearest whole number, how many payments could he make from the money he earned? **9** payments

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10. The Weston Laundry washes all the linens for local hotels. In 7 days, they washed 2,853.8 lb of towels and 3,534.7 lb of sheets. How many pounds of laundry did they wash each day? **912.6** pounds

Enrich
Unit Pricing

The unit price of an item is the cost of the item given in terms of one unit of the item. The unit might be something that you count, like jars or cans, or it might be a unit of measure, like ounces or pounds. You can find a unit price using this formula.

\[
\text{unit price} = \frac{\text{cost of item}}{\text{number of units}}
\]

For example, you find the unit price of the tuna in the ad at the right by finding the quotient \(0.89 \div 6\). The work is shown below the ad. Rounding the quotient to the nearest cent, the unit price is \$0.15 per ounce.

Find a unit price for each item.

1. 5-pound bag CARROTS $1.29
   5NS2.1, 5NS2.2
   $0.26 per lb

2. 18-ounce jar PEANUT BUTTER $2.49
   $0.14 per oz

3. Grade A Jumbo EGGS Dozen $1.59
   5NS2.1, 5NS2.2
   $0.13 per egg

Give two different unit prices for each item.

4. Frozen BURRITOS
   5-ounce pkg
   2 for $1.39
   3/$1 5-ounce can
   \$0.70 per pkg; \$0.14 per oz

5. Purr-fect CAT FOOD
   3/3-ounce can
   \$0.33 per can; \$0.11 per oz

6. Old Tyme SPAGHETTI SAUCE
   12-ounce jars 2/$3
   \$1.50 per jar; \$0.13 per oz

Circle the better buy.

7. Mozarella Cheese 10-ounce pkg
   Mozarella Cheese 18-ounce pkg
   18-oz pkg

8. Dee-light Chicken Wings 5-pound bag
   Top Q Chicken Wings 5-lb bag
   18-ounce bag

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To divide when the divisor is a decimal, multiply the divisor by the least power of ten that will make it a whole number. Then multiply the dividend by the same power of ten.

Divide 3.66 \div 0.6.

Multiply the divisor by the power of 10 that makes it a whole number.

\[
\begin{array}{c}
6.1 \\
36.6
\end{array}
\]

Multiply the dividend by the same number. Rewrite the problem.

Divide as with whole numbers. Place the decimal point above its new position in the dividend.

\[
\begin{array}{c}
6.1 \\
36.6
\end{array}
\]

so, \(3.66 \div 0.6 = 6.1\)

Divide.

\[
\begin{array}{cccc}
1. & 0.08 \div 0.8 & 2. & 0.4 \div 26 \\
3. & 0.25 \div 10 & 4. & 0.12 \div 6.6 \\
5. & 1.2 \div 0.312 & 6. & 0.35 \div 6.4 \\
7. & 0.8 \div 548 & 8. & 0.001 \div 0.8 \\
9. & 0.42 \div 14.7 &
\end{array}
\]

Divide.

\[
\begin{array}{cccc}
1. & 0.08 \div 0.8 & 2. & 0.4 \div 26 \\
3. & 0.25 \div 10 & 4. & 0.12 \div 6.6 \\
5. & 1.2 \div 0.312 & 6. & 0.35 \div 6.4 \\
7. & 0.8 \div 548 & 8. & 0.001 \div 0.8 \\
9. & 0.42 \div 14.7 &
\end{array}
\]

Solve.

27. One type of motor-driven camera can take a picture every 0.06 second. While taking some action pictures, a photographer let the camera run for 3.6 seconds. How many pictures did the camera take?

\[
60 \text{ pictures}
\]
**Homework Practice**

Dividing by Decimals

Divide.

1. \(14.57 \div 3.1 = 4.7\)
2. \(9.7 \div 2.5 = 3.9\)
3. \(8.8 \div 0.5 = 17.6\)
4. \(9.3 \div 0.03 = 310\)
5. \(8.3 \div 0.010 = 830\)
6. \(35.2 \div 6.4 = 5.5\)
7. \(5.9 \div 0.04 = 147.5\)
8. \(3.066 \div 0.73 = 4.2\)
9. \(3.4 \div 0.4 = 8.5\)
10. \(10.22 \div 1.4 = 7.3\)
11. \(1.3425 \div 8.95 = 0.15\)
12. \(111.36 \div 17.4 = 6.4\)

13. If you pay $2.70 for corn, and you buy 5 pounds of corn, what is the cost per pound?

54 cents

**Problem-Solving Practice**

**Dividing by Decimals**

Divide. Round your answer to the nearest tenth if necessary.

1. Zachary’s pet snake eats 18 meals in 5.5 weeks. How many meals does the snake eat in 1 week?

3.3 meals

2. The Garcia family drove 234.8 miles for a family reunion and used 9.4 gallons of gas. How many miles did they get per gallon?

25 miles

3. Marco loves to jog. He jogs 3.2 miles every day. How many days would it take Marco to jog 96 miles?

30 days

4. A can of tomatoes weighs 16.5 ounces. A grocery store receives a box of canned tomatoes that weighs 412.5 ounces. How many cans of tomatoes are in the box?

25 cans

5. At the school store, pencils are on sale for $0.17 each. Mara spends $1.36 on pencils. How many pencils did she buy?

8 pencils

6. A cheetah can sprint at a speed of 70 miles per hour. A very fast human can sprint at a speed of 14.7 miles per hour. How many times faster is the cheetah than a human?

4.8 times

7. Ming is making cereal bars for her school bake sale. She uses 0.3 box of cereal for each batch of bars. If Ming has 3.6 boxes, how many batches can she make?

12
Choose the Best Strategy

Dominique made invitations on her computer for a party. She distributed $\frac{1}{2}$ of the invitations, while her friend gave out 11. There are 5 more invitations that need to be delivered. How many invitations were there to begin with?

**Step 1** Understand
- Be sure you understand the problem.
- Read carefully.
- What facts do you know?
  - Dominique distributed $\frac{1}{2}$ of the invitations.
  - Her friend gave out 11 invitations.
  - There are 5 invitations that still need to be delivered.
- What do you need to find?
  - The number of invitations there were to begin with.

**Step 2** Plan
- Choose a Strategy
  - Make an organized list
  - Determine reasonable answers
  - Use logical reasoning
- Make a plan.
  - You can work backward to solve the problem.
  - Start with the number of invitations that still need to be delivered. Add the number of invitations that Dominique's friend gave out.
  - Double the sum to find the number of invitations there were to begin with.
**Problem-Solving Investigation**

**Step 3: Solve**

Add the number of invitations that still need to be delivered and the number of invitations that Dominique's friend gave out.

\[
\frac{5}{2} + \frac{11}{2} = \frac{16}{2} = 8
\]

So, there were 16 invitations left after Dominique distributed her invitations.

Think: Dominique distributed \( \frac{1}{2} \) of the invitations. If there are 16 left over, they are the other half.

Add the number of invitations that Dominique distributed to the number of invitations left after she distributed hers.

\[
16 + 16 = 32
\]

How many invitations were there to begin with?

32 invitations

**Step 4: Check**

Is the solution reasonable?

Reread the problem.

How can you check your answer by working forward?

**One half of 32 is 16.** So there were 16 invitations left after Dominique gave out the number of invitations she gave out to her friend.

11 invitations and 16 \(-11\) = 5. So there were 5 more invitations to be delivered.

**Practice**

1. The coach gives uniforms to \( \frac{1}{2} \) of the players on a soccer team. Brad helps out, giving uniforms to 3 players. James gives the remaining uniforms to 5 players. How many players are on the soccer team?

   **16 players**

2. Leslie is \( \frac{1}{2} \) as old as Carey. Carey is 2 years older than Jennifer. Jennifer is 18 years old. How old is Leslie?

   **10 years old**

3. Brooke is making a necklace in which the first, fifth, ninth, and thirteenth beads are blue and the rest of the first 15 beads are not blue. If the necklace continues this pattern and has 50 beads in all, how many of them will be blue?

   **13 blue beads**

   **Strategy:** Draw a diagram.

4. Create a problem that you could solve by making an organized list. Share your work with others.

5. Ms. Gonzaga ordered a bookcase that cost $89.45. The delivery fee was \( f \) dollars. The cost with the delivery fee was \( t \) dollars. Write an equation that represents the relationship between the delivery fee and the cost with the delivery fee.

\[
t = 89.45 + f, \text{ or } t = f + 89.45
\]

6. Use the equation you wrote for exercise 5 to find the total cost if the delivery fee was $29.95.

   **$119.40**

7. A salesman spends $89 per night for 5 nights at a hotel, $219.49 for transportation, and $137.71 for food. What are his total travel expenses?

   **$802.20**

   **Strategy:** Write an equation

   **Check students' problems.**
Solve. Use any strategy to solve.

1. Hoshi attends her ballet class each week. At class, the students
dance for 2.3 hours at a time. How many hours does she dance in 20 weeks?

**46 hours**

2. Seki had her friends over to play. They played a board game for
45 minutes and then played cards for 30 minutes. They built a fort
for 45 minutes and painted for another 30 minutes. How long were
her friends over to play?

**2.5 hours**

3. Jack ordered 3 drums, 2 blankets, and 3 pairs of pants. If he paid
with eight 20-dollar bills, how much change will he get back?

**$14.28**

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blanket</td>
<td>$15.95</td>
</tr>
<tr>
<td>Pants</td>
<td>$12.99</td>
</tr>
<tr>
<td>Drum</td>
<td>$24.95</td>
</tr>
</tbody>
</table>

**Spiral Review**

Divide. Round to the nearest tenth if necessary. (Lesson 6–5)

4. $8.4 \div 0.6 = 14$
5. $0.792 \div 2.1 = 0.4$
6. $34.87 \div 3.8 = 9.2$
7. $0.19 \div 0.07 = 2.7$
8. If you buy rocks for your garden for
$2.80 a pound, how much will it be for
150 pounds?

**$420**

9. If you buy the same rocks and need
3.8 times that many, how much will
you pay?

**$1,596**

1–8. Sample answers given.

1. video game: $23.95
   **about $16**

2. CD: $15.99
   **about $12**

3. headphones: $10.98
   **about $5.50**

4. three packs of TRUE-CELL batteries; $5.98 per pack
   **about $9**

5. one CD: $20.95
   one video game: $27.99
   **about $33**

6. one set of headphones: $15.79
   two video games: $17.55 and $15.50
   **about $30**

7. one CD: $16.95
   one set of headphones: $14.50
   one DVD: $19.98
   **about $37**

8.样答案给出的。
Reteach

Estimating Products of Fractions

To estimate a fraction of a whole number or mixed number, you can round the whole number or mixed number to a multiple of the denominator.

Estimate \(\frac{5}{6} \times 44\).

Think: \(\frac{5}{6} \times 42\)

Round the whole number to the closest multiple of the denominator.

So, \(\frac{5}{6} \times 44\) is about 35.

Estimate each product.

1. \(\frac{1}{5} \times 27\)
   Denominator of fraction: 5
   Multiples of denominator: 5, 10, 15, 20, 25, 30
   Estimate: \(\frac{1}{5} \times 25 = 5\)

2. \(30 \times \frac{7}{8}\)
   \(32 \times \frac{7}{8} = 28\)
   \(32 \times \frac{7}{8} = 28\)
   \(32 \times \frac{7}{8} = 28\)

3. \(\frac{3}{4} \times 17\)
   Multiples of denominator: 4, 8
   Estimate: \(\frac{3}{4} \times 8 = 6\)

4. \(43 \times \frac{3}{4}\)
   \(33 \times \frac{3}{4} = 27\)

5. \(\frac{1}{6} \times 28\)
   Multiples of denominator: 6, 12
   \(\frac{1}{6} \times 30 = 5\)

6. \(\frac{3}{5} \times 37\)
   \(\frac{3}{5} \times 40 = 24\)

7. \(29 \times \frac{3}{4}\)
   \(28 \times \frac{3}{4} = 21\)

8. \(\frac{4}{5} \times 34\)
   Multiples of denominator: 5, 10
   \(\frac{4}{5} \times 35 = 28\)

9. \(\frac{5}{6} \times 43\)
   \(\frac{5}{6} \times 42 = 35\)

10. \(\frac{9}{10} \times 28\)
    \(\frac{9}{10} \times 30 = 27\)

11. \(39 \times \frac{7}{8}\)
    \(40 \times \frac{7}{8} = 35\)

12. \(\frac{2}{3} \times 20\)
    \(\frac{2}{3} \times 21 = 14\)

13. \(\frac{1}{3} \times 44\)
    \(\frac{1}{3} \times 45 = 15\)

14. \(\frac{3}{8} \times 32\)
    \(\frac{3}{8} \times 32 > \frac{1}{2} \times 10\)

15. \(\frac{3}{8} \times 32 > \frac{1}{2} \times 10\)

Estimate to compare. Write >, <, or =.

16. \(34 \times \frac{3}{4} < 35 \times \frac{5}{6} \times \frac{3}{4}\)
   \(36 \times \frac{3}{4} < 60 \times \frac{1}{2}\)

17. \(\frac{3}{8} \times 32 > \frac{1}{2} \times 10\)

Solve.

18. Teresa rode \(\frac{6}{10}\) miles on her bike in one hour. If she continues at this pace, how far could she ride in 5 hours?
   about 35 miles

19. Chan is riding his bike on a 48-mile cross-country course. He knows that \(\frac{3}{8}\) of the course is uphill. About how many miles will Chan have to ride uphill?
   about 20 miles
Homework Practice

Estimating Products of Fractions

Estimate each product.

1. \(36 \times \frac{1}{5} = \frac{35}{5} \times \frac{1}{5} = 7\)
2. \(\frac{5}{6} \times 100 = \frac{5}{6} \times 96 = 60\)
3. \(\frac{1}{3} \times 23 = \frac{1}{3} \times 24 = 8\)
4. \(\frac{2}{3} \times 76 = \frac{2}{3} \times 75 = 50\)
5. \(\frac{5}{7} \times \frac{1}{8} = 0\)
6. \(\frac{5}{5} \times \frac{4}{8} = \frac{6}{9} = 54\)

Estimate the area of the rectangle.

7. The length is 4 \(\frac{6}{8}\) feet and the width is 7 \(\frac{2}{8}\) feet.
   \[35 \text{ ft}^2\]
8. The width is 24 \(\frac{3}{5}\) feet and the length is 8 \(\frac{2}{3}\) feet.
   \[225 \text{ ft}^2\]
9. A garden measures 5 \(\frac{1}{3}\) feet by 10 \(\frac{2}{3}\) feet.
   \[55 \text{ ft}^2\]

Spiral Review

Use any strategy shown below to solve. (Lesson 6–6)

• Make an organized list.
• Determine reasonable answers.
• Use logical reasoning.

10. If you pay 25 cents a pound for apples, and you buy 12 pounds of apples, what is the total amount?
   \[\$3.00\]
11. You buy a shirt online that costs $39.30. Shipping and handling was \(d\) dollars. Write an equation that represents the relationship between the delivery fee and the total cost.
   \[t = 39.30 + d\]

Problem-Solving Practice

Estimating Products of Fractions

Estimate each product.

1. The baseball team practices 1 \(\frac{3}{4}\) hours after school. About how many hours do they practice each week?
   about 10 hr
2. Tyra has 6 bricks. Each brick is 8 \(\frac{1}{2}\) inches long. She lays them end-to-end to make a border in her garden. About how long is the border?
   about 48 in. or 4 ft
3. A living room measures 23 \(\frac{3}{4}\) feet wide by 23 \(\frac{1}{4}\) feet long. Estimate the area of the room. [Hint: To find the area, multiply the width times the length.]
   about 552 ft²
4. Casey and his brother plan to baby-sit for 44 \(\frac{1}{2}\) hours this month. His brother plans to do \(\frac{1}{5}\) of the baby-sitting. About how much time will Casey's brother spend baby-sitting?
   about 9 hr
5. Neesa has 98 pictures from her trip to Mexico. She will take \(\frac{3}{4}\) of the best shots and put them into a scrapbook. Each page can hold 4 or 5 pictures. About how many pages will she use if she puts 4 pictures on each page? If she puts 5 pictures on each page?
   about 20 pages; about 15 pages
6. Chang has 288 baseball cards of players from his favorite teams. About one third of them are Boston players, about one sixth are Oakland players, and about one twelfth are Texas players. About how many cards do not represent players from these teams?
   about 120 cards
**Enrich**

**Mixed Numbers and Mental Math**

Sometimes you can multiply a whole number and a mixed number in your head. Think of the mixed number in two parts—the whole number and the fraction.

**Find each product mentally.**

<table>
<thead>
<tr>
<th>Example</th>
<th>Think: $3 \times 10$</th>
<th>Think: $\frac{1}{2}$ of $10$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. $7\frac{1}{2} \times 6$</td>
<td>$42$ + $3$</td>
<td>$45$</td>
</tr>
<tr>
<td>2. $4 \times 9\frac{1}{2}$</td>
<td>$36$ + $2$</td>
<td>$38$</td>
</tr>
<tr>
<td>3. $4\frac{1}{3} \times 6$</td>
<td>$24$ + $2$</td>
<td>$26$</td>
</tr>
<tr>
<td>4. $5\frac{1}{4} \times 8$</td>
<td>$40$ + $2$</td>
<td>$42$</td>
</tr>
<tr>
<td>5. $15 \times 2\frac{1}{5}$</td>
<td>$30$ + $3$</td>
<td>$33$</td>
</tr>
</tbody>
</table>

Now you can use this mental math technique to make better estimates. Here’s how.

**Estimate each product.**

| 6. $6\frac{1}{2} \times 4\frac{2}{11}$ | $\text{about 26}$ |
| 7. $5\frac{1}{3} \times 8\frac{9}{10}$ | $\text{about 48}$ |
| 8. $11\frac{5}{16} \times 2\frac{1}{4}$ | $\text{about 27}$ |
| 9. $\frac{7}{10} \times 4\frac{1}{6}$ | $\text{about 25}$ |

---

**Reteach**

**Multiplying Fractions**

To multiply a fraction by a fraction, multiply the numerators and the denominators. Then simplify the product.

$$\frac{2}{5} \times \frac{5}{8} = \frac{2 \times 5}{5 \times 8} = \frac{10}{40} = \frac{10 \div 2}{24 \div 2} = \frac{5}{12}$$

When the numerator and denominator of either fraction have a common factor, you can simplify before you multiply. Divide the numerator and the denominator by their GCF (greatest common factor).

Look at the numerator, 2, and the denominator, 8. Their GCF is 2, so divide both 2 and 8 by 2.

Look at the other numerator, 5, and the other denominator, 3. Their GCF is 1, so dividing won’t change the answer.

Now multiply. The product is already in simplest form.

$$\frac{5}{12} \times \frac{5}{4} = \frac{1 \times 5}{3 \times 4} = \frac{5}{12}$$

**Multiply. Write in simplest form.**

| 1. $\frac{3}{5} \times \frac{1}{4}$ | $\frac{3 \times 1}{5 \times 4}$ | $\frac{3}{20}$ |
| 2. $\frac{4}{7} \times \frac{5}{3}$ | $\frac{2 \times 5}{3 \times 7}$ | $\frac{10}{21}$ |
| 3. $\frac{3}{8} \times \frac{5}{10}$ | $\frac{1 \times 3}{2 \times 2}$ | $\frac{3}{4}$ |
| 4. $\frac{1}{8} \times \frac{1}{3}$ | $\frac{1 \times 1}{1 \times 2}$ | $\frac{1}{2}$ |
| 5. $\frac{1}{2} \times \frac{3}{4}$ | $\frac{3}{8}$ |
| 6. $\frac{1}{6} \times \frac{4}{5}$ | $\frac{2}{15}$ |
| 7. $\frac{3}{8} \times \frac{5}{6}$ | $\frac{5}{16}$ |
| 8. $\frac{2}{9} \times \frac{3}{10}$ | $\frac{1}{15}$ |
| 9. $\frac{1}{12} \times \frac{1}{3}$ | $\frac{1}{36}$ |
| 10. $\frac{5}{16} \times \frac{2}{5}$ | $\frac{1}{8}$ |
Skills Practice
Multiplying Fractions

Multiply. Write in simplest form.

1. \( \frac{1}{2} \times \frac{3}{8} = \frac{3}{16} \)
2. \( \frac{7}{12} \times \frac{4}{5} = \frac{7}{15} \)
3. \( \frac{3}{4} \times \frac{1}{9} = \frac{1}{12} \)
4. \( \frac{4}{9} \times \frac{5}{6} = \frac{27}{9} \)
5. \( \frac{3}{4} \times \frac{1}{3} = \frac{1}{4} \)
6. \( \frac{5}{8} \times \frac{3}{10} = \frac{16}{40} \)
7. \( \frac{2}{9} \times \frac{1}{2} = \frac{1}{9} \)
8. \( \frac{3}{5} \times \frac{3}{8} = \frac{9}{40} \)
9. \( \frac{8}{9} \times \frac{5}{16} = \frac{18}{72} \)

Multiply. Write in simplest form.

1. \( \frac{1}{3} \times \frac{1}{4} = \frac{1}{8} \)
2. \( \frac{5}{6} \times \frac{2}{3} = \frac{5}{9} \)
3. \( \frac{3}{4} \times \frac{3}{4} = \frac{9}{16} \)
4. \( \frac{5}{9} \times \frac{2}{8} = \frac{10}{72} \)
5. \( \frac{1}{12} \times \frac{1}{3} = \frac{1}{36} \)
6. \( \frac{2}{3} \times \frac{7}{8} = \frac{14}{24} \)

Evaluate each expression if \( a = \frac{1}{2}, b = \frac{3}{8}, \) and \( c = \frac{4}{5} \).

7. \( 5a = 2 \frac{1}{2} \)
8. \( 15c = 12 \)
9. \( \frac{1}{3} + \frac{4}{5} = \frac{19}{15} \)
10. \( \frac{3}{4} a + \frac{3}{5} c = \frac{109}{60} \)
11. \( ab + c = \frac{79}{60} \)
12. \( \frac{4}{7} b = \frac{14}{14} \)

13. You pay \( \frac{1}{2} \) the price for apples as compared to grapefruit if the grapefruit is \$2.99 per pound, how much do you pay for apples per pound?

50 cents per pound

Homework Practice
Multiplying Fractions

Evaluate each expression if \( a = \frac{1}{4} \) and \( b = \frac{2}{5} \).

19. \( ab = \frac{1}{10} \)
20. \( 4a = 1 \)
21. \( 8b = \frac{3}{5} \)
22. \( \frac{6}{7} a = \frac{3}{14} \)
23. \( 15b = 6 \)
24. \( \frac{5}{6} b = \frac{1}{3} \)

25. Each year the Gardners plant \( \frac{1}{2} \) of an acre with tomatoes. They sell half of what they grow at a roadside stand. What part of an acre do the Gardners use for the tomatoes they sell?

\( \frac{7}{16} \) acre

26. The Wilsons’ garden covers \( \frac{5}{32} \) acre. One fourth of the garden is planted with flowers. The rest is vegetables. What part of an acre is planted with flowers? With vegetables?

\( \frac{5}{32} \) acre; \( \frac{15}{32} \) acre

Spiral Review
Estimate each product. (Lesson 6–7)

14. \( \frac{6}{7} \times \frac{1}{4} = \frac{1}{4} \)
15. \( \frac{1}{5} \times 31 = 6 \)
16. \( \frac{2}{3} \times 61 = 40 \)
17. \( 11 \times \frac{1}{4} \times \frac{7}{10} = \frac{77}{10} \)
18. \( \frac{1}{3} \times 28 = 9 \)
19. \( \frac{2}{5} \times 6 \frac{1}{3} = 18 \)
Chapter 6

6–8

Problem-Solving Practice

Multiplying Fractions

Solve.

1. Renee wants to make a $\frac{1}{4}$ batch of muffins. If the full recipe calls for $\frac{1}{2}$ cup of milk, how much milk must she use for this smaller batch?

   $\frac{1}{8}$ cup of milk

2. Rob spends $\frac{1}{2}$ hour each day caring for his pets. He spends $\frac{1}{3}$ of the time taking care of his birds. How much time does Rob spend taking care of his birds?

   $\frac{1}{4}$ hr per day

3. It will take Jordan $\frac{1}{2}$ a day to do the yard work around the house. He decides to spend $\frac{3}{4}$ of that time mowing the lawn. How much time does Jordan spend doing other yard work?

   $\frac{1}{6}$ of a day

4. Anya needs to divide $\frac{3}{4}$ gallon of milk equally between her two friends. How much milk will each friend get?

   $\frac{1}{3}$ gal

5. Two-fifths of Troy’s card collection are postcards. Of these postcards, one-third are from Boston and one-sixth are from New York. What fraction of Troy’s cards are from Boston and New York?

   $\frac{1}{5}$

6. If Troy decides to give one-fourth of his baseball cards to his brother and one-sixth of his baseball cards to his cousin, what fraction of his cards will he have left?

   $\frac{7}{12}$

Enrich

Operations with Fractions and Decimals

Sometimes an operation involves both fractions and decimals. To perform the operation, you need to express all the numbers in the same form. Here are two examples.

\[
\frac{1}{5} \div 0.3 = \frac{1}{5} \div \frac{3}{10} \quad \text{Express the decimal as a fraction}
\]

\[= \frac{1}{5} \times \frac{10}{3} = \frac{10}{15} = \frac{2}{3}\]

\[
\frac{3}{4} + 0.115 = 0.75 + 0.115 \quad \text{Express the fraction as a decimal}
\]

\[= 0.865\]

Perform the operation. Express the answer as a fraction in simplest form.

1. $\frac{5}{16} \div 0.25 = \frac{1}{4}$

2. $0.6 \div \frac{7}{9} = \frac{6}{7}$

3. $0.125 \times \frac{4}{3} = \frac{1}{22}$

4. $1\frac{1}{3} \times 0.3 = \frac{2}{5}$

5. $0.8 - \frac{3}{5} = \frac{1}{5}$

6. $1\frac{3}{8} - 0.875 = \frac{1}{2}$

Perform the operation. Express the answer as a decimal.

7. $0.34 \div \frac{1}{5} = 1.7$

8. $\frac{1}{8} + 0.005 = 0.25$

9. $0.001 \times \frac{3}{5} = 0.0006$

10. $6.39 + \frac{7}{8} = 7.265$

11. $9.1 - \frac{1}{4} = 8.85$

12. $3 \div 0.709 + \frac{2}{5} = 1.484$

13. Kevin is making one recipe that calls for $\frac{1}{2}$ pounds of hamburger and another that calls for 2 pounds. In the store, he finds a family pack of hamburger that is labeled 3.75 pounds. Is this more or less than he needs? How much more or less?

   more: $\frac{1}{2}$ lb

14. Daneesha needs $\frac{1}{4}$ yards of material to make a jacket and $\frac{3}{4}$ yards of material to make a skirt. The material costs $7.50 per yard. What is the total cost of the material for the skirt and jacket? Round your answer to the nearest cent.

   $\$24.38$
Reteach

Multiplying Mixed Numbers

When you multiply with mixed numbers, write the mixed numbers as improper fractions. Then multiply as with fractions.

Multiply $2 \frac{4}{5} \times 1 \frac{2}{3}$.

Write the mixed numbers as fractions.

\[
\frac{14}{5} \times \frac{5}{3}
\]

Divide a numerator and a denominator by their GCF, if possible. Then multiply and simplify the product.

Multiply. Write in simplest form.

1. $2 \frac{3}{4} \times 2 \frac{1}{3}$

\[
\frac{11}{4} \times \frac{7}{3} = \frac{77}{12} = \frac{65}{12}
\]

2. $2 \frac{1}{6} \times 3 \frac{3}{4}$

\[
\frac{13}{6} \times \frac{3}{2} = \frac{13}{8}
\]

3. $1 \frac{7}{9} \times 1 \frac{3}{4}$

\[
\frac{16}{9} \times \frac{7}{4} = \frac{28}{9} = \frac{31}{9}
\]

Solve.

22. The Parks Department uses $1 \frac{3}{8}$ gallons of paint for each picnic shelter. At the end of the first day, the workers had painted $2 \frac{1}{2}$ shelters. How much paint had they used that day?

23. While cleaning up around the picnic shelters, the workers filled $6 \frac{1}{2}$ plastic bags with trash. If the average weight of a bag was $3 \frac{3}{4}$ pounds, how many pounds of trash were collected?

\[
4 \frac{3}{8} \text{ gallons}
\]

\[
24 \frac{3}{8} \text{ pounds}
\]
1. Erin usually walks $6\frac{3}{5}$ blocks for exercise. One day, she walks $1\frac{1}{2}$ times as far. How far did she walk?

2. Felix collected $4\frac{1}{3}$ bags of trash along the highway. His friend Kenji picked up $2\frac{1}{2}$ times as much. How much trash did Kenji collect?

3. Aaron built a model of his favorite airplane. The length of the model is $1\frac{1}{2}$ times its width. If its width is $7\frac{1}{8}$ inches, how long is the model?

4. Mr. Craig moved to a new house. He drove $4\frac{1}{3}$ miles to his job from his old house. From his new house, he has to drive $1\frac{1}{2}$ times as far. How far does he have to drive to work now?

5. Chris collects rocks. She has 54 different types. Her friend Jenny has $1\frac{1}{2}$ times as many rocks as Chris has, and their friend Julie has $1\frac{1}{2}$ times as many as Jenny has. How many rocks does Julie have?

6. David is planting an L-shaped vegetable garden. He measures the length and width of each section and draws the sketch below. Use his diagram to find the area of the garden. (Remember that area is found by multiplying length and width.)
## Answers (Lessons 6–9 and 6–10)

### Dividing Fractions

1. Divide $\frac{7}{8} \div \frac{3}{4}$.
   - Step 1: Find the reciprocal of the divisor.
   - The divisor is $\frac{3}{4}$.
   - The reciprocal of $\frac{3}{4}$ is $\frac{4}{3}$.
   - Step 2: Multiply by the reciprocal of the divisor.
   - $\frac{7}{8} \times \frac{4}{3} = \frac{28}{24}$
   - Step 3: Simplify.
   - $\frac{7}{8} \div \frac{3}{4} = \frac{7}{6}

2. Divide $\frac{5}{6} \div \frac{3}{5}$.
   - Step 1: Find the reciprocal of the divisor.
   - The divisor is $\frac{3}{5}$.
   - The reciprocal of $\frac{3}{5}$ is $\frac{5}{3}$.
   - Step 2: Multiply by the reciprocal of the divisor.
   - $\frac{5}{6} \times \frac{5}{3} = \frac{25}{18}$

### Multiplying Mixed Numbers

### Enrich

#### Pancakes (serves 6)

- 3 cups flour
- 1 tsp baking powder
- 1/2 cup sugar
- 1/4 tsp salt
- 2 eggs
- 1/4 cup oil

#### Pancakes (serves 8)

- 2 1/3 cups flour
- 2 1/2 tsp salt
- 1/3 cup sugar
- 1/4 tsp baking powder
- 3 eggs

#### To convert a recipe that serves 6 to a recipe that serves 8, multiply all measurements by 1 2/3.

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### Skills Practice

#### Dividing Fractions

Find the reciprocal of each number.

1. \( \frac{3}{2} \)
2. \( \frac{5}{3} \)
3. \( \frac{7}{1} \)
4. \( \frac{6}{5} \)
5. \( \frac{8}{7} \)
6. \( \frac{4}{1} \)
7. \( \frac{12}{7} \)
8. \( \frac{11}{12} \)

Divide. Write in simplest form.

9. \( \frac{1}{5} \)
10. \( \frac{1}{2} \)

11. \( \frac{4}{5} \)
12. \( \frac{1}{8} \)

#### Homework Practice

#### Dividing Fractions

Find the reciprocal of each number.

1. \( \frac{3}{2} \)
2. \( \frac{7}{8} \)
3. \( \frac{3}{4} \)
4. \( \frac{3}{5} \)
5. \( \frac{3}{2} \)
6. \( \frac{8}{3} \)
7. \( \frac{2}{3} \)
8. \( \frac{1}{3} \)

Divide. Write in simplest form.

9. \( \frac{3}{2} \)
10. \( \frac{3}{10} \)
11. \( \frac{3}{8} \)
12. \( \frac{3}{15} \)

Evaluate each expression if \( x = \frac{2}{3}, y = \frac{1}{2}, \) and \( z = \frac{3}{4}. \)

9. \( y + x \)
10. \( z + y \)
11. \( 3x + z \)

12. You pay \( \frac{1}{3} \) the price for beans as compared to pineapple. If pineapple is \( \$5.99 \) per pound, how much do you pay for beans per pound?

$2.00 per pound

### Spiral Review

Multiply. Write in simplest form. (Lesson 6–9)

13. \( \frac{1}{2} \times \frac{3}{4} \)
14. \( \frac{5}{6} \times \frac{3}{2} \)
15. \( \frac{3}{4} \times \frac{5}{6} \)
16. \( \frac{6}{7} \times \frac{3}{4} \)
17. \( \frac{3}{5} \times \frac{2}{3} \)
18. \( \frac{3}{5} \times \frac{4}{1} \)

Evaluate each expression if \( a = \frac{1}{2}, b = \frac{3}{3}, \) and \( c = \frac{2}{2}. \)

19. \( \frac{3}{4} \)
20. \( \frac{1}{2} \)
21. \( \frac{3}{8} \)
**Problem-Solving Practice**

**Dividing Fractions**

Divide. Write in simplest form.

1. Lynn made several pans of lasagna. Each piece is $\frac{1}{12}$ of a pan. How many pieces were in five pans of lasagna?
   - **60** pieces

2. Chi feeds his cat $\frac{5}{8}$ cup of food each day. How many days can he feed his cat with 6 cups of food?
   - **8** days

3. Zane made a recipe for a cake that requires 2 teaspoons of cinnamon. The only measuring spoon he had measures $\frac{1}{4}$ teaspoon. How many times must he use this measuring spoon to get the correct amount of cinnamon?
   - **8** times

4. Leigh is planning a birthday party for her little sister. She bought 5 pounds of candy to fill a piñata. If each child at the party receives $\frac{1}{3}$ pound of candy, how many children will be at the party?
   - **30** children

5. Steve made a fruit salad for dinner. The recipe called for 4 cups of apples, 2$\frac{1}{2}$ cups of nuts, 2 cups of celery, and $\frac{1}{4}$ cup of raisins. If each person eats $\frac{1}{2}$ cup of the salad, how many people will the salad serve?
   - **12** people

6. Anita is placing mulch around her trees and shrubs. She bought 20 pounds of mulch. If each tree or shrub requires $\frac{1}{2}$ pound of mulch, how many trees and shrubs can she mulch?
   - **30** shrubs and trees

**Enrich**

**Modeling Division of Fractions on a Ruler**

How many half-inch lengths are in 4 inches? When you look at a ruler, it is easy to see that the answer is 8.

So, this diagram is also a model for the division, $4 \div \frac{1}{2} = 8$.

Write the division that is modeled in each diagram.

1. $\frac{5}{8} \div 5 = 8$

2. $\frac{4}{2} \div \frac{3}{4} = 6$

3. $\frac{4}{1} \div \frac{1}{4} = 4$

4. $\frac{4}{7} \div \frac{5}{8} = 3$

5. Use the ruler below. Create a model for the division $4\frac{2}{3} \div \frac{2}{3} = 7$. 

**Answers (Lesson 6–10)**
Dividing Mixed Numbers

Divide $5 \frac{1}{3} \div 2 \frac{2}{5}$. Find the reciprocal of the divisor. Multiply $16 \div 3$ by the reciprocal.

Divide. Write in simplest form.

1. $\frac{1}{5} \div \frac{3}{2} = \frac{3}{10}$
2. $\frac{2}{3} \div \frac{5}{3} = \frac{1}{5}$
3. $45 \div 2 \frac{1}{2} = 18$
4. $15 \frac{1}{2} \div \frac{7}{4} = \frac{7}{2}$
5. $52 \div 3 \frac{1}{4} = 16$
6. $12 \div 3 \frac{1}{3} = 3 \frac{1}{3}$
7. $32 \div 5 \frac{1}{3} = \frac{6}{3}$
8. $2 \frac{1}{5} \div 2 \frac{1}{2} = \frac{22}{25}$
9. $6 \frac{1}{2} \div 1 \frac{1}{4} = 26$
10. $1 \frac{3}{4} \div 3 \frac{1}{8} = \frac{2}{5}$
11. $2 \frac{2}{5} \div 7 \frac{1}{5} = \frac{1}{3}$
12. $1 \frac{1}{4} \div 9 \frac{1}{10} = \frac{17}{18}$
13. $2 \frac{5}{8} \div 1 \frac{3}{4} = \frac{11}{2}$
14. $1 \frac{3}{4} \div 3 \frac{7}{8} = \frac{14}{31}$
15. $1 \frac{3}{10} \div 2 \frac{2}{5} = \frac{1}{2}$

Solve.

1. $\frac{2}{5} \div \frac{1}{8} = 2 \times \frac{16}{5} = \frac{3}{5}$
2. $\frac{3}{4} \div \frac{3}{7} = \frac{7}{3} \div \frac{7}{4} = \frac{13}{4}$
3. $\frac{1}{5} \div \frac{3}{5} = \frac{3}{25}
4. $\frac{2}{3} \div \frac{3}{19} = \frac{19}{3} \div \frac{5}{9} = \frac{42}{9}$

Problem Solving

23. Joe had a piece of string 8 feet long. He cut it into small pieces. Each piece is 1 \frac{3}{4} feet long. How many pieces did he cut?

24. Brenda had 5 \frac{1}{4} quarts of paint. She used the paint for 3 art projects. She used the same amount of paint for each art project. How much paint did she use for each art project?
**Homework Practice**
Dividing Mixed Numbers

Divide. Write in simplest form.

1. \( \frac{2}{3} \div \frac{7}{8} \) = \( \frac{7}{15} \)
2. \( \frac{7}{8} \div \frac{1}{3} \) = \( \frac{2}{8} \)
3. \( \frac{8}{3} \div \frac{3}{5} \) = \( \frac{10}{3} \)
4. \( \frac{5}{3} \div \frac{2}{3} \) = \( \frac{8}{5} \)
5. \( \frac{12}{3} \div \frac{4}{9} \) = \( \frac{16}{21} \)
6. \( \frac{6}{4} \div \frac{1}{8} \) = \( \frac{3}{9} \)
7. \( \frac{3}{2} \div \frac{5}{2} \) = \( \frac{1}{16} \)
8. \( \frac{3}{1} \div \frac{4}{3} \) = \( \frac{11}{111} \)

Evaluate each expression if \( x = 6 \), \( y = 3 \frac{4}{5} \), and \( z = 1 \frac{1}{2} \).

9. \( y \div x \) = \( \frac{30}{19} \)
10. \( \frac{x}{z} \) = \( \frac{4}{1} \)
11. \( \frac{1}{3} \) = \( \frac{2}{1} \)

12. How many full \( \frac{7}{8} \) pound jars of jelly can Alexa make from \( 9 \frac{12}{13} \) pounds of jelly?

\[ 11 \text{ jars} \]

**Spiral Review**
Divide. Write in simplest form. (Lesson 6–10)

13. \( \frac{3}{4} \div \frac{1}{2} \) = \( \frac{1}{1} \)
14. \( \frac{3}{5} \div \frac{7}{8} \) = \( \frac{24}{35} \)
15. \( \frac{1}{8} \div \frac{4}{5} \) = \( \frac{5}{32} \)

Find the value of each expression if \( a = \frac{1}{4}, b = \frac{1}{2}, \) and \( c = \frac{2}{5} \).

16. \( c \div a \) = \( \frac{3}{5} \)
17. \( a + b + c \) = \( \frac{9}{10} \)
18. \( b + c \) = \( \frac{1}{4} \)

**Problem-Solving Practice**
Dividing Mixed Numbers

Divide.

1. You are making bags of oranges. You have 3 baskets of oranges and each basket holds \( 2 \frac{3}{4} \) pounds of oranges. How many bags can you make that are \( \frac{5}{3} \) pound?

\[ 12 \frac{3}{4} \text{ bags} \]

2. A farmer harvests \( 75 \frac{3}{8} \) pounds of beans a day. The farmer works \( 8 \frac{1}{2} \) hours each day. How many pounds of beans does he harvest each hour?

\[ 9 \frac{1}{10} \text{ pounds} \]

3. If you are laying out a photo page and have each photo cut to \( 3 \frac{3}{4} \) inches wide, how many can you fit in a row that is \( 27 \frac{1}{2} \) inches long? There are no spaces between the photos.

\[ 8 \text{ photos} \]

4. If you cut blankets from a piece of fleece that is \( 2 \frac{1}{2} \) yards long, how many \( \frac{3}{4} \)-yard pieces will you cut?

\[ 3 \text{ pieces} \]

5. How many \( 8 \frac{3}{4} \) ounce steaks can you make from \( 61 \frac{1}{4} \) ounces of meat?

\[ 7 \text{ steaks} \]

6. If you drive \( 240 \frac{1}{2} \) miles on your trip in \( 10 \frac{5}{6} \) hours, how many miles per hour did you travel? Write in simplest form.

\[ 22.4 \text{ miles/hour} \]
Divide Fractions and Mixed Numbers

Riddle: What do the emu, the cassowary, and the ostrich have in common?

To find out, find the following quotients. Then, find the quotients at the bottom of the page and put the letter of each above the answer.

F. $\frac{8}{3} \div \frac{2}{3} = \frac{12}{5}$
G. $4\frac{1}{2} \div 6\frac{2}{3} = \frac{27}{40}$

H. $35 \div 5\frac{5}{7} = \frac{49}{7}$
I. $5\frac{5}{8} \div 9 = \frac{72}{18}$

J. $\frac{7}{12} \div \frac{5}{9} = \frac{20}{1}$
K. $8\frac{1}{6} \div 2\frac{1}{3} = \frac{3}{2}$

L. $\frac{5}{9} \div 15\frac{5}{9} = \frac{28}{3}$
M. $9 \div 4\frac{9}{1} = \frac{20}{4}$

N. $\frac{3}{16} \div \frac{7}{8} = \frac{14}{3}$
O. $\frac{3}{2} \div \frac{4}{5} = \frac{9}{2}$

P. $26 \div 7\frac{2}{9} = \frac{3}{5}$
Q. $\frac{7}{12} \div 42 = \frac{1}{72}$

THE YEAR BIRDS

THAT CAN FLY

1. compatible numbers
2. reciprocals
3. scientific notation
4. factor
5. numerator
6. denominator
7. quotient

A. A number that divides into a whole number evenly.
B. The number above the bar in a fraction; the part of the fraction that tells how many of the equal parts are being used.
C. The bottom number in a fraction.
D. The result of a division problem.
E. Two numbers whose product is 1.
F. Expressing a number as the product of two factors where the first factor is between 1 and 10 and the second factor is a power of 10.
G. Numbers in a problem or related numbers that are easy to work with mentally.
Place a few highlighters, books, and glue sticks on the table. Use pieces of paper to label them with prices: $4.87 for the books, $1.87 for the highlighters, and $2.99 for the glue sticks. Have the student act as the storeowner, and you as the customer buying products. Read each question aloud to the student. Then write the student’s answers on the lines below the question.

1. If I wanted to buy 2 highlighters, how much would it cost?
   $3.74

2. If I wanted to buy 2 books and 2 glue sticks, how much would it cost?
   $15.72

3. If I wanted to buy one of each product, how much would it cost?
   $9.73

4. Tell how you got your answer.
   $4.87 + $1.87 + $2.99 = $9.73

5. If I spent $24.35 on books, how many books did I buy?
   5 books

6. Tell how you got your answer.
   $24.35 ÷ $4.87 = 5

7. On the chalkboard or a piece of paper, write the following price chart:

<table>
<thead>
<tr>
<th>Item</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sandwich</td>
<td>$2.99</td>
</tr>
<tr>
<td>Fruit Slices</td>
<td>$1.75</td>
</tr>
<tr>
<td>Yogurt</td>
<td>$1.25</td>
</tr>
<tr>
<td>Juice Drinks</td>
<td>$1.50</td>
</tr>
<tr>
<td>Muffin</td>
<td>$2.50</td>
</tr>
</tbody>
</table>

8. What is the most expensive item on the menu?
   Sandwich

9. Tell how you got your answer.
   $2.99 > than all other items.

10. How many juice drinks can you purchase for $10.50?
    7 drinks

11. If someone purchased 3 juice drinks and 3 yogurts, how much would it cost?
    $8.25

12. Tell how you got your answer.
    $3 × $1.50 = $4.50; 3 × $1.25 = $3.75;
    $4.50 + $3.75 = $8.25
## Chapter 6 Assessment Answer Key

### Chapter Diagnostic Assessment
Page 64

1. 345
2. 903
3. 5,148
4. 693
5. 25,262
6. 3,650
7. 85
8. 41
9. 20
10. 20
11. 34
12. $57
13. \[
\frac{16}{15}
\]
14. \[
\frac{8}{5}
\]
15. \[
\frac{16}{5}
\]
16. \[
\frac{11}{4}
\]

### Chapter Pretest
Page 65

1. 9
2. 42.24
3. 0.025
4. $799.60
5. 82.9
6. 8.9
7. 1.5
8. 13
9. About 20
10. About 40
11. About 24
12. About 3
13. \[
\frac{10}{21}
\]
14. \[
\frac{13}{16}
\]
15. \[
\frac{2}{3}
\]
16. \[
\frac{15}{68}
\]

### Quiz 1 (6–1 through 6–3)
Page 66

1. 28.2
2. 26.1
3. 50.4
4. 19.68
5. 14.62
6. 19.32
7. 12.69
8. 8.55
9. Yes, it is reasonable
10. No, about 120 square feet

(continued on the next page)
Chapter 6 Assessment Answer Key

Quiz 2 (6–4 through 6–6)
Page 67

1. 120
2. 20
3. 14
4. 3.6
5. 0.2
6. 13.1
7. 4.03
8. 5.6
9. 72 miles
10. 10 shelves
11. 5.6

Quiz 3 (6–7 through 6–11)
Page 68

1. \( \frac{1}{12} \)
2. \( \frac{10}{21} \)
3. \( \frac{10}{3} \)
4. \( \frac{12}{3} \)
5. \( \frac{10}{17} \)
6. 21
7. \( \frac{5}{4} \)
8. \( \frac{1}{27} \)
9. \( \frac{13}{28} \)
10. 8 miles
11. 50 birds
12. meatballs

Mid-Chapter Review
(6–1 through 6–5)
Page 69

1. B
2. J
3. C
4. F
5. B
6. H
7. 109.94
8. 1.98
9. 0.22
10. 76.85
11. $10
12. 236.25 sq. ft

(continued on the next page)
Chapter 6 Assessment Answer Key

Chapter Test, Form 1
Page 75

1. C
2. J
3. C
4. G
5. A
6. J
7. D
8. F
9. C
10. G

Page 76

11. C
12. G
13. A
14. H
15. D
16. F
17. C
18. F
19. D

Chapter Test, Form 2A
Page 77

1. C
2. F
3. C
4. G
5. A
6. H
7. C
8. F
9. A
10. G

(continued on the next page)
<table>
<thead>
<tr>
<th>Chapter Test, Form 2A Page 78</th>
<th>Chapter Test, Form 2B Page 79</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.  H</td>
<td>13.  A</td>
</tr>
<tr>
<td>15.  A</td>
<td>14.  H</td>
</tr>
<tr>
<td>16.  H</td>
<td>15.  A</td>
</tr>
<tr>
<td>17.  A</td>
<td>16.  F</td>
</tr>
<tr>
<td>18.  F</td>
<td>17.  C</td>
</tr>
<tr>
<td></td>
<td>1. 77.04</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Answer Key for Chapter 6 Assessment - Forms 2C and 2D

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(continued on the next page)
Chapter 6 Assessment Answer Key

Chapter Test, Form 2D  
Page 84

14. about 6
15. about 9
16. about 6

27.64 miles per gallon

17. 726.11
18. $26.02 per gallon

19. 5

20. $4

Chapter Test, Form 3  
Page 85

1. 726.11
2. 25.56
3. $80.55
4. 76.63
5. 13
6. 0.0909
7. $3 \frac{3}{4}
8. $14 \frac{27}{27}
9. about 50
10. about 5

11. 112
12. 1 \frac{1}{49}
13. 1 \frac{3}{7}
14. 192
15. 4 \frac{13}{18}
16. 4.973

17. about 6
18. $11
19. 8 inches
## Chapter 6 Assessment Answer Key

Page 87, Extended-Response Test

### Scoring Rubric

<table>
<thead>
<tr>
<th>Level</th>
<th>Specific Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>The student demonstrates a <strong>thorough understanding</strong> of the mathematics concepts and/or procedures embodied in the task. The student has responded correctly to the task, used mathematically sound procedures, and provided clear and complete explanations and interpretations. The response may contain minor flaws that do not detract from the demonstration of a thorough understanding.</td>
</tr>
<tr>
<td>3</td>
<td>The student demonstrates an <strong>understanding</strong> of the mathematics concepts and/or procedures embodied in the task. The student’s response to the task is essentially correct with the mathematical procedures used and the explanations and interpretations provided demonstrating an essential but less than thorough understanding. The response may contain minor errors that reflect inattentive execution of the mathematical procedures or indications of some misunderstanding of the underlying mathematics concepts and/or procedures.</td>
</tr>
<tr>
<td>2</td>
<td>The student has demonstrated only a <strong>partial understanding</strong> of the mathematics concepts and/or procedures embodied in the task. Although the student may have used the correct approach to obtaining a solution or may have provided a correct solution, the student’s work lacks an essential understanding of the underlying mathematical concepts. The response contains errors related to misunderstanding important aspects of the task, misuse of mathematical procedures, or faulty interpretations of results.</td>
</tr>
<tr>
<td>1</td>
<td>The student has demonstrated a <strong>very limited understanding</strong> of the mathematics concepts and/or procedures embodied in the task. The student’s response to the task is incomplete and exhibits many flaws. Although the student has addressed some of the conditions of the task, the student reached an inadequate conclusion and/or provided reasoning that was faulty or incomplete. The response exhibits many errors or may be incomplete.</td>
</tr>
<tr>
<td>0</td>
<td>The student has provided a <strong>completely incorrect</strong> solution or uninterpretable response, or no response at all.</td>
</tr>
</tbody>
</table>
Chapter 6 Assessment Answer Key
Page 87, Extended-Response Test

Sample Answers
In addition to the scoring rubric found on page A37, the following sample answers may be used as guidance in evaluating open-ended assessment items.

1. a. First, round the prices of the food and drink items: Pizza is about $13, sodas are about $2, and a salad is about $5. Then, multiply the prices of the food and drink by the quantities Jinwon and his friends bought: $13 \times 1 = $13, $2 \times 4 = $8, and $5 \times 2 = $10. Finally, add the total costs: $13 + $8 + $10 = $31. Jinwon and his friends will pay about $31.


c. To find the product of a decimal and a whole number, multiply as if using whole numbers. One way to figure out where the decimal point should be is to estimate the product and compare it to the actual product. The other way is to count the number of decimal places to the right of the decimal in the factor, then place the decimal the same number of spaces counting from right to left in the product.

2. a. When dividing by decimals, change the divisor to a whole number by multiplying both the divisor and the dividend by the same power of 10. So, $0.75 \div 4.5$ becomes $75 \div 450$. Then, divide as with whole numbers: $450 \div 75 = 6$.

b. First, change the divisor to a whole number by multiplying both the divisor and the dividend by the same power of 10. So $0.75 \div 6.9$ becomes $75 \div 690$. Then, divide as with whole numbers. Lindsay can make 9 headbands and she will have 0.15 foot of velvet ribbon left over.

3. a. Round each dimension of the dodge ball court up or down, according to the rounding rules. The length is about 18 feet and the width is about 16 feet. Then, multiply to find the estimate: $18 \times 16 = 288$. The area of the dodge ball court is about 288 square feet.

b. To find $18 \frac{1}{8} \times 15 \frac{1}{2}$, first write the mixed numbers as improper fractions: $\frac{145}{8} \times \frac{31}{2}$. Then, multiply the numerators and multiply the denominators: $\frac{145}{8} \times \frac{31}{2} = \frac{4,495}{16}$. Then simplify: $\frac{4,495}{16} = 280 \frac{15}{16}$. The area of the dodge ball court is $280 \frac{15}{16}$ square feet.
Chapter 6 Assessment Answer Key

Cumulative Standardized Test Practice
Page 89

1. __________

2. __________

3. _________ B

4. _________ F

5. _________ C

6. _________ G

7. _________ D

8. _________ F

9. _________ A

10. _________ G

11. _________ 320

12. _________ 20

13. _________ 15.33

14. _________ 0.07

15. _________ $10.00

16. _________ 0.07

17. _________ 0.25

No, Jared’s actual bill was closer to $40 than $30.

18. _________ 27.3 yd²

19. _________ 0.5

20. _________