Study Guide Review

Vocabulary Development

Integrating the ELPS
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ELPS c.4.E Read linguistically accommodated content area material with a decreasing need for linguistic accommodations as more English is learned.

MODULE 1 Integers

Key Concepts
- Integers are positive and negative whole numbers. (Lesson 1.1)
- Inequality symbols include >, or "greater than," and <, or "less than." (Lesson 1.2)
- The absolute value of a number is always positive, since it is the number’s distance from 0. (Lesson 1.3)

MODULE 2 Rational Numbers

Key Concepts
- A rational number is any number that can be written as $\frac{a}{b}$. (Lesson 2.1)
- The opposite of a rational number is the number the same distance from 0 on the number line but on the opposite side of 0. (Lesson 2.2)
- To compare and order rational numbers, convert them to decimals or fractions. (Lesson 2.3)
**Example 1**
James recorded the temperature at noon in Fairbanks, Alaska, over a week in January.

<table>
<thead>
<tr>
<th>Day</th>
<th>Mon</th>
<th>Tues</th>
<th>Wed</th>
<th>Thurs</th>
<th>Fri</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature</td>
<td>3</td>
<td>2</td>
<td>7</td>
<td>-3</td>
<td>-1</td>
</tr>
</tbody>
</table>

Graph the temperatures on the number line, and then list the numbers in order from least to greatest.

The temperatures listed from least to greatest are -3, -1, 2, 3, 7.

**Exercises**
1. Graph each number on the number line. (Lesson 1.1)
   - -2, 1, 5, 7
   - -10, -9, 8, -7, -6, -5, -4, -3, -2, 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10

**Example 2**
Graph the following numbers on the number line. Then use the number line to find each absolute value.

-4, 0, 2, -1

|
|---|
| -4 |
| -3 |
| -2 |
| -1 |
| 0  |
| 1  |
| 2  |
| 3  |
| 4  |

\[ | -4 | = 4 \]
\[ | 0 | = 0 \]
\[ | 2 | = 2 \]
\[ | -1 | = 1 \]

**Module 2: Rational Numbers**

**Example 1**
Use the Venn diagram to determine in which set or sets each number belongs.

- \( \frac{1}{2} \) The number \( \frac{1}{2} \) belongs in the sets of rational numbers.
- -5 The number -5 belongs in the sets of integers and rational numbers.
- 4 The number 4 belongs in the set of whole numbers, integers, and rational numbers.
- 0.2 The number 0.2 belongs in the set of rational numbers.

**Exercises**
2. Write the opposite of each number. (Lesson 1.1)
   - 8 \( \rightarrow -8 \)
   - 3 \( \rightarrow 3 \)

3. List the numbers from least to greatest. (Lesson 1.2)
   - 4, 0, -2, 3
   - -2, 0, 3, 4
   - -5, -3, -2, 2

4. Use a number line to help you compare the numbers. Use < or >. (Lesson 1.2)
   - \( 4 \, > \, 1 \)
   - -2 \, < \, 2
   - -3 \, > \, -5
   - -7 \, < \, 2

5. Find each absolute value. (Lesson 1.3)
   - 6
   - |-2|
   - 2
EXAMPLE 2
A. Order \(\frac{1}{10}, 0.9, 0.2, \frac{3}{5}\), and 0.35 from least to greatest.
   Write the fractions as equivalent decimals. \(\frac{1}{10} = 0.1\) \(\frac{3}{5} = 0.6\)
   Use the number line to write the decimals in order.
   \[
   \begin{array}{ccccccc}
   & -1 & -0.8 & -0.6 & -0.4 & -0.2 & 0 & 0.2 & 0.4 & 0.6 & 0.8 & 1 \\
   0.1 & 0.2 & 0.35 & 0.6 & 0.9
   \end{array}
   \]
   \(0.1 < 0.2 < 0.35 < 0.6 < 0.9\)
   The numbers in order from least to greatest are \(\frac{1}{10}, 0.2, 0.35, \frac{3}{5}, 0.9\).
B. Order \(\frac{5}{3}, 0.2,\) and \(\frac{9}{5}\) from greatest to least.
   Write the decimal as an equivalent fraction. \(0.2 = \frac{2}{10} = \frac{1}{5}\)
   Find equivalent fractions with 15 as the common denominator.
   \[
   \begin{array}{c}
   \frac{5}{3} \times \frac{5}{5} = \frac{25}{15} \\
   \frac{3}{5} \times \frac{3}{3} = \frac{9}{15} \\
   \frac{1}{5} \times \frac{3}{3} = \frac{3}{15}
   \end{array}
   \]
   Order fractions with common denominators by comparing the numerators.
   \[
   \frac{5}{3} > \frac{3}{5} > \frac{1}{5}
   \]
   The numbers in order from greatest to least are, \(\frac{5}{3}, \frac{3}{5}, \frac{1}{5}\), and 0.2.

EXERCISES
Classify each number by indicating in which set or sets it belongs. (Lesson 2.1)

1. \(8\) whole numbers, integers, rational numbers
2. \(0.25\) rational numbers

Find the absolute value of each rational number. (Lesson 2.2)

3. \(|3.7|\) \(3.7\)
4. \(|-\frac{2}{3}|\) \(\frac{2}{3}\)

Graph each set of numbers on the number line and order the numbers from greatest to least. (Lesson 2.1, 2.3)

5. \(-0.5, -1, -\frac{1}{2}, 0\)

\[
\begin{array}{ccccccc}
-1 & -0.5 & 0 & 0.25 & 0.5 & \\
-1.5 & -1 & -0.5 & 0 & 0.5 & \\
0 & \frac{1}{2} & -0.5 & -1
\end{array}
\]
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MODULE 3 Multiplying and Dividing Fractions


Key Concepts
• The product of two proper fractions is less than each of the fractions. (Lesson 3.1)
• When multiplying mixed numbers, rewrite mixed numbers as fractions greater than 1 before multiplying numerators and denominators. (Lessons 3.1, 3.2)
• To find the reciprocal of a fraction, switch the numerator and the denominator. (Lesson 3.3)
• To divide fractions and mixed numbers, write any mixed numbers as fractions greater than 1, find the reciprocal of the second fraction, and multiply the numerators and denominators. (Lessons 3.3, 3.4)

MODULE 4 Multiplying and Dividing Decimals

6.3.E

Key Concepts
• The number of decimal places in the product of decimals is the sum of the decimal places in the factors. (Lesson 4.1)
• To divide a decimal by a decimal, multiply both the divisor and the dividend by a power of 10 to make the divisor a whole number. (Lesson 4.2)
• To multiply or divide a fraction by a decimal, write both as fractions or as decimals. (Lesson 4.3)
MODULE 5  Adding and Subtracting Integers

Key Concepts
• To add integers with the same sign, add the absolute value of the integers and use the sign of the integers for the sum. (Lesson 5.1)
• To add integers with different signs, subtract the smaller absolute value from the greater absolute value. The sign of the sum will be the sign of the addend with the greater absolute value. (Lesson 5.2)
• Subtracting one integer from another integer is the same as adding its opposite. (Lesson 5.3)
• To solve multistep problems involving addition and subtraction of integers, use a four step problem-solving plan. (Lesson 5.4)

MODULE 6  Multiplying and Dividing Integers

Key Concepts
• The product of two integers with the same sign is positive. The product of two integers with different signs is negative. (Lesson 6.1)
• The quotient of two integers with the same sign is positive. The quotient of two integers with different signs is negative. (Lesson 6.2)
• To simplify an expression with more than one operation, use the order of operations to simplify the expression. (Lesson 6.3)
UNIT 2
Study Guide Review

MODULE 3
Multiplying and Dividing Fractions

ESSENTIAL QUESTION
How can you use products and quotients of fractions to solve real-world problems?

EXAMPLE 1
Multiply.
A. \( \frac{4}{5} \times \frac{1}{8} \)
B. \( \frac{3}{4} \times \frac{1}{3} \)

EXAMPLE 2
Divide.
A. \( \frac{2}{3} \div \frac{1}{2} \)
B. \( \frac{5}{6} \div \frac{2}{3} \)

EXERCISES
Multiply. Write the answer in simplest form. (Lessons 3.1, 3.2)
1. \( \frac{3}{4} \times \frac{2}{3} = \frac{1}{2} \)
2. \( \frac{5}{6} \times \frac{1}{2} = \frac{5}{12} \)
3. \( \frac{2}{3} \times \frac{1}{4} = \frac{1}{6} \)
4. \( \frac{1}{2} \times \frac{5}{6} = \frac{5}{12} \)
5. \( \frac{1}{2} \times \frac{1}{2} = \frac{1}{4} \)
6. \( \frac{1}{4} \times \frac{2}{3} = \frac{1}{6} \)

Divide. Write answer in simplest form. (Lessons 3.3, 3.4)
7. \( \frac{3}{4} \div \frac{1}{2} = \frac{3}{2} \)
8. \( \frac{1}{2} \div \frac{1}{3} = \frac{3}{2} \)
9. \( \frac{3}{4} \div \frac{1}{2} = \frac{3}{2} \)

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MODULE 4
Multiplying and Dividing Decimals

ESSENTIAL QUESTION
How can you use products and quotients of decimals to solve real-world problems?

EXAMPLE 1
Rebecca bought 2.5 pounds of red apples. The apples cost $0.98 per pound. What was the total cost of Rebecca’s apples?

\[ 2.5 \times 98 = 245 \] decimal places

EXAMPLE 2
Rashid spent $37.29 on gas for his car. Gas was $3.39 per gallon. How many gallons did Rashid purchase?

Step 1: The divisor has two decimal places, so multiply both the dividend and the divisor by 100 so that the divisor is a whole number:

\[ 3729 \div 339 = 11 \]

Step 2: Divide:

\[ 339 \left[ \begin{array}{c} 3729 \\ \hline 339 \\ \hline 339 \\ \hline 0 \end{array} \right. \]

Rashid purchased 11 gallons of gas.
EXAMPLE 1
Add.
A. $-8 + (-7)$
   The signs of both integers are the same.
   $8 + 7 = 15$
   Find the sum of the absolute values.
   $-8 + (-7) = -15$
   Use the sign of the integers to write the sum.
B. $-5 + 11$
   The signs of the integers are different.
   $|11| - |5| = 6$
   Greater absolute value – less absolute value.
   $-5 + 11 = 6$
   $11$ has the greater absolute value, so the sum is positive.

EXERCISES
Multiply. (Lesson 4.1)
1. $12 \times 0.4 = 4.8$
2. $0.15 \times 9.1 = 1.365$
3. $3.12 \times 0.25 = 0.78$

Divide. (Lesson 4.2)
4. $5 \div 45 = 0.111$
5. $0.6 \div 25 = 0.02$
6. $2.1 \div 36 = 0.05$

7. Olga worked 37.5 hours last week at the library and earned $12.50 an hour. If she gets a $2.50 per hour raise, how many hours will she have to work to make the same amount of money as she did last week? (Lesson 4.3)
   $31.25$ hours

8. A pound of rice crackers costs $2.88. Matthew purchased $\frac{3}{4}$ pound of crackers. How much did he pay for the crackers? (Lesson 4.3)
   $0.72$

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   $0.72$

EXAMPLE 2
The temperature Tuesday afternoon was 3 °C. Tuesday night, the temperature was −6 °C. Find the change in temperature.

Solve $-6 - 3$.

Rewrite as $-6 + (-3)$. $-3$ is the opposite of 3.

$-6 + (-3) = -9$

The temperature decreased 9 °C.

EXERCISES
Add. (Lessons 5.1, 5.2)
1. $-10 + (-5) = -15$
2. $9 + (-20) = -11$
3. $-13 + 32 = 19$

Subtract. (Lesson 5.3)
4. $-12 - 5 = -17$
5. $25 - (-4) = 29$
6. $-3 - (-4) = 7$

7. Antoine has $13$ in his savings account. He buys some school supplies and ends up with $5$ in his account. What was the overall change in Antoine’s account? (Lesson 5.4)
   $-8$

8. Steve finds the value of $-12 + 18$. Marion finds the value of $-10 - (-15)$. Whose expression has the greater value? (Lesson 5.4)
   Steve’s expression

MODULE 6 Multiplying and Dividing Integers

EXERCISES
Multiply. (Lesson 5.4)
A. $(13)(-3)$
   Find the sign of the product. The numbers have different signs, so the product will be negative. Multiply the absolute values. Assign the correct sign to the product.
   $13(-3) = -39$
B. \((-5)(-8)\)

Find the sign of the product. The numbers have the same sign, so the product will be positive. Multiply the absolute values. Assign the correct sign to the product.

\((-5)(-8) = 40\)

**EXAMPLE 2**

Christine received \(-25\) points on her exam. She got 5 questions wrong. How many points did Christine receive for each wrong answer?

Divide \(-25\) by 5.

\(-25 \div 5 = -5\)

The numbers have different signs. The quotient will be negative.

Christine received \(-5\) points for each wrong answer.

**EXAMPLE 3**

Simplify: \(15 + (-3) \times 8\)

\[15 + (-24)\] Multiply first.

\[= -9\] Add.

**EXERCISES**

Multiply or divide. (Lessons 6.1, 6.2)

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. (-9 \times (-5))</td>
<td>45</td>
<td>2. (0 \times (-10))</td>
<td>0</td>
</tr>
<tr>
<td>3. (12 \times (-4))</td>
<td>-48</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. (-32 \div 8)</td>
<td>5</td>
<td>5. (-9 \div (-1))</td>
<td>9</td>
</tr>
<tr>
<td>6. (-56 \div 8)</td>
<td>-7</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Simplify. (Lesson 6.3)

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>7. (-14 \div 2 - 3)</td>
<td>-10</td>
<td>8. (8 + (-20) \times 3)</td>
<td>-52</td>
</tr>
<tr>
<td>9. (36 \div (-6) - 15)</td>
<td>-21</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Write an expression to represent the situation. Evaluate the expression and answer the question.

10. Steve spent $24 on dog grooming supplies. He washed 6 dogs and charged the owners $12 per dog wash. How much money did Steve earn? (Lesson 6.3)

\[-24 + 6 \times 12 = 48; \$48\]

11. Tony and Mario went to the store to buy school supplies. Tony bought 3 packs of pencils for $4 each and a pencil box for $7. Mario bought 4 binders for $6 each and used a coupon for $6 off. Who spent more money? (Lesson 6.3)

Tony: \(3 \times 4 + 7 = 19\); Mario: \(4 \times 6 - 6 = 18\); Tony spent more money.
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**MODULE 7 Representing Ratios and Rates**


**Key Concepts**
- A ratio is the comparison of two quantities expressed with the same units. *(Lesson 7.1)*
- A rate is a comparison of two quantities that have different units, and a unit rate has a denominator of 1. *(Lesson 7.2)*
- You can use equivalent ratios to solve real-world problems. *(Lesson 7.3)*

**MODULE 8 Applying Ratios and Rates**

**TEKS** 6.4.A, 6.4.H, 6.5.A

**Key Concepts**
- You can represent real-world problems involving ratios and rates using tables and graphs. *(Lesson 8.2)*
- A proportion is a statement that two ratios or rates are equivalent. *(Lesson 8.3)*
- You can use rates and proportions to convert one unit of measurement to another within the same measurement system. *(Lesson 8.4)*

**MODULE 9 Percents**


**Key Concepts**
- A percent is a ratio that compares a number to 100. *(Lesson 9.1)*
- Any percent can be written as an equivalent fraction and an equivalent decimal. *(Lesson 9.2)*
- You can use proportional reasoning to solve problems that involve percents. *(Lesson 9.3)*

Additional Resources

**Assessment Resources**
- Leveled Unit Tests: A, B, C, D
- Performance Assessment
- Mid-Year Test: Modules 1–9
**EXAMPLE 1**

Tina pays $45.50 for 13 boxes of wheat crackers. What is the unit price?

\[ \frac{45.50}{13 \text{ boxes}} = \frac{3.50}{1 \text{ box}} \]

The unit price is $3.50 per box of crackers.

**EXAMPLE 2**

A trail mix recipe calls for 3 cups of raisins and 4 cups of peanuts. Mitt made trail mix for a party and used 5 cups of raisins and 6 cups of peanuts. Did Mitt use the correct ratio of raisins to peanuts?

\[ \frac{3 \text{ cups of raisins}}{4 \text{ cups of peanuts}} \]

The ratio of raisins to peanuts in the recipe is \( \frac{3}{4} \).

Mitt used a ratio of \( \frac{5}{6} \).

Mitt used a higher ratio of raisins to peanuts in his trail mix.

**EXERCISES**

Write three equivalent ratios for each ratio. (Lesson 7.1) Sample answers given.

1. \( \frac{18}{6}, \frac{36}{12}, \frac{9}{3}, \frac{3}{1} \)

2. \( \frac{5}{4}, \frac{10}{8}, \frac{2}{1}, \frac{1}{0} \)

3. \( \frac{3}{1}, \frac{6}{2}, \frac{9}{3}, \frac{12}{4}, \frac{15}{5} \)

4. To make a dark orange color, Ron mixes 3 ounces of red paint with 2 ounces of yellow paint. Write the ratio of red paint to yellow paint three ways. (Lesson 7.1) \( \frac{3}{2}, \frac{3}{2} \) to \( \frac{2}{2} \)

5. A box of a dozen fruit tarts costs $15.00. What is the cost of one fruit tart? (Lesson 7.2) $1.25

Compare the ratios. (Lesson 7.3)

6. \( \frac{1}{3} < \frac{1}{2} \)

7. \( \frac{2}{3} > \frac{10}{7} \)

8. \( \frac{8}{11} < \frac{7}{12} \)

9. \( \frac{5}{6} < \frac{8}{9} \)

**EXAMPLE 1**

Jessica earns $5 for each dog she walks. Complete the table, describe the rule, and tell whether the relationship is additive or multiplicative. Then graph the ordered pairs on a coordinate plane.

<table>
<thead>
<tr>
<th>Number of dogs</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Profit ($)</td>
<td>5</td>
<td>10</td>
<td>15</td>
<td>20</td>
<td>25</td>
</tr>
</tbody>
</table>

Jessica’s profit is the number of dogs walked multiplied by $5. The relationship is multiplicative.

**EXAMPLE 2**

Kim’s softball team drank 3 gallons of water during practice. How many cups of water did the team drink?

- 16 cups = 3 gallons
- 1 gallon = 32 cups

The team drank 48 cups of water.

**EXERCISES**

1. Thaddeus already has $5 saved. He wants to save more to buy a book. Complete the table, and graph the ordered pairs on the coordinate graph. (Lesson 8.1, 8.2)

<table>
<thead>
<tr>
<th>New savings</th>
<th>4</th>
<th>6</th>
<th>8</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total savings</td>
<td>9</td>
<td>11</td>
<td>13</td>
<td>15</td>
</tr>
</tbody>
</table>

2. There are 2 hydrogen atoms and 1 oxygen atom in a water molecule. Complete the table, and list the equivalent ratios shown on the table. (Lesson 8.1, 8.2)

<table>
<thead>
<tr>
<th>Hydrogen atoms</th>
<th>8</th>
<th>12</th>
<th>16</th>
<th>20</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oxygen atoms</td>
<td>4</td>
<td>6</td>
<td>8</td>
<td>10</td>
</tr>
</tbody>
</table>

3. Sam can solve 30 multiplication problems in 2 minutes. How many can he solve in 20 minutes? (Lesson 8.5)

300 multiplication problems
4. A male Chihuahua weighs 5 pounds. How many ounces does he weigh? (Lesson 8.4) 80 ounces

EXAMPLE 1
Find an equivalent percent for \( \frac{1}{10} \).

EXAMPLE 2
Thirteen of the 50 states in the United States do not touch the ocean. Write \( \frac{13}{50} \) as a decimal and a percent.

EXAMPLE 3
Buckner put $60 of his $400 paycheck into his savings account. Find the percent of his paycheck that Buckner saved.

EXERCISES
Write each fraction as a decimal and a percent. (Lessons 9.1, 9.2)

Complete each statement. (Lessons 9.1, 9.2)

7. 42 of the 150 employees at Carlo’s Car Repair wear contact lenses. What percent of the employees wear contact lenses? (Lesson 9.3) 28%

8. Last week at Best Bargain, 75% of the computers sold were laptops. If 340 computers were sold last week, how many were laptops? (Lesson 9.3) 255 laptops
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MODULE 10 Generating Equivalent Numerical Expressions

TEKS 6.7.A

Key Concepts
• A power is a number that is formed by repeated multiplication by the same factor. An exponent and a base can be used to write a power. (Lesson 10.1)
• Factors are whole numbers that are multiplied to find a product. (Lesson 10.2)
• To simplify an expression with more than one operation, there is a specific order in which to apply the operations. (Lesson 10.3)

MODULE 11 Generating Equivalent Algebraic Expressions

TEKS 6.7.C, 6.7.D

Key Concepts
• An algebraic expression is an expression that contains one or more variables and may also contain operation symbols, such as + or −. A variable is a letter or symbol used to represent an unknown number. (Lesson 11.1)
• To evaluate an expression, substitute a number for the variables and find the value of the expression. (Lesson 11.2)
• To generate equivalent expressions, use the properties of operations to combine like terms. (Lesson 11.3)
MODULE 12 Equations and Relationships

Key Concepts

• An equation is a mathematical statement that two expressions are equal, which, if it includes a variable, has a solution. (*Lesson 12.1*)

• Both sides of an equation remain equal after adding, or subtracting, the same number from both sides. (*Lesson 12.2*)

• Both sides of an equation remain equal after multiplying, or dividing, both sides by the same number. (*Lesson 12.3*)
MODULE 13  Inequalities and Relationships

Key Concepts
• An inequality is a mathematical statement that uses one of the following inequality symbols: greater than, $>$, less than, $<$, greater than or equal to, $\geq$, or less than or equal to, $\leq$. (Lesson 13.1)
• All inequalities have many solutions. (Lesson 13.2)
• Reverse the inequality symbol when multiplying or dividing both sides of an inequality by a negative number. (Lesson 13.4)

MODULE 14  Relationships in Two Variables

Key Concepts
• An ordered pair is a pair of numbers in the form $(x, y)$ that gives the location of a point on a coordinate plane. (Lesson 14.1)
• The quantity that depends on the other quantity is called the dependent variable, and the quantity it depends on is called the independent variable. (Lesson 14.2)
• Tables and graphs can be used to represent the relationship between an independent and dependent variable. (Lesson 14.4)
UNIT 4
Study Guide Review
MODULE 10
Generating Equivalent Numerical Expressions

ESSENTIAL QUESTION
How can you generate equivalent numerical expressions and use them to solve real-world problems?

EXAMPLE 1
Find the value of each power.
A. \(0.9^2 = 0.9 \times 0.9 = 0.81\)  
B. \(18^2 = 18 \times 18 = 324\)  
C. \(\left(\frac{1}{3}\right)^2 = \frac{1}{3} \times \frac{1}{3} = \frac{1}{9}\)

EXAMPLE 2
Find the prime factorization of 60.

\[
\begin{array}{c|c}
2 & 60 \\
2 & 30 \\
3 & 15 \\
5 & 5 \\
1 & 1 \\
\end{array}
\]

The prime factorization of 60 is \(2^2 \times 3 \times 5\).

EXAMPLE 3
Simplify each expression.
A. \(4 \times (2^2 + 5) = 4 \times (4 + 5) = 4 \times 9 = 36\)
B. \(27 \div 3^2 = 27 \div 9 = 3\)
C. \(4 \times 5 = 20\)

EXERCISES
Use exponents to write each expression. (Lesson 10.1)
1. \(3 \times 6 = 3^1 \times 6^1 = 3 \times 6 = 18\)
2. \(9 \times 9 \times 9 = 9^3 = 9 \times 9 \times 9 = 27\)
3. \(\frac{4}{5} \times \frac{4}{5} = \left(\frac{4}{5}\right)^2 = \frac{4}{5} \times \frac{4}{5} = \frac{16}{25}\)

Key Vocabulary
- base (base (in numerical expression))
- exponent (exponent)
- order of operations (orden de las operaciones)
- power (potencia)

MODULE 11
Generating Equivalent Algebraic Expressions

ESSENTIAL QUESTION
How can you generate equivalent algebraic expressions and use them to solve real-world problems?

EXAMPLE 1
Evaluate each expression for the given value of the variable.
A. \(2(x^2 - 9); \quad x = 5\)
B. \(w - y^2 + 3w; \quad w = 2, \quad y = 6\)

\[
\begin{array}{c|c}
2(5^2 - 9) & \quad 5^2 = 25 \\
= 2(26) & \quad 2 - 6^2 + 3(2) \\
= 52 & \quad 2 - 36 + 6 \\
= 52 & \quad \text{Multiply.} \\
& \quad \text{Add and subtract from left to right.} \\
& \quad \text{Multiply.}
\end{array}
\]

When \(x = 5\), \(2(x^2 - 9) = 52\). When \(w = 2\) and \(y = 6\), \(w - y^2 + 3w = 12\).

EXAMPLE 2
Determine whether the algebraic expressions are equivalent:
\(5(x + 2)\) and \(10 + 5x\).

\[
\begin{array}{c|c}
5(x + 2) & \quad 5x + 10 \\
= 10 + 5x & \quad \text{Distributive Property} \\
& \quad \text{Commutative Property}
\end{array}
\]

\(5(x + 2)\) is equal to \(10 + 5x\). They are equivalent expressions.

EXERCISES
Write each phrase as an algebraic expression. (Lesson 11.1)
1. \(x\) subtracted from 15 \(15 - x\)
2. \(12\) divided by \(t\) \(\frac{12}{t}\)

Find the value of each power. (Lesson 10.1)
4. \(12^2 = 144\)
5. \(13^3 = 2197\)
6. \(\left(\frac{2}{3}\right)^4 = \frac{16}{81}\)

Write the prime factorization of each number. (Lesson 10.2)
7. \(75 = 3 \times 5^2\)
8. \(29 = 29\)
9. \(168 = 2^3 \times 3 \times 11\)
10. \(Eduardo\) is building a sandbox that has an area of 84 square feet. What are the possible whole number measurements for the length and width of the sandbox? (Lesson 10.2) \(1, 84; 2, 42; 3, 28; 4, 21; 6, 14; 7, 12\)

UNIT 4
Expressions, Equations, and Relationships 408
Write a phrase for each algebraic expression. (Lesson 11.1)

3. \(8p\) \space \text{the product of 8 and } p\n
4. \(s + 7\) \space \text{the sum of } s \text{ and } 7

Evaluate each expression for the given value of the variable. (Lesson 11.2)

5. \(8z + 3; z = 8\) \space 67

6. \(3(7 + x); x = 2\) \space 33

7. \(s = -5t + p; s = 4, \ t = -1\) \space 25

8. \(x - y; x = -7, y = 3\) \space -34

9. The expression \(\frac{1}{2} (b_1 + b_2)\) gives the area of a trapezoid, with \(b_1\) and \(b_2\) representing the two base lengths of a trapezoid and \(h\) representing the height. Find the area of a trapezoid with base lengths 4 in. and 6 in. and a height of 8 in. (Lesson 11.2)

\[40 \text{ in}^2\]

Determine if the expressions are equivalent. (Lesson 11.3)

10. \(7 + 7x; 7(x + \frac{1}{2})\) \space \text{not equivalent}

11. \(2.5(3 + x); 2.5x + 7.5\) \space \text{equivalent}

Combine like terms. (Lesson 11.3)

12. \(3m - 6 + m^2 - 5m + 1\) \space \(m^2 - 2m - 5\)

13. \(7x + 4(2x - 6)\) \space \(15x - 24\)

EXAMPLE 1

Determine if the given value is a solution of the equation.

A. \(r - 5 = 17; r = 12\)

B. \(\frac{x}{6} = -7; x = -42\)

12 - 5 \(\neq\) 17 \space \text{Substitute.}

\(-42 \neq -7\) \space \text{Substitute.}

\(x \neq 7\)

7 is not a solution of \(r - 5 = 17\).

\(-42\) is a solution of \(\frac{x}{6} = -7\).

EXERCISES

Determine whether the given value is a solution of the equation. (Lesson 12.1)

1. \(7x = 14; x = 3\) \space \text{no}

2. \(y + 13 = -4; y = -17\) \space \text{yes}

Write an equation to represent the situation. (Lesson 12.1)

3. Don has three times as much money as his brother, who has \(\$25\). \(\frac{d}{3} = 25\)

4. There are \(s\) students enrolled in Mr. Rodriguez’s class. There are 6 students absent and 18 students present today. \(s - 6 = 18\)

Solve each equation. Check your answer. (Lessons 12.2, 12.3)

5. \(p - 5 = 18\) \space \(p = 23\)

6. \(\frac{t}{4} = -12\) \space \(t = -48\)

7. \(9q = 18.9\) \space \(q = 2.1\)

8. \(3.5 + x = 7\) \space \(x = 3.5\)

9. \(18 - x = 31\) \space \(x = 49\)

10. \(\frac{3}{7} = 2x\) \space \(x = \frac{1}{14}\)

11. Sonia used \$12.50 to buy a new journal. She has \$34.25 left in her savings account. How much money did Sonia have before she bought the journal? Write and solve an equation to solve the problem. (Lesson 12.2) \(x - 12.50 = 34.25; \$46.75\)

12. Tom read 132 pages in 4 days. He read the same number of pages each day. How many pages did he read each day? Write and solve an equation to solve the problem. (Lesson 12.3) \(4p = 132; 33\) pages

Key Vocabulary

equation (ecuación)
solution (solución)
EXAMPLE 1
Write and graph an inequality to represent each situation.

A. There are at least 5 gallons of water in an aquarium.
   \[ g \geq 5 \]

B. The temperature today will be less than 35 °F.
   \[ t < 35 \]

EXAMPLE 2
Solve each inequality. Graph and check your solutions.

A. \[ x - 7 \leq 2 \]  
   \[ x \leq 9 \]  Add 7 to both sides.

B. \[ -3y < -15 \]  
   \[ y > 3 \]  Divide by -3. Reverse the symbol.

EXERCISES
Write and graph an inequality to represent each situation.

1. Orange Tech’s stock is worth less than $2.50 per share, \( s < 2.5 \).
2. Tina got a haircut, and her hair is still at least 15 inches long. \( h \geq 15 \).

Solve each inequality. Graph and check your solutions.

3. \[ q - 12 \geq 3 \]  
   \[ q \geq 15 \]
4. \[ \frac{2}{5} \leq -1 \]  
   \[ t \leq -4 \]
5. \[ 9q > 10.8 \]  
   \[ q > 1.2 \]
6. \[ 87 \leq 25 + x \]  
   \[ x \geq 62 \]
7. \[ -\frac{3}{4}x < 8 \]  
   \[ x > -10 \]
8. \[ -4 \geq -0.5x \]  
   \[ x \geq 8 \]

9. Write a real-world comparison that can be described by \( x - 3 \geq 11 \).
   Sample answer: Juan’s dog lost 3 pounds and still weighs at least 11 pounds.

10. Omar wants a rectangular vegetable garden. He only has enough space to make the garden 5 feet wide, and he wants the area of the garden to be more than 80 square feet. Write and solve an inequality to find the possible lengths of the garden. (Lesson 13.3)
   \[ 5l > 80, \ l > 16 \]

MODULE 14
Relationships in Two Variables

EXAMPLE 1
Graph the point \( (4, -2) \) and identify the quadrant where it is located.

\( (4, -2) \) is located 4 units to the right of the origin and 2 units down from the origin.

\( (4, -2) \) is in quadrant IV.

EXAMPLE 2
Tim is paid $8 more than the number of bags of peanuts he sells at the baseball stadium. The table shows the relationship between the money Tim earns and the number of bags of peanuts Tim sells. Identify the independent and dependent variables, and write an equation that represents the relationship.

<table>
<thead>
<tr>
<th># of bags of peanuts, ( x )</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Money earned, ( y )</td>
<td>8</td>
<td>9</td>
<td>10</td>
<td>11</td>
</tr>
</tbody>
</table>

The number of bags is the independent variable, and the money Tim earns is the dependent variable.

The equation \( y = x + 8 \) expresses the relationship between the number of bags Tim sells and the amount he earns.
**EXERCISES**

Graph and label each point on the coordinate plane. *(Lesson 14.1)*

1. (4, 4)
2. (−3, −1)
3. (−1, 4)

Use the graph to answer the questions. *(Lesson 14.2)*

4. What is the independent variable? **time**
5. What is the dependent variable? **distance**
6. Describe the relationship between the independent variable and the dependent variable.

   The dependent variable is 3 times the independent variable.

7. Use the data on the table to write an equation to express $y$ in terms of $x$. Then graph the equation. *(Lessons 14.3, 14.4)*

<table>
<thead>
<tr>
<th>$x$</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>$y$</td>
<td>-2</td>
<td>-1</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

   $y = x - 2$
Study Guide Review

Vocabulary Development

Integrating the ELPS
Encourage English learners to refer to their notes and the illustrated, bilingual glossary as they review the unit content.

**c.4.E** Read linguistically accommodated content area material with a decreasing need for linguistic accommodations as more English is learned.

**MODULE 15  Angles, Triangles, and Equations**

**TEKS 6.8.A**

**Key Concepts**
- To form a triangle, the sum of the lengths of any two sides of the triangle must be greater than the length of the third side. *(Lesson 15.1)*
- The sum of the measures of the angles in a triangle is 180°. *(Lesson 15.2)*
- The longest side length of a triangle is opposite the largest angle; the shortest side length of a triangle is opposite the smallest angle; and the midsize angle is opposite the midsize side. *(Lesson 15.3)*

**MODULE 16  Area and Volume Equations**


**Key Concepts**
- The area $A$ of a parallelogram is the product of its base $b$ and its height $h$, $A = bh$. *(Lesson 16.1)*
- The area of a trapezoid is half its height multiplied by the sum of the lengths of its two bases, $A = \frac{1}{2}h(b_1 + b_2)$. *(Lesson 16.1)*
- The area of a rhombus is half of the product of its two diagonals, $A = \frac{1}{2}d_1d_2$. *(Lesson 16.1)*
- The area $A$ of a triangle is half the product of its base $b$ and its height $h$, $A = \frac{1}{2}bh$. *(Lesson 16.2)*
- The volume $V$ of a rectangular prism is the product of its length $l$, its width $w$, and its height $h$, $V = lwh$. *(Lesson 16.4)*
**EXAMPLE 1**

Find the missing angle measure in each triangle.

\[ \begin{align*} 
51 + 90 + x &= 180 \\
141 + x &= 180 \\
x &= 39^\circ \\
18 + 21 + y &= 180 \\
39 + y &= 180 \\
y &= 141^\circ 
\end{align*} \]

**EXAMPLE 2**

The triangle shown has approximate side lengths of 5 cm, 5.8 cm, and 3 cm. Match each side with its correct length.

- \( AB = 5 \text{ cm} \)
- \( BC = 3 \text{ cm} \) (Shortest side length across from the smallest angle)
- \( AC = 5.8 \text{ cm} \) (Greatest side length across from the greatest angle)

**EXERCISES**

Tell whether a triangle can have sides with the given lengths. If it cannot, give an inequality that shows why not. (Lesson 15.1)

1. 5 in., 12 in., 13 in. **yes**
2. 4.5 ft, 5.5 ft, 11 ft **no, 4.5 + 5.5 \leq 11**

---

**MODULE 15**

**Angles, Triangles, and Equations**

**Key Vocabulary**
- parallelogram
- rhombus (rhomb)
- trapezoid (trapezio)

**ESSENTIAL QUESTION**

How can you use angles, triangles, and equations to solve real-world problems?

**EXAMPLE 2**

Find each missing angle measure. Classify each triangle as acute, obtuse, or right. (Lesson 15.2)

3. 41°, 90°, right
4. 60°, acute

**Match each side length with its correct measure. Classify each triangle as scalene, isosceles, or equilateral. (Lesson 15.3)**

5. The side lengths of triangle \( ABC \) are 6.4 ft, 10 ft, and 6.4 ft.
   - \( AB = 6.4 \text{ ft} \)
   - \( BC = 10 \text{ ft} \)
   - \( AC = 6.4 \text{ ft} \)
   - **isosceles**

6. The side length of \( ZX \) is 17 cm.
   - \( xy = 17 \text{ cm} \)
   - \( yz = 17 \text{ cm} \)
   - **equilateral**

---

**MODULE 16**

**Area and Volume Equations**

**Key Vocabulary**
- parallelogram (paralelogramo)
- rhombus (rombo)
- trapezoid (trapezio)

**ESSENTIAL QUESTION**

How can you use area and volume equations to solve real-world problems?

**EXAMPLE 1**

Find the area of the trapezoid.

\[ A = \frac{1}{2} (h) (b_1 + b_2) \]
\[ A = \frac{1}{2} (10) (7 + 4) \]
\[ A = 55 \text{ in}^2 \]
EXAMPLE 2
A triangular sail for a sailboat has a height of 30 feet and an area of 330 square feet. Find the base length of the sail.

\[ A = \frac{1}{2}bh \]
\[ 330 = \left( \frac{1}{2} \right) 30b \]
\[ b = 22 \text{ ft} \]

EXAMPLE 3
A cubic centimeter of gold weighs approximately 19.32 grams. Find the weight of a brick of gold that has a height of 6 centimeters, width of 3 centimeters, and length of 8 centimeters.

\[ V = \text{length} \times \text{width} \times \text{height} \]
\[ V = 8 \times 3 \times 6 \]
\[ V = 144 \text{ cm}^3 \]

The weight of the gold is \(144 	imes 19.32\) grams, which is approximately 2782.08 grams.

EXERCISES
Find the area of each figure. (Lessons 16.1, 16.2)

1. \[ 24 \text{ in.} \]
\[ 12 \text{ in.} \]
\[ \text{Area} = 288 \text{ in}^2 \]

2. \[ 8 \text{ ft} \]
\[ \text{Area} = 32 \text{ ft}^2 \]

Find the missing measurement. (Lesson 16.3)

3. \[ \text{Length} = 11 \text{ m} \]
\[ \text{Width} = 14 \text{ m} \]
\[ h = 5 \text{ m} \]

4. \[ \text{Base} = b \]
\[ \text{Height} = 4 \text{ mm} \]
\[ \text{Area} = 26 \text{ mm}^2 \]
\[ b = 13 \text{ mm} \]

Find the volume of each rectangular prism. (Lesson 16.4)

5. \[ 6 \text{ in.} \]
\[ 8 \text{ in.} \]
\[ 20 \text{ in.} \]
\[ \text{Volume} = 960 \text{ in}^3 \]

6. A rectangular prism with a width of 7 units, a length of 8 units, and a height of 2 units
\[ \text{Volume} = 112 \text{ cubic units} \]

7. Jelani is ordering a piece of glass in the shape of a trapezoid to create a patio table top. Each square foot of glass costs $25. The trapezoid has base lengths of 5 feet and 3 feet and a height of 4 feet. Find the cost of the glass. (Lesson 16.1)
**Study Guide Review**

**Vocabulary Development**

**Integrating the ELPS**

Encourage English learners to refer to their notes and the illustrated, bilingual glossary as they review the unit content.

**c.4.E** Read linguistically accommodated content area material with a decreasing need for linguistic accommodations as more English is learned.

**MODULE 17 Displaying, Analyzing, and Summarizing Data**


**Key Concepts**

- The mean, or average, of a data set is the sum of the data values divided by the number of data values in the set. *(Lesson 17.1)*
- The median is the middle value of an ordered data set. *(Lesson 17.1)*
- The measure of spread is a single number that describes the spread of a data set. Interquartile range, or IQR, and range are two measures of spread. *(Lesson 17.3)*
- A statistical question is a question that has many different, or variable, answers. *(Lesson 17.3)*
- The frequency of a data value is the number of times it occurs in a data set. *(Lesson 17.4)*
- Categorical data are data that are sorted into categories on the basis of qualitative characteristics. *(Lesson 17.5)*
- The relative frequency of a data item is the ratio of its frequency to the total number of data items. *(Lesson 17.5)*
- You can display data using box plots, dot plots, stem-and-leaf plots, or histograms. *(Lessons 17.2, 17.3, and 17.4)*

**Unit 6 Performance Tasks**

The Performance Tasks provide students with the opportunity to apply concepts from this unit in real-world problem situations.

**CAREERS IN MATH**

For more information about careers in mathematics as well as various mathematics appreciation topics, visit the American Mathematical Society at [www.ams.org](http://www.ams.org).

**SCORING GUIDES FOR PERFORMANCE TASKS**

1. **MATHEMATICAL PROCESSES**

<table>
<thead>
<tr>
<th>Task</th>
<th>Possible Points (Total: 6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>1 point for naming mode as the appropriate measure of center, and 1 point for explaining that mean and median depend on numerical, ordered data, while the mode does not</td>
</tr>
<tr>
<td>b</td>
<td>1 point for correctly answering that no measure of variability is appropriate, and 1 point for explaining that IQR and mean absolute deviation only work with numerical data</td>
</tr>
</tbody>
</table>
1. **Example 1**

   **The ages of Thomas’s neighbors are shown.**

   Ages of Thomas’s Neighbors
   
<table>
<thead>
<tr>
<th>Age</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td></td>
</tr>
<tr>
<td>31</td>
<td></td>
</tr>
<tr>
<td>32</td>
<td></td>
</tr>
<tr>
<td>33</td>
<td></td>
</tr>
<tr>
<td>34</td>
<td></td>
</tr>
<tr>
<td>35</td>
<td></td>
</tr>
<tr>
<td>36</td>
<td></td>
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<td>37</td>
<td></td>
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<td>38</td>
<td></td>
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<tr>
<td>39</td>
<td></td>
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<td>40</td>
<td></td>
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<td>41</td>
<td></td>
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<tr>
<td>42</td>
<td></td>
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<td>43</td>
<td></td>
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<td>44</td>
<td></td>
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<td>45</td>
<td></td>
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<tr>
<td>46</td>
<td></td>
</tr>
<tr>
<td>47</td>
<td></td>
</tr>
<tr>
<td>48</td>
<td></td>
</tr>
<tr>
<td>49</td>
<td></td>
</tr>
<tr>
<td>50</td>
<td></td>
</tr>
</tbody>
</table>

2. **Example 2**

   **Find the mean, median, and range of the data shown on the dot plot.**

   - The mean is 13.
   - The median is 13.5.
   - The range is 7.

3. **Exercises**

   1. **Exercise 1**
      
      Find the mean and median of the data set: 4, 6, 2, 8, 14, 2.
      
      Mean: \( \frac{4+6+2+8+14+2}{6} = \frac{34}{6} = 5.66 \)
      
      Median: 6
      
      Range: 14

   2. **Exercise 2**
      
      The number of goals for the 13 players on a soccer team are: 4, 9, 0, 1, 2, 0, 2, 8, 3, 1. Find the median, lower quartile, and upper quartile. Then make a box plot for the data.
      
      Mean: 5
      
      Median: 2
      
      Lower Quartile: 1
      
      Upper Quartile: 8

4. **Exercise 3**

   Use the dot plot to find the mean, median, and range of the data. (Lesson 17.3)
   
   Mean: 20
   
   Median: 20
   
   Range: 6

5. **Exercise 4**

   The coach recorded the time it took 15 students to run a mile. The times are as follows: 9:23, 8:15, 9:23, 9:01, 6:45, 6:55, 7:20, 9:14, 6:21, 7:12, 7:34, 8:10, 9:15, 9:18. (Lesson 17.4)
   
   Use the data to complete the frequency table. Then use the table to make a histogram.

<table>
<thead>
<tr>
<th>Interval</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>6-6.59</td>
<td>4</td>
</tr>
<tr>
<td>7-7.59</td>
<td>3</td>
</tr>
<tr>
<td>8-8.59</td>
<td>1</td>
</tr>
<tr>
<td>9-9.59</td>
<td>6</td>
</tr>
</tbody>
</table>

6. **Exercise 5**

   The 16 students in Mr. Wu’s algebra class took a survey on their favorite color. The results are shown in the frequency table. (Lesson 17.5)
   
   Favorite Color
   
<table>
<thead>
<tr>
<th>Color</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blue</td>
<td>5</td>
</tr>
<tr>
<td>Green</td>
<td>4</td>
</tr>
<tr>
<td>Yellow</td>
<td>3</td>
</tr>
<tr>
<td>Red</td>
<td>4</td>
</tr>
</tbody>
</table>
   
   Make a relative frequency table of the data that shows each data item as a fraction of the total and as a percent.
   
<table>
<thead>
<tr>
<th>Color</th>
<th>Frequency</th>
<th>Relative Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blue</td>
<td>5</td>
<td>31.25%</td>
</tr>
<tr>
<td>Green</td>
<td>4</td>
<td>25%</td>
</tr>
<tr>
<td>Yellow</td>
<td>3</td>
<td>18.75%</td>
</tr>
<tr>
<td>Red</td>
<td>4</td>
<td>25%</td>
</tr>
</tbody>
</table>
Study Guide Review

Vocabulary Development

**Integrating the ELPS**
Encourage English learners to refer to their notes and the illustrated, bilingual glossary as they review the unit content.

**c.4.E** Read linguistically accommodated content area material with a decreasing need for linguistic accommodations as more English is learned.

**MODULE 18  Becoming a Knowledgeable Consumer and Investor**


**Key Concepts**
- Debit cards and credit cards are used to purchase goods and services. With a debit card purchase, money spent is deducted immediately from a checking or savings account, and with a credit card purchase, money spent is paid later through a monthly bill. *(Lesson 18.1)*
- A person’s credit history includes information about how well he/she managed his/her money and paid bills. Credit reports are compiled by agencies to help lenders decide whether or not to loan money to consumers. A good credit history will give you a good credit score. *(Lesson 18.2)*
- The debt-to-income ratio is found by dividing a person’s monthly debt payments by his or her monthly income. *(Lesson 18.2)*
- To quickly estimate the total earnings of an occupation over a long period of time, multiply the median annual income of the profession by the number of years in the period of time. *(Lesson 18.4)*
UNIT 7 Study Guide Review

Becoming a Knowledgeable Consumer and Investor

EXAMPLE 1
The table shows fees charged by Jeremy’s bank. He uses his checking account to pay for his 10 monthly bills, and he uses his debit card to pay for lunch about 20 times each month. Calculate his monthly bank fees.

<table>
<thead>
<tr>
<th>Item</th>
<th>Jeremy’s bank fees</th>
</tr>
</thead>
<tbody>
<tr>
<td>checks</td>
<td>$0.15 each</td>
</tr>
<tr>
<td>monthly checking fee</td>
<td>$10</td>
</tr>
<tr>
<td>ATM fee</td>
<td>free</td>
</tr>
<tr>
<td>debit card fee</td>
<td>$2.50 per month</td>
</tr>
</tbody>
</table>

Write 10 checks: $0.15 \times 10 = $1.50
Monthly checking fee: $10.00
Debit card fee: $2.50
Total: $14.00
Jeremy’s monthly bank fees are $14.00.

EXAMPLE 2
Calculate the debt-to-income ratio for Alicia. Her monthly income is $1,400, and she has a monthly payment of $120 for her car and $75 for her credit card.

Alicia’s monthly debt is $120 + $75 = $195.
Debt-to-income ratio is $195 \div 1,400 \approx 0.139 \approx 14\%$

EXAMPLE 3
The average median income for a cashier is $24,000. The average median income for a programmer is $78,000.

a. What is the total income of a cashier over 20 years?
   $24,000 \times 20 = $480,000
b. What is the total income of a programmer over 20 years?
   $78,000 \times 20 = $1,560,000
c. How much more will the programmer make than the cashier over the 20 years?
   $1,560,000 - $480,000 = $1,080,000

EXERCISES

1. Emily is looking for a bank. Compare the two banks in the table. Emily has an average balance of $500, writes 15 checks a month, and uses her ATM card 17 times a month. (Lesson 18.1)

<table>
<thead>
<tr>
<th>Item</th>
<th>Uptown Bank</th>
<th>First Bank</th>
</tr>
</thead>
<tbody>
<tr>
<td>checks</td>
<td>$0.20 each</td>
<td>$2 for less than $20</td>
</tr>
<tr>
<td>monthly checking fee</td>
<td>$10 if under $100</td>
<td>$5 if over $100</td>
</tr>
<tr>
<td>ATM fee</td>
<td>free</td>
<td>$0.50 per use</td>
</tr>
<tr>
<td>debit card fee</td>
<td>$3.50 per month</td>
<td>$2.50 per month</td>
</tr>
</tbody>
</table>

Emily will build a better checking account with Uptown Bank, because she is charged less in fees for her usage.

2. Damien has a monthly income of $2,500, a car payment of $400, and a credit card payment of $100. (Lesson 18.2)

3. Mara has a monthly income of $1,000, a credit card payment of $50, and a student loan payment of $75. (Lesson 18.3)

4. Alicia has a monthly income of $4,000, and a student loan payment of $300. (Lesson 18.4)

5. Steven has a monthly income of $500, and a credit card payment of $25. (Lesson 18.5)

6. The average median income for a truck driver is $35,000 per year, for a middle school teacher is $3,400 per month, and for a bank teller is $450 per week. (Lesson 18.6)

   a. Which profession makes the most per year?
      The middle school teacher makes the most per year.

   b. Compare the income of a truck driver to a bank teller over 20 years. Show your work.
      Truck driver: $35,000 \times 20 = $700,000; bank teller: $(450 \times 52) \times 20 = $468,000; the truck driver will make $232,000 more than the bank teller in 20 years.

   c. Compare the income of a truck driver to a middle school teacher over 20 years. Show your work.
      Truck driver: $35,000 \times 20 = $700,000; middle school teacher: $(3,400 \times 12) \times 20 = $816,000; the middle school teacher will make $116,000 more than the truck driver in 20 years.