

Student Handbook

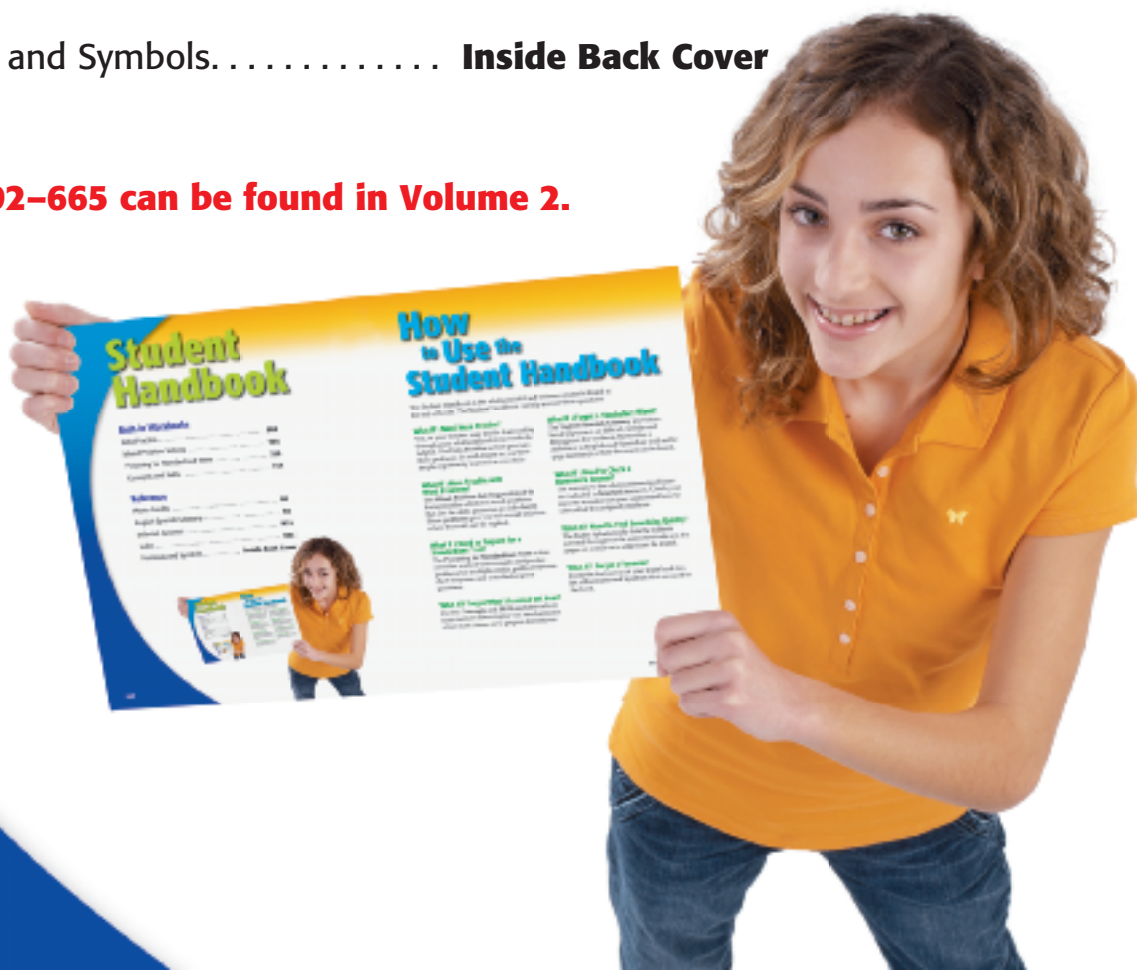
Built-In Workbooks

Extra Practice	668
Mixed Problem Solving	704
Preparing for Standardized Tests	716
Concepts and Skills	734

Reference

Photo Credits	R1
English-Spanish Glossary	R2
Selected Answers	R25
Index	R52
Formulas and Symbols	Inside Back Cover

Pages 392–665 can be found in Volume 2.



How to Use the Student Handbook

The Student Handbook is the additional skill and reference material found at the end of books. The Student Handbook can help answer these questions.

What If I Need More Practice?

You, or your teacher, may decide that working through some additional problems would be helpful. The **Extra Practice** section provides these problems for each lesson so you have ample opportunity to practice new skills.

What If I Have Trouble with Word Problems?

The **Mixed Problem Solving** portion of the book provides additional word problems that use the skills presented in each chapter. These problems give you real-world situations where the math can be applied.

What If I Need to Prepare for a Standardized Test?

The **Preparing for Standardized Tests** section provides worked-out examples and practice problems for multiple-choice, gridded response, short-response, and extended-response questions.

What If I Forget What I Learned Last Year?

Use the **Concepts and Skills** section to refresh your memory about topics you have learned in other math classes or to prepare for next year.

What If I Forget a Vocabulary Word?

The **English-Spanish Glossary** provides a list of important, or difficult, words used throughout the textbook. It provides a definition in English and Spanish as well as the page number(s) where the word can be found.

What If I Need to Check a Homework Answer?

The answers to the odd-numbered problems are included in **Selected Answers**. Check your answers to make sure you understand how to solve all of the assigned problems.

What If I Need to Find Something Quickly?

The **Index** alphabetically lists the subjects covered throughout the entire textbook and the pages on which each subject can be found.

What If I Forget a Formula?

Inside the back cover of your math book is a list of **Formulas and Symbols** that are used in the book.

Extra Practice

Lesson 1-1

Pages 25-29

Use the four-step plan to solve each problem.

- The Reyes family rode their bicycles for 9 miles to the park. The ride back was along a different route for 14 miles. How many miles did they ride in all? **23 mi**
- Four hundred sixty people are scheduled to attend a banquet. If each table seats 8 people, how many tables are needed? **58 tables**
- A group of 251 people is eating dinner at a school fund-raiser. If each person pays \$8.00 for their meal, how much money is raised? **\$2,008**
- Sherita's service charges a monthly fee of \$20.00 plus \$0.15 per minute. One monthly bill is \$31.25. How many minutes did Sherita use during the month? **75 min**
- ABC Car Rental charges \$25 per day to rent a mid-sized car plus \$0.20 per mile driven. Mr. Ruiz rents a mid-sized car for 3 days and drives a total of 72 miles. Find the amount of Mr. Ruiz's bill. **\$89.40**

Lesson 1-2

Pages 30-33

Write each power as a product of the same factor.

- 13^4 **$13 \cdot 13 \cdot 13 \cdot 13$**
- 9^6 **$9 \cdot 9 \cdot 9 \cdot 9 \cdot 9 \cdot 9$**
- 1^7 **$1 \cdot 1 \cdot 1 \cdot 1 \cdot 1 \cdot 1 \cdot 1$**
- 12^2 **$12 \cdot 12$**
- 5^8 **$5 \cdot 5 \cdot 5 \cdot 5 \cdot 5 \cdot 5 \cdot 5 \cdot 5$**
- 15^4 **$15 \cdot 15 \cdot 15 \cdot 15$**

Evaluate each expression.

- 5^6 **15,625**
- 17^3 **4,913**
- 2^{12} **4,096**
- 10^5 **100,000**
- 1^4 **1**
- 5^3 **125**
- 10^2 **100**
- 2^8 **256**
- 8^2 **64**
- 7^4 **2,401**
- 20^3 **8,000**
- 42^3 **74,088**

Write each product in exponential form.

- $2 \cdot 2 \cdot 2 \cdot 2 \cdot 2$ **2^5**
- $3 \cdot 3 \cdot 3$ **3^3**
- $9 \cdot 9 \cdot 9 \cdot 9 \cdot 9 \cdot 9 \cdot 9 \cdot 9 \cdot 9 \cdot 9$ **9^{10}**
- $18 \cdot 18 \cdot 18 \cdot 18$ **18^4**
- $1 \cdot 1 \cdot 1 \cdot 1 \cdot 1 \cdot 1 \cdot 1 \cdot 1 \cdot 1 \cdot 1$ **1^6**
- $10 \cdot 10 \cdot 10 \cdot 10 \cdot 10 \cdot 10$ **10^6**

Lesson 1-3

Pages 34-37

Find the square of each number.

- 4**
- 19**
- 13**
- 169**
- 9**
- 2**
- 4**
- 14**
- 196**
- 100**
- 10,000**
- 250**
- 62,500**

Find each square root.

- $\sqrt{324}$ **18**
- $\sqrt{8,100}$ **90**
- $\sqrt{1,024}$ **32**
- $\sqrt{900}$ **30**
- $\sqrt{676}$ **26**
- $\sqrt{841}$ **29**
- $\sqrt{576}$ **24**
- $\sqrt{100}$ **10**
- $\sqrt{2,304}$ **48**
- $\sqrt{784}$ **28**
- $\sqrt{3,025}$ **55**

Extra Practice

Pages 38-41

Lesson 1-4

Evaluate each expression.

- $14 - (5 + 7)$ **2**
- $(32 + 10) - 5 \times 6$ **12**
- $(50 - 6) + (12 + 4)$ **60**
- $12 - 2 \cdot 3$ **6**
- $16 + 4 \times 5$ **36**
- $(5 + 3) \times 4 - 7$ **25**
- $2 \times 3 + 9 \times 2$ **24**
- $6 \cdot (8 + 4) \div 2$ **36**
- $7 \times 6 - 14$ **28**
- $8 + (12 \times 4) \div 8$ **14**
- $13 - 6 \cdot 2 + 1$ **2**
- $(80 \div 10) \times 8$ **64**
- $14 - 2 \cdot 7 + 0$ **0**
- $156 - 6 \times 0$ **156**
- $30 - 14 \cdot 2 + 8$ **10**
- $3 \times 4 - 3^2$ **3**
- $10^2 - 5$ **95**
- $18 \cdot 3 + (10 - 5 + 1)^2$ **39**
- $(4 + 3)^2 \div 7$ **7**
- 8×10^3 **8,000**
- $10^4 \times 6$ **60,000**
- 4.5×10^3 **4,500**
- 1.8×10^2 **180**
- $24 \cdot 3 + 5(1.7 + 2.3)$ **23**
- $4(3.6 + 5.4) - 9$ **27**
- $10 + 3(6.1 + 3.7)$ **39.4**
- $6(7.5 + 2.1) - 2.3$ **55.3**

Lesson 1-5

Pages 42-43

Use the guess and check strategy to solve each problem.

- NUMBERS** A number is divided by 3. Then 8 is added to the quotient. The result is 15. What is the number? **21**
- NUMBERS** Benny is thinking of two numbers. Their product is 32 and their difference is 4. Find the numbers. **4 and 8**
- MONEY** A theater is charging \$5 for children under 12 and \$8 for everyone else. If the total for a group of people was \$36, how many people under the age of 12 were in the group? **4**
- PLACE VALUE** Mindy wrote down a decimal number. The digit in the tenth's place is half the digit in the hundredth's place. If the product of the two digits is 18, what is the number? **0.36**
- MONEY** Penny has 14 coins totaling \$1.55. She has one more nickel than she has dimes, and three less quarters than nickels. How many quarters, dimes, and nickels does she have if these are the only coin types she has? **3 quarters, 5 dimes, and 6 nickels**
- SOUVENIRS** A souvenir shop sells standard-sized postcards in packages of 5 and large-sized postcards in packages of 3. If Juan bought 16 postcards, how many packages of each did he buy? **Juan bought 2 standard size packages and 2 large size packages.**

Lesson 1-6

Pages 44-47

Evaluate each expression if $a = 3$, $b = 4$, $c = 12$, and $d = 1$.

- $a + b$ **7**
- $c - d$ **11**
- $a + b + c$ **19**
- $b - a$ **1**
- $c - ab$ **0**
- $a + 2d$ **5**
- $b + 2c$ **28**
- ab **12**
- $a + 3b$ **15**
- $6a + c$ **30**
- $\frac{c}{d}$ **12**
- abc **144**
- $2(a + b)$ **14**
- $\frac{2c}{b}$ **6**
- $144 - abc$ **0**
- $2ab$ **24**
- $\frac{b}{2}$ **2**
- a^2 **9**
- $c^2 - 100$ **44**
- $a^3 + 3$ **30**
- $2b^2 - 32$ **1**
- $b^3 + c$ **76**
- $\frac{a^2}{d}$ **9**
- $5a^2 + 2d^2$ **47**
- $\frac{4d^2}{b}$ **1**
- $\frac{15}{a}$ **5**
- $3a^2 - 27$ **7**
- $\frac{ab}{c}$ **1**
- $\frac{(a + b)}{d}$ **7**
- $2.5b + c$ **22**
- $\frac{10}{d}$ **10**
- $\frac{(2c + b)}{b}$ **7**
- $\frac{(b^2 + 2d)}{a}$ **6**
- $\frac{(2c + ab)}{c}$ **3**
- $\frac{(3.5c + 2)}{11}$ **4**

Lesson 1-7

Pages 49–52

Solve each equation mentally.

- $b + 7 = 12$ **5**
- $a + 3 = 15$ **12**
- $s + 10 = 23$ **13**
- $9 + n = 13$ **4**
- $20 = 24 - n$ **4**
- $4x = 36$ **9**
- $2y = 10$ **5**
- $15 = 5h$ **3**
- $j \div 3 = 2$ **6**
- $14 = w - 4$ **18**
- $24 \div k = 6$ **4**
- $b - 3 = 12$ **15**
- $c \div 10 = 8$ **80**
- $6 = t \div 5$ **30**
- $14 + m = 24$ **10**
- $3y = 39$ **13**
- $\frac{f}{2} = 12$ **24**
- $16 = 4v$ **4**
- $81 = 80 + a$ **1**
- $9 = \frac{72}{x}$ **8**
- $66 = 22m$ **3**
- $77 - 12 = a$ **65**
- $9k = 81$ **9**
- $95 + d = 100$ **5**
- $b = \frac{72}{6}$ **12**
- $z = 15 + 22$ **37**
- $15b = 225$ **15**
- $43 + s = 57$ **14**
- $4w = 52$ **13**
- $e - 10 = 0$ **10**
- $62 - d = 12$ **50**
- $14f = 14$ **1**
- $48 \div n = 8$ **6**
- $a - 82 = 95$ **177**
- $\frac{x}{2} = 36$ **72**
- $99 = c \div 2$ **198**

Lesson 1-8 13–24. See Student Handbook Answer Appendix for justification.

Pages 53–56

Use the Distributive Property to evaluate each expression.

- $3(4 + 5)$ **27**
 - $(2 + 8)6$ **60**
 - $4(9 - 6)$ **12**
 - $8(6 - 3)$ **24**
 - $5(200 - 50)$ **750**
 - $20(3 + 6)$ **180**
 - $(20 - 5)8$ **120**
 - $50(8 + 2)$ **300**
 - $15(1,000 - 200)$ **12,000**
 - $3(2,000 + 400)$ **7,200**
 - $12(1,000 + 10)$ **12,120**
 - $7(1,000 - 50)$ **6,650**
- Find each expression mentally. Justify each step.
- $(5 + 17) + 25$ **47**
 - $13 + (22 + 17)$ **52**
 - $(8 + 18) + 92$ **118**
 - $(11 + 32) + 9$ **52**
 - $4 + (15 + 76)$ **95**
 - $(25 + 56) + 75$ **156**
 - $(4 \cdot 21) \cdot 25$ **2,100**
 - $5 \cdot (40 \cdot 8)$ **1,600**
 - $(2 \cdot 38) \cdot 50$ **3,800**
 - $(12 \cdot 7) \cdot 5$ **420**
 - $25 \cdot (12 \cdot 4)$ **1,200**
 - $(15 \cdot 9) \cdot 2$ **270**

Lesson 1-9 1–24. See Student Handbook Answer Appendix.

Pages 57–61

Describe the relationship between the terms in each arithmetic sequence. Then write the next three terms in each sequence.

- 5, 9, 13, 17, ...
- 3, 5, 7, 9, ...
- 10, 15, 20, 25, ...
- 90, 93, 96, 99, ...
- 8, 14, 20, 26, ...
- 4.5, 5.4, 6.3, 7.2, ...
- 0.3, 0.4, 0.5, ...
- 2.3, 3.4, 4.5, 5.6, ...
- 8.9, 9.1, 9.3, 9.5, ...
- 350, 375, 400, 425, ...
- 620, 635, 650, 665, ...
- 3, 11, 19, 27, ...
- 10, 17, 24, 31, ...
- 0, 7, 14, 21, ...
- 2, 7, 12, 17, ...
- 95, 101, 107, 113, ...
- 9, 90, 171, 252, ...
- 1, 7, 13, 19, ...
- 4.1, 4.6, 5.1, 5.6, ...
- 6.6, 7.7, 8.8, 9.9, ...
- 19.5, 21, 22.5, 24, ...
- 14.5, 14.8, 15.1, 15.4, ...
- 0.1, 0.4, 0.7, 1.0, ...

670 Extra Practice

Lesson 1-10

Pages 63–67

Copy and complete each function table. Then identify the domain and range.

- | x | 2x | y |
|---|------|---|
| 0 | 2(0) | 0 |
| 1 | 2(1) | 2 |
| 2 | 2(2) | 4 |
| 3 | 2(3) | 6 |

domain: {0, 1, 2, 3}
range: {0, 2, 4, 6}

- | x | 3x + 1 | y |
|---|----------|----|
| 1 | 3(1) + 1 | 4 |
| 2 | 3(2) + 1 | 7 |
| 3 | 3(3) + 1 | 10 |
| 4 | 3(4) + 1 | 13 |

domain: {1, 2, 3, 4}
range: {4, 7, 10, 13}

- | x | x - 2 | y |
|---|-------|---|
| 3 | 3 - 2 | 1 |
| 4 | 4 - 2 | 2 |
| 5 | 5 - 2 | 3 |
| 6 | 6 - 2 | 4 |

domain: {3, 4, 5, 6}
range: {1, 2, 3, 4}

- | x | x + 0.1 | y |
|---|---------|-----|
| 2 | 2 + 0.1 | 2.1 |
| 3 | 3 + 0.1 | 3.1 |
| 4 | 4 + 0.1 | 4.1 |
| 5 | 5 + 0.1 | 5.1 |

domain: {2, 3, 4, 5}
range: {2.1, 3.1, 4.1, 5.1}

Lesson 2-1

Pages 80–83

Write an integer for each situation.

- seven degrees below zero **-7**
- a loss of 3 pounds **-3**
- a loss of 20 yards **-20**
- a profit of \$25 **25**
- 112°F above 0 **112**
- 2,830 feet above sea level **2,830**

Graph each set of integers on a number line.

- {-2, 0, 2}
 - {1, 3, 5}
 - {-2, -5, 3}
 - {7, -1, 4}
 - 7-10. See Student Handbook Answer Appendix.
- Evaluate each expression.
- |1| **1**
 - |-8| **8**
 - |0| **0**
 - |-82| **82**
 - |64| **64**
 - |-128| **128**
 - |-22| + 5 **27**
 - |-40| - 8 **32**
 - |-18| + |10| **28**
 - |-7| + |-1| **8**
 - |98| - |-5| **93**
 - |-49| - |-10| **39**

Lesson 2-2

Pages 84–87

Replace each \bullet with $<$ or $>$ to make a true sentence.

- $7 \bullet -7$ **$>$**
- $-8 \bullet 4$ **$<$**
- $-4 \bullet -9$ **$>$**
- $-3 \bullet 0$ **$<$**
- $8 \bullet 10$ **$<$**
- $-5 \bullet -4$ **$<$**
- $6 \bullet -7$ **$>$**
- $-12 \bullet -13$ **$>$**
- $3 \bullet 1$ **$>$**
- $-2 \bullet 2$ **$<$**
- $7 \bullet -1$ **$>$**
- $-15 \bullet -20$ **$>$**
- $-40 \bullet 30$ **$<$**
- $0 \bullet -3$ **$>$**
- $-5 \bullet 0$ **$<$**
- $16 \bullet 85$ **$<$**
- -17 **$>$**
- $-12, -8, -6, -2, 4, 10$
- $-21, -19, -14, 18, 19, 32$
- $-95, -23, -18, 2, 18, 23, 95$
- 19, -19, -21, 32, -14, 18
- 46, -48, -47, -52, -18, 12
- 2, -8, 4, 10, -6, -12
- 18, 23, 95, -95, -18, -23, 2
- 0, -10, -6, -8, 12, -10, -8, -6, 0, 12
- 15, 18, -1, 0, 14, -20
- $-52, -48, -47, -18, 12, 46$
- $-20, -15, -1, 0, 14, 18$

Order the integers from least to greatest.

- 17, -12, -8, -6, -2, 4, 10
- 21, -19, -14, 18, 19, 32
- 95, -23, -18, 2, 18, 23, 95
- 19, -19, -21, 32, -14, 18
- 46, -48, -47, -52, -18, 12
- 2, -8, 4, 10, -6, -12
- 18, 23, 95, -95, -18, -23, 2
- 0, -10, -6, -8, 12, -10, -8, -6, 0, 12
- 15, 18, -1, 0, 14, -20
- $-20, -15, -1, 0, 14, 18$

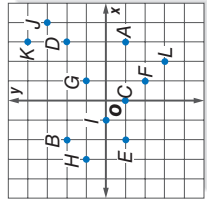
670 Extra Practice

Extra Practice 671

Lesson 2-3

Pages 88–92

Write the ordered pair for each point graphed at the right. Then name the quadrant or axis on which each point is located.



- A (3, -1), IV
- B (-2, 2), II
- C (0, -1), y-axis
- D (3, 2), I
- E (-2, -1), III
- F (1, -2), IV
- G (-3, 1), I
- H (-3, 1), II
- I (-1, 0), x-axis
- J (4, 3), I
- K (3, 4), I
- L (2, -3), IV

On graph paper, draw a coordinate plane. Then graph and label each point.

- N(-4, 3)
- K(2, 5)
- W(-6, -2)
- X(5, 0)
- Y(4, -4)
- M(0, -3)
- Z(-2, 0.5)
- S(-1, -3)
- A(0, 2)
- C(-2, -2)
- E(0, 1)
- G(1, -1)

13–24. See Student Handbook Answer Appendix.

Lesson 2-4

Pages 95–99

Add.

- $-4 + 8$ **4**
- $14 + 16$ **30**
- $-7 + (-7)$ **-14**
- $-9 + (-6)$ **-15**
- $-18 + 11$ **-7**
- $-36 + 40$ **4**
- $42 + (-18)$ **24**
- $-42 + 29$ **-13**
- $18 + (-32)$ **-14**
- $12 + (-9)$ **3**
- $-24 + 9$ **-15**
- $-7 + (-1)$ **-8**

Evaluate each expression if $a = 6$, $b = -2$, $c = -6$, and $d = 3$.

- $-96 + a$ **-90**
- $b + (-5)$ **-7**
- $c + (-32)$ **-38**
- $d + 98$ **101**
- $-120 + b$ **-122**
- $-120 + c$ **-126**
- $5 + b$ **3**
- $a + d$ **9**
- $c + a$ **0**
- $d + (-9)$ **-6**
- $b + c$ **-8**
- $d + c$ **-3**

Lesson 2-5

Pages 103–106

Subtract.

- $3 - 7$ **-4**
- $-5 - 4$ **-9**
- $-6 - 2$ **-8**
- $8 - 13$ **-5**
- $6 - (-4)$ **10**
- $12 - 9$ **3**
- $-2 - 23$ **-25**
- $63 - 78$ **-15**
- $0 - (-14)$ **14**
- $15 - 6$ **9**
- $18 - 20$ **-2**
- $-5 - 8$ **-13**
- $21 - (-37)$ **58**
- $-60 - 32$ **-92**
- $57 - 63$ **-6**

Evaluate each expression if $k = -3$, $p = 6$, $n = 1$, and $d = -8$.

- $55 - k$ **58**
- $p - 7$ **-1**
- $d - 15$ **-23**
- $n - 12$ **-11**
- $-51 - d$ **-43**
- $k - 21$ **-24**
- $n - k$ **4**
- $-99 - k$ **-96**
- $p - k$ **9**
- $d - (-1)$ **-7**
- $k - d$ **5**
- $n - d$ **9**

672 Extra Practice

Extra Practice

Lesson 2-6

Pages 107–111

Multiply.

- $5(-2)$ **-10**
 - $6(-4)$ **-24**
 - $4(21)$ **84**
 - $-11(-5)$ **55**
 - $-6(5)$ **-30**
 - $-50(0)$ **0**
 - $-5(-5)$ **25**
 - $-4(8)$ **-32**
 - $3(-13)$ **-39**
 - $12(-5)$ **-60**
 - $-9(-12)$ **108**
 - $15(-8)$ **-120**
 - $(-6)^2$ **36**
 - $(-2)^2$ **4**
 - $(-4)^3$ **-64**
 - $(-5)^3$ **-125**
- Evaluate each expression if $a = -5$, $b = 2$, $c = -3$, and $d = 4$.
- $-2d$ **-8**
 - $6a$ **-30**
 - $3ab$ **-30**
 - $-12d$ **-48**
 - $-4b^2$ **-16**
 - $-5cd$ **60**
 - a^2 **25**
 - $13ab$ **-130**

Lesson 2-7

Pages 112–113

Solve using the look for a pattern strategy.

- NUMBERS** Determine the next three numbers in the pattern below. **3:50 A.M., 4:10 A.M., 4:51, 5:17, 5:21, 27, 33, 39, ...**
- TIME** Determine the next two times in the pattern below. **2:30 A.M., 2:50 A.M., 3:10 A.M., 3:30 A.M., ...**
- MONEY** The table shows Abigail's savings. If the pattern continues, what will be the total amount in week 6? **\$2,400**
- SCIENCE** A single rotation of Earth takes about 24 hours. Copy and complete the table to determine the number of hours in a week.

Week	Total (\$)
1	\$400
2	\$800
3	\$1,200
4	\$1,600
5	\$2,000
6	■

Number of Days	Number of Hours
1	24
2	48
3	72
4	■ 96
5	■ 120
6	■ 144
7	■ 168

Lesson 2-8

Pages 114–118

Divide.

- $4 \div (-2)$ **-2**
- $16 \div (-8)$ **-2**
- $-14 \div (-2)$ **7**
- $\frac{32}{8}$ **4**
- $18 \div (-3)$ **-6**
- $-18 \div 3$ **-6**
- $8 \div (-8)$ **-1**
- $0 \div (-1)$ **0**
- $-25 \div 5$ **-5**
- $\frac{-14}{-7}$ **2**
- $-32 \div 8$ **-4**
- $-56 \div (-8)$ **7**
- $-81 \div 9$ **-9**
- $-42 \div (-7)$ **6**
- $121 \div (-11)$ **-11**
- $-81 \div (-9)$ **9**
- $18 \div (-2)$ **-9**
- $\frac{-55}{-11}$ **5**
- $-21 \div 3$ **-7**

Evaluate each expression if $a = -2$, $b = -7$, $x = 8$, and $y = -4$.

- $-64 \div x$ **-8**
- $\frac{16}{y}$ **-4**
- $x \div 2$ **4**
- $24 \cdot \frac{a}{2}$ **-1**
- $ax \div y$ **4**
- $\frac{bx}{y}$ **14**
- $2y \div 1$ **-8**
- $\frac{x}{ay}$ **1**
- $-y \div a$ **-2**
- $x^2 \div y$ **-16**
- $\frac{ab}{1}$ **14**
- $\frac{xy}{a}$ **16**

Extra Practice **673**

Lesson 3-1 1–20. See Student Handbook Answer Appendix.

Pages 128–133

Write each phrase as an algebraic expression.

- six less than p
- twenty more than c
- the quotient of a and b
- Juana's age plus 6
- x increased by twelve
- $\$1,000$ divided by z
- 3 divided into y
- the product of 7 and m
- the difference of f and 9
- twenty-six less q
- 19 decreased by z
- two less than x

Write each sentence as an algebraic equation.

- Three times a number less four is 17.
- The sum of a number and 6 is 5.
- Twenty more than twice a number is -30 .
- Four plus three times a number is 18.
- Five times a number minus 15 is 92.
- Eight times a number plus twelve is 36.
- The difference of a number and 24 is -30 .

Lesson 3-2

Pages 136–141

Solve each equation. Check your solution.

- $r - 3 = 14$ **17**
- $t + 3 = 21$ **18**
- $s + 10 = 23$ **13**
- $7 + a = -10$ **-17**
- $14 + m = 24$ **10**
- $-9 + n = 13$ **22**
- $s - 2 = -6$ **-4**
- $6 + f = 71$ **65**
- $x + 27 = 30$ **3**
- $a - 7 = 23$ **30**
- $-4 + b = -5$ **-1**
- $w + 18 = -4$ **-22**
- $k - 9 = -3$ **6**
- $j + 12 = 11$ **-1**
- $-42 + v = -42$ **0**
- $s + 1.3 = 18$ **16.7**
- $x + 7.4 = 23.5$ **16.1**
- $p + 3.1 = 18$ **14.9**
- $w - 3.7 = 4.63$ **8.33**
- $x - 1.3 = 12$ **13.3**
- $y + 3.4 = 18$ **14.6**
- $z - 12.1 = 14$ **26.1**
- $7.2 + g = 9.1$ **1.9**
- $v - 18 = 13.7$ **31.7**
- $w - 0.1 = 0.32$ **0.42**
- $r + 6.7 = 1.2$ **-5.5**

Lesson 3-3

Pages 142–146

Solve each equation. Check your solution.

- $2m = 18$ **9**
- $-42 = 6n$ **-7**
- $72 = 8k$ **9**
- $-20r = 20$ **-1**
- $420 = 5s$ **84**
- $325 = 25t$ **13**
- $-14 = -2p$ **7**
- $18q = 36$ **2**
- $40 = 10a$ **4**
- $100 = 20b$ **5**
- $416 = 4c$ **104**
- $45 = 9d$ **5**
- $0.5m = 3.5$ **7**
- $1.8 = 0.6x$ **3**
- $1.86 = 6.2z$ **0.3**
- $0.4y = 2$ **5**
- $1.67t = 10.02$ **6**
- $-8x = 24$ **-3**
- $8.34 = 2r$ **4.17**
- $4.08 = 1.2y$ **3.4**
- $243 = 27a$ **9**
- $0.9x = 4.5$ **5**
- $59.66 = 3.14m$ **19**
- $8d = 112$ **14**
- $5f = 180.5$ **36.1**
- $98.4 = 8p$ **12.3**
- $208 = 26k$ **8**

674 Extra Practice

Lesson 3-4

Pages 148–149

Use the *work backward* strategy to solve each problem.

- NUMBERS** A number is divided by 2.
- MONEY** Holly spent $\$13.76$ on a birthday present for her mom. She also spent $\$3.25$ on a snack for herself. If she now has $\$7.74$, how much money did she have initially? **\\$24.75**
- DVDs** Jack rented 2 times as many DVDs as Paloma last month. Paloma rented 4 fewer than Greg, but 4 more than Grace. Greg rented 9 DVDs. How many DVDs did each person rent?
- TIME** A portion of a shuttle bus schedule is shown. What is the earliest time after 9 A.M. when the bus departs? **9:43 A.M.**
- FOOD** After four days, 0.5 pound of lunch meat was left in the refrigerator. If half this amount was eaten on each of the previous four days, how much lunch meat was initially in the refrigerator? **1.5 lb**

Departs	Arrives
8:55 A.M.	9:20 A.M.
?	10:08 A.M.
10:31 A.M.	10:56 A.M.
11:19 A.M.	11:44 A.M.

Lesson 3-5 3. See Student Handbook Answer Appendix.

Pages 151–155


Solve each equation. Check your solution.


- $3x + 6 = 6$ **0**
- $2r - 7 = -1$ **3**
- $-10 + 2d = 8$ **9**
- $2b + 4 = -8$ **-6**
- $5w - 12 = 3$ **3**
- $5t - 4 = 6$ **2**
- $2q - 6 = 4$ **5**
- $2g - 3 = -9$ **-3**
- $15 = 6y + 3$ **2**
- $3s - 4 = 8$ **4**
- $18 - 7f = 4$ **2**
- $13 + 3p = 7$ **-2**
- $7.5r + 2 = -28$ **-4**
- $4.2 + 7z = 2.8$ **-0.2**
- $-9m - 9 = 9$ **-2**
- $32 + 0.2c = 1$ **-155**
- $5t - 14 = -14$ **0**
- $-0.25x + 0.5 = 4$ **-14**
- $5w - 4 = 8$ **2.4**
- $4d - 3 = 9$ **3**
- $2g - 16 = -9$ **3.5**
- $4k + 13 = 20$ **1.75**
- $7 = 5 - 2x$ **-1**
- $8z + 15 = -1$ **-2**
- $92 - 16b = 12$ **5**
- $14e + 14 = 28$ **1**
- $1.1j + 2 = 7.5$ **5**

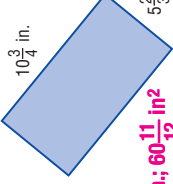
Lesson 3-6 6, 8. See Student Handbook Answer Appendix.

Pages 156–161

Find the perimeter and area of each rectangle.

- 

22 yd; 24 yd²
- 

55.4 cm; 189.1 cm²
- 

32 5/6 in.; 60 11/12 in²
- $\ell = 80$ yd, $w = 20$ yd **200 yd; 1,600 yd²**
- $\ell = 75$ cm, $w = 2.5$ cm **200 cm; 1,875 cm²**
- $\ell = 8.6$ cm, $w = 2.5$ cm **22.2 cm; 21.5 cm²**
- $\ell = 12$ ft, $w = 3$ ft **30 ft; 36 ft²**
- $\ell = 20.25$ m, $w = 4.75$ m
- $\ell = 5 \frac{1}{4}$ mi, $w = 2 \frac{1}{2}$ mi **15 1/8 mi; 13 1/8 mi²**
- $\ell = 10 \frac{2}{3}$ ft, $w = 5 \frac{5}{6}$ ft **33 ft; 62 2/9 ft²**

Extra Practice 675

Lesson 3-7 1–11. See Student Handbook Answer Appendix.

Graph the function represented by the table.

Number of Tennis Balls	Total Cost (\$)
3	6
4	8
5	10
6	12

Gallon	Quarts
1	4
2	8
3	12
4	16

1. $y = 3x$

2.

Graph each equation.

3. $y = 3x$
 4. $y = 2x + 3$
 6. $y = 0.5x + 2$
 7. $y = -x + 3$
 9. $y = -3x + 6$
 10. $y = -x + 1$
 3. $y = -x$
 8. $y = 0.25x + 6$
 11. $y = 5 - 0.5x$

Lesson 4-1

Determine whether each number is *prime* or *composite*.

1. 32 **composite**
 4. 21 **composite**
 7. 239 **prime**
 2. 41 **prime**
 5. 71 **prime**
 8. 93 **composite**
 3. 52 **composite**
 6. 102 **composite**
 9. 123 **composite**

Find the prime factorization of each number.

10. 81 **3^4**
 11. 72 **$2^3 \times 3^2$**
 13. 245 **5×7^2**
 14. 423 **$3^2 \times 47$**
 16. 750 **$2 \times 3 \times 5^3$**
 17. 914 **2×457**
 12. 144 **$2^4 \times 3^2$**
 15. 525 **$3 \times 5^2 \times 7$**
 18. 975 **$3 \times 5^2 \times 13$**

Factor each expression. 19–24. See Student Handbook Answer Appendix.

19. $35xy$
 20. $14a^2$
 22. $27cd^2$
 21. $30r$
 24. $60p^2qr$

Lesson 4-2

Find the GCF of each set of numbers.

1. 12, 16 **4**
 4. 37, 100 **1**
 7. 36, 81 **9**
 10. 12, 18, 42 **6**
 13. 32, 80, 96 **16**
 2. 63, 81 **9**
 5. 32, 240 **16**
 8. 140, 350 **70**
 11. 24, 56, 120 **8**
 14. 14, 49, 70 **7**
 3. 225, 500 **25**
 6. 412, 640 **4**
 9. 72, 170 **2**
 12. 48, 60, 84 **12**
 15. 8, 10, 20 **2**

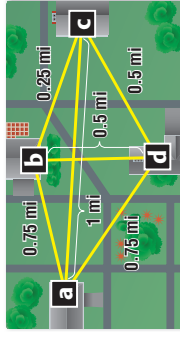
Find the GCF of each set of expressions.

16. $18b, 24b$ **$6b$**
 17. $2a, 3a$ **a**
 19. $12cd, 24c$ **$12c$**
 20. $30x, 50x^2$ **$10x$**
 22. $2c, 4ac, 8a$ **2**
 23. $d, 6c^2d, 12d$ **d**
 18. $5n, 5mn$ **$5n$**
 21. $15az, 25az$ **$5az$**
 24. $10ab, 15bc, 20b^2$ **$5b$**

Lesson 4-3

Use the *make a list* strategy to solve each problem.

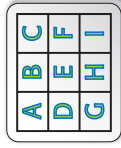
1. **MEASUREMENT** Gabriel has to make deliveries to three neighbors. He lives at house *b* on the map. Find the shortest route to make the deliveries and return home?



Sample answer: $b-a-d-c-b$; 2.25 mi

2. **FOOD** Daniel is making a peanut butter and jelly sandwich. His choices are creamy or crunchy peanut butter, white or wheat bread, and grape, apple, or strawberry jelly. How many different types of sandwiches can Daniel make? **12**

3. **GAMES** On the game board, you plan to move two spaces away from square A. You can move horizontally, vertically, or diagonally. How many different moves can you make from square A? List them.



3. 15; A-B-C, A-B-F, A-B-E, A-B-D, A-D-G, A-D-H, A-D-E, A-D-B, A-E-I, A-E-F, A-E-C, A-E-B, A-E-H, A-E-G, A-E-D

Lesson 4-4

Write each fraction in simplest form.

1. $\frac{14}{28}$ **$\frac{1}{2}$**
 2. $\frac{15}{25}$ **$\frac{3}{5}$**
 3. $\frac{100}{130}$ **$\frac{10}{13}$**
 4. $\frac{14}{35}$ **$\frac{2}{5}$**
 5. $\frac{9}{51}$ **$\frac{3}{17}$**
 6. $\frac{54}{27}$ **$\frac{2}{1}$**
 7. $\frac{75}{90}$ **$\frac{5}{6}$**
 8. $\frac{24}{40}$ **$\frac{3}{5}$**
 9. $\frac{180}{270}$ **$\frac{2}{3}$**
 10. $\frac{312}{390}$ **$\frac{4}{5}$**
 11. $\frac{240}{448}$ **$\frac{15}{28}$**
 12. $\frac{71}{82}$ **$\frac{71}{82}$**
 13. $\frac{333}{900}$ **$\frac{37}{100}$**
 14. $\frac{85}{255}$ **$\frac{1}{3}$**
 15. $\frac{84}{128}$ **$\frac{21}{32}$**
 16. $\frac{64}{96}$ **$\frac{2}{3}$**
 17. $\frac{99}{99}$ **$\frac{1}{1}$**
 18. $\frac{3}{99}$ **$\frac{1}{33}$**
 19. $\frac{44}{55}$ **$\frac{4}{5}$**
 20. $\frac{57}{69}$ **$\frac{19}{23}$**
 21. $\frac{15}{37}$ **$\frac{15}{37}$**
 22. $\frac{204}{408}$ **$\frac{1}{2}$**
 23. $\frac{5}{125}$ **$\frac{1}{25}$**
 24. $\frac{144}{216}$ **$\frac{2}{3}$**
 25. $\frac{15}{75}$ **$\frac{1}{5}$**

Lesson 4-5

Write each fraction or mixed number as a decimal. Use bar notation if the decimal is a repeating decimal.

1. $\frac{16}{20}$ **0.8**
 2. $\frac{30}{120}$ **0.25**
 3. $1\frac{7}{8}$ **1.875**
 4. $\frac{1}{6}$ **$0.\overline{16}$**
 5. $\frac{11}{40}$ **0.275**
 6. $5\frac{13}{50}$ **5.26**
 7. $\frac{55}{300}$ **$0.\overline{183}$**
 8. $1\frac{1}{2}$ **1.5**
 9. $\frac{5}{9}$ **$0.\overline{5}$**
 10. $2\frac{3}{4}$ **2.75**
 11. $\frac{9}{11}$ **$0.\overline{81}$**
 12. $4\frac{1}{9}$ **$4.\overline{1}$**

Write each decimal as a fraction or mixed number in simplest form.

13. 0.26 **$\frac{13}{50}$**
 14. 0.75 **$\frac{3}{4}$**
 15. 0.4 **$\frac{2}{5}$**
 16. 0.1 **$\frac{1}{10}$**
 17. 4.48 **$4\frac{12}{25}$**
 18. 9.8 **$9\frac{4}{5}$**
 19. 0.91 **$\frac{91}{100}$**
 20. 11.15 **$11\frac{3}{20}$**

Lesson 4-6

Pages 202–205

Write each ratio as a percent.

- 39 out of 100 **39%**
- $\frac{23}{100}$ **23%**
- 17:100 **17%**
- 72 per 100 **72%**
- 4 to 100 **4%**
- 98 in 100 **98%**

Write each fraction as a percent.

- $\frac{1}{2}$ **50%**
- $\frac{2}{5}$ **40%**
- $\frac{60}{100}$ **60%**
- $\frac{7}{25}$ **28%**
- $\frac{1}{20}$ **5%**
- $\frac{8}{100}$ **8%**
- $\frac{9}{100}$ **9%**
- $\frac{1}{100}$ **1%**
- $\frac{50}{50}$ **100%**
- $\frac{49}{50}$ **98%**
- $\frac{17}{20}$ **85%**
- $\frac{7}{7}$ **100%**
- $\frac{49}{50}$ **98%**

Write each percent as a fraction in simplest form.

- 12% $\frac{3}{25}$
- 23% $\frac{23}{100}$
- 1% $\frac{1}{100}$
- 36% $\frac{9}{25}$
- 4% $\frac{1}{25}$
- 72% $\frac{18}{25}$
- 65% $\frac{13}{20}$
- 47% $\frac{47}{100}$
- 15% $\frac{3}{20}$
- 98% $\frac{49}{50}$
- 85% $\frac{17}{20}$
- 100% **1**
- 48% $\frac{12}{25}$

Lesson 4-7

Pages 206–210

Write each percent as a decimal.

- 42% **0.42**
- 100% **1.0**
- 8% **0.08**
- 20% **0.2**
- 35% **0.35**
- 3% **0.03**
- 62% **0.62**
- 50% **0.5**
- 28% **0.28**
- 87% **0.87**
- 7.5% **0.075**
- 87.5% **0.875**
- 1.8% **0.018**
- 99.9% **0.999**
- 85 $\frac{1}{4}$ % **0.8525**
- 24 $\frac{1}{2}$ % **0.245**
- 64 $\frac{4}{5}$ % **0.648**
- 36 $\frac{3}{4}$ % **0.3675**
- 1 $\frac{1}{5}$ % **0.012**
- 2 $\frac{1}{2}$ % **0.025**

Write each decimal as a percent.

- 0.16 **16%**
- 0.1 **10%**
- 0.5 **50%**
- 0.98 **98%**
- 0.31 **31%**
- 0.76 **76%**
- 0.07 **7%**
- 0.8 **80%**
- 0.07 **7%**
- 0.10 **10%**
- 0.90 **90%**
- 1.00 **100%**
- 0.666 **66.6%**
- 0.725 **72.5%**
- 0.138 **13.8%**
- 0.899 **89.9%**
- 0.256 **25.6%**
- 0.038 **3.8%**
- 0.0525 **5.25%**
- 0.017 **1.7%**

Lesson 4-8

Pages 211–214

Find the LCM of each set of numbers.

- 4, 9 **36**
- 6, 16 **48**
- 24, 36 **72**
- 48, 84 **336**
- 8, 9 **72**
- 49, 56 **392**
- 42, 66 **462**
- 15, 39 **195**
- 56, 64 **448**
- 24, 42 **168**
- 80, 250 **2,000**
- 16, 24 **48**
- 13, 14 **182**
- 36, 48 **144**
- 10, 100 **100**
- 25, 200 **200**
- 1, 2, 5 **10**
- 2, 3, 7 **42**
- 1, 9, 27 **27**
- 7, 21, 35 **105**
- 12, 18, 28 **252**
- 2, 24, 36 **72**
- 32, 80, 96 **480**
- 5, 18, 45 **90**
- 11, 22, 33 **66**
- 35, 70, 140 **140**
- 25, 200, 400 **400**
- 100, 200, 300 **600**

678 Extra Practice

Pages 215–220

Lesson 4-9

Replace each \bullet with $<$, $>$, or $=$ to make a true sentence.

- $-\frac{1}{5} \bullet -\frac{3}{4} >$
- $-\frac{7}{8} \bullet -\frac{5}{6} <$
- $-\frac{1}{6} \bullet -\frac{5}{6} >$
- $-\frac{3}{4} \bullet -\frac{1}{4} <$
- $-2\frac{1}{4} \bullet -2\frac{2}{8} =$
- $-4\frac{3}{7} \bullet -4\frac{2}{7} <$
- $-1\frac{4}{9} \bullet -1\frac{8}{9} >$
- $-3\frac{4}{5} \bullet -3\frac{2}{5} <$
- $\frac{7}{9} \bullet \frac{3}{5} >$
- $\frac{14}{25} \bullet \frac{3}{4} <$
- $\frac{8}{24} \bullet \frac{20}{60} =$
- $\frac{5}{12} \bullet \frac{4}{9} <$
- $\frac{18}{24} \bullet \frac{10}{18} >$
- $\frac{4}{6} \bullet \frac{5}{9} >$
- $\frac{11}{49} \bullet \frac{12}{42} <$
- $\frac{5}{14} \bullet \frac{2}{6} >$

Order each set of numbers from least to greatest.

19. $\frac{61}{100}$, **61.5%**, **0.65**

- 70%, 0.6, $\frac{2}{3}$, **0.6**, $\frac{2}{3}$, **70%**
- 0.8, $\frac{17}{20}$, 17%, **0.8**, $\frac{17}{20}$, **17%**
- 0.42, $\frac{3}{7}$, 42%, **0.42**, $\frac{3}{7}$, **42%**
- 2.15, 2.105, $2\frac{7}{50}$, **2.105**, $2\frac{7}{50}$, **2.15**

- $\frac{7}{8}$, 7.81, 7.18
- $\frac{7}{8}$, 7.81, 7.18

7, **7.18**, **7.81**

Lesson 5-1

Pages 230–235

Estimate. 1–27. Sample answers are given.

- $\frac{3}{7} + \frac{6}{8}$ $\frac{1}{2} + 1 = 1\frac{1}{2}$
- $\frac{3}{9} + \frac{7}{8}$ $\frac{1}{2} + 1 = 1\frac{1}{2}$
- $\frac{1}{8} + \frac{8}{9}$ **0 + 1 = 1**
- $3\frac{1}{8} + 7\frac{6}{7}$ **3 + 8 = 11**
- $4\frac{2}{3} + 6\frac{7}{8}$ **5 + 7 = 12**
- $3\frac{2}{3} \times 2\frac{1}{3}$ **4 × 2 = 8**
- $\frac{4}{5} \cdot 3$ **1 · 3 = 3**
- $9\frac{7}{8} - 6\frac{2}{3}$ **10 - 7 = 3**
- $\frac{3}{4} \cdot \frac{7}{8}$ **1 · 1 = 1**
- $7\frac{1}{4} \div \frac{3}{2}$ **7 ÷ 1 = 7**
- $5\frac{1}{3} - 2\frac{3}{4}$ **5 - 3 = 2**
- $9\frac{3}{5} + 3\frac{1}{8}$ **10 + 3 = 13**
- $5\frac{1}{3} - 2\frac{3}{4}$ **5 - 3 = 2**
- $\frac{13}{15} \cdot \frac{3}{8}$ $1 \cdot \frac{1}{2} = \frac{1}{2}$
- $\frac{1}{9} \div 2$ **0 ÷ 2 = 0**
- $13\frac{7}{8} - 2\frac{1}{3}$ **14 - 2 = 12**
- $9\frac{2}{3} + 4\frac{7}{8}$ **10 + 5 = 15**
- $\frac{1}{2} \cdot 2.5$ $1 \cdot 2.5 = 2.5$
- $35\frac{1}{4} \div 6\frac{3}{4}$ **35 ÷ 7 = 5**

Lesson 5-2

Pages 236–241

Add or subtract. Write in simplest form.

- $\frac{5}{11} + \frac{9}{11}$ $1\frac{3}{11}$
- $\frac{5}{8} - \frac{1}{8}$ $\frac{4}{8} = \frac{1}{2}$
- $\frac{1}{2} + \frac{3}{4}$ $1\frac{1}{4}$
- $\frac{9}{12} - \frac{5}{12}$ $\frac{4}{12} = \frac{1}{3}$
- $\frac{2}{9} + \frac{3}{9}$ $\frac{5}{9}$
- $\frac{1}{4} - \frac{3}{12}$ **0**
- $\frac{3}{7} + \frac{6}{14}$ $\frac{6}{7}$
- $\frac{4}{9} + \frac{1}{2}$ $1\frac{17}{18}$
- $\frac{5}{7} - \frac{4}{6}$ $1\frac{1}{42}$
- $\frac{3}{3} + \frac{3}{4}$ $1\frac{7}{12}$
- $\frac{5}{8} - \frac{1}{8}$ $\frac{4}{8} = \frac{1}{2}$
- $\frac{2}{9} + \frac{1}{3}$ $\frac{5}{9}$
- $\frac{3}{7} + \frac{6}{14}$ $\frac{6}{7}$
- $\frac{5}{4} - \frac{1}{6}$ $1\frac{11}{12}$
- $\frac{2}{3} - \frac{1}{8}$ $1\frac{13}{24}$

Evaluate each expression if $a = \frac{2}{3}$ and $b = \frac{7}{12}$.

- $\frac{1}{5} + a$ $1\frac{13}{15}$
- $\frac{1}{5} + a$ $1\frac{13}{15}$
- $\frac{7}{9} - a$ $\frac{5}{9}$
- $a + b$ $1\frac{1}{4}$
- $b + \frac{7}{8}$ $1\frac{11}{24}$
- $a - b$ $\frac{1}{12}$

Extra Practice 679

Lesson 5-3

Pages 242–246

Add or subtract. Write in simplest form.

- $\frac{2}{3} + \frac{1}{3} = \frac{3}{3}$
- $5\frac{2}{7} - 2\frac{3}{7} = \frac{26}{7}$
- $6\frac{3}{8} + 7\frac{1}{8} = 13\frac{4}{8}$
- $2\frac{3}{4} - 1\frac{1}{4} = \frac{1}{1}$
- $5\frac{1}{2} - 3\frac{1}{4} = 2\frac{1}{4}$
- $2\frac{2}{3} + 4\frac{1}{9} = 6\frac{7}{9}$
- $7\frac{4}{5} + 9\frac{3}{10} = 17\frac{10}{10}$
- $3\frac{3}{4} + 5\frac{5}{8} = 9\frac{3}{8}$
- $17\frac{2}{9} - 12\frac{1}{3} = 4\frac{8}{9}$
- $6\frac{5}{12} + 12\frac{5}{12} = 18\frac{5}{6}$
- $7 - 6\frac{4}{9} = \frac{5}{9}$
- $6\frac{1}{8} + 4\frac{2}{3} = 10\frac{19}{24}$
- $7\frac{2}{3} + 8\frac{1}{4} = 15\frac{11}{12}$
- $12\frac{3}{11} + 14\frac{3}{13} = 26\frac{72}{143}$
- $9\frac{2}{5} - 8\frac{1}{3} = 1\frac{1}{15}$
- $19\frac{1}{4} + 6\frac{1}{4} = 25\frac{11}{4}$
- $2\frac{1}{12} + 2\frac{1}{12} = 3\frac{2}{12}$
- $2\frac{1}{12} - 1\frac{3}{8} = \frac{23}{24}$
- $18\frac{1}{4} + 15\frac{5}{6} = 23\frac{1}{12}$
- $8\frac{1}{12} + 12\frac{6}{11} = 20\frac{83}{132}$
- $21\frac{1}{3} + 15\frac{3}{8} = 36\frac{17}{24}$
- $18\frac{1}{4} - 3\frac{3}{8} = 14\frac{7}{8}$
- $10 - \frac{2}{3} = 9\frac{1}{3}$

Lesson 5-4

Pages 247–248

Eliminate possibilities to solve each problem.

- MEASUREMENT** Guillermo has a 3-gallon cooler with $1\frac{3}{4}$ gallons of juice in it. If he wants the cooler full for his soccer game, how much juice should he add? **C**
 - A 4 gallons
 - B $3\frac{1}{4}$ gallons
 - C $1\frac{1}{4}$ gallons
 - D $\frac{1}{4}$ gallon
- ELEPHANTS** An elephant in a zoo eats 58 cabbages in a week. About how many cabbages does an elephant eat in one year? **J**
 - F 7
 - G 700
 - H 1,500
 - J 3,000
- TRAVEL** Mr. Rollins drove 780 miles on a 5-day trip. He rented a car for \$23 per day plus \$0.15 per mile after 500 free miles. About how much did the rental car cost? **C**
 - A \$100
 - B \$130
 - C \$160
 - D \$180

Lesson 5-5

Pages 256–257

Multiply. Write in simplest form.

- $\frac{2}{3} \times \frac{3}{5} = \frac{2}{5}$
- $\frac{1}{6} \times \frac{2}{5} = \frac{1}{15}$
- $\frac{4}{9} \times \frac{3}{7} = \frac{4}{21}$
- $\frac{5}{12} \times \frac{6}{11} = \frac{5}{22}$
- $\frac{3}{8} \times \frac{8}{9} = \frac{1}{3}$
- $\frac{2}{5} \times \frac{5}{8} = \frac{1}{4}$
- $\frac{2}{3} \times \frac{3}{13} = \frac{2}{13}$
- $\frac{4}{9} \times \frac{1}{6} = \frac{2}{27}$
- $\frac{3}{5} \times 15 = 9$
- $3\frac{1}{2} \times 4\frac{1}{3} = 15\frac{1}{6}$
- $\frac{7}{8} \times 16 = 14$
- $2\frac{2}{3} \times 2\frac{1}{4} = 6$
- $8\frac{2}{3} \times 1\frac{1}{2} = 13$
- $22 \times \frac{3}{11} = 6$
- $22\frac{1}{3} \times \frac{1}{3} = 14\frac{2}{9}$
- $5 \times \frac{2}{9} = \frac{10}{9}$
- $3 \times \frac{1}{3} = 1$
- $6\frac{1}{8} \times 5\frac{1}{7} = 31\frac{1}{2}$
- $7 \times \frac{1}{14} = \frac{1}{2}$
- $\frac{1}{2} \times 10\frac{2}{3} = 5\frac{1}{3}$
- $21 \times \frac{1}{2} = 10\frac{1}{2}$
- $11 \times \frac{1}{4} = 2\frac{3}{4}$

680 Extra Practice

Lesson 5-6

Pages 258–263

Find the multiplicative inverse of each number.

- $\frac{3}{2}$ or $1\frac{1}{2}$
- $\frac{5}{4}$
- $1\frac{1}{1}$ or 1
- $\frac{1}{7}$
- $3\frac{3}{4}$ or $3\frac{3}{4}$
- $\frac{9}{16}$ or $1\frac{7}{9}$
- $1\frac{3}{3}$ or 4
- $7\frac{3}{8}$ or $\frac{59}{8}$
- $6\frac{2}{5}$ or $\frac{32}{5}$
- $33\frac{1}{3}$ or $\frac{100}{3}$
- $\frac{a}{13}$
- $\frac{8}{9}x = 24$
- $\frac{2}{8}t = 36$
- $16 = \frac{h}{4}$
- $\frac{m}{8} = 12$
- $\frac{5}{8}n = 45$
- $\frac{1}{7}x = 7$
- $5 = \frac{1}{5}y$
- $\frac{4}{3}m = 28$
- $\frac{c}{9} = 81$
- $\frac{m}{9} = 9$
- $16 = \frac{4f}{9}$
- $\frac{2}{4}t = \frac{1}{2}$
- $20 = 10 = \frac{b}{10}$
- $\frac{2}{3}z = 20$
- $\frac{15}{8}x = 225$

Solve each equation. Check your solution.

- $\frac{2}{3} \div \frac{3}{2} = \frac{4}{9}$
- $\frac{3}{5} \div \frac{2}{5} = 1\frac{1}{2}$
- $\frac{5}{9} \div \frac{2}{5} = \frac{17}{18}$
- $9 \div \frac{5}{9} = 16\frac{1}{5}$
- $15 \div \frac{3}{5} = 25$
- $\frac{3}{8} \div \frac{2}{7} = 2\frac{1}{7}$
- $16 \div \frac{3}{4} = 21\frac{1}{3}$
- $\frac{3}{8} \div 2\frac{1}{2} = \frac{3}{20}$
- $3\frac{1}{4} \div 5 = \frac{13}{22}$
- $\frac{7}{10} \div \frac{3}{8} = 1\frac{13}{15}$
- $8 \div \frac{4}{5} = 10$
- $\frac{1}{14} \div 7 = \frac{1}{98}$
- $\frac{7}{8} \div 10 = \frac{7}{80}$
- $5\frac{1}{2} \div 2\frac{1}{2} = 2\frac{1}{5}$
- $7\frac{1}{2} \div 3\frac{1}{2} = 2\frac{1}{2}$

Lesson 5-7

Pages 265–270

Divide. Write in simplest form.

- $\frac{2}{3} \div \frac{3}{2} = \frac{4}{9}$
- $\frac{3}{5} \div \frac{2}{5} = 1\frac{1}{2}$
- $\frac{5}{9} \div \frac{2}{5} = 1\frac{7}{9}$
- $9 \div \frac{5}{9} = 16\frac{1}{5}$
- $15 \div \frac{3}{5} = 25$
- $\frac{9}{14} \div \frac{3}{4} = \frac{6}{7}$
- $16 \div \frac{3}{4} = 21\frac{1}{3}$
- $\frac{3}{8} \div 2\frac{1}{2} = \frac{3}{20}$
- $3\frac{1}{4} \div 5 = \frac{13}{22}$
- $\frac{7}{10} \div \frac{3}{8} = 1\frac{13}{15}$
- $8 \div \frac{4}{5} = 10$
- $\frac{1}{14} \div 7 = \frac{1}{98}$
- $\frac{7}{8} \div 10 = \frac{7}{80}$
- $5\frac{1}{2} \div 2\frac{1}{2} = 2\frac{1}{5}$
- $7\frac{1}{2} \div 3\frac{1}{2} = 2\frac{1}{2}$

Lesson 6-1

Pages 282–286

LUNCH Use the survey results to write each ratio as a fraction in simplest form.

- fish sticks: macaroni and cheese $\frac{4}{14} = \frac{2}{7}$
- pizza: macaroni and cheese $\frac{64}{140} = \frac{32}{70} = \frac{16}{35}$
- all votes: macaroni and cheese $\frac{64}{100} = \frac{16}{25}$
- pizza: all votes $\frac{100}{3} = 33\frac{1}{3}$
- other: hamburger $\frac{15}{15} = 1$

Favorite School Lunch	Votes
Pizza	64
Hamburger	15
Macaroni and Cheese	14
Fish Sticks	4
Other	3

6, 7. See Student Handbook Answer Appendix.

Determine whether the following ratios are equivalent. Explain.

- 4 out of 6 balloons popped, 8 out of 12 balloons popped
- 20 out of 25 students agree, 16 out of 30 students agree

Extra Practice 681

Lesson 6-2

Pages 287–292

Find each unit rate. Round to the nearest hundredth if necessary.

- \$240 for 4 days **\$60/day**
- 250 people in 5 buses **50 people/bus**
- 500 miles in 10 hours **50 mi/h**
- 18 cups for 24 pounds **$\frac{3}{4}$ cup/pound**
- 32 people in 8 cars **4 people/car**
- \$4.50 for 3 dozen **\$1.50/dozen**
- 245 tickets in 5 days **49 tickets/day**
- 12 classes in 4 semesters **3 classes/semester**
- 60 people in 4 rows **15 people/row**
- 48 ounces in 3 pounds **16 oz/lb**
- 20 people in 4 groups **5 people/group**
- 1.5 pounds for \$3.00 **0.5 lb/\$**
- 45 miles in 60 minutes **0.75 mi/min**
- \$5.50 for 10 disks **\$0.55/disk**
- 360 miles for 12 gallons **30 mi/gal**
- 24 cups for \$1.20 **20 cups/dollar**
- 160 words in 4 minutes **40 words/min**
- \$60 for 5 books **\$12/book**

Lesson 6-3

Pages 293–297

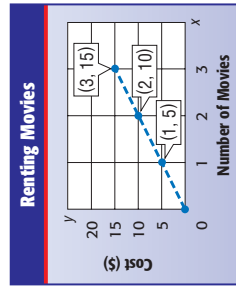
For Exercises 1 and 2, find the rate of change for each table.

Age (yr)	Height (in.)
9	54
10	56
11	58
12	60

Time (h)	Temperature (°C)
0	0
4	3
8	6
12	9

2. **2 in. per yr** **3°C per 4h**

- MOVIE RENTALS** The graph shows the cost of renting movies. Use the graph to find the rate of change. **cost increases by \$5 for each movie rental**



Lesson 6-4

Pages 298–303

Complete.

- 4,000 lb = **T** **2**
- 5 T = **lb** **10,000**
- 12,000 lb = **T** **6**
- $\frac{1}{4}$ lb = **oz** **4**
- 24 fl oz = **c** **3**
- 8 pt = **c** **16**
- 10 pt = **qt** **5**
- $2\frac{1}{4}$ c = **fl oz** **18**
- 10 gal = **qt** **40**
- 4 qt = **fl oz** **128**
- 13,200 ft = **mi** **$2\frac{1}{2}$**
- 120 oz = **lb** **$7\frac{1}{2}$**
- 7,480 yd = **mi** **$4\frac{1}{4}$**
- $12\frac{1}{2}$ lb = **oz** **200**
- $2\frac{1}{4}$ mi = **ft** **11,880**
- $\frac{3}{8}$ c = **fl oz** **25**
- 5 lb = **oz** **80**
- 12 pt = **c** **24**
- 8 pt = **c** **16**
- 6 lb = **oz** **96**
- 4 pt = **c** **8**
- $9\frac{1}{4}$ gal = **qt** **37**
- $7\frac{1}{2}$ qt = **pt** **15**
- $3\frac{2}{3}$ T = **lb** **$7,333\frac{1}{3}$**

Lesson 6-5

Pages 304–309

Complete. Round to the nearest hundredth if necessary.

- 400 mm = **cm** **40**
- 4 km = **m** **4,000**
- 660 cm = **m** **6.6**
- 0.3 km = **m** **300**
- 30 mm = **cm** **3**
- 84.5 m = **km** **0.0845**
- m = 54 cm **0.54**
- 18 km = **cm** **1,800,000**
- mm = 45 cm **450**
- 4 kg = **g** **4,000**
- 632 mg = **g** **0.632**
- 4,497 g = **kg** **4.497**
- mg = 0.51 kg **510,000**
- 0.63 kg = **g** **630**
- kg = 563 g **0.563**
- 662 m = **km** **0.662**
- 5,283 mL = **L** **5.283**
- 0.24 cm = **mm** **2.4**
- 380 kL = **L** **380,000**
- 10.8 g = **mg** **10,800**
- 83,000 mL = **L** **83**
- 56 in. \approx **cm** **142.24**
- 32.8 ft. \approx **m** **9.84**
- 609 yd \approx **m** **554.19**
- 21.78 mi \approx **km** **35.07**
- 48 lb \approx **g** **21,772.8**
- 2.3 T \approx **kg** **2,086.56**
- 8.5 c \approx **mL** **2,011.02**
- 33 gal \approx **L** **125.07**
- 1.8 qt \approx **mL** **1,703.43**

Lesson 6-6

Pages 310–315

Determine if the quantities in each pair of ratios are proportional.

Explain. **1–6. See Student Handbook Answer Appendix.**

- MONEY** 2 coins for every 3 bills and 6 coins for every 9 bills
 - SCALE** 3 feet for every 1 in and 15 feet for every 6 in
 - FAMILY** 2 children for every 1 adult and 8 children for every 3 adults
- Solve each proportion.
- $\frac{u}{72} = \frac{2}{4}$ **36**
 - $\frac{12}{m} = \frac{15}{10}$ **8**
 - $\frac{8}{32} = \frac{8}{64}$ **4**
 - $\frac{5}{14} = \frac{10}{a}$ **28**
 - $\frac{15}{w} = \frac{60}{4}$ **1**
 - $\frac{81}{90} = \frac{v}{20}$ **18**
 - $\frac{125}{v} = \frac{20}{5}$ **31.25**
 - $\frac{4}{5} = \frac{x}{3}$ **2.4**
 - $\frac{36}{90} = \frac{16}{t}$ **40**
 - $\frac{k}{18} = \frac{5}{3}$ **30**
 - $\frac{45}{8} = \frac{36}{d}$ **6.4**
 - $\frac{45}{75} = \frac{j}{3}$ **1.8**

Lesson 6-7

Pages 318–319

Use the *draw a diagram* strategy to solve the following problems.

- TESTS** The scores on a test are found by adding or subtracting points as shown below. If Salazar's score on a 15-question test was 86 points, how many of his answers were correct, incorrect, and blank?
- GAMES** Six members of a video game club are having a tournament. In the first round, every player will play a video game against every other player. How many games will be in the first round of the tournament?

15 games

Answer	Points
Correct	+8
Incorrect	-4
No answer	-2

See Student Handbook Answer Appendix.

- FAMILY** At Latrice's family reunion, $\frac{4}{5}$ of the people are 18 years of age or older. Half of the remaining people are under 12 years old. If 20 children are under 12 years old, how many people are at the reunion? **200 people**

Lesson 6-8

On a map, the scale is 1 inch = 50 miles. For each map distance, find the actual distance.

- 5 inches **250 mi**
- 12 inches **600 mi**
- $3\frac{3}{8}$ inches **$118\frac{3}{4}$ mi**
- $\frac{4}{5}$ inch **40 mi**
- $2\frac{5}{6}$ inches **$141\frac{2}{3}$ mi**
- 3.25 inches **162.5 mi**
- 4.75 inches **237.5 mi**
- 5.25 inches **262.5 mi**

On a scale drawing, the scale is $\frac{1}{2}$ inch = 2 feet. Find the dimensions of each room in the scale drawing.

- 14 feet by 18 feet **$3\frac{1}{2}$ in. by $4\frac{1}{2}$ in.**
- 3 feet by 5 feet **$3\frac{3}{4}$ in. by $1\frac{1}{4}$ in.**
- 32 feet by 6 feet **8 in. by $1\frac{1}{2}$ in.**
- 20 feet by 30 feet **5 in. by $7\frac{1}{2}$ in.**

Lesson 6-9

Write each percent as a fraction in simplest form.

- 32% **$\frac{8}{25}$**
- 89% **$\frac{89}{100}$**
- 72% **$\frac{18}{25}$**
- 11% **$\frac{11}{100}$**
- 1% **$\frac{1}{100}$**
- 28% **$\frac{7}{25}$**
- 55% **$\frac{11}{20}$**
- 18.5% **$\frac{37}{200}$**
- 22.75% **$\frac{91}{400}$**
- 25.2% **$\frac{63}{250}$**
- 75.5% **$\frac{151}{200}$**
- 48.25% **$\frac{193}{400}$**
- 6.5% **$\frac{13}{200}$**
- 1.25% **$\frac{1}{80}$**
- 88.9% **$\frac{889}{1,000}$**
- $52\frac{1}{4}$ % **$\frac{209}{400}$**
- 895% **$8\frac{19}{20}$**
- 480% **$4\frac{4}{5}$**
- 0.78% **$\frac{39}{5,000}$**
- 0.3% **$\frac{3}{1,000}$**

Write each fraction as a percent. Round to the nearest hundredth if necessary.

- $\frac{14}{25}$ **56%**
- $\frac{28}{50}$ **56%**
- $\frac{14}{20}$ **70%**
- $\frac{7}{10}$ **70%**
- $\frac{17}{17}$ **100%**
- $\frac{80}{125}$ **64%**
- $\frac{9}{12}$ **75%**
- $\frac{4}{6}$ **66.67%**
- $\frac{11}{12}$ **91.67%**
- $\frac{9}{16}$ **56.25%**
- $\frac{8}{9}$ **88.89%**
- $\frac{3}{16}$ **18.75%**
- $\frac{5}{32}$ **15.63%**
- $\frac{1}{16}$ **6.25%**
- $\frac{8}{15}$ **53.33%**
- $\frac{9}{11}$ **81.82%**
- $\frac{1}{250}$ **0.4%**
- $\frac{1}{500}$ **0.2%**
- $12\frac{1}{2}$ % **1,250%**
- $18\frac{2}{5}$ % **1,840%**

Lesson 7-1

Find each number. Round to the nearest tenth if necessary.

- 5% of 40 **2**
- 10% of 120 **12**
- 12% of 150 **18**
- 12.5% of 40 **5**
- 75% of 200 **150**
- 13% of 25.3 **3.3**
- 250% of 44 **110**
- 0.5% of 13.7 **0.1**
- 600% of 7 **42**
- 1.5% of \$25 **\$0.38**
- 81% of 134 **108.5**
- 43% of 110 **47.3**
- 61% of 524 **319.6**
- 100% of 3.5 **3.5**
- 20% of 58.5 **11.7**
- 45% of 125.5 **56.5**
- 23% of 500 **115**
- 80% of 8 **6.4**
- 90% of 72 **64.8**
- 32% of 54 **17.3**

Lesson 7-2

Find each number. Round to the nearest tenth if necessary.

- What number is 25% of 280? **70**
- 38 is what percent of 50? **76%**
- 54 is 25% of what number? **216**
- 24.5% of what number is 15? **61.2**
- What number is 80% of 500? **400**
- 12% of 120 is what number? **14.4**
- Find 68% of 50. **34**
- What percent of 240 is 32? **13.3%**
- 99 is what percent of 150? **66%**
- Find 75% of 1. **0.8**
- What number is $33\frac{1}{3}$ % of 66? **22**
- 50% of 350 is what number? **175**
- What percent of 450 is 50? **11.1%**
- What number is $37\frac{1}{2}$ % of 32? **12**
- 95% of 40 is what number? **38**
- Find 30% of 26. **7.8**
- 9 is what percent of 30? **30%**
- 52% of what number is 109.2? **210**
- What number is 65% of 200? **130**
- What number is 15.5% of 45? **7.0**

Lesson 7-3

Estimate by using fractions. 1–36. Sample answers are given. 3. $(4 \cdot 20) + (\frac{1}{2} \cdot 20) = 90$

- 28% of 48 **$\frac{1}{4} \cdot 48 = 12$**
- 99% of 65 **$1 \cdot 65 = 65$**
- 445% of 20 **$4 \cdot 20 = 80$**
- 9% of 81 **$\frac{1}{10} \cdot 80 = 8$**
- 73% of 240 **$\frac{3}{4} \cdot 240 = 180$**
- 65.5% of 75 **$\frac{2}{3} \cdot 75 = 50$**
- 48.2% of 93 **$\frac{1}{2} \cdot 90 = 45$**
- 39.45% of 51 **$\frac{2}{5} \cdot 50 = 20$**
- 287% of 122 **$3 \cdot 120 = 360$**
- 53% of 80 **$\frac{1}{2} \cdot 80 = 40$**
- 414% of 72 **$4 \cdot 72 = 288$**
- 59% of 105 **$\frac{3}{5} \cdot 105 = 63$**

Estimate by using 10%. 13–24. See Student Handbook Answer Appendix.

- 30% of 42 **14**
- 70% of 104 **73**
- 90% of 152 **137**
- 78% of 92 **73**
- 12% of 183 **22**
- 51% of 221 **113**
- 81% of 390 **316**
- 41% of 60 **25**
- 59% of 178 **105**
- 22% of 450 **99**

Estimate.

- 50% of 37 **$\frac{1}{2} \cdot 40 = 20$**
- 18% of 90 **$\frac{1}{5} \cdot 100 = 20$**
- 300% of 245 **$3 \cdot 250 = 750$**
- 1% of 48 **$\frac{1}{100} \cdot 50 = 0.5$**
- 70% of 300 **$\frac{7}{10} \cdot 300 = 210$**
- 35% of 35 **$\frac{7}{20} \cdot 40 = 14$**
- 60.5% of 60 **$\frac{3}{5} \cdot 60 = 36$**
- $5\frac{1}{2}$ % of 100 **$\frac{50}{10} \cdot 100 = 633$**
- 40.01% of 16 **$\frac{2}{5} \cdot 15 = 6$**
- 80% of 62 **$\frac{4}{5} \cdot 60 = 48$**
- 45% of 119 **$\frac{9}{20} \cdot 120 = 54$**
- 14.81% of 986 **$\frac{3}{20} \cdot 1,000 = 150$**

Lesson 7-4

Write an equation for each problem. Then solve. Round to the nearest tenth if necessary. 1–14. See Student Handbook Answer Appendix for equations.

- Find 45% of 50. **22.5**
- 75 is what percent of 300? **25%**
- 16% of what number is 2? **12.5**
- 75% of 80 is what number? **60**
- 5% of what number is 12? **240**
- Find 60% of 45. **27**
- 90 is what percent of 64 is what number? **18.2**
- Find 46.5% of 75. **34.9**
- 80.5% of what number is 80.5? **100**
- $66\frac{2}{3}$ % of what number is 40? **60**
- Find 122.5% of 80. **98**
- 250% of what number is 75? **30**

Lesson 7-5

Pages 366–367

Solve each problem using the *reasonable answers* strategy.

- SKIING** Benito skied for 13.5 hours and estimated that he spent 30% of his time on the ski lift. Did he spend about 4, 6, or 8 hours on the ski lift? **about 4 h**
- GAS MILEAGE** Miguel's car gets 38 miles per gallon and has 2.5 gallons of gasoline left in the tank. Can he drive for 85, 95, or 105 more miles before he runs out of gas? **95 mi**
- DINING** At a restaurant, the total cost of a meal is \$87.50. Nadia wants to leave a 20% tip. Should she leave a total of \$95, \$105, or \$115? **\$105**

Lesson 7-6

Pages 369–374

Find each percent of change. Round to the nearest whole percent if necessary. State whether the percent of change is an *increase* or *decrease*.

- 450 centimeters to 675 centimeters
- 77 million to 200.2 million
- 500 albums to 100 albums
- 350 yards to 420 yards
- 3.25 meters to 2.95 meters
- \$65 to \$75
- 180 dishes to 160 dishes
- 450 pieces to 445.5 pieces
- 700 grams 910 grams
- 55 women to 11 women
- 412 children to 1,339 children
- 464 kilograms to 20 kilograms
- 24 hours to 86 hours
- 16 minutes to 24 minutes

Lesson 7-7 1–12. See Student Handbook Answer Appendix.

Pages 375–378

Find the total cost or sale price to the nearest cent.

- \$45 sweater; 6% tax
- \$18.99 CD; 15% discount
- \$199 ring; 10% discount
- \$29 shirt; 7% tax
- \$19 purse; 25% discount
- \$145 coat; 6.25% tax
- \$12 meal; 4.5% tax
- \$899 computer; 20% discount
- \$105 skateboard; $7\frac{1}{2}\%$ tax
- \$599 TV; 12% discount
- \$12,500 car; $3\frac{3}{4}\%$ tax
- \$49.95 gloves; $5\frac{1}{4}\%$ tax

Find the percent of discount to the nearest percent.

- sneakers: regular price, \$72 sale price, \$60
- dress shirt: regular price, \$90 sale price, \$22.50
- portable game player: regular price, \$125 sale price, \$100
- car: regular price, \$25,000 sale price, \$22,000
- hiking boots: regular price, \$139 sale price, \$113.98
- airline tickets: regular price, \$556 sale price, \$500.40
- CD: regular price, \$15 sale price, \$9
- computer: regular price, \$600 sale price, \$450

686 Extra Practice

Lesson 7-8

Pages 379–382

Find the simple interest earned to the nearest cent for each principal, interest rate, and time. **1–9. See Student Handbook Answer Appendix.**

- \$2,000, 8%, 5 years
- \$500, 10%, 8 months
- \$750, 5%, 1 year
- \$175.50, $6\frac{1}{2}\%$, 18 months
- \$236.20, 9%, 16 months
- \$89, $7\frac{1}{2}\%$, 6 months
- \$800, 5.75%, 3 years
- \$225, $1\frac{1}{2}\%$, 2 years
- \$12,000, $4\frac{1}{2}\%$, 40 months
- \$750, 18%, 2 years
- \$1,500, 19%, 16 months
- \$300, 9%, 1 year
- \$4,750, 19.5%, 30 months
- \$2,345, 17%, 9 months
- \$689, 12%, 2 years
- \$390, 18.75%, 15 months
- \$1,250, 22%, 8 months
- \$3,240, 18%, 14 months

Find the simple interest paid to the nearest cent for each loan, interest rate, and time. **10–18. See Student Handbook Answer Appendix.**

- \$750, 18%, 2 years
- \$1,500, 19%, 16 months
- \$300, 9%, 1 year
- \$4,750, 19.5%, 30 months
- \$2,345, 17%, 9 months
- \$689, 12%, 2 years
- \$390, 18.75%, 15 months
- \$1,250, 22%, 8 months
- \$3,240, 18%, 14 months

Lesson 8-1

Pages 395–400

Display each set of data in a line plot. Identify any clusters, gaps, or outliers. **1–4. See Student Handbook Answer Appendix.**

- | Number of Pets in the Home | High Temperatures for 18 Days (°F) |
|----------------------------|------------------------------------|
| 0 | 75 |
| 1 | 81 |
| 3 | 75 |
| 4 | 65 |
| 0 | 76 |
| 2 | 80 |
| 1 | 0 |
| 1 | 1 |
| 10 | 85 |
| 0 | 66 |
| 1 | 75 |
| 5 | 80 |
| 2 | 75 |

- | Number of Stories for Buildings in Denver | Ages of Children at Sunny Day Care (years) |
|---|--|
| 56 | 4 |
| 43 | 1 |
| 36 | 6 |
| 42 | 4 |
| 29 | 5 |
| 54 | 4 |
| 42 | 5 |
| 32 | 1 |
| 34 | 2 |
| 52 | 3 |
| 40 | 2 |
| 32 | 4 |
| 32 | 4 |
| 32 | 1 |
| 32 | 3 |

- | Number of Stories for Buildings in Denver | Ages of Children at Sunny Day Care (years) |
|---|--|
| 56 | 4 |
| 43 | 1 |
| 36 | 6 |
| 42 | 4 |
| 29 | 5 |
| 54 | 4 |
| 42 | 5 |
| 32 | 1 |
| 34 | 2 |
| 52 | 3 |
| 40 | 2 |
| 32 | 4 |
| 32 | 4 |
| 32 | 1 |
| 32 | 3 |

Source: *The World Almanac and Book of Facts*

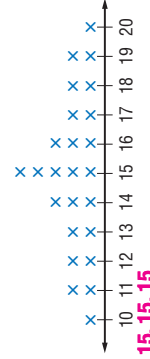
Lesson 8-2

Pages 401–407

Find the mean, median, and mode for each set of data.

- 1, 5, 9, 1, 2, 6, 8, 2
- 2, 5, 8, 9, 7, 6, 3, 5, 1, 4
- 82, 79, 93, 91, 95, 95, 81
- 117, 103, 108, 120
- 256, 265, 247, 256
- 47, 54, 66, 54, 46, 66
- | Number of Absences | Tally | Frequency |
|--------------------|-------|-----------|
| 0 | | 4 |
| 1 | | 9 |
| 2 | | 6 |
| 3 | | 5 |

1.5, 1, 1



686

Extra Practice

Extra Practice 687

Lesson 8-3 1-4. See Student Handbook Answer Appendix.

Display each set of data in a stem-and-leaf plot.

- 23, 15, 39, 68, 57, 42, 51, 52, 41, 18, 29
- 189, 182, 196, 184, 197, 183, 196, 194, 184

4. **Average Monthly High Temperatures in Albany, NY (°F)**

21	46	72	50
24	58	70	40
34	67	61	27

Source: *The World Almanac and Book of Facts*

Super Bowl Winning Scores 1987-2004

39	55	52	27	34	20
42	20	30	35	23	48
20	37	49	31	34	32

Source: *The World Almanac and Book of Facts*

Lesson 8-4 1-4. See Student Handbook Answer Appendix.

Select the appropriate graph to display each set of data: bar graph or histogram. Then display the data in the appropriate graph.

1. **Longest Snakes**

Snake Name	Length (ft)
Royal python	35
Anaconda	28
Indian python	25
Diamond python	21
King cobra	19
Boa constrictor	16

Source: *The Top 10 of Everything*

2. **Least Densely Populated States**

State	People Per Square Mile
Alaska	1
Wyoming	5
Montana	6
North Dakota	9
South Dakota	10
New Mexico	15

Source: *The Top 10 of Everything*

3. **Cost of a Movie Ticket at Selected Theaters**

\$5.25	\$6.50	\$3.50	\$3.75
\$7.50	\$9.25	\$10.40	\$4.75
\$10.00	\$4.50	\$8.75	\$7.25
\$3.50	\$6.70	\$4.20	\$7.50

4.

Highest Recorded Wind Speeds For Selected U.S. Cities (mph)

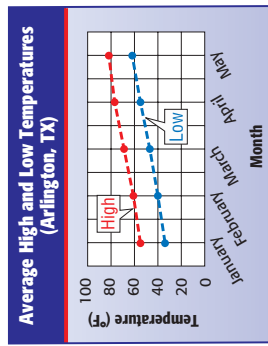
52	55	81	46	73	57
75	54	58	76	46	58
60	91	53	53	51	56
80	60	75	46	49	47

Source: *The World Almanac and Book of Facts*

Lesson 8-5

WEATHER For Exercises 1-3, solve by using the graph. **3. Sample answer: 88°F, 72°F**

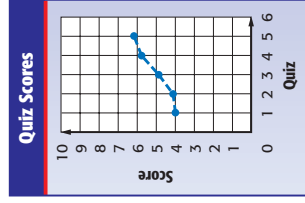
- In which month is the average high temperature about twice as high as the average low temperature for January? **March**
- What is the approximate difference between the average high temperature and the average low temperature each month? **about 20°F**
- Predict the high and low temperatures for June based on the data given on the graph.



Extra Practice

Lesson 8-6 2 a-c. See Student Handbook Answer Appendix.

For Exercises 1-3, refer to the graph at the right which shows Rachel's quiz scores for six quizzes.



- Describe the trend in Rachel's quiz scores. **Sample answer: The scores are increasing.**
- If the trend continues, predict Rachel's score on the seventh quiz. **Sample answer: 7**
- If the trend continues, predict Rachel's score on the tenth quiz. **Sample answer: 10**

For Exercises 4-6, use the table which shows the average price paid to farmers per 100 pounds of sheep they sold.

Year	Price Per 100 Pounds (\$)
1940	4
1950	12
1960	6
1970	8
1980	21
1990	23
2000	34

Source: *The World Almanac and Book of Facts*

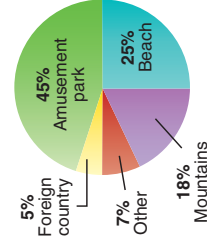
- Make a scatter plot of the data.
- Describe the relationship, if any, between the two sets of data.
- Predict the price per 100 pounds for 2010. Explain. **4-6. See Student Handbook Answer Appendix.**

Lesson 8-7

Cookie	Number
chocolate chip	49
peanut butter	12
oatmeal	10
sugar	8
raisin	3

- SURVEYS** The table shows the results of a survey of students' favorite cookies. Predict how many of the 424 students at Scobey High School prefer chocolate chip cookies. **about 263 students**

Vacation Survey



- VACATION** The circle graph shows the results of a survey of teens and where they would prefer to spend a family vacation. Predict how many of 4,000 teens would prefer to go to an amusement park. **1,800 teens**
- TRAVEL** In 2000, about 29% of the foreign visitors to the U.S. were from Canada. If a particular hotel had 150,000 foreign guests in one year, how many would you predict were from Canada? **43,500 Canadians**

Lesson 8-8 1-3. See Student Handbook Answer Appendix.

Pages 438-443

Determine whether each conclusion is valid. Justify your answer.

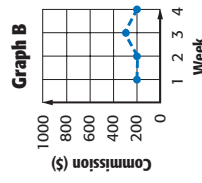
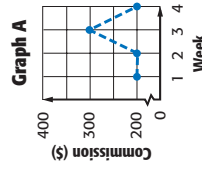
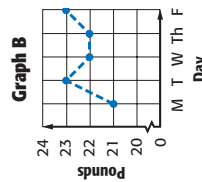
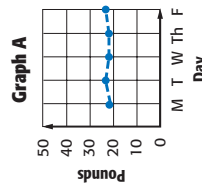
- To determine whether most students participate in after school activities, the principal of Humberson Middle School randomly surveyed 75 students from each grade level. Of these, 34% said they participate in after school activities. The principal concluded that about a third of the students at Humberson Middle School participate in after school activities.
- To evaluate their product, the manager of an assembly line inspected the first 100 watches produced on Monday. Of these, 2 were defective. The manager concluded that about 2% of all watches produced are defective.
- A television program asked its viewers to dial one of two phone numbers indicating their preference for one of two brands of shampoo. Of those that responded, 76% said they prefer Brand A. The program concluded that Brand A was the most popular brand of shampoo.

Lesson 8-9 1, 2. See Student Handbook Answer Appendix.

Pages 444-449

Which graph could be misleading? Explain your reasoning.

- Both graphs show pounds of grapes sold to Westview School in one week.
- Both graphs show commissions made by Mr. Turner for a four-week pay period.

**Lesson 9-1**

Pages 460-464

Use the spinner at the right to find each probability. Write as a fraction in simplest form.

- $P(\text{even number})$ $\frac{1}{2}$
- $P(\text{prime number})$ $\frac{3}{8}$
- $P(\text{factor of } 12)$ $\frac{5}{8}$
- $P(\text{composite number})$ $\frac{3}{8}$
- $P(\text{greater than } 10)$ 0
- $P(\text{neither prime nor composite})$ $\frac{1}{8}$



A package of balloons contains 5 green, 3 yellow, 4 red, and 8 pink balloons. Suppose you reach in the package and choose one balloon at random. Find the probability of each event. Write as a fraction in simplest form.

- $P(\text{red balloon})$ $\frac{1}{5}$
- $P(\text{orange balloon})$ 0
- $P(\text{yellow balloon})$ $\frac{3}{20}$
- $P(\text{pink balloon})$ $\frac{2}{5}$
- $P(\text{not green balloon})$ $\frac{3}{4}$
- $P(\text{red or yellow balloon})$ 0
- $P(\text{red or yellow balloon})$ $\frac{3}{4}$
- $P(\text{yellow balloon})$ $\frac{3}{20}$
- $P(\text{pink balloon})$ $\frac{2}{5}$
- $P(\text{not green balloon})$ $\frac{3}{4}$

690 Extra Practice

Lesson 9-2

Pages 465-470

For each situation, find the sample space using a tree diagram.

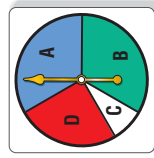
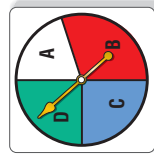
- rolling 2 number cubes **1-5. See Student Handbook Answer Appendix for tree diagrams.**
- choosing an ice cream cone from waffle, plain, or sugar and a flavor of ice cream from chocolate, vanilla, or strawberry
- making a sandwich from white, wheat, or rye bread, cheddar or Swiss cheese and ham, turkey, or roast beef
- tossing a penny twice
- choosing one math class from Algebra and Geometry and one foreign language class from French, Spanish, or Latin

Lesson 9-3

Pages 471-474

Use the Fundamental Counting Principle to find the total number of outcomes in each situation.

- choosing a local phone number if the exchange is 398 and each of the four remaining digits is different **5,040 outcomes**
- choosing a way to drive from Millville to Westwood if there are 5 roads that lead from Millville to Miamisburg, 3 roads that connect Miamisburg to Hathaway, and 4 highways that connect Hathaway to Westwood **60 outcomes**
- tossing a quarter, rolling a number cube, and tossing a dime **24 outcomes**
- spinning the spinners shown below **96 outcomes**

**Lesson 9-4**

Pages 475-478

- RACES** Eight runners are competing in a 100-meter sprint. In how many ways can the gold, silver, and bronze medals be awarded? **336 ways**
- LOCKERS** Five-digit locker combinations are assigned using the digits 1-9. In how many ways can the combinations be formed if no digit can be repeated? **15,120 ways**
- SCHEDULES** In how many ways can the classes math, language arts, science, and social studies be ordered on student schedules as the first four classes of their day? **24 ways**
- TOYS** At a teddy bear workshop, customers can select from black, brown, golden, white, blue, or pink for their bear's color. If a father randomly selects two bear colors, what is the probability that he will select a white bear for his son and a pink bear for his daughter? The father cannot pick the same color for both bears. **$\frac{1}{30}$**
- WRITING** If you randomly select three of your last seven writing assignments to submit to an essay contest, what is the probability that you will select your first, fourth, and sixth essays in that order? **$\frac{1}{210}$**

Extra Practice 691

Lesson 9-5

Pages 480–483

- EXERCISE** How many ways can you choose to exercise three days of a week? **35 ways**
- BOOKS** In how many ways can six books be selected from a collection of 12? **924 ways**
- REPORTS** In how many ways can you select three report topics from a total of 8 topics? **56 ways**
- GROUPS** How many ways can four students be chosen from a class of 26? **14,950 ways**
- ROLLER COASTERS** In how many ways can you ride five out of nine roller coasters if you don't care in what order you ride them? **126 ways**

Lesson 9-6

Pages 484–485

Use the *act it out* strategy to solve each problem.

- STAIRS** Lynnette lives on a certain floor of her apartment building. She goes up two flights of stairs to put a load of laundry in a washing machine on that floor. Then she goes down five flights to borrow a book from a friend. Next, she goes up 8 flights to visit another friend who is ill. How many flights up or down does Lynnette now have to go to take her laundry out of the washing machine? **3 flights up**
- LOGIC PUZZLE** Suppose you are on the west side of a river with a fox, a duck, and a bag of corn. You want to take all three to the other side of the river, but...
 - your boat is only large enough to carry you and either the fox, duck, or bag of corn.
 - you cannot leave the fox alone with the duck.
 - you cannot leave the duck alone with the corn.
 - you cannot leave the corn alone on the east side of the river because some wild birds will eat it.
 - the wild birds are afraid of the fox.
 - you cannot leave the fox, duck, and the corn alone.
 - you can bring something across the river more than once.
 If there is no other way to cross the river, how do you get everything to the other side?
First carry the duck across the river and bring the boat back empty. Then carry the fox across the river and carry the duck back. Then carry the corn across the river and bring the boat back empty. Finally carry the duck across the river.

Lesson 9-7

Pages 486–490

The frequency table shows the results of a fair number cube rolled 40 times.

Face	Frequency
1	5
2	9
3	2
4	8
5	12
6	4

- Find the experimental probability of rolling a 4. **$\frac{1}{5}$**
- Find the theoretical probability of *not* rolling a 4. **$\frac{5}{6}$**
- Find the theoretical probability of rolling a 2. **$\frac{1}{6}$**
- Find the experimental probability of *not* rolling a 6. **$\frac{9}{10}$**
- Suppose the number cube was rolled 500 times. About how many times would it land on 5? **150**

Lesson 9-8

Pages 492–497

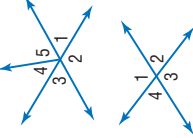
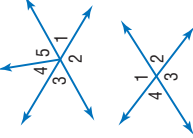
- COINS** Two evenly balanced nickels are tossed. Find the probability that one head and one tail result. **$\frac{1}{4}$**
- MONEY** A wallet contains four \$5 bills, two \$10 bills, and eight \$1 bills. A bill is randomly selected. Find $P(\$5 \text{ or } \$1)$. **$\frac{6}{7}$**
- PROBABILITY** Two chips are selected from a box containing 6 blue chips, 4 red chips, and 3 green chips. The first chip selected is replaced before the second is drawn. Find $P(\text{red, green})$. **$\frac{12}{169}$**
- PROBABILITY** A bag contains 7 blue, 4 orange, 8 red, and 5 purple marbles. Suppose one marble is chosen and not replaced. A second marble is then chosen. Find $P(\text{purple, red})$. **$\frac{5}{69}$**

Lesson 10-1

Pages 510–513

Classify each angle as *acute*, *right*, *obtuse*, or *straight*.

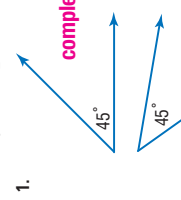
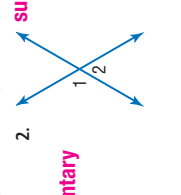
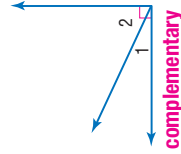
- right** 
- obtuse** 
- straight** 
- acute** 

- Identify a pair of vertical angles in the diagram at the right. **$\angle 1$ and $\angle 3$**

- Identify a pair of adjacent angles in the diagram at the right. **Sample answer: $\angle 1$ and $\angle 2$**


Lesson 10-2

Pages 514–517

Classify each pair of angles as *complementary*, *supplementary*, or *neither*.

- complementary** 
- supplementary** 
- complementary** 

Find the value of x in each figure.

- 40** 
- 55** 
- 160** 

Lesson 10-3 1, 2. See Student Handbook Answer Appendix.

Pages 518–523

Display each set of data in a circle graph.

Style	Percent
sedan	45%
SUV	22%
pickup truck	9%
sports car	13%
compact car	11%

Flavor	Number
vanilla	11
chocolate	15
strawberry	8
mint chip	5
cookie dough	3

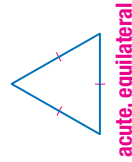
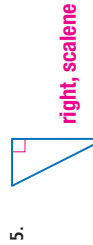
Lesson 10-4

Pages 524–529

Find the value of x .



Classify each triangle by its angles and by its sides.



Lesson 10-5 1, 2. See Student Handbook Answer Appendix.

Pages 530–531

Use the *logical reasoning* strategy to solve each problem.

- GEOMETRY** Draw several isosceles triangles and measure their angles. What do you notice about the measures of the angles of an isosceles triangle?
- BASKETBALL** Placido, Dexter, and Scott play guard, forward, and center on a team, but not necessarily in that order. Placido and the center drove Scott to practice on Saturday. Placido does not play guard. Who is the guard?

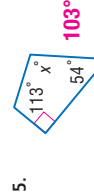
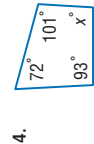
Lesson 10-6

Pages 533–539

Classify each quadrilateral using the name that *best* describes it.



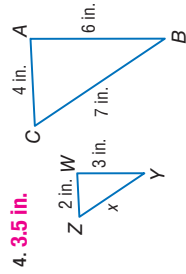
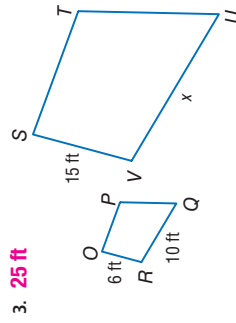
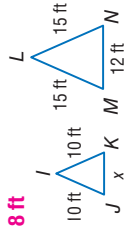
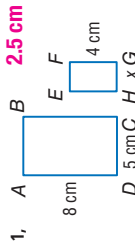
Find the missing angle measure in each quadrilateral.



Lesson 10-7

Pages 540–545

Find the value of x in each pair of similar figures.



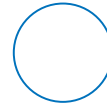
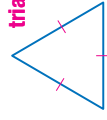
5.

6.

Lesson 10-8

Pages 546–551

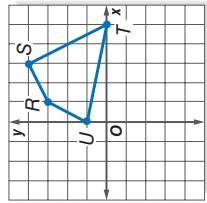
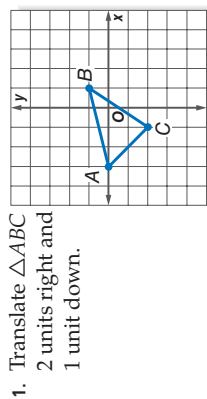
Determine whether each figure is a polygon. If it is, classify the polygon and state whether it is regular. If it is *not* a polygon, explain why.



Find the measure of an angle in each polygon if polygon is regular. Round to the nearest tenth of a degree if necessary.

- triangle 60°
- 30-gon 168°
- hexagon 120°
- 18-gon 160°
- 14-gon 154.3°
- 27-gon 166.7°
- nonagon 140°
- octagon 135°

Lesson 10-9 1, 2. See Student Handbook Answer Appendix.



- Translate $\triangle ABC$ 2 units right and 1 unit down.
- Translate quadrilateral $RSTU$ 4 units left and 3 units down.

Triangle TRI has vertices $T(1, 1)$, $R(4, -2)$, and $I(-2, -1)$. Find the vertices of $T'R'I'$ after each translation. Then graph the figure and its translated image. 3-6. See Student Handbook Answer Appendix for graphs.

- 2 units right, 1 unit down $T'(3, 0)$, $R'(6, -3)$, $I'(0, -2)$
- 5 units left, 1 unit up $T'(-4, 2)$, $R'(-1, -1)$, $I'(-7, 0)$
- 3 units right $T'(4, 1)$, $R'(7, -2)$, $I'(1, -1)$
- 2 units up $T'(1, 3)$, $R'(4, 0)$, $I'(-2, 1)$

Lesson 10-10

Determine whether each figure has line symmetry. Write *yes* or *no*. If so, copy the figure and draw all lines of symmetry.

- yes**
- no**
- yes**
- no**
- yes**
- yes**

7. See Student Handbook Answer Appendix.
8. See Student Handbook Answer Appendix for graph.

Graph each figure and its reflection over the x -axis. Then find the coordinates of the vertices of the reflected image.

- quadrilateral $QUAD$ with vertices $Q(-1, 4)$, $U(2, 2)$, $A(1, 1)$, and $D(-2, 2)$
- triangle $\triangle ABC$ with vertices $A(0, -1)$, $B(4, -3)$, and $C(-4, -5)$ $A'(0, 1)$, $B'(4, 3)$, $C'(-4, 5)$
- See Student Handbook Answer Appendix for graphs. Graph each figure and its reflection over the y -axis. Then find the coordinates of the vertices of the reflected image.
- parallelogram $PARL$ with vertices $P(3, 5)$, $A(5, 4)$, $R(5, 1)$, and $L(3, 2)$ $P'(-3, 5)$, $A'(-5, 4)$, $R'(-5, 1)$, $L'(-3, 2)$
- pentagon $PENTA$ with vertices $P(-1, 3)$, $E(1, 1)$, $N(0, -2)$, $T(-2, -2)$, and $A(-3, 1)$ $P'(1, 3)$, $E'(-1, 1)$, $N'(0, -2)$, $T'(2, -2)$, $A'(3, 1)$

Lesson 11-1

Find the area of each parallelogram. Round to the nearest tenth if necessary.

- 12 m²**
- 108 m²**
- 437 ft²**

- base = 19 m
height = 6 m **114 m²**
- base = 8.2 cm
height = 5.5 cm **45.1 cm²**
- base = 135 in.
height = 15 in. **2,025 in²**
- base = 29.3 m
height = 10.1 m **295.9 m²**

Lesson 11-2

Find the area of each figure. Round to the nearest tenth if necessary.

- 20 ft²**
- 7.5 cm²**
- 34.5 cm²**

- triangle: base = 5 in., height = 9 in. **22.5 in²**
- trapezoid: bases = 3 cm and 8 cm, height = 12 cm **66 cm²**
- trapezoid: bases = 10 ft and 15 ft, height = 12 ft **150 ft²**
- triangle: base = 12 cm, height = 8 cm **48 cm²**
- trapezoid: bases = 82.6 cm and 72.2 cm, height = 44.5 cm **3,444.3 cm²**
- triangle: base = 500.5 ft, height = 254.5 ft **63,688.6 ft²**

Lesson 11-3

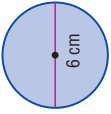


Find the circumference of each circle. Use 3.14 or $\frac{22}{7}$ for π . Round to the nearest tenth if necessary.

- 25.1 ft**
- 18.8 in.**
- 3.1 m**
- 26 5/7 ft**
- $r = 1$ m **6.3 m**
- $d = 2$ yd **6.3 yd**
- $r = 0.5$ cm **3.1 cm**
- $d = 6.4$ m **20.1 m**
- $d = \frac{3}{16}$ in. **56**
- $r = 5\frac{1}{2}$ mi **34 1/4 mi**
- $d = 42\frac{3}{4}$ ft **134 5/14 ft**
- $d = 5,280$ ft **16,579.2 ft**
- $r = 10.7$ km **67.2 km**

Lesson 11-4

Pages 587–591

Find the area of each circle. Round to the nearest tenth.

-  28.3 cm^2
-  12.6 yd^2
-  3.1 in^2
- radius = 8 in. 201.0 in^2
- diameter = 5 ft 19.6 ft^2
- radius = 24 cm $6,180.8 \text{ cm}^2$
- diameter = 2.3 m 4.2 m^2
- diameter = 82 ft $5,278.3 \text{ ft}^2$
- radius = 68 cm $12,355.8 \text{ in}^2$
- radius = 9.8 mi 301.6 mi^2
- diameter = 25.6 m
- diameter = $6\frac{7}{8}$ in.
- radius = $1\frac{1}{4}$ ft 4.9 ft^2
- diameter = $5\frac{2}{3}$ yd
- diameter = $45\frac{1}{2}$ mi

9, 11, 14, 15. See Student Handbook Answer Appendix.

Lesson 11-5

Pages 592–593

Use the *solve a simpler problem strategy* to solve each problem.

- EARNINGS** Cedric makes \$51,876 each year. If he is paid once every two weeks and actually takes home about 67% of his wages after taxes, how much does he take home each paycheck? Round to the nearest cent if necessary. $\$1,336.80$
- CARS** Jorge plans to decorate the rims on his tires by putting a strip of shiny metal around the outside edge on each rim. The diameter of each tire is 17 inches, and each rim is 2.75 inches from the outside edge of each tire. If he plans to cut the four individual pieces for each tire from the same strip of metal, how long of a strip should he buy? Round to the nearest tenth. 144.5 in.
- SAVINGS** Erin's aunt invested a total of \$1,500 into three different savings accounts. She invested \$450 into a savings account with an annual interest rate of 3.25% and \$600 into a savings account with an annual interest rate of 4.75%. The third savings account had an annual interest rate of 4.375%. After 3 years, how much money will Erin's aunt have in the three accounts altogether if she made no more additional deposits or withdrawals? Round to the nearest cent. $\$1,688.44$

BIOLOGY For Exercises 4–6, use the following information.

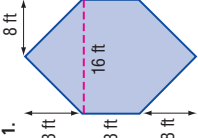
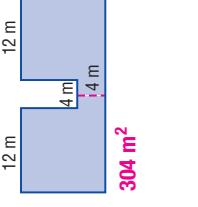
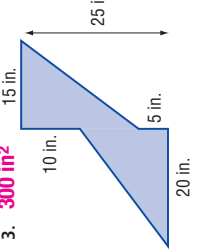
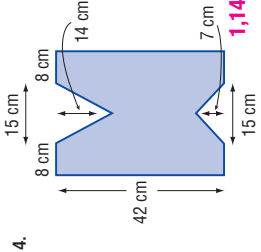
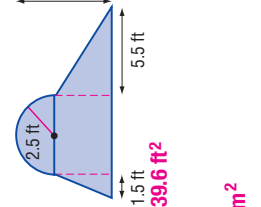
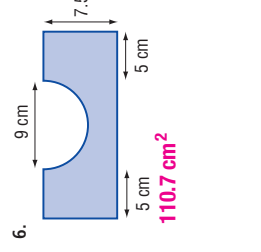
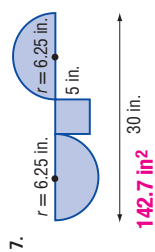
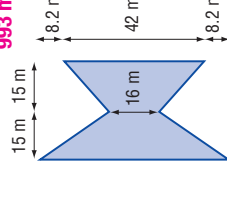
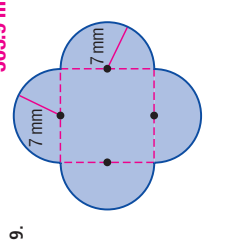
- About five quarts of blood are pumped through the average human heart in one minute.
- At this rate, how many quarts of blood are pumped through the average human heart in one year? (Use 365 days = 1 year) $2,628,000 \text{ qt}$
 - If the average heart beats 72 times per minute, how many quarts of blood are pumped with each beat? Round to the nearest tenth. 0.1 qt
 - About how many total gallons of blood are pumped through the average human heart in one week? **about 12,600 gal**
 - LAND** A rectangular plot of land measures 1,450 feet by 850 feet. A contractor wishes to section off a portion of this land to build an apartment complex. If the complex is 425 feet by 550 feet, how many square feet of land will not be sectioned off to build it? $998,750 \text{ ft}^2$

698 Extra Practice

Lesson 11-6

Pages 694–697




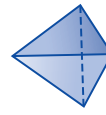

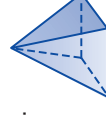
Find the area of each figure. Round to the nearest tenth if necessary.

-  256 ft^2
-  304 m^2
-  300 in^2
-  $1,144.5 \text{ cm}^2$
-  39.6 ft^2
-  110.7 cm^2
-  142.7 in^2
-  993 m^2
-  503.9 mm^2

Lesson 11-7

Pages 601–604

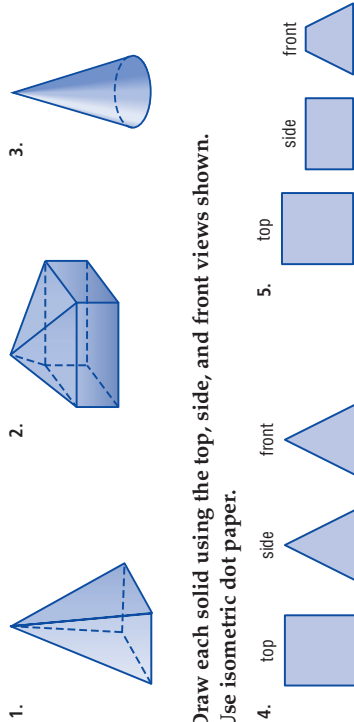
For each figure, identify the shape of the base(s). Then classify the figure.

-  **rectangle; rectangular prism**
-  **none; sphere**
-  **circle; cone**
-  **triangle; triangular pyramid**
-  **pentagon; pentagonal prism**
-  **square; square pyramid**
- SOUP** Classify the shape of a soup can as a three-dimensional figure. **cylinder**
- APPLIANCES** Classify the shape of a microwave oven as a three-dimensional figure. **rectangular prism**

Extra Practice 699

Lesson 11-8 1-5. See Student Handbook Answer Appendix.

Draw a top, a side, and a front view of each solid.

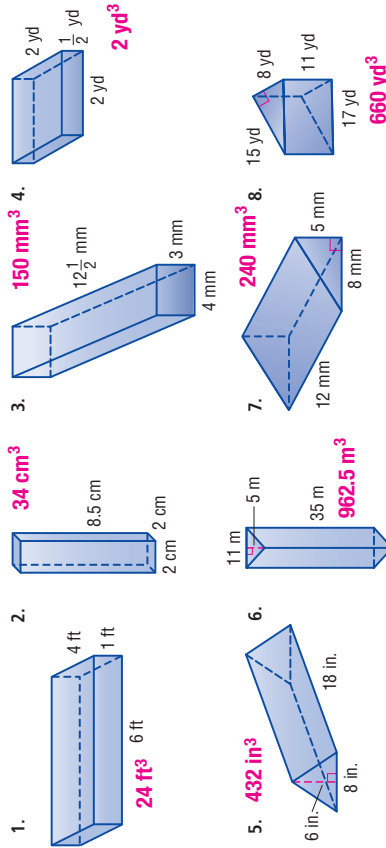


Draw each solid using the top, side, and front views shown. Use isometric dot paper.



Lesson 11-9

Find the volume of each prism. Round to the nearest tenth if necessary.

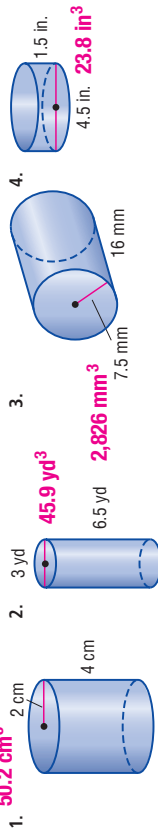


Find the volume of each rectangular prism. Round to the nearest tenth if necessary.

- length = 3 ft, width = 10 ft, height = 2 ft **60 ft³**
- length = 4.5 cm, width = 6.75 cm, height = 2 cm **60.8 cm³**
- length = 18 cm, width = 23 cm, height = 15 cm **6,210 cm³**
- length = 16 mm, width = 0.7 mm, height = 12 mm **134.4 mm³**
- length = 25 mm, width = 32 mm, height = 10 mm **8,000 mm³**
- length = 3 1/2 ft, width = 5 1/2 in., height = 6 in. **210 ft³**
- length = 3 yards, width = 5 feet, and a height of 12 feet. **540 ft³**
- length = 18 cm, width = 1.5 in., height = 3 in. **16,222.8 in³**
- length = 10 ft, width = 3 in., height = 6 in. **2,000 ft³**
- length = 16 mm, width = 10 ft, height = 6 ft **210 ft³**
- length = 3 yards, width = 5 feet, and a height of 12 feet. **540 ft³**
- length = 18 cm, width = 1.5 in., height = 3 in. **16,222.8 in³**

Lesson 11-10

Find the volume of each cylinder. Round to the nearest tenth. Use 3.14 for π .



- radius = 6 in., height = 3 in. **339.1 in³**
- radius = 8.5 cm, height = 3 cm **680.6 cm³**
- radius = 12 m, height = 4.75 m **536.9 m³**
- radius = 40.5 m, height = 65.1 m **335,290.1 m³**
- radius = 8 ft, height = 10 ft **2,009.6 ft³**
- radius = 6 km, height = 12 km **7,1356.5 km³**
- radius = 2.5 mm, height = 4.5 yd **904.3 yd³**
- diameter = 16 yd, height = 2.5 mm **24.0 mm³**
- diameter = 100 ft, height = 35 ft **274,750 ft³**
- diameter = 5/8 in., height = 4 in. **1.2 in³**
- radius = 0.5 cm, height = 1.6 cm **1.3 cm³**
- radius = 5 1/2 in., height = 8 3/4 in. **330.6 in³**
- radius = 6 inches, height = 2 feet. **0.4 ft³ or 678.2 in³**
- How tall is a cylinder that has a volume of 2,123 cubic meters and a radius of 13 meters? Round to the nearest tenth. **4.0 m**
- A cylinder has a volume of 310.2 cubic yards and a radius of 2.9 yards. What is the height of the cylinder? Round to the nearest tenth. **11.7 yd**
- Find the height of a cylinder whose diameter is 25 centimeters and volume is 8,838 cubic centimeters. Round to the nearest tenth. **18.0 cm**

Lesson 12-1 16-30. See Student Handbook Answer Appendix.

Estimate each square root to the nearest whole number.

- $\sqrt{27}$ **5**
- $\sqrt{112}$ **11**
- $\sqrt{249}$ **16**
- $\sqrt{88}$ **9**
- $\sqrt{1,500}$ **39**
- $\sqrt{612}$ **25**
- $\sqrt{340}$ **18**
- $\sqrt{495}$ **22**
- $\sqrt{350}$ **19**
- $\sqrt{834}$ **29**
- $\sqrt{298}$ **17**
- $\sqrt{101}$ **10**
- $\sqrt{3,700}$ **61**
- $\sqrt{800}$ **28**

Graph each square root on a number line.

- $\sqrt{58}$
- $\sqrt{750}$
- $\sqrt{1,000}$
- $\sqrt{374}$
- $\sqrt{255}$
- $\sqrt{200}$
- $\sqrt{1,200}$
- $\sqrt{999}$
- $\sqrt{3,750}$
- $\sqrt{845}$
- $\sqrt{10,001}$

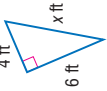
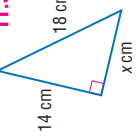
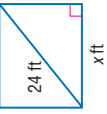
31. ALGEBRA Evaluate $\sqrt{a - b}$ to the nearest tenth if $a = 16$ and $b = 4$. **3.5**

32. ALGEBRA Estimate the value of $\sqrt{x + y}$ to the nearest whole number if $x = 64$ and $y = 25$. **9**

Lesson 12-2

Pages 638–643

Find the missing measure of each triangle. Round to the nearest tenth if necessary.

- 
- 
- 
- $a = 12$ cm, $b = 25$ cm
- $a = 5$ yd, $c = 10$ yd
- $b = 12$ mi, $c = 20$ mi
- $a = 15$ yd, $b = 24$ yd
- $a = 4$ m, $c = 12$ m
- $a = 8$ mm, $b = 11$ mm
- $a = 1$ mi, $c = 3$ mi
- $a = 5$ yd, $b = 8$ yd
- $b = 7$ in., $c = 19$ in.
- $a = 50$ km, $c = 75$ km
- $b = 82$ ft, $c = 100$ ft
- $a = 100$ m, $b = 200$ m

Lesson 12-3

Pages 644–645

Use the *make a model* strategy to solve each problem.

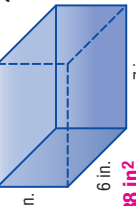
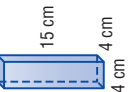
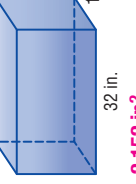
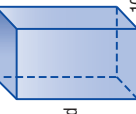
- ARCHITECTURE** An architect is designing a large skyscraper for a local firm. The skyscraper is to be 1,200 feet tall, 500 feet long, and 400 feet wide. If his model has a scale of 80 feet = 1 inch, find the volume of the model.
- STACKING BOXES** Box A has twice the volume of Box B. Box B has a height of 10 centimeters and a length of 5 centimeters. Box A has a width of 20 centimeters, a length of 10 centimeters, and a width of 5 centimeters. What is the width of Box B?
- TRAVEL** On Monday, Mara drove 400 miles as part of her journey to see her sister. She drove 60% of this distance on Tuesday. If the distance she drove on Tuesday represents one third of her total journey, how many more miles does she still need to drive?
- PIZZA** On Monday, there was a whole pizza in the refrigerator. On Tuesday, Enrico ate $\frac{1}{3}$ of the pizza. On Wednesday, he ate $\frac{1}{3}$ of what was left. On Thursday, he ate $\frac{1}{2}$ of what remained. What fractional part of the pizza is left?
- GARDENS** Mr. Blackwell has a circular garden in his backyard. He wants to build a curved brick pathway around the entire garden. The garden has a radius of 18 feet. The distance from the center of the garden to the outside edge of the brick pathway will be 21.5 feet. Find the area of the brick pathway. Round to the nearest tenth.

702 Extra Practice

Lesson 12-4

Pages 647–651

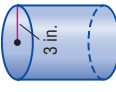
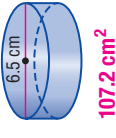
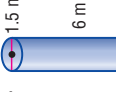
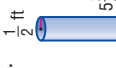
Find the surface area of each rectangular prism. Round to the nearest tenth if necessary.

- 
 - 
 - 
 - 
 - $\text{length} = 10$ m
 $\text{width} = 6$ m
 $\text{height} = 7$ m
 - $\text{length} = 20$ mm
 $\text{width} = 15$ mm
 $\text{height} = 25$ mm
 - $\text{length} = 16$ ft
 $\text{width} = 20$ ft
 $\text{height} = 12$ ft
 - $\text{length} = 52$ cm
 $\text{width} = 48$ cm
 $\text{height} = 45$ cm
 - $\text{length} = 8$ ft
 $\text{width} = 6.5$ ft
 $\text{height} = 7$ ft
 - $\text{length} = 9.4$ m
 $\text{width} = 2$ m
 $\text{height} = 5.2$ m
 - $\text{length} = 20.4$ cm
 $\text{width} = 15.5$ cm
 $\text{height} = 8.8$ cm
 - $\text{length} = 8.5$ mi
 $\text{width} = 3$ mi
 $\text{height} = 5.8$ mi
 - $\text{length} = 7\frac{1}{4}$ ft
 $\text{width} = 5$ ft
 $\text{height} = 6\frac{1}{2}$ ft
 - $\text{length} = 15\frac{2}{3}$ yd
 $\text{width} = 7\frac{1}{3}$ yd
 $\text{height} = 9$ yd
 - $\text{length} = 4\frac{1}{2}$ in.
 $\text{width} = 10$ in.
 $\text{height} = 8\frac{3}{4}$ in.
 - $\text{length} = 12.2$ mm
 $\text{width} = 7.4$ mm
 $\text{height} = 7.4$ mm
17. Find the surface area of an open-top box with a length of 18 yards, a width of 11 yards, and a height of 14 yards.
18. Find the surface area of a rectangular prism with a length of 1 yard, a width of 7 feet, and a height of 2 yards.

Lesson 12-5 9–12. See Student Handbook Answer Appendix.

Pages 654–657

Find the surface area of each cylinder. Round to the nearest tenth.

- 
- 
- 
- 
- $\text{height} = 6$ cm
 $\text{radius} = 3.5$ cm
- $\text{height} = 16.5$ mm
 $\text{diameter} = 18$ mm
- $\text{height} = 22$ yd
 $\text{radius} = 10.5$ yd
- $\text{height} = 6$ ft
 $\text{radius} = 18.5$ ft
- $\text{height} = 10.2$ mi
 $\text{diameter} = 4$ mi
- $\text{height} = 8.6$ cm
 $\text{diameter} = 8.2$ cm
- $\text{height} = 5.8$ km
 $\text{diameter} = 3.6$ km
- $\text{height} = 32.7$ m
 $\text{radius} = 21.5$ m
- $\text{height} = 2\frac{2}{3}$ yd
 $\text{diameter} = 6$ yd
- $\text{height} = 12\frac{3}{4}$ ft
 $\text{radius} = 7\frac{1}{4}$ ft
- $\text{height} = 5\frac{1}{5}$ mi
 $\text{radius} = 18\frac{1}{3}$ mi
- $\text{height} = 5\frac{1}{2}$ in.
 $\text{diameter} = 3$ in.

Extra Practice 703

Mixed Problem Solving

Chapter 1 Introduction to Algebra and Functions

Pages 22-77

1. **HISTORY** In 1932, Amelia Earhart flew 2,026 miles in 14 hours 56 minutes. To the nearest mile, what was her speed in miles per minute? (Lesson 1-1) **2 mi/min**

2. **LIGHT** The speed of light is about 67^3 kilometers per second. How many kilometers per second is this? (Lesson 1-2) **300,763 km/s**

3. **FARMING** Find the length of one side of a square field with an area of 180,625 square feet. (Lesson 1-3) **425 ft**

4. **SALES** A department store is having a back-to-school sale. The table shows the prices of three popular items.

Item	Price (\$)
Jeans	37.99
Sweatshirt	19.88
Polo Shirt	22.50

Latonia wants to buy 2 pairs of jeans, 3 sweatshirts, and 1 polo shirt. Write and evaluate a numerical expression that represents the total cost of all three items. (Lesson 1-4) **5. Sample answer: 7 quarters, 6 dimes, 3 nickels, 8 pennies**

5. **MONEY** Mateo has \$2.58 in coins. If he has quarters, dimes, nickels, and pennies, how many of each coin does he have? Use the *guess and check* strategy. (Lesson 1-5)

6. **FITNESS** You can estimate how fast you walk in miles per hour by evaluating the expression $\frac{n}{30}$, where n is the number of steps you take in one minute. Find your speed in miles per hour if you take 96 steps in one minute. (Lesson 1-6) **3.2 mi/h**

7. **BASEBALL** Last year, Scott attended 13 Minnesota Twins baseball games. This year, he attended 24. Solve $13 + n = 24$ to find how many more games he attended this year than last. (Lesson 1-7)

Chapter 2 Integers

1. **AIR CONDITIONING** Jacob turned on the air conditioning and the temperature in his apartment decreased 8 degrees. Write an integer to represent the change in temperature. (Lesson 2-1) **-8**

EARTH SCIENCE For Exercises 2 and 3, use the table below. It describes the deepest land depressions in the world in feet below sea level. **2, 3. See Student Handbook Answer Appendix.**

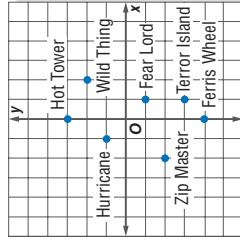
Depth (ft)			
220	436	511	282
383	505	235	230

Source: *The Top 10 Everything*

2. Write an integer to represent each depth. (Lesson 2-1)

3. Order the integers from greatest depth to least depth. (Lesson 2-2)

ENTERTAINMENT For Exercises 4-8, use the diagram below. It shows the locations of several rides at the Outlook Amusement Park. (Lesson 2-3)



4. Which ride(s) is located in quadrant III? **Zip Master**

5. Which ride(s) is located on the y -axis? Name the coordinates. **See Student Handbook Answer Appendix.**

6. Which ride(s) has coordinates in which the x -coordinates and y -coordinates are equal? **Wild Thing, Zip Master**

7. In which quadrant is the Hurricane located? **Quadrant II**

8. A new ride is built with a location on the x -axis and 5 units left of the origin. Name the coordinates of this point. **(-5, 0)**

Mixed Problem Solving

Pages 78-125

9. **CAVERNS** Adriana is 52 feet underground touring the Lewis and Clark Caverns. She climbs a ladder up 15 feet. What is her new location? (Lesson 2-4) **37 ft underground or -37 ft**

10. **RECORDS** The lowest temperature recorded in Verkhoyansk, Russia, was about -90°F . The highest temperature was about 99°F . What is the difference between these temperatures? (Lesson 2-5) **189°F**

11. **EARTH SCIENCE** The highest and lowest points in California are shown in the table. What is the difference in elevations? (Lesson 2-5) **14,776 ft**

Location	Elevation
Mount Whitney	14,494 ft above sea level
Death Valley	282 ft below sea level

Source: *The World Almanac of the U.S.A.*

12. **RIDES** A glider ride over the Crazy Mountains has a maximum altitude of 12,000 feet. It is descending at a rate of about 300 feet per minute. At what altitude will the glider be 20 minutes later? (Lesson 2-6) **6,000 ft**

13. **SPORTS** Every 12 times at bat, Simon hits the ball 3 times. About how many times will he hit the ball after 20 times at bat? 40? 84? Use the *look for a pattern* strategy. (Lesson 2-7)

Times at Bat	Number of Hits
12	3
20	5
40	10
84	21

14. **TEMPERATURE** A temperature of -89°C was recorded in Antarctica. Use the expression $\frac{9C}{5} + 32$, where C is the temperature in degrees Celsius, to find the temperature in degrees Fahrenheit. (Lesson 2-8) **about -128.2°F**

Mixed Problem Solving

Pages 22-77

8. **HOT AIR BALLOONS** Miyoki paid \$140 for a four-hour hot air balloon ride over the Bridger Mountains. Solve $4h = 140$ to find the cost per hour of the ride. (Lesson 1-7) **\$35**

ENTERTAINMENT For Exercises 9 and 10, use the following information. The five members of the Wolff family went to an amusement park. They each purchased an all-day ride pass and a water park pass, as shown below. (Lesson 1-8)

Item	Price (\$)
All-Day Ride Pass	14.95
Water Park Pass	6.50

5 (14.95 + 6.50); 5 (14.95) + 5 (6.50)

9. Use the Distributive Property to write two different expressions that represent the total cost for the family.

10. Find the total cost of the passes. **\$107.25**

11. **NUMBER THEORY** Numbers that can be represented by a square arrangement of dots are called *square numbers*. The first four square numbers are shown below. (Lesson 1-9)



Write a sequence formed by the area of the first eight square numbers.

1, 4, 9, 16, 25, 36, 49, 64

12. **TIME** Copy and complete the function table showing how many days y there are in various number of weeks x . Then identify the domain and range. (Lesson 1-10)

x	$7x$	y
1	7(1)	7
2	7(2)	14
3	7(3)	21
4	7(4)	28

Domain:

(1, 2, 3, 4)

Range:

(7, 14, 21, 28)

Chapter 3 Algebra: Linear Equations and Functions

Pages 126–175

1. **TOURISM** The Statue of Liberty in New York, New York, and the Eiffel Tower in Paris, France, were designed by the same person. The Statue of Liberty is 152 feet tall. It is 732 feet shorter than the Eiffel Tower, x . Write an equation that models this situation. (Lesson 3-1) **$152 = x - 732$**

ELECTIONS For Exercises 2 and 3, use the table below and the following information.

New York has one more electoral vote than Texas. Pennsylvania has 9 fewer electoral votes than Texas. (Lesson 3-2)

Number of Electoral Votes 2000	
California	54
New York	33
Texas	■
Florida	25
Pennsylvania	23

2. **$33 = n + 1$; $23 = n - 9$** Write two different equations to find the number of electoral votes in Texas, n .

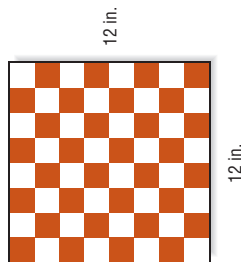
3. Find the number of electoral votes **32 votes**

4. **ROLLER COASTERS** The track length of a popular roller coaster is 5,106 feet. The roller coaster has an average speed of about 2,000 feet per minute. At that speed, how long will it take to travel its length of 5,106 feet? Use the formula $d = rt$. (Lesson 3-3) **about 2.553 min**

5. **NUMBERS** A number is halved. Then three is subtracted from the quotient, and 5 is multiplied by the difference. Finally, 1 is added to the product. If the ending number is 26, what was the beginning number? Use the *work backward* strategy. (Lesson 3-4) **16**

6. **BUSINESS** Carla's Catering charges a \$25 fee to serve 15 or fewer people. In addition to that fee, they charge \$10 per appetizer. You are having a party for 12 people and can spend a total of \$85. How many appetizers can you order from Carla's Catering? (Lesson 3-5) **6 appetizers**

CHES For Exercises 7–10, use the chess board below. (Lesson 3-6)



7. What is the perimeter of the chess board? **48 in.**
8. What is the area of the chess board? **144 in^2**
9. What is the area of each small square? **2.25 in^2**
10. A travel chess board has half the length and width of the board shown. What is the perimeter and area? **24 in.; 36 in^2**

11. **FENCING** Mr. Hernandez will build a fence to enclose a rectangular yard for his horse. If the area of the yard to be enclosed is 1,944 square feet, and the length of the yard is 54 feet, how much fencing is needed? (Lesson 3-6) **180 ft**

12. **GEOMETRY** The formula for the perimeter of a square is $P = 4s$, where P is the perimeter and s is the length of a side. Graph the equation. (Lesson 3-7)
See Student Handbook Answer Appendix.

AGES For Exercises 13–16, use the table below. It shows how Jared's age and his sister Emily's age are related. (Lesson 3-7)

Jared's age (yr)	1	2	3	4	5
Emily's age (yr)	7	8	9	10	11

13. Write a verbal expression to describe how the ages are related.
Emily is 6 years older than Jared.
14. Write an equation for the verbal expression. Let x represent Jared's age and y represent Emily's age. **$y = x + 6$**
15. Predict how old Emily will be when Jared is 10 years old. **16 years**
16. **See Student Handbook Answer Appendix.**
16. Graph the equation.

Chapter 4 Fractions, Decimals, and Percents

LAND For Exercises 1–3, use the information below.

- A section of land is one mile long and one mile wide. (Lesson 4-1) **$1.25 \times 3 \times 5 \times 11$**
 $2.27878, 400 \text{ ft}^2$
1. Write the prime factorization of 5,280.
2. Find the area of the section of land in square feet. (Hint: 1 mile = 5,280 feet)
3. Write the prime factorization of the area that you found in Exercise 2.
 $2^{10} \times 3^2 \times 5^2 \times 11^2$

DECORATIONS For Exercises 4 and 5, use the information below.

Benito is cutting streamers from crepe paper for a party. He has a red roll of crepe paper 144 inches long, a white roll 192 inches long, and a blue roll 360 inches long. (Lesson 4-2)

4. If he wants to have all colors of streamers the same length, what is the longest length that he can cut? **24 in.**
5. If he cuts the longest possible length, how many streamers can he cut?
6. **PRIZES** By reaching into a bag that has the letters A, B, and C, George will select three winners in order. How many possible combinations are there of the people who could win? Use the *make an organized list* strategy. (Lesson 4-3)
6 combinations; ABC; ACB; BAC; BCA; CAB; CBA
- OLYMPICS** For Exercises 7 and 8, refer to the table below. It shows the medals won by the top three countries in the 2000 Summer Olympics.

Country	Medals		
	Gold	Silver	Bronze
United States	40	24	33
Russia	32	28	28
China	28	16	15

Source: The World Almanac

7. Write the number of gold medals that Russia won as a fraction of the total number that Russia won in simplest form. (Lesson 4-4) **$\frac{4}{11}$**
8. Write the fraction that you wrote in Exercise 7 as a decimal. (Lesson 4-5) **0.36**

Mixed Problem Solving

Pages 178–227

9. **SPORTS** At Belgrade Intermediate School, 75 out of every 100 students participate in sports. What percent of students do *not* participate in sports? (Lesson 4-6) **25%**

ADVERTISING For Exercises 10–13, use the table below. It shows the results of a survey in which teens were asked which types of advertising they pay attention to.

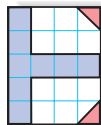
Type of Advertising	Percent of Teens
Television	80%
Magazine	62%
Product in a Movie	48%
Ad in an E-Mail	24%

Source: E-Poll

Write each percent as a fraction in simplest form. (Lesson 4-6) **13. $\frac{6}{25}$**

10. television **$\frac{4}{5}$** 11. magazine **$\frac{31}{50}$**
12. product in a movie **$\frac{12}{25}$** 13. ad in an e-mail

GEOMETRY For Exercises 14–16, refer to the grid at the right. (Lesson 4-7)



14. Write a decimal and a percent to represent the "T" shaded area. **0.4; 40%**
15. Write a decimal and a percent to represent the area shaded pink. **0.05; 5%**
16. What percent of the grid is *not* shaded? **55%**

17. **FLOWERS** Roses can be ordered in bunches of 6 and carnations in bunches of 15. If Ingrid wants to have the same number of roses as carnations for parent night, what is the least number of each flower that she must order? (Lesson 4-8) **30**

18. Alaska, Wisconsin, Michigan

18. **WATER** The table at the right shows the fraction of each state that is water. Order the states from least to greatest fraction of water. (Lesson 4-9)
- | State | Fraction |
|-----------|-----------------|
| Alaska | $\frac{3}{41}$ |
| Michigan | $\frac{40}{97}$ |
| Wisconsin | $\frac{1}{6}$ |
- Source: The World Almanac of the U.S.A.

Chapter 5 Applying Fractions

Pages 228–277

1. **MEALS** A box of instant potatoes contains 20 cups of flakes. A family-sized bowl of potatoes uses $3\frac{2}{3}$ cups of the flakes. Estimate how many family-sized bowls can be made from one box. (Lesson 5-1)
Sample answer: $20 \div 4$ or **5 bowls**

2. **BAKING** A recipe calls for $2\frac{1}{3}$ cups of flour. Theo wants to make six batches of this recipe. About how much flour should he have available to use? (Lesson 5-1)
about $2 \times 6 + 3$ or $12 + 2$ or **14 c**

3. **CRAFTS** Kyle bought $\frac{5}{6}$ yard of fabric to make a craft item. He used $\frac{3}{4}$ yard in making the item. How much fabric was left over? (Lesson 5-2) $\frac{1}{12}$ yd
12

RAINFALL For Exercises 4 and 5, use the table. It shows the average annual precipitation for three of the driest locations on Earth. (Lesson 5-2)

Location	Precipitation (in.)
Arica, Chile	$\frac{3}{100}$
Iquique, Chile	$\frac{1}{5}$
Callao, Peru	$\frac{12}{25}$

Source: The Top 10 Everything

4. How much more rain does Iquique get per year than Arica? $\frac{17}{100}$ in.

5. How much more annual rain does Callao get than Iquique? $\frac{7}{25}$ in.

6. **INTERIOR DESIGN** A living room wall is $16\frac{1}{4}$ feet long. A window runs from the floor to the ceiling and has a length along the floor of $6\frac{3}{8}$ feet. How long is the wall without the window? (Lesson 5-3) $9\frac{7}{8}$ ft

7. **HEALTH** The human body is about $\frac{7}{10}$ water. About how much would a person weigh if they had 70 pounds of water weight? Use the *eliminate possibilities* strategy. (Lesson 5-4) **B**

- A 200 pounds
- C 150 pounds
- B 100 pounds
- D 70 pounds

8. **FOOD** The table below shows the carry-out menu for a Benito's Restaurant.

Take-out	Price (\$)
Main Dish	5.00
Side Dishes	1.00
Dessert	2.00

A family of four spent \$24.00 dollars for a take-home meal. What combination is possible for their meal? Use the *eliminate possibilities* strategy. (Lesson 5-4) **H**

F 3 main dishes and 2 side dishes

G 4 main dishes and 3 side dishes

H 3 main dishes, 3 side dishes, and 3 desserts

J 4 main dishes and 4 desserts

9. **STARS** The star Sirius is about $8\frac{7}{10}$ light years from Earth. Alpha Centauri is half this distance from Earth. How far is Alpha Centauri from Earth? (Lesson 5-5)
 $4\frac{7}{20}$ light years

10. **LIFE SCIENCE** Use the table below. It shows the average growth per month of hair and fingernails. Solve $3 = \frac{1}{2}t$ to find how long it takes hair to grow 3 inches. (Lesson 5-6) **6 mo**

Average Monthly Growth	
Hair	$\frac{1}{2}$ in.
Fingernails	$\frac{2}{25}$ in.

11. **SEWING** Jocelyn has nine yards of fabric to make table napkins for a senior citizens' center. She needs $\frac{3}{8}$ yard for each napkin. Use $\frac{3}{8}c = 9$ to find the number of napkins that she can make with this amount of fabric. (Lesson 5-6) **24 napkins**
 $12. 2\frac{3}{10}$ T/mc

12. **WHALES** During the first year, a baby whale gains about $27\frac{3}{5}$ tons. What is the average weight gain per month? (Lesson 5-7)

Chapter 6 Ratios and Proportions

Pages 280–339

1. **SCHOOLS** In a recent year, Oregon had 924 public elementary schools and 264 public high schools. Write a ratio in simplest form comparing the number of public high schools to elementary schools. (Lesson 6-1) $\frac{2}{7}$

2. **MONTHS** Write a ratio in simplest form comparing the number of months that begin with the letter J to the total number of months in a year. (Lesson 6-1) $\frac{1}{4}$

3. **EXERCISE** A person jumps rope 14 times in 10 seconds. What is the unit rate in jumps per second? (Lesson 6-2) **1.4 jumps per s**

4. **FOOD** A 16-ounce box of cereal costs \$3.95. Find the unit price to the nearest cent. (Lesson 6-2) **\$0.25 per oz**

5. **MARKERS** The table below shows the number of markers per box. Graph the data. Then find the slope of the line. Explain what the slope represents. (Lesson 6-3)
See Student Handbook Answer Appendix.

Markers	8	16	24	32
Boxes	1	2	3	4

6. **TEMPERATURE** At 2:00, the temperature is 78°F. At 3:00, the temperature is 81°F. What is the rate of change? (Lesson 6-3)

7. **LIFE SCIENCE** An adult has about $3\frac{1}{2}$ quarts of blood. If a person donates 1 pint of blood, how many pints are left? (Lesson 6-4)

8. **COFFEE** In Switzerland, the average amount of coffee consumed per year is 1,089 cups per person. How many pints is this? (Lesson 6-4) **544.5 pt**

9. **BUILDINGS** A skyscraper is 0.484 kilometers tall. What is the height of the skyscraper in meters? (Lesson 6-5) **484 m**

10. **WATER** A bottle contains 1,065 milliliters of water. About how many cups of water does the bottle hold? (Lesson 6-5) **about 4.5 c**

11. **PHOTOGRAPHS** Mandy is enlarging a photograph that is 3 inches wide and 4.5 inches long. If she wants the width of the enlargement to be 10 inches, what will be the length? (Lesson 6-6) **15 in.**

12. **TILES** A kitchen is 10 feet long and 8 feet wide. If kitchen floor tiles are $2\frac{1}{2}$ inches by 3 inches, how many tiles are needed for the kitchen? Use the *draw a diagram* strategy. (Lesson 6-7) **1,536**

13. **MAPS** Washington, D.C., and Baltimore, Maryland, are $2\frac{7}{8}$ inches apart on a map. If the scale is $\frac{1}{2}$ inch: 6 miles, what is the actual distance between the cities? (Lesson 6-8) **$34\frac{1}{2}$ mi**

14. **MODELS** Ian is making a miniature bed for his daughter's doll house. The actual bed is $6\frac{3}{4}$ feet long. If he uses the scale $\frac{1}{2}$ inch = $1\frac{1}{2}$ feet, what will be the length of the miniature bed? (Lesson 6-8) **$2\frac{1}{4}$ in.**

15. **POPULATION** According to the U.S. Census Bureau, 6.6% of all people living in Florida are 10–14 years old. What fraction is this? Write in simplest form. (Lesson 6-9) $\frac{33}{500}$

COINS For Exercises 16 and 17, use the table below. It shows the fraction of a quarter that is made up of the metals nickel and copper. Write each fraction as a percent. Round to the nearest hundredth if necessary. (Lesson 6-9)

Metal	Fraction of Quarter
Nickel	$\frac{1}{12}$
Copper	$\frac{11}{12}$

16. nickel **8.33%** 17. copper **91.67%**

Mixed Problem Solving

Mixed Problem Solving

Chapter 7 Applying Percents

Pages 340–391

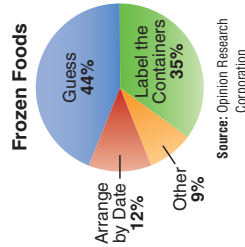
1. **SEEDS** A packet of beans guarantees that 95% of its 200 seeds will germinate. How many seeds are expected to germinate? (Lesson 7-1) **190 seeds**

2. **SKIS** Toshiro spent \$520 on new twin-tip skis. This was 40% of the money he earned at his summer job. How much did he earn at his summer job? (Lesson 7-2) **\$1,300**

3. **GEOGRAPHY** In Washington, about 5.7% of the total area is water. If the total area of Washington is 70,637 square miles, estimate the number of square miles of water by using 10%. (Lesson 7-3) **See Student Handbook Answer Appendix.**

4. **GOVERNMENT** Of the 435 members in the U.S. House of Representatives, 53 are from California and 13 are from North Carolina. To the nearest whole percent, what percent of the representatives are from California? from North Carolina? (Lesson 7-4) **12%; 3%**

FOOD For Exercises 5 and 6, use the graph below. It shows the results of a survey in which 1,200 people were asked how they determine how long food has been in their freezer. (Lesson 7-4)



5. How many of the 1,200 surveyed guess to determine how long food has been in their freezer? **528 people**

6. How many of the 1,200 surveyed label their freezer containers? **420 people**

Chapter 8 Statistics: Analyzing Data

NUTRITION For Exercises 1–3, use the data below, that gives the grams of carbohydrates in fifteen different energy bars.

24. 16, 16, 2, 20, 26, 14, 20, 20, 16, 16, 15, 20

1. Make a line plot of the data. (Lesson 8-1)
2. What is the range of the data? (Lesson 8-1) **24**
3. Identify any clusters, gaps, or outliers and explain what they represent. (Lesson 8-1)

1, 3. See Student Handbook Answer Appendix.

BASKETBALL For Exercises 4–5, refer to the table below. It shows the number of games played by Michael Jordan each year from 1986–1987 to 2001–2002.

Year	Number of Games Played
1986–1987	82
1987–1988	81
1988–1989	82
1989–1990	82
1990–1991	82
1991–1992	82
1992–1993	82
1993–1994	82
1994–1995	82
1995–1996	82
1996–1997	82
1997–1998	82
1998–1999	82
1999–2000	82
2000–2001	82
2001–2002	82

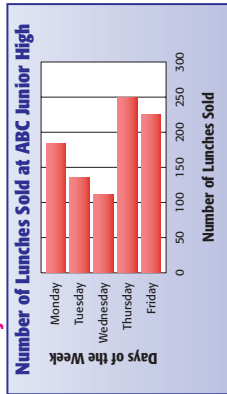
4. Find the mean, median, and mode of the data. (Lesson 8-2) **55.625; 80.5; 82**
5. Make a stem-and-leaf plot of the data. (Lesson 8-3)

5–6. See Student Handbook Answer Appendix.

6. TOURISTS The table shows the countries from which the most tourists in the United States came. Make a bar graph of the data. (Lesson 8-4)

Country	Visitors (millions)
Canada	14.6
Mexico	10.3
Japan	5.0
United Kingdom	4.7

7. **LUNCHES** Use the bar graph to determine on what day about twice as many lunches were sold as on Wednesday. (Lesson 8-5) **Friday**



Pages 394–457

SWIMMING For Exercises 8 and 9, refer to the table. It shows the winning Olympic times for the Women's 4 × 100-meter Freestyle Relay in swimming. (Lesson 8-6)

Year	Time (s)
1976	225
1980	223
1984	224
1988	221
1992	220
1996	219
2000	217

Source: ESPN Sports Almanac

See Student Handbook Answer Appendix.

8. Make a line graph of the data.
9. Predict the winning time in 2008. **Sample answer: 215 s**
10. **SURVEYS** A survey of randomly selected teens revealed that 68% have a personal cell phone. If there are 1,200 teens at Harrisburg Middle School, about how many have a personal cell phone? (Lesson 8-7) **about 816 teens**

11, 12. See Student Handbook Answer Appendix.

11. **CATS** To determine what type of cat most customers prefer, the president of a cat food company mailed 250 surveys to cat owners. Of the 185 surveys that were returned, 52% preferred calico cats. The president concluded that about half of cat owners prefer calico cats. Determine whether this conclusion is valid. Justify your answers. (Lesson 8-8)

12. **CELL PHONES** The table shows the number of monthly minutes Mallory used on her cell phone during the past year. She claims that the average number of minutes used is about 324. Explain how this is misleading. (Lesson 8-9)

284	322	286	359	318	294
602	278	292	267	299	285

Chapter 9 Probability

Pages 458-505

1. DENTISTS A dental hygienist randomly chooses a toothbrush in a drawer containing 17 white, 12 green, and 5 blue toothbrushes. What is the probability that she chooses a green toothbrush? Write as a fraction in simplest form. (Lesson 9-1) $\frac{6}{17}$

SURVEYS For Exercises 2 and 3, use the table below. It shows the results of a survey in which adults were asked how proud they were to be an American. (Lesson 9-1)

Response	Number
Extremely	650
Very	250
Moderately	60
Little/Not at All	30
No Opinion	10

Source: Gallup Poll

2. If one person participating in the survey is chosen at random, what is the probability that the person is extremely patriotic? Write as a fraction in simplest form. $\frac{13}{20}$
3. If one person participating in the survey is chosen at random, what is the probability that he is *not* moderately patriotic? Write as a fraction in simplest form. $\frac{47}{50}$

RANCHING For Exercises 4 and 5, use the following information.

For Roger to reach his cattle pasture, he must pass through three consecutive gates. Any of the three gates can be either *open* or *closed*. (Lesson 9-2)

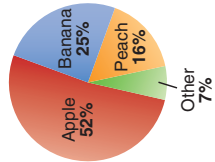
4. Make a tree diagram to show all of the possible positions of the gates.
5. What is the probability that all three gates will be closed when Roger visits this pasture? Write as a fraction. $\frac{1}{8}$
- 6. 5 PATTERNS** World Sports makes skateboards with different deck patterns. You can choose one of four deck lengths and one of six types of wheels. If they have 120 different skateboards, how many deck patterns are there? (Lesson 9-3)

7. **READING** Mr. Steadman plans to read eight children's novels to his second graders during the school year. In how many ways can he arrange the books to be read? (Lesson 9-4) **40,320 ways**

8. **CRAFTS** Marina has print fabric in pink, blue, magenta, green, yellow, and tan. How many different stuffed bears can she make if each bear has only four different fabrics, and the order of the fabrics is not important? (Lesson 9-5) **15 bears**

9. **TRAVEL** There are four seats in Pedro's car: two in the front and two in the back. If Benny, Carlita, and Juanita are all in the car with Pedro, how many ways can they be seated in the car if Pedro is driving? Use the *act it out* strategy. (Lesson 9-6) **6 ways**

10. FOOD The graph shows the results of a survey in which 7th graders at Plentywood Middle School were asked to name their favorite fruit. If a 7th grader at the school is randomly selected, what is the probability that they chose bananas as their favorite? Write as a fraction in simplest form. (Lesson 9-7) $\frac{1}{4}$



MARBLES For Exercises 11 and 12, refer to the table. (Lesson 9-8)

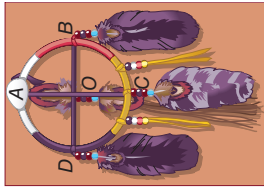
Color	Number
Red	10
Blue	6
Purple	10
Yellow	4
Green	2

11. What is the probability of randomly selecting one yellow marble and then one purple marble? Assume that the first marble is not replaced. $\frac{5}{124}$
12. What is the probability of randomly selecting two red marbles? Assume that the first marble is replaced. **256**

Chapter 10 Geometry: Polygons

Pages 508-569

For Exercises 8 and 9, use the figure below.



ART For Exercises 1 and 2, use the diagram and the Native American artifact.

1. Name a right angle and a straight angle. (Lesson 10-1)
2. If $m\angle AOB = 90^\circ$, what is $m\angle DOC$? (Lesson 10-2) **90°**

1. Sample answer: $\angle AOB$; $\angle AOC$

TELEVISION For Exercises 3 and 4, use the survey results shown in the table below. (Lesson 10-3)

Number	Percent
5 or fewer	30%
6-12	33%
13-25	19%
26 or more	14%

3. The fifth category in the survey is *no TV or no opinion*. What percent of the people surveyed were in this category? **4%**
4. Make a circle graph of the data.
- 4, 5. See Student Handbook Answer Appendix.**
5. **ART** Victor drew a right triangle so that one of the acute angles measures 55° . Without measuring, describe how Victor can determine the measure of the other acute angle in the triangle. Then find the angle measure. (Lesson 10-4)

6. Mr. Sanchez can increase the width to 11 m.

GARDENING Mr. Sanchez has a flower bed with a length of 10 meters and a width of 5 meters. If he can only change the width of the flower bed, describe what he can do to increase the perimeter by 12 meters. Use the *logical reasoning* strategy. (Lesson 10-5)

- 7. Mitchell, Deidre, Carlos, Traminee** Four friends are entered in a race. Deidre finishes directly ahead of Carlos. Mitchell finishes three places ahead of Traminee and directly ahead of Deidre. If Traminee finishes fourth, place the runners in order from first to last. Use logical reasoning. (Lesson 10-5)

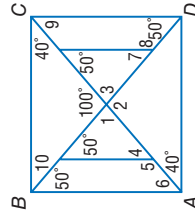
Mixed Problem Solving

Mixed Problem Solving

8, 9. See Student Handbook Answer Appendix.

8. Find the measure of each angle numbered from 1-10. (Lesson 10-4)

9. Find the *best* name to classify quadrilateral $ABCD$. Explain your reasoning. (Lesson 10-6)

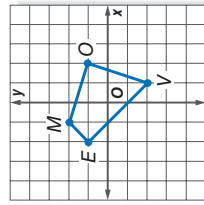


10. CRAFTS Priscilla makes porcelain dolls that are proportional to a real child. If Jody is $4\frac{2}{3}$ feet tall with a 23-inch waist, what should be the waist measure of a doll that is 13 inches tall? Round to the nearest inch. (Lesson 10-7) **5 in.**

11. ART Draw a tessellation using two of the polygons listed at the right. Identify the polygons and explain why the tessellation works. (Lesson 10-8)

- regular triangles
- quadrilaterals
- pentagons
- hexagons
- octagons

11-13. See Student Handbook Answer Appendix. For Exercises 12 and 13, use the quadrilateral $MOVE$ shown below.

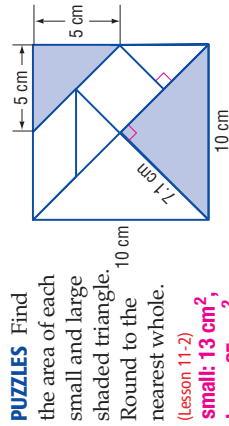


12. Describe the translation that will move M to the point at $(2, -2)$. Then graph quadrilateral $MOVE'$ using this translation. (Lesson 10-9)
13. Find the coordinates of the vertices of quadrilateral $MOVE$ after a reflection over the y -axis. Then graph the reflection. (Lesson 10-10)

Chapter 11 Measurement: Two- and Three-Dimensional Figures

Pages 568–631

- CRAFTS** A quilt pattern uses 25 parallelogram-shaped pieces of fabric, each with a base of 4 inches and a height of $2\frac{1}{2}$ inches. How much fabric is used to make the 25 pieces? (Lesson 11-1) **250 in²**
- FURNITURE** A corner table is in the shape of a right triangle. If the side lengths of the tabletop are 3.5 feet, 3.5 feet, and 4.9 feet, what is the area? Round to the nearest tenth if necessary. (Lesson 11-2) **6.1 ft²**



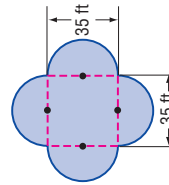
- PUZZLES** Find the area of each small and large shaded triangle. Round to the nearest whole. (Lesson 11-2)
small: 13 cm²
large: 25 cm²

- EARTH SCIENCE** Earth has a diameter of 7,926 miles. Use the formula for the circumference of a circle to estimate the circumference of Earth at its equator. (Lesson 11-3) **about 24,000 mi**

- COOKIES** In New Zealand, a giant circular chocolate chip cookie was baked with a diameter of 81 feet 8 inches. To the nearest square foot, what was the area of the cookie? (Lesson 11-4) **5,236 ft²**

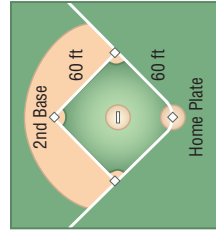
- SPORTS PROFIT** A stadium seats 1,001,800 people. 22% of the tickets cost \$134.87 each. 45% of the tickets cost \$67.99 each. The remaining 33% cost only \$35.87 each. About how much revenue is made from one game when each seat is sold out? Use the *solve a simpler problem* strategy. (Lesson 11-5) **about \$72,000,000**

- LANDSCAPING** Find the area of the flower garden shown in the diagram at the right. Round to the nearest square foot. (Lesson 11-6)



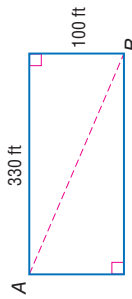
- OMELETS** In Japan, a gigantic omelet was made with an area of 1,383 square feet. If the omelet was a square, what would be its side lengths? Round to the nearest tenth. (Lesson 12-1) **37.2 ft**

- SOFTBALL** A softball diamond is a square measuring 60 feet on each side.



How far does a player on second base throw when she throws from second base to home? Round to the nearest tenth. (Lesson 12-2) **84.9 ft**

- BANDS** Mr. Garcia is planning a band formation at a football game. The diagram shows the dimensions of the field.



To the nearest foot, what is the distance from A to B? (Lesson 12-2) **345 ft**

- GEOMETRY** Two right triangles are side by side such that they form a larger isosceles triangle. If the two right triangles are congruent and each have angle measures of 90° , 45° , and 45° , what type of triangle will the new isosceles triangle be? Use the *make a model* strategy. (Lesson 12-3) **right triangle**

- CUBES** A rectangular prism is formed from 48 centimeter cubes such that the height of the prism is one half of the width and one third of the length of the prism. Find the dimensions of the rectangular prism. Use the *make a model* strategy. (Lesson 12-3) **6 cm by 4 cm by 2 cm**

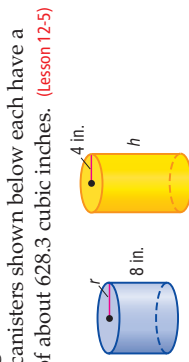
Chapter 12 Extending Geometry and Measurement

Pages 634–663

For Exercises 6 and 7, use the following information.
Liz is designing some gift boxes. The small box is 6 inches long, 4 inches wide, and 2.5 inches high. The medium box has dimensions that are each 3 times the dimensions of the small box. (Lesson 12-4)

- Find the surface area of the small box. **6.98 in²**
- What are the dimensions of the medium box? Then find the surface area of the medium box. **18 in. by 12 in. by 7.5 in.; 882 in²**

STORAGE For Exercises 8–10, use the following information.
The two canisters shown below each have a volume of about 628.3 cubic inches. (Lesson 12-5)



- What is the radius of the blue canister? Round to the nearest tenth. **5.0 in.**
- What is the height of the yellow canister? Round to the nearest tenth. **12.5 in.**
- What is the difference between the surface areas of the two canisters? **6.3 in²**

HATS For Exercises 11–13, use the following information. (Lesson 12-5)

A certain cylinder-shaped hat box has a height of 9 inches and a radius of 5.5 inches. Its lid is also shaped as a cylinder, with a slightly larger diameter so that the lid fits over the box.

- How many square inches of material are needed to make the hat box, not including the lid? Round to the nearest tenth. **405.8 in²**
- If the lid has a height of 3.5 inches and a diameter of 11.8 inches, how many square inches of material are needed to make the lid? Round to the nearest tenth. **239.0 in²**
- How many times more material is needed to make the hat box than the lid? Round to the nearest tenth. **1.7**

- GEOMETRY** A certain three-dimensional figure has four triangular faces and one square face. Classify this figure. (Lesson 11-7) **square pyramid**

- RECORDS** According to the *Guinness Book of World Records*, the tallest hotel in the world is the 1,053-foot sail-shaped Burj Al Arab in Dubai, United Arab Emirates.

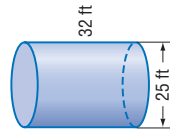


Draw possible sketches of the top, side, and front views of the hotel. (Lesson 11-8)
See Student Handbook Answer Appendix.

OCEANS For Exercises 10 and 11, use the following information.

- The Atlantic Ocean has an area of about 33,420,000 square miles. Its average depth is 11,730 feet. (Lesson 11-9)
- To the nearest hundredth, what is the average depth of the Atlantic Ocean in miles? (Hint: 1 mi = 5,280 ft) **2.22 mi**
 - What is the approximate volume of the Atlantic Ocean in cubic miles? **74,192,400 mi³**

WATER For Exercises 12–13, use the cylinder-shaped water tank. (Lesson 11-10)



- Find the volume of the tank. Round to the nearest cubic foot. **15,700 ft³**
- One cubic foot is approximately 7.48 gallons. Find the approximate volume of the water tank to the nearest gallon.

Preparing for Standardized Tests

Throughout the school year, you may be required to take several standardized tests, and you may have many questions about them. Here are some answers to help you get ready.

How Should I Study?

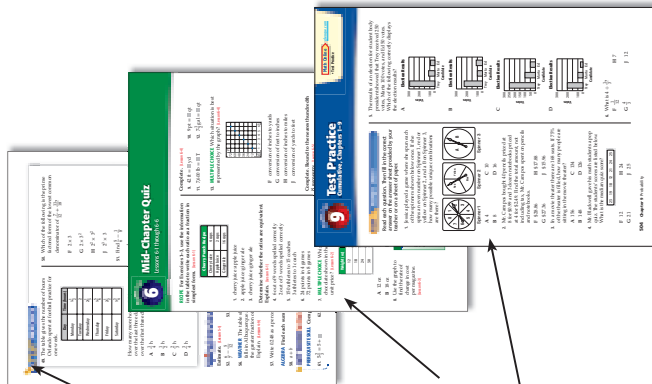
The good news is that you've been studying all along—a little bit every day. Here are some of the ways your textbook has been preparing you.

- **Every Day** Each lesson had multiple-choice practice questions.
- **Every Week** The Mid-Chapter Quiz and Practice Test also had several practice questions.
- **Every Month** The Test Practice pages at the end of each chapter had even more questions, including short-response/grid-in and extended-response questions.

Are There Other Ways to Review?

Absolutely! The following pages contain even more practice for standardized tests.

Tips for Success	717
Multiple-Choice Questions	718
Gridded-Response Questions	722
Short-Response Questions	726
Extended-Response Questions	730



Tips for SUCCESS

Prepare

- Go to bed early the night before the test. You will think more clearly after a good night's rest.
- Become familiar with common formulas and when they should be used.
- Think positively.

During the Test

- Read each problem carefully. Underline key words and think about different ways to solve the problem.
- Watch for key words like *not*. Also look for order words like *least*, *greatest*, *first*, and *last*.
- Answer questions you are sure about first. If you do not know the answer to a question, skip it and go back to that question later.
- Check your answer to make sure it is reasonable.
- Make sure that the number of the question on the answer sheet matches the number of the question on which you are working in your test booklet.

Whatever you do...

- Don't try to do it all in your head. If no figure is provided, draw one.
- Don't rush. Try to work at a steady pace.
- Don't give up. Some problems may seem hard to you, but you may be able to figure out what to do if you read each question carefully or try another strategy.



Multiple-Choice Questions

Multiple-choice questions are the most common type of question on standardized tests. These questions are sometimes called *selected-response questions*. You are asked to choose the best answer from four or five possible answers.

To record a multiple-choice answer, you may be asked to shade in a bubble that is a circle or an oval or just to write the letter of your choice. Always make sure that your shading is dark enough and completely covers the bubble.

The answer to a multiple-choice question may not stand out from the choices. However, you may be able to eliminate some of the choices. Another answer choice might be that the correct answer is not given.

Incomplete shading	(A) <input type="radio"/>	(B) <input type="radio"/>	(C) <input type="radio"/>	(D) <input type="radio"/>
Too light shading	(A) <input type="radio"/>	(B) <input type="radio"/>	(C) <input type="radio"/>	(D) <input type="radio"/>
Correct shading	(A) <input type="radio"/>	(B) <input type="radio"/>	(C) <input type="radio"/>	(D) <input type="radio"/>

TEST EXAMPLE

- 1 Mrs. Hon's seventh grade students are purchasing stuffed animals to donate to a charity. They bought 3 boxes containing eight animals each and 2 boxes containing twelve animals each. Which expression **cannot** be used to find the total number of animals they bought to give to the charity?

- A $8 + 8 + 8 + 12 + 12$ C $3(8) + 2(12)$
 B $3 \times 8 + 2 \times 12$ D $5 \times (8 + 12)$

Notice that the problem asks for the expression that **cannot** represent the situation.

Read the problem carefully and locate the important information. There are 3 boxes that have eight animals, so that is 3×8 , or 24 animals. There are 2 boxes of twelve animals, so that is 2×12 , or 24 animals. The total number of animals is $24 + 24$, or 48.

You know from reading the problem that you are looking for the expression that *does not* simplify to 48. Simplify each expression to find the answer.

$$\begin{aligned} \text{A } 8 + 8 + 8 + 12 + 12 &= (8 + 8 + 8) + (12 + 12) \\ &= 24 + 24 \\ &= 48 \\ \text{B } 3 \times 8 + 2 \times 12 &= 24 + 24 \\ &= 48 \\ \text{C } 3(8) + 2(12) &= 24 + 24 \\ &= 48 \\ \text{D } 5 \times (8 + 12) &= 5 \times 20 \\ &= 100 \end{aligned}$$

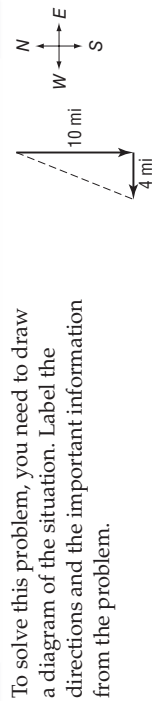
The only expression that *does not* simplify to 48 is D. The correct choice is D.

Some problems are easier to solve if you draw a diagram. If you cannot write in the test booklet, draw a diagram on scratch paper.

TEST EXAMPLE

- 2 On a hiking trip, Grace and Alicia traveled 10 miles south and 4 miles west. If they take the shortest return route, how far will the hike be back to their starting point? Round to the nearest tenth of a mile.

- A 6.0 mi B 9.2 mi C 10.8 mi D 14.0 mi



Use the Pythagorean Theorem to find the distance that they will hike back to their starting point.

$$\begin{aligned} c^2 &= a^2 + b^2 && \text{Pythagorean Theorem} \\ c^2 &= 4^2 + 10^2 && \text{Replace } a \text{ with 4 and } b \text{ with 10.} \\ c^2 &= 16 + 100 && \text{Simplify.} \\ c^2 &= 116 && \text{Add.} \\ \sqrt{c^2} &= \sqrt{116} && \text{Take the square root of each side.} \\ c &\approx 10.8 && \text{Use a calculator to simplify.} \end{aligned}$$

The hike back will be about 10.8 miles. The correct choice is C.

Some problems give you more information than you need to solve the problem. Read the question carefully to determine the information you need.

TEST EXAMPLE

- 3 One of the biggest pieces of cheese ever produced was made in 1866 in Ingersoll, Canada. It weighed 7,300 pounds. It was shaped as a cylinder with a diameter of 7 feet and a height of 3 feet. To the nearest cubic foot, what was the volume of the cheese? Use 3.14 for π .

- A 462 ft³ B 143 ft³ C 115 ft³ D 63 ft³

You need to use the formula for the volume of a cylinder. The diameter is 7 feet, so the radius is $\frac{7}{2}$ or 3.5 feet. The height is 3 feet.

$$\begin{aligned} V &= \pi r^2 h && \text{Volume of a cylinder} \\ V &\approx (3.14)(3.5)^2(3) && \text{Replace } \pi \text{ with 3.14, } r \text{ with 3.5, and } h \text{ with 3.} \\ V &\approx 115.395 && \text{Simplify.} \end{aligned}$$

The volume of the cheese is about 115 cubic feet. The correct choice is C.

STRATEGY

Diagrams
Draw a diagram for the situation.

Round the answer to the correct decimal place.

STRATEGY

Formulas
Use the reference sheet to find the correct formula.

Multiple-Choice Practice

Choose the best answer.

Number and Operations

- The world's smallest fruit is the fruit of a wolffia plant, which measures about 0.01 inch in length. Another small fruit is the eye of a sewing needle, with a length of 0.20 inch. How many times longer is the eye of a sewing needle fruit than a wolffia fruit? **D**
- The table shows what types of trash fill landfills in the United States. What fraction of the trash in landfills is plastic? **D**

Type of Trash	Percent in Landfills
metal	8%
plastic	24%
food, yard waste	11%
rubber, leather	6%
paper	21%
other trash	30%

Source: *The World Almanac for Kids*

- F** $\frac{1}{100}$ **H** $\frac{1}{6}$

G $\frac{1}{24}$ **J** $\frac{6}{25}$
- A recent movie earned 317 million dollars in ticket sales. What is this value in scientific notation? **C**
- A** 3.17

B 317×10^6

C 3.17×10^8

D 3.17×10^{11}
- Mercury orbits the sun at 29.75 miles per second. Earth orbits the sun at 18.51 miles per second. How many more miles does Mercury travel in one minute than Earth? **C**
- F** 11.24 mi **H** 674.4 mi

G 269.76 mi **J** 40,464 mi

Algebra

- The table shows the population growth of a certain bacteria. How many bacteria will there be after 5 hours? **C**
- Which function rule describes the relationship between distance from home y and hours traveled x ? **D**

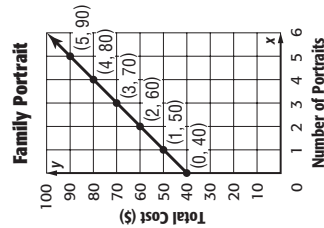
Hours	0	1	2	3	4	5
Number of Bacteria	32	48	72	104	144	?

- A** 243 **B** 200 **C** 192 **D** 178

Time (h)	Distance from Home (mi)
x	y
0	0
1	65
2	130
3	195

- F** $65y = x$ **H** $y = x + 65$
- G** $y = 65 \div x$ **J** $y = 65x$

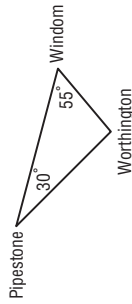
- For a family portrait, a photographer charges a sitting fee and an amount of money per portrait ordered. Which function rule describes the relationship between the total cost y and number of portraits x ? **C**



- A** $y = 10 + 40x$ **C** $y = 40 + 10x$
- B** $y = 40x + 10x$ **D** $y = 10x$

Geometry

- The three towns on the map form a triangle. Which term *best* describes the angle with vertex at Worthington? **A**

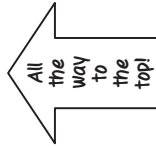


- F** obtuse **H** acute
- G** right **J** straight

- Pedro is using a triangle in a computer graphics design. On a coordinate plane, the vertices of the triangle are $A(-1, 1)$, $B(0, 2)$, and $C(5, -1)$. If Pedro translates the triangle 4 units left and 3 units down, what will be the coordinates of B ? **D**

- A** $(-1, -4)$ **C** $(4, 5)$
- B** $(4, -1)$ **D** $(-4, -1)$

- Jasmine is using this polygon on a poster she is making for the basketball team. Which term *best* describes the polygon? **D**



- F** quadrilateral **H** hexagon
- G** decagon **J** heptagon

Measurement

- Crispy Crackers are packaged in a box that measures 6 inches by 2.5 inches by 10 inches. Which dimensions are of a prism that has the same volume as the Crispy Crackers box? **B**

- A** 6.5 in. by 2 in. by 10 in.
- B** 6.25 in. by 3 in. by 8 in.
- C** 7.25 in. by 2 in. by 9.5 in.
- D** 4 in. by 7.5 in. by 6 in.

TEST-TAKING TIP

Question 11 Most standardized tests will include any commonly used formulas at the front of the test booklet. Quickly review the list before you begin so that you know what formulas are available.

- The Crab nebula is a cloud of gas and dust particles in space that is expanding at a rate of 930 miles per second. What is its rate of expansion in miles per hour? **D**
- F** 22,320 mph **H** 1,339,200 mph
- G** 55,800 mph **J** 3,348,000 mph

- Super Toys makes two sizes of building blocks shaped as cubes. The large block has side length four times the length of the small block. What is the ratio of the surface area of the small block to the surface area of the large block? **C**

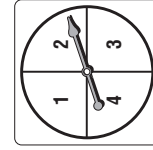
- A** 1 to 4 **C** 1 to 16
- B** 1 to 6 **D** 1 to 32

Data Analysis and Probability

- The table shows the number of students playing each sport at Wilson Junior High. Find the mean of the data. **C**

Sport	Number of Students
baseball/softball	49
basketball	74
soccer	82
swimming	21
track and field	115
volleyball	25

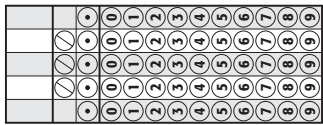
- F** 23 **G** 49 **H** 61 **J** 94



- The spinner is divided into four equal-sized sections. If you spin the spinner 62 times, which is the *best* estimate for the number of times you will land on 2? **A**

- A** 15 **B** 30 **C** 40 **D** 50

Gridded-Response Questions

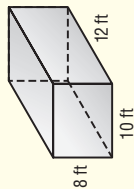


Gridded-response questions are another type of question on standardized tests. These questions are sometimes called *student-produced response* or *grid in*.

For gridded response, you must mark your answer on a grid printed on an answer sheet. The grid contains a row of four or five boxes at the top, two rows of ovals or circles with decimal and fraction symbols, and four or five columns of ovals, numbered 0–9. An example of a grid from an answer sheet is shown.

TEST EXAMPLE

- 1 Mr. Byrd builds and sells storage buildings. The dimensions of his most popular model are shown in the diagram. What is the volume of the building in cubic feet?



What do you need to find?

You need to find the volume of a rectangular prism. Use the formula and the dimensions given in the diagram.

$$V = \ell wh$$

$$V = 12 \cdot 10 \cdot 8$$

$$V = 960$$

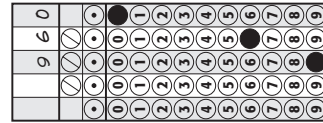
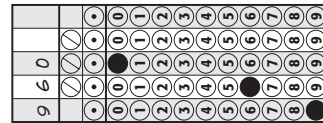
The volume is 960 cubic feet.

How do you fill in the grid for the answer?

- Write your answer in the answer boxes.
- Write only one digit or symbol in each answer box.
- Do not write any digits or symbols outside the answer boxes.
- You may write your answer with the first digit in the left answer box, or with the last digit in the right answer box. You may leave blank any boxes you do not need on the right or the left side of your answer.
- Fill in only one bubble for every answer box that you have written in. Be sure not to fill in a bubble under a blank answer box.

STRATEGY

Formulas
Use the reference sheet to find the formula you need.



Many gridded-response questions result in an answer that is a fraction or a decimal. These values can also be filled in on the grid.

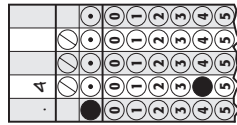
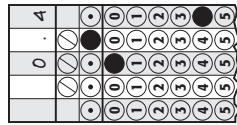
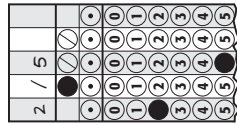
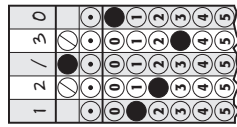
TEST EXAMPLE

- 2 A prize box contains 12 glitter pencils, 5 fluorescent pens, and 13 mechanical pencils. If Alex randomly selects a prize, what is the probability that he will choose a glitter pencil?

$$P(\text{glitter pencil}) = \frac{\text{number of favorable outcomes}}{\text{number of possible outcomes}}$$

$$= \frac{12}{12 + 5 + 13} = \frac{12}{30} \text{ or } \frac{2}{5}$$

You can either grid the fraction $\frac{12}{30}$ or $\frac{2}{5}$. You also can rewrite the fraction as a decimal and grid 0.4. Be sure to write the decimal point or fraction bar in the answer box. The following are acceptable answers.



Any equivalent fraction that fits the grid will be counted as correct.

Do not leave a blank answer box in the middle of an answer.

Preparing for Standardized Tests

If the answer is a mixed number, change it to an equivalent improper fraction or decimal.

TEST EXAMPLE

- 3 A hummingbird measures $2\frac{1}{2}$ inches in length. A sandpiper, measures $4\frac{1}{2}$ inches in length. How many times as long is the sandpiper as the hummingbird?

Divide the length of the sandpiper by the length of the hummingbird.

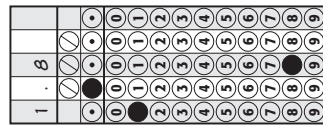
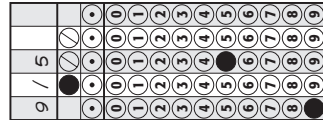
$$4\frac{1}{2} \div 2\frac{1}{2} = \frac{9}{2} \div \frac{5}{2}$$

$$= \frac{9}{2} \cdot \frac{2}{5}$$

$$= \frac{9}{5}$$

Rename $2\frac{1}{2}$ as $\frac{5}{2}$.
Multiply by the reciprocal of $\frac{5}{2}$, which is $\frac{2}{5}$.

You can either grid the improper fraction $\frac{9}{5}$, or rewrite it as 1.8 and grid the decimal. Do not enter $14/5$, as this will be interpreted as $\frac{14}{5}$.



Gridded-Response Practice

Solve each problem. Then copy and complete a grid like the one shown on page 722.

Number and Operations

- The seventh-grade class at Willow Creek Middle School is planning a class trip. Each student will need to pay \$4.50 for the bus ride, \$8.00 for a ticket to the museum, and \$5.25 for lunch. If there are 52 students in the class, what will be the total cost in dollars of the trip? **923**

- The highest point in Louisiana is Driskill Mountain at 585 feet. The lowest point is -8 feet in New Orleans. What is the difference in feet between the highest and lowest elevation points? **593**

- People in the United States own about 204 million cars. If the number of cars is written in scientific notation, what is the exponent of the 10 in the expression? **8**
- Ashlee has $5\frac{1}{4}$ cups of cocoa powder. If each batch of chocolate cookies uses $\frac{1}{2}$ cup of cocoa powder, how many batches could she make? **$2\frac{1}{2}$ or 10.5**

Algebra

- The number of televisions per 1,000 people in France is 598. The number of televisions per 1,000 people in the United States is 208 greater than the number in France. How many televisions are there in the United States per 1,000 people? **806**
- The table shows the number of white beads that Carmen uses in each row for a particular pattern in a necklace that she designed. How many white beads will there be in the sixth row? **32**

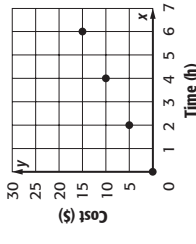
Row	1	2	3	4	5
Beads	1	2	4	8	16

- The table shows the cost of renting a booth at the week-long Fall Festival. There is an initial charge for reserving a booth and a fee per day. What is the cost in dollars of renting a booth for the 7 days of the festival? **330**

Days	0	1	2	3
Cost (\$)	50	90	130	170

- The graph shows the cost to rent a power paint sprayer. Let x be the number of hours the sprayer is rented and y be the total cost of the rental. Suppose an equation of the form $y = ax$ represents the data in the graph. What is the value of a ? **2.5 or 2.50**

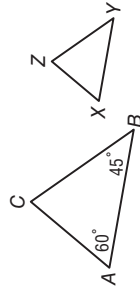
Renting a Power Paint Sprayer



- The temperature on a January morning is -18°F . The temperature is expected to rise at a rate of 5° each hour for the next several hours. In how many hours will the temperature be 7°F ? **5**

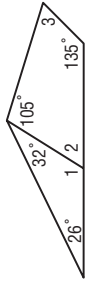
Geometry

- Triangle ABC is similar to triangle XYZ . What is the measure of $\angle Z$ in degrees? **75**



- Triangle DEF has vertices $D(1, 1)$, $E(4, -2)$, and $F(0, -3)$. Find the y -coordinate of point E after the triangle is reflected over the x -axis. **2**

- In the diagram, $\angle 1$ and $\angle 2$ are supplementary. Find the measure of $\angle 3$ in degrees. **62**



- Rectangle B has width and length 3 times the width and length of Rectangle A . As a fraction, what is the ratio of the area of Rectangle A to the area of Rectangle B ? **$\frac{1}{9}$**

Measurement

- In the United States, the average amount of meat eaten per person is 261 pounds per year. If there are 365 days in a year, what is the average number of ounces of meat eaten per day? Round to the nearest ounce. **11**

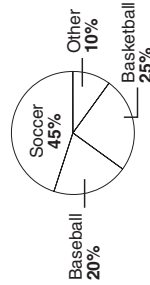
TEST-TAKING TIP

Question 14 The units of measure given in a question may not be the same as the units of measure asked for in the answer. Check that your solution is in the correct unit.

- A rectangle has an area of 318 square centimeters and a width of 12 centimeters. What is the length of the rectangle in centimeters? **26.5**

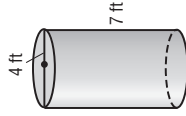
- The circle graph shows the results of a survey in Ms. Chen's fifth period math class. What is the exact degree measure of the section of the circle graph representing soccer? **162**

Favorite Sports of
Ms. Chen's Students



- One acre of land is 43,560 square feet. How many square yards are in one acre? **4840**

- The Browns plan to paint the top, bottom, and sides of the cylinder-shaped barrel with a waterproof coating. What is the surface area in square feet of the barrel? Round to the nearest square foot. **113**



Data Analysis and Probability

- The table shows the world's highest dams and the countries in which they are located. Find the range of the data. **128**

Country	Height (ft)
Tajikistan	984
Switzerland	935
Georgia	892
Italy	859
Mexico	856

Source: Scholastic Book of World Records

- The table shows the prices in dollars that Mike spent on his college textbooks. What is the mean of the data? **53.50**

66.00	51.25	50.00	63.00
56.25	9.00	82.00	50.50

- Kaya has the following scores for the first four tests in her science class: 82%, 95%, 100%, and 90%. She wants the mean of her first five tests to be 93%. What score as a percent must she earn on the fifth test? **98**

- In a carnival game, the probability of winning is 0.005. As a percent, what is the probability of losing? **99.5**

- A beverage cooler contains 6 regular colas, 5 orange drinks, 7 iced teas, and 7 diet colas. James reaches into the cooler and randomly takes two drinks, one after the other. Find the probability that he will choose a regular cola and then an orange drink. **$\frac{1}{20}$ or 0.05**

Short-Response Questions

Short-response questions require you to provide a solution to the problem as well as any method, explanation, and/or justification you used to arrive at the solution. These are sometimes called *constructed-response*, *open-response*, *open-ended*, *free-response*, or *student-produced questions*.

The following is a sample **rubric**, or scoring guide.

Credit	Score	Criteria
Full	2	Full credit: The answer is correct and a full explanation is provided that shows each step in arriving at the final answer.
Partial	1	Partial credit: There are two different ways to receive partial credit. <ul style="list-style-type: none"> The answer is correct, but the explanation provided is incomplete or incorrect. The answer is incorrect, but the explanation and method of solving the problem is correct.
None	0	No credit: Either an answer is not provided or the answer does not make sense.

On some standardized tests, no credit is given for a correct answer if your work is not shown.

TEST EXAMPLE

1 Hanna is deciding between a desktop and a laptop that are on sale. The desktop costs \$609.00 with a 10% discount. The laptop costs \$725.00 with a 25% discount. There is also a 6.75% sales tax on all purchases. Which computer is less expensive? What will be the total cost of the computer including discount and sales tax?

Full Credit Solution

Since there are two computers to compare, I will first find the discounted price of each computer. I will change each percent to a decimal to make the calculations.

$$\begin{array}{l} \text{desktop} \\ 609.00 \times 0.10 = 60.90 \\ 609.00 - 60.90 = 548.10 \end{array} \qquad \begin{array}{l} \text{laptop} \\ 725.00 \times 0.25 = 181.25 \\ 725.00 - 181.25 = 543.75 \end{array}$$

The laptop is less expensive after the discount. I still need to find the cost of the laptop computer with tax.

$$\begin{array}{l} 543.75 \times 0.0675 \\ = 36.703125 \\ \approx 36.70 \end{array} \qquad \begin{array}{l} 6.75\% = 0.0675 \\ \text{Use a calculator.} \end{array}$$

Now I will add the sales tax to the cost of the laptop.

$$543.75 + 36.70 = 580.45$$

The laptop will cost Hanna \$580.45, including sales tax.

The step calculations and results are clearly stated.

STRATEGY

Reread the Problem
Look for the important information in the problem.

Partial Credit Solution

In this sample solution, the calculations are correct and the answer is correct. However, there is no explanation for any of the calculations.

$$\begin{array}{l} 609.00 \times 0.10 = 60.90 \\ 609.00 - 60.90 = 548.10 \\ 548.10 \times 1.0675 = 585.09675 \\ \\ 725.00 \times 0.25 = 181.25 \\ 725.00 - 181.25 = 543.75 \\ 543.75 \times 1.0675 = 580.453125 \end{array}$$

The laptop is cheaper for \$580.45.

Notice that the student multiplies the discounted price by 1.0675 since the cost is 1 and the tax is 0.0675. So, the total is then 1.0675.

Partial Credit Solution

In this sample solution, the answer is partially incorrect because the student does not add the sales tax.

I will find the discount price for each set.

Desktop: Since the current price is 100% and the discount is 10%, the sale price will be $100 - 10 = 90\%$ or 0.9 .
 $609.00 \times 0.9 = 548.10$

Laptop: Since the current price is 100% and the discount is 25%, the sale price will be $100 - 25 = 75\%$ or 0.75 .
 $725.00 \times 0.75 = 543.75$

Hanna should get the laptop for \$543.75.

The student does not add the cost of the tax.

No Credit Solution

In this sample solution, the student does not understand how to find discounted prices and the sales tax. There are just some calculations using the numbers in the problem.

$$\begin{array}{l} 609.00 - 10\% = 602.91 \\ 725.00 - 25\% = 625.00 \\ 602.91 + 6.75\% = 609.66 \\ 625.00 + 6.75 = 631.75 \end{array}$$

I think Hanna should buy the desktop for \$609.66.

Short-Response Practice

Solve each problem. Show all your work.

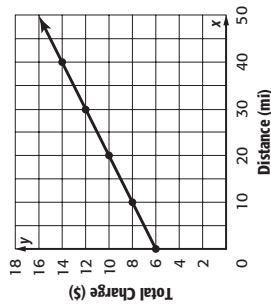
Number and Operations

- A main unit of currency in Egypt is the pound. One U.S. dollar is equal to $3\frac{4}{5}$ pounds. How many pounds are equivalent to \$10.00 in the U.S.? **38 pounds**
- The average daytime temperature on Venus is 870°F . The average temperature on Jupiter is -160°F . What is the difference between the average temperatures on Venus and Jupiter? **$1,030^\circ\text{F}$**
- A bag of chocolate candies has a nutrition label stating that each serving contains 20% of the recommended daily amount of fat. A serving has 13 grams of fat. Using this information, what is the total recommended daily amount of fat in grams? **65 g**
- The Montana Department of Fish, Wildlife, and Parks raised the price of a tag to catch a paddlefish from \$2.50 to \$5.00 for residents and from \$7.50 to \$15.00 for nonresidents. Which percent of increase is greater, the increase for residents or for nonresidents? **They are the same with both being a 100% increase.**
- A recent article in the newspaper said that there were 75 cell phones for every 100 people in Finland. The number of cell phones in Finland was given to be 3,893,000. Estimate the population of Finland using this information. **about 5,000,000 people**

Algebra

- Florida has 8,426 miles of shoreline. Alaska has 25,478 more miles of shoreline than Florida. Write and solve an equation to find the number of miles of shoreline for Alaska. **$a = 8,426 + 25,478$; $a = 33,904$ mi**
- Juana is saving money to buy a skateboard that costs \$95. She has \$25 and plans to save \$5 per week. In how many weeks will she have enough money for the skateboard? **14 weeks**

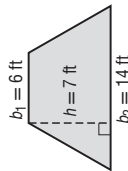
- Tyler delivers televisions for Electronics Depot. The graph shows the amount Tyler charges for delivery based on distance. Name the slope and y -intercept of the graph and describe what they mean in this situation.
See Student Handbook Answer Appendix. Charge for Delivery



9. Solve $\frac{2}{3}b = \frac{8}{7}$. **$\frac{12}{7}$**

Geometry

- The formula for the area of a trapezoid is $A = \frac{1}{2}h(b_1 + b_2)$. Find the area of the trapezoid. **70 ft²**



- Angles MNP and PNO are supplementary. Find $m\angle PNO$. **155°**

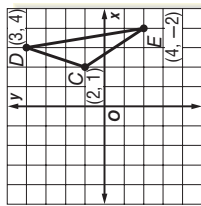


- What is the value of x ? **62**



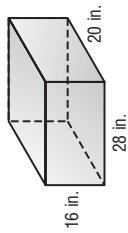
- Colby is planning to use $\triangle CDE$ for a design by using transformations. He plans to reflect it over the y -axis. Find the coordinates of $\triangle CDE$ after this reflection. Graph the reflected image of the triangle.

See Student Handbook Answer Appendix.



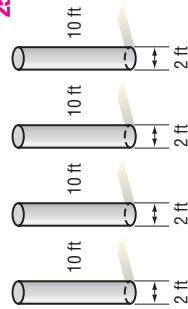
Measurement

- Diego ran in a 10-kilometer race. What is the distance of this race in meters? **10,000 m**
- What is the surface area of the box? **2,656 in²**



- A certain aircraft uses 350 gallons of fuel per hour. If the plane used 1,925 gallons of fuel on a flight between two cities, how many hours long was the flight? **5.5 h**

- Curtis is painting the four columns for the set of a school play. What is the surface area that needs to be painted? Assume that the tops and bottoms of the columns do *not* need to be painted. **251.3 ft²**



- The record for women running the Boston Marathon was set in 2002 when Margaret Okayo of Kenya ran the 26.2-mile course in approximately 2 hours and 21 minutes. What was her average speed in miles per hour? **about 11.15 mph**

TEST-TAKING TIP

Questions 17 and 18 After finding the solution, always go back and read the problem again to make sure your solution answers what the problem is asking.

Data Analysis and Probability

- The stem-and-leaf plot shows the scores on the last math test in Mr. Hill's class. What is the range of the data? **39**

Stem	Leaf
9	1 2 3 5 6 9
8	0 2 5 6 6 7 8 8
7	1 2 3 5 7 9 9
6	0 5 8 9 9

$8|2 = 82$ points

- The table shows the heights of the world's largest flightless birds. Make a bar graph of the data.
See Student Handbook Answer Appendix.

Bird	Height (in.)
Ostrich	96
Emu	60
Cassowary	60
Rhea	54
Emperor Penguin	45

- The table shows the average precipitation in inches for each month in Syracuse, New York. Make a scatter plot of the data. Use the months on the horizontal axis and the precipitation on the vertical axis. Describe the graph.
See Student Handbook Answer Appendix.

Month	Precipitation (in.)	Month	Precipitation (in.)
Jan	2.34	July	3.81
Feb	2.15	Aug	3.51
Mar	2.77	Sep	3.79
Apr	3.33	Oct	3.24
May	3.28	Nov	3.72
June	3.79	Dec	3.2

- Two number cubes each marked with 1, 2, 3, 4, 5, 6 on their faces are rolled. List all the possible outcomes. **There are 36 possible outcomes: 1, 1; 1, 2; 1, 3; ... 6, 6.**

Extended-Response Questions

Extended-response questions are often called *open-ended* or *constructed-response questions*. Most extended-response questions have multiple parts. You must answer all parts to receive full credit.

Extended-response questions are similar to short-response questions in that you must show all of your work in solving the problem and a rubric is used to determine whether you receive full, partial, or no credit. The following is a sample rubric for scoring extended-response questions.

Credit	Score	Criteria
Full	4	Full credit: A correct solution is given that is supported by well-developed, accurate explanations.
Partial	3, 2, 1	Partial credit: A generally correct solution is given that may contain minor flaws in reasoning or computation, or an incomplete solution is given. The more correct the solution, the greater the score.
None	0	No credit: An incorrect solution is given indicating no mathematical understanding of the concept, or no solution is given.

On some standardized tests, no credit is given for a correct answer if your work is not shown.

Make sure that when the problem says to *Show your work*, you show every aspect of your solution including figures, sketches of graphing calculator screens, or the reasoning behind computations.

TEST EXAMPLE

Each fall, the community pool is drained. The pool contains 100,000 gallons of water. The pool has two drains that together drain the pool at a rate of 10,000 gallons per hour.

- Make a function table for this situation. Let x represent the time in hours the pool drains. Let y represent the gallons of water left in the pool.
- Make a graph of the data in the function table.
- Predict how many hours it will take for the pool to drain.

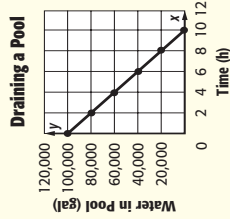
Full Credit Solution

Part a A complete table includes labeled columns.

Every 2 hours there will be 20,000 gallons less water.

Hours (x)	Water Left (y)	(x, y)
2	80,000	(2, 80,000)
4	60,000	(4, 60,000)
6	40,000	(6, 40,000)
8	20,000	(8, 20,000)
10	0	(10, 0)

Part b A complete graph includes a title for the graph, appropriate scales and labels for the axes, and correctly graphed points.



The student gives reasoning in graphing the ordered pairs.

Part c

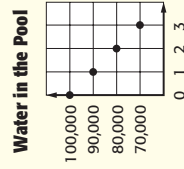
The pool is drained when the y -value is 0. That is at 10 hours. It will take 10 hours to drain the pool.

Partial Credit Solution

Part a This sample answer has an incomplete table.

1	90,000
2	80,000
3	70,000

Part b Partial credit is given because the points are graphed correctly, but the scale on the y -axis jumps from 0 to 70,000 with no break.



Partial credit can be given if parts of the table and graph are missing.

Part c

I wrote a function rule to find how long it will take to drain the pool. I let $y = 0$ to find the number of hours.

$$y = 100,000 - 10,000x$$

$$0 = 100,000 - 10,000x$$

$$10,000x = 100,000$$

Full credit is given for Part c.

$$x = 10 \quad \text{It will take 10 hours to drain the pool.}$$

No Credit Solution

If the student demonstrates no understanding of making a table or graph or making a prediction, then no credit is given.

Extended-Response Practice

Solve each problem. Show all your work.

Number and Operations

1. The table shows the land area and water area of five states.
a–c. See Student Handbook Answer Appendix.

State	Land Area (mi ²)	Water Area (mi ²)
Florida	53,937	5991
Colorado	103,729	371
Alaska	570,374	44,856
Iowa	55,875	401
Rhode Island	1,045	186

- a. Find the percent of each state that is water. The entire state area is the sum of the land and water areas.
 b. Order the states from the state with the least percent water to the greatest percent water.
 c. Suppose a state had land and water areas such that the water area was 20% of the total area. Give a possible land and water area, with land area greater than 1,000 square miles, such that this is true.

Algebra

2. The table shows the rental rates for a crane rental service. There is an initial fee to reserve the crane and a daily fee.
a–c. See Student Handbook Answer Appendix.

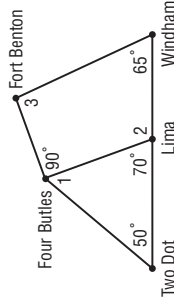
Days	Cost	Days	Cost
0	\$100	4	\$280
1	\$145	5	\$325
2	\$190	6	\$370
3	\$235		

- a. Graph the data. Let x = number of days and y = cost. Connect the points.
 b. What is the slope of the line? What does the slope represent?
 c. What would be the charge for renting the crane for 10 days?

3. A long-distance phone company charges 40¢ per call plus 4¢ per minute.
 a. Write and solve an equation to find the number of minutes used for a call that costs \$2.80.
 b. Another long-distance company charges 6¢ per minute and no connection fee. What is the cost of a 60-minute call?
 c. Which service would charge less for a 90-minute call?
a–c. See Student Handbook Answer Appendix.

Geometry

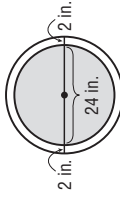
4. Ava and Bryn are making rectangular fleece blankets. Ava is making her blanket 40 inches by 60 inches. Bryn says she wants to make her blanket “twice as big.”
 a. What is the area of Ava’s blanket?
 b. Bryn makes her blanket such that both the length and width are each twice the length and width of Ava’s blanket. What will be the area of Bryn’s blanket?
 c. What is the ratio of the area of Bryn’s blanket in Part b to the area of Ava’s blanket in Part a?
 d. Ava tells Bryn that a blanket is “twice as big” if the area is twice the area of the other. Give a possible length and width for a blanket twice as big as Ava’s using this idea of “twice as big.”
a–d. See Student Handbook Answer Appendix.
 5. The map shows five towns and the angle measures for roads connecting them.



- a. Find the measure of $\angle 1$. Explain.
 b. Find the measures of $\angle 2$ and $\angle 3$. Explain.

Measurement

6. City planners are considering enlarging the circular manholes in their streets. Currently, the diameter of a manhole cover is 24 inches. The new size being considered is 2 inches greater all the way around.
a–c. See Student Handbook Answer Appendix.

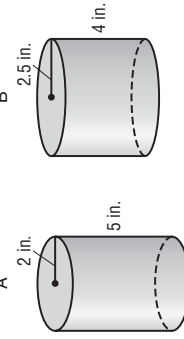


- a. Find the area of a current manhole cover with diameter of 24 inches. Round to the nearest square inch.
 b. Find the area of a new manhole cover. Round to the nearest square inch.
 c. What would be the percent increase in the area of a manhole cover if the new covers are made?

TEST-TAKING TIP

Question 6 Be sure to completely and carefully read the problem before beginning any calculations. If you read too quickly, you may miss a key piece of information.

7. A company that sells beads for craft projects has the two containers shown for packaging the beads.
a–c. See Student Handbook Answer Appendix.



- a. Find the volume of each container. Round to the nearest tenth of a cubic inch.
 b. Find the ratio of the volume of container A to the volume of container B.
 c. The company wants to make a container shaped as a rectangular prism. Find a possible length, width, and height for the container such that its volume is twice the volume of container B.

Data Analysis and Probability

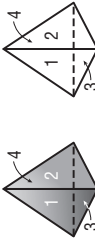
8. The table shows the normal monthly temperatures in degrees Fahrenheit for Honolulu, Hawaii, and Minneapolis, Minnesota.
a–c. See Student Handbook Answer Appendix.

Month	Honolulu	Minneapolis
Jan	73	13
Feb	73	20
Mar	74	32
Apr	76	47
May	77	59
Jun	80	68
Jul	81	73
Aug	82	71
Sep	82	61
Oct	80	49
Nov	78	33
Dec	75	19

Source: *The World Almanac*

- a. Make a scatter plot of the data for Honolulu. Place the months on the x -axis and the temperatures on the y -axis. Describe the graph.
 b. Make a scatter plot of the data for Minneapolis. Place the months on the x -axis and the temperatures on the y -axis. Describe the graph.
 c. Compare the range for each city’s temperature data. Explain a possible reason for the difference in the data.

9. Two 4-sided number cubes are rolled for a game, one white and one black. Each number cube has faces numbered 1 through 4.
a–c. See Student Handbook Answer Appendix.



- a. List the sample space for rolling the two number pieces.
 b. What is the theoretical probability that a player will roll a sum of 8?
 c. If you played this game 50 times, how many times would you expect to get a sum of 4?

Concepts and Skills Bank

1 Divisibility Patterns

In $54 \div 6 = 9$, the quotient, 9, is a whole number. So, we say that 54 is **divisible** by 6. You can use the following rules to determine whether a number is by 2, 3, 4, 5, 6, 9, and 10.

A number is divisible by:

- 2 if the ones digit is divisible by 2.
- 3 if the sum of the digits is divisible by 3.
- 4 if the number formed by the last two digits is divisible by 4.
- 5 if the ones digit is 0 or 5.
- 6 if the number is divisible by both 2 and 3.
- 9 if the sum of the digits is divisible by 9.
- 10 if the ones digit is 0.

EXAMPLE

Use Divisibility Rules

Determine whether 972 is divisible by 2, 3, 4, 5, 6, 9, or 10.

- 2: Yes; the ones digit, 2, is divisible by 2.
 3: Yes; the sum of the digits, $9 + 7 + 2 = 18$, is divisible by 3.
 4: Yes; the number formed by the last two digits, 72, is divisible by 4.
 5: No; the ones digit is not 0 or 5.
 6: Yes; the number is divisible by 2 and 3.
 9: Yes; the sum of the digits, 18, is divisible by 9.
 10: No; the ones digit is not 0.

Exercises

Use divisibility rules to determine whether the first number is divisible by the second number.

- 447; 3 **yes**
 - 135; 6 **no**
 - 240; 4 **yes**
 - 419; 3 **no**
 - 831; 3 **yes**
 - 4,408; 4 **yes**
 - 7,110; 5 **yes**
 - 1,287; 9 **yes**
 - 2,984; 9 **no**
 - 7,026; 6 **yes**
 - 1,260; 10 **yes**
 - 8,903; 6 **no**
- Determine whether each number is divisible by 2, 3, 4, 5, 6, 9, or 10.
- 712 **2, 4**
 - 1,035 **3, 5, 9**
 - 8,901 **3, 9**
 - 462 **2, 3, 6**
 - 270 **2, 3, 5, 6, 9, 10**
 - 1,005 **3, 5**
 - 32,221 **none**
 - 8,340 **2, 3, 4, 5, 6, 10**
 - 920 **2, 4, 5, 10**
 - 50,319 **3, 9**
 - 64,042 **2**
 - 3,498 **2, 3, 6**

25. **MEASUREMENT** Jordan has 5,280 feet of rope. Can he cut the rope into 9-foot pieces and use all of the rope? Explain. **No; 5,280 is not divisible by 9.**

2 Estimating with Decimals

Estimation can be used to provide quick answers when an exact answer is not necessary. It is also an excellent way to check whether your answer is reasonable. One method of estimating is to use rounding. Round numbers to any place value that makes estimation easier.

EXAMPLES

Estimate by Rounding

Estimate by rounding.

$$1 \quad 23.485 - 9.757$$

$$\begin{array}{r} 23.485 \rightarrow 23 \quad \text{Round to the nearest} \\ -9.757 \rightarrow -10 \quad \text{whole numbers.} \\ \hline 13 \end{array}$$

The difference is about 13.

$$2 \quad 6.43 + 2.17 + 9.1 + 4.87$$

$$\begin{array}{r} 6.43 \rightarrow 6 \\ 2.17 \rightarrow 2 \quad \text{Round to the nearest} \\ 9.1 \rightarrow 9 \quad \text{whole numbers.} \\ +4.87 \rightarrow +5 \\ \hline 22 \quad \text{The sum is about 22.} \end{array}$$

Another way to estimate sums is to use **clustering**. This strategy is used when all the numbers are close to a common value.

EXAMPLE

Estimate by Clustering

$$3 \quad \text{Estimate } 9.775 + 9.862 + 9.475 + 9.724 \text{ by clustering.}$$

All of the numbers are clustered around 10. There are four numbers. So, the sum is about 4×10 or 40.

Exercises

Estimate by rounding. 1–15. Sample answers are given. **2. 35 – 18 = 17**

- 8.56 + 5.34 **9 + 5 = 14**
- 34.84 – 17.69 **3. 6.8 + 2.4 7 + 2 = 9**
- 40.79 – 6.8 **41 – 7 = 34**
- 6.9 + 5.2 **7 + 5 = 12**
- 23.84 + 12.13 **24 + 12 = 36**
- 34.3 – 18.9 **34 – 19 = 15**
- 7.5 + 8.4 **8 + 8 = 16**
- 65.48 – 9.3 **65 – 9 = 56**
- 26.3 + 9.7 **26 + 10 = 36**
- 33.21 – 8.23 **33 – 8 = 25**
- 67.86 – 24.35 **68 – 24 = 44**
- 8.99 – 2.6 **9 – 3 = 6**
- 121.5 + 487.8 **14. 122 + 488 = 610**

Estimate by clustering. 16–23. See Student Handbook Answer Appendix.

- 18.4 + 22.5 + 20.7
- 56.9 + 63.2 + 59.3 + 61.1
- 42.3 + 41.5 + 39.8 + 40.4
- 77.8 + 75.6 + 81.2 + 79.9
- 239.8 + 242.43 + 236.20 + 240.77
- 9.9 + 10.0 + 10.3 + 11.1 + 9.8 + 11.2
- 50.4 + 51.1 + 48.9 + 49.5 + 50.8
- 100.5 + 97.8 + 101.6 + 100.2 + 99.3

3 Multiplying Decimals

To multiply decimals, multiply as with whole numbers. The product has the same number of decimal places as the sum of the decimal places of the factors. Use estimation to determine whether your answers are reasonable.

EXAMPLES Multiply Decimals

Multiply.

1 1.3×0.9 **Estimate** $1 \times 1 = 1$

$$\begin{array}{r} 1.3 \\ \times 0.9 \\ \hline 1.17 \end{array}$$

The product is reasonable.

2 0.054×1.6 **Estimate** $0 \times 2 = 0$

$$\begin{array}{r} 0.054 \\ \times 1.6 \\ \hline 324 \\ 540 \\ \hline 0.0864 \end{array}$$

Annex a zero on the left so the answer has four decimal places. Compare to the estimate.

Exercises

Place the decimal point in each product. Add zeros if necessary.

- $1.32 \times 4 = 528$ **5.28**
 - $0.07 \times 1.1 = 77$ **0.077**
 - $0.4 \times 0.7 = 28$ **0.28**
 - $1.9 \times 0.6 = 114$ **1.14**
 - $1.4 \times 0.09 = 126$ **0.126**
 - $5.48 \times 3.6 = 19728$ **19.728**
 - $4.5 \times 0.34 = 153$ **1.53**
 - $0.45 \times 0.02 = 9$ **0.009**
 - $150.2 \times 32.75 = 4919050$ **4,919,050**
- Multiply.
- 0.2×6

$$\begin{array}{r} 0.2 \\ \times 6 \\ \hline 1.2 \end{array}$$
 - 0.3×0.9

$$\begin{array}{r} 0.3 \\ \times 0.9 \\ \hline 0.27 \end{array}$$
 - 0.45×0.12

$$\begin{array}{r} 0.45 \\ \times 0.12 \\ \hline 0.054 \end{array}$$
 - 6.78×1.3

$$\begin{array}{r} 6.78 \\ \times 1.3 \\ \hline 8.814 \end{array}$$
 - 10.1×2

$$\begin{array}{r} 10.1 \\ \times 2 \\ \hline 20.2 \end{array}$$
 - 16.2×0.3

$$\begin{array}{r} 16.2 \\ \times 0.3 \\ \hline 4.86 \end{array}$$
 - 15.8×11 **173.8**
 - 88×2.5 **220**
 - 0.003×482 **1.446**
 - 0.6×2 **1.2**
 - 38.3×29.1 **1,114.53**
 - 8×0.3 **2.4**
 - 12.2×12.4 **151.28**
 - 42×0.17 **7.14**
 - 0.44×0.5 **0.22**
 - 88×2.5 **220**
 - 33×0.03 **0.99**
 - 1.88×1.11 **2.0868**
 - 0.7×18 **12.6**
 - 380×1.25 **475**
 - 0.23×0.2 **0.046**
 - 44×0.55 **24.2**
38. **JOB** Antonia earns \$10.75 per hour. What are her total weekly earnings if she works 34.5 hours? Round to the nearest cent. **\$370.88**

4 Powers of Ten

You can use a pattern to mentally find the product of any number and a power of 10 that is greater than 1. Count the number of zeros in the power of 10 or use the exponent. Then move the decimal point that number of places to the right.

Decimal Power of 10	Product
19.7×10^1 (or 10)	= 197
19.7×10^2 (or 100)	= 1,970
19.7×10^3 (or 1,000)	= 19,700
19.7×10^4 (or 10,000)	= 197,000

EXAMPLES Use Mental Math to Multiply

Multiply mentally.

1 12.562×100

$$12.562 \times 100 = 12.562$$

Move the decimal point two places to the right, since 100 has two zeros.

$$= 1,256.2$$

2 0.59×10^4

$$0.59 \times 10^4 = 0.5900$$

Move the decimal point four places to the right, since the exponent is 4.

$$= 5,900$$

Decimal Power of 10	Product
19.7×0.1 (or $\frac{1}{10}$)	= 1.97
19.7×0.01 (or $\frac{1}{100}$)	= 0.197
19.7×0.001 (or $\frac{1}{1000}$)	= 0.0197

To mentally multiply by a power of ten that is less than 1, count the number of decimal places. Or, if the power is written as a fraction, use the exponent in the denominator. Then move the decimal point that number of places to the left.

EXAMPLES Use Mental Math to Multiply

Multiply mentally.

3 10.5×0.01

$$10.5 \times 0.01 = 10.5$$

Move the decimal point two places to the left.

$$= 0.105$$

4 $5,284 \times 0.00001$

$$5,284 \times 0.00001 = 0.5284$$

Move the decimal point five places to the left.

$$= 0.05284$$

Exercises

Multiply mentally.

- 12.53×10 **125.3**
- 4.6×10^3 **4,600**
- 78.4×0.01 **0.784**
- 0.05×100 **5**
- 4.527×100 **452.7**
- $2.78 \times 1,000$ **2,780**
- 13.58×0.01 **0.1358**
- 5.49×10^3 **5,490**
- 0.1×0.8 **0.08**
- 0.925×10 **9.25**
- 99.44×10^2 **9,944**
- 0.01×16 **0.16**
- 1.32×10^3 **1,320**
- $0.56 \times 10,000$ **5,600**
- 1.4×0.001 **0.0014**
- 11.23×10^5 **1,123,000**
- 68.94×0.01 **0.6894**
- 0.8×10^4 **8,000**
- 28.1×0.01 **0.281**
- 9.3×10^7 **93,000,000**
- $625,799 \times 0.0001$ **62.5799**

5 Dividing Decimals

To divide two decimals, use the following steps.

- If necessary, change the divisor to a whole number by moving the decimal point to the right. You are multiplying the divisor by a power of ten.
- Move the decimal point in the dividend the same number of places to the right. You are multiplying the dividend by the same power of ten.
- Divide as with whole numbers.

EXAMPLES Divide Decimals

Divide.

1 $25.8 \div 2$ **Estimate** $26 \div 2 = 13$

$\begin{array}{r} 12.9 \\ 2 \overline{)25.8} \\ \underline{-2} \\ 5 \\ \underline{-4} \\ 18 \\ \underline{-18} \\ 0 \end{array}$ The divisor, 2, is already a whole number, so you do not need to move the decimal point. Divide as with whole numbers. Then place the decimal directly above the decimal point in the dividend.

$\begin{array}{r} 18 \\ -18 \\ \hline 0 \end{array}$

Compared to the estimate, the quotient, 12.9, is reasonable.

2 $199.68 \div 9.6$ **Estimate** $200 \div 10 = 20$

$\begin{array}{r} 20.8 \\ 9.6 \overline{)199.68} \\ \underline{-192} \\ 768 \\ \underline{-768} \\ 0 \end{array}$

Move each decimal point one place to the right.

Compare the answer to the estimate.

Exercises

Divide.

- $0.3 \overline{)9.81}$ **32.7** 2. $12 \overline{)0.12}$ **0.01** 3. $3.2 \overline{)5.76}$ **1.8** 4. $0.22 \overline{)0.0132}$ **0.06** 5. $0.04 \overline{)0.008}$ **0.2**
- $3.18 \overline{)0.636}$ **0.2** 7. $0.2 \overline{)8.24}$ **41.2** 8. $82.3 \overline{)24.04}$ **10** 9. $12.02 \overline{)24.04}$ **2** 10. $0.5 \overline{)85}$ **170**
- $74.9 \overline{)5.992}$ **0.0812** 11. $19.2 \overline{)4.416}$ **0.2313** 1.9 $\overline{)38.57}$ **20.314** 13.8 $\overline{)131.1}$ **9.5** 15. $6.48 \overline{)259.2}$ **40**
- $812 \div 0.4$ **2,030** 17. $0.34 \div 0.2$ **1.7** 18. $14.4 \div 0.12$ **120** 19. $90.175 \div 2.5$ **36.07**
- $39.95 \div 799$ **0.0521** 88.8 $\div 444$ **0.2** 22. $613.8 \div 66$ **9.3** 23. $2,445.3 \div 33$ **74.1**
- $20.24 \div 2.3$ **8.8** 25. $45 \div 0.09$ **500** 26. $2.475 \div 0.03$ **82.5** 27. $4.6848 \div 0.366$ **12.8**
- $180 \div 0.36$ **500** 29. $97.812 \div 1.1$ **88.92** 30. $23 \div 0.023$ **1,000** 31. $1,680.042 \div 44.2$ **38.01**
- OLYMPICS** In the 2000 Olympics, Michael Johnson of the U.S. ran the 400-meter run in 43.84 seconds. To the nearest hundredth, find his speed in meters per second. **9.12 m/s**
- SCIENCE** It takes Pluto 247.69 Earth years to revolve once around the Sun. It takes Jupiter 11.86 Earth years to revolve once around the Sun. About how many times longer does it take Pluto than Jupiter to revolve once around the Sun? **about 21 times**

6 Converting Currencies

Countries around the world use different types of currency. By using an exchange rate table, proportions, and a calculator, you can convert from one type of currency to another.

Examine the following exchange rate table. All values in the same column are equivalent to each other.

	Exchange Rates				
United States Dollars	1	2.020590	0.999950	1.407465	0.864699
British Pounds	0.494905	1	0.494880	0.696562	0.427944
Canadian Dollars	1.000050	2.020691	1	1.407536	0.864742
Euros	0.710497	1.435623	0.710461	1	0.614366
Australian Dollars	1.156472	2.336756	1.156414	1.627694	1

*Exchange rates as of September 21, 2007

You can use proportions to convert any amount of money from one currency to another.

EXAMPLE

Julian has 16 United States dollars to exchange for Euros. How many Euros will he receive?

$$\begin{array}{l} \text{U.S. dollar} \longrightarrow \frac{1}{0.710497} = \frac{16}{x} \quad \text{Set up a proportion.} \\ \text{euros} \quad \quad \quad \longrightarrow \end{array}$$

$$\begin{array}{l} 1(x) = 16(0.710497) \quad \text{Cross multiply.} \\ x = 11.367952 \quad \text{Simplify.} \end{array}$$

He will receive about 11.37 euros in exchange for 16 United States dollars.

Exercises

Fill in the blanks by converting each currency. Round to the nearest hundredth.

- 26.41 Canadian dollars = **18.76** euros
- 46.82 British pounds = **94.60** United States dollars
- 4.7 Australian dollars = **2.89** euros
- 285.31 United States dollars = **141.20** British pounds
- 567.31 Canadian dollars = **656.05** Australian dollars
- 91.67 euros = **129.03** Canadian dollars
- 6 Australian dollars = **2.57** British pounds
- 37.24 euros = **52.41** United States dollars
- 64.28 British pounds = **129.89** Canadian dollars
- 74.28 United States dollars = **85.90** Australian dollars

7 Solving Inequalities

You have already solved one- and two-step equations. You can apply what you learned about equations to solve one- and two-step inequalities. **Inequalities** are sentences that compare quantities that are not equal. The symbols used are $<$, $>$, \leq , \geq , and \neq .

Inequality Symbols		Key Concept
Symbols	$<$, $>$, \leq , \geq	\neq
Words	<ul style="list-style-type: none"> • less than • fewer than 	<ul style="list-style-type: none"> • greater than or equal to • no less than • at least

EXAMPLE Solve a One-Step Inequality

1 Solve $s + \frac{3}{4} \leq 1\frac{1}{4}$.

$$s + \frac{3}{4} \leq 1\frac{1}{4}$$

$$s + \frac{3}{4} - \frac{3}{4} \leq 1\frac{1}{4} - \frac{3}{4}$$

$$s + \frac{3}{4} - \frac{3}{4} \leq \frac{5}{4} - \frac{3}{4}$$

$$s \leq \frac{2}{4} \text{ or } \frac{1}{2}$$

The solution is $s \leq \frac{1}{2}$.

Write the inequality.

Subtract $\frac{3}{4}$ from each side.

Change $1\frac{1}{4}$ to an improper fraction, $\frac{5}{4}$.

Subtract.

EXAMPLE Solve a Two-Step Inequality

2 Solve $7p + 21 \leq 49$.

$$7p + 21 \leq 49$$

$$7p + 21 - 21 \leq 49 - 21$$

$$7p \leq 28$$

$$p \leq \frac{28}{7}$$

$$p \leq 4$$

The solution is $p \leq 4$.

Write the inequality.

Subtract 21 from each side.

Simplify.

Divide each side by 7.

Simplify.

Unlike the solution to an equation, the solution $p \leq 4$ reflects a set of numbers. One way to show this is in a number line graph.

EXAMPLE Graph an Inequality

3 Graph $p \leq 4$.

Draw a number line and label the integers. Draw a circle at 4. The circle on the graph shows that the numbers up to 4 but not including 4 are included in the solution.



When \geq or \leq is used, the circle on the graph is filled in to show that the number is included in the solution.

Test numbers on either side of 4 to determine the direction of the graph. Draw an arrow pointing in the direction of 2. Use other numbers in this set to check the solution.



p	$7p + 21 \leq 49$	Solution
5	$7 \times 5 + 21 \stackrel{?}{\leq} 49$ $35 + 21 \stackrel{?}{\leq} 49$ $56 \not\leq 49$	No
3	$7 \times 3 + 21 \stackrel{?}{\leq} 49$ $21 + 21 \leq 49$ $42 \leq 49$	Yes

Exercises

Solve each inequality. Graph each solution on a number line. Round to the nearest tenth if necessary. 1–12. See Student Handbook Answer Appendix.

- $2x \geq -14$
- $\frac{30}{n} < 160$
- $y + 51 \leq 85$
- $2.5 + 1.5n \leq 7.5$
- $8.1n + 6.3 \geq 22.5$
- $0.75g + 23 < 34$
- $2m + 6.2 \geq 15.6$
- $3.3(f + 2) > 36.3$
- $\frac{1}{2}(p + 8) \geq 12$
- $\frac{1}{3}r - \frac{2}{3} \geq 1$
- $2n - \frac{1}{5} < \frac{9}{5}$
- $\frac{1}{14}d + \frac{3}{14} \leq \frac{2}{7}$

13. **SAVINGS** Trisha wants to save up to buy a new cell phone that costs less than \$150. She already has \$75 saved. She also makes \$10 a week doing her chores. Write and solve an inequality to find the number of weeks worked that would allow Trisha to buy a new cell phone. **$10w + 75 \geq 150$; $w \geq 7.5$**

14. **TEXT MESSAGING** Joshua spends \$0.25 every time he sends a text message through his cell phone. Write and solve an inequality that shows the number of text messages he can send with \$3.00. **$0.25t \leq 3$; $t \leq 12$**

15. **SPORTS** Allyson spends $7\frac{1}{2}$ hours playing sports each week. Softball takes a total of $3\frac{1}{4}$ hours each week. If she plays sports 4 days a week, write and solve an inequality that shows the average amount of time per day she spends on other sports. **$4h + 3\frac{1}{4} \geq 7\frac{1}{2}$; $h \geq 1\frac{1}{16}$**

8

Monomials and Polynomials

A **polynomial** is an algebraic expression that includes real numbers and variables. In a polynomial, there are no terms with variables in the denominator and no terms with variables under a radical sign.

polynomial: $2x^2 - 3x + 4$ not a polynomial: $x^2 - \frac{8}{x}$

A specific kind of polynomial is a **monomial**. Since the prefix *mono-* means one, a monomial is a polynomial that contains only one term, like $7x$. Monomials that contain the same variables to the same power are *like terms*.

EXAMPLES

Classify Polynomials

Determine whether each expression is a polynomial. Explain your reasoning. If it is a polynomial, state the number of terms in the expression.

1 $3x^3 + 8x + 7$

2 $m - \frac{1}{m}$

This is a polynomial because it is the sum of three monomials. There are three terms.

This is *not* a polynomial because $\frac{1}{m}$ has a variable in the denominator.

EXAMPLE

Simplify Polynomials

3 Find $8x + 7 + 3x + 2$.

$$8x + 7 + 3x + 2$$

$$= (8x + 3x) + (7 + 2)$$

$$= 11x + 9$$

Write the expression.

Group like terms.

Simplify by combining like terms.

Exercises

Determine whether each expression is a polynomial. Explain your reasoning. If it is a polynomial, state the number of terms in the expression. 1–18. See Student Handbook Answer Appendix.

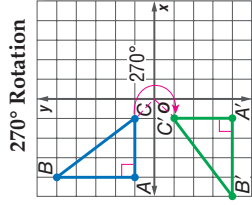
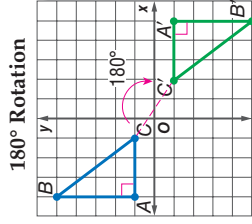
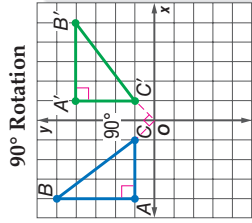
- $\frac{t^2}{5}$
 - $5 + \sqrt{b}$
 - $p^4 + 5p - 2$
 - $-5y^4z$
 - $4d^2 - 2a + \sqrt{90}$
 - $\frac{6}{r^4} + \frac{r^2}{3} - 5$
 - $-8c^5d^3 - 4cd + 3d$
 - $15r^2s^3 - 9r + \sqrt{s}$
- Simplify each expression.
- $12r + 8s + 4r + s$
 - $4a + 5b + 10 + 6a$
 - $7f + 8g + 2f + g$
 - $16x + 12y + 21y + 12x$
 - $5t + 7 + u + 3$
 - $13c + 10d + 4c + 7d$
 - $4j + 6 + 9j + 3$
 - $11p + 12q + 4p + 9q$
 - $15mn + 12m + 4n + 7mn$

18. **GEOMETRY** The sides of a hexagon measure $3x$, $7y$, $6y$, $8x$, y , and $4x$. Write the perimeter of the figure in simplest form.

9

Rotations

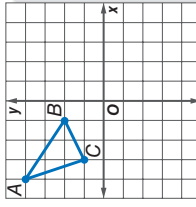
A **rotation** occurs when a figure is rotated around a point. A rotation does not change the size or shape of the figure. The rotations shown below are clockwise around the origin.



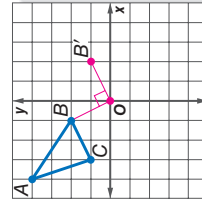
EXAMPLE

Rotate a Figure About the Origin

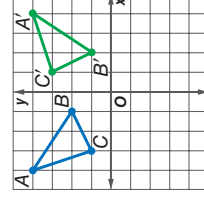
- 1 Triangle ABC has vertices $A(-4, 4)$, $B(-1, 2)$, and $C(-3, 1)$. Graph the figure and its rotated image after a clockwise rotation of 90° about the origin. Then give the coordinates of the vertices for $\triangle A'B'C'$.



- STEP 1** Graph $\triangle ABC$ on a coordinate plane.



- STEP 2** Sketch segment \overline{BO} connecting point B to the origin. Sketch another segment, $\overline{B'O'}$ so that the angle between point B , O , and B' measures 90° and the segment is congruent to \overline{BO} .



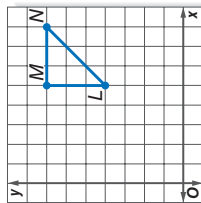
- STEP 3** Repeat Step 2 for points A and C . Then connect the vertices to form $\triangle A'B'C'$. So, the coordinates of the vertices of $\triangle A'B'C'$ are $A'(4, 4)$, $B'(2, 2)$, and $C'(1, 3)$.

EXAMPLE

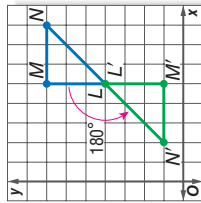
Rotate a Figure About a Point

2 Triangle LMN has vertices $L(5, 4)$, $M(5, 7)$, and $N(8, 7)$. Graph the figure and its rotated image after a counterclockwise rotation of 180° about vertex L . Then give the coordinates of the vertices for $\triangle L'M'N'$.

STEP 1 Graph the original triangle.



STEP 2 Graph the rotated image.

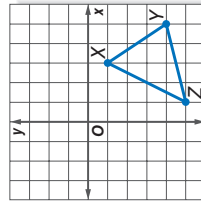


So, the coordinates of the vertices of $\triangle L'M'N'$ are $L'(5, 4)$, $M'(5, 1)$, and $N'(2, 1)$.

Exercises 1–6. See Student Handbook Answer Appendix.

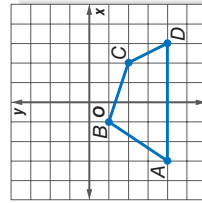
Graph $\triangle XYZ$ and its rotated image after each rotation. Then give the coordinates of the vertices for $\triangle X'Y'Z'$.

1. 180° clockwise about the origin
2. 270° counterclockwise about vertex X
3. 90° counterclockwise about the origin
4. 270° clockwise about vertex Y
5. 180° counterclockwise about vertex Z
6. 90° clockwise about the origin



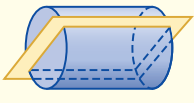
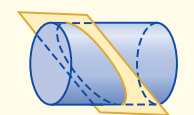
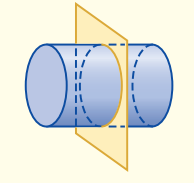
Graph quadrilateral $ABCD$ and its rotated image after each rotation. Then give the coordinates of the vertices for quadrilateral $A'B'C'D'$. 7–12. See Student Handbook Answer Appendix.

7. 90° counterclockwise about the origin
8. 90° clockwise about vertex A
9. 180° counterclockwise about vertex D
10. 270° clockwise about the origin
11. 90° clockwise about the origin
12. 180° clockwise about vertex B



10 Cross Sections of Three-Dimensional Figures

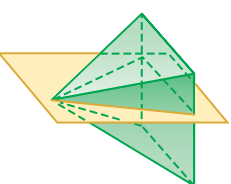
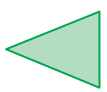
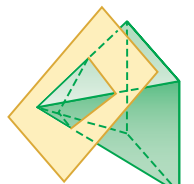

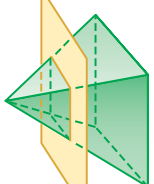

The intersection of a solid and a plane is called a **cross section** of the solid.

Inequality Symbols		Key Concept
Vertical Slice		Horizontal Slice
Angled Slice		
The cross section is a rectangle.		The cross section is an oval.
The cross section is a rectangle.		The cross section is a circle.

EXAMPLE

Describe Cross Sections

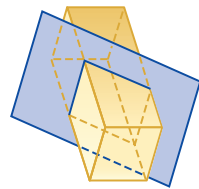
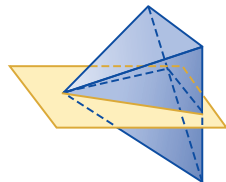
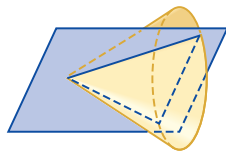
1 Draw and describe the shape resulting from a vertical, angled, and horizontal cross section of a square pyramid.

	Slice	Drawing	Description
Vertical			The cross section is a triangle.
Angled			The cross section is a trapezoid.
Horizontal			The cross section is a square.

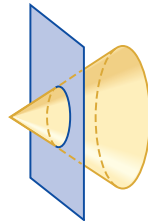
Exercises 1–13. See Student Handbook Answer Appendix.

Draw and describe the shape resulting from each cross section.

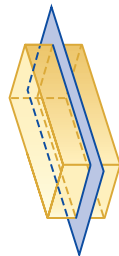
- cone
- triangular pyramid
- rectangular prism



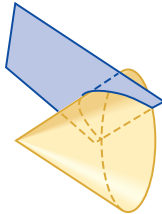
- cone



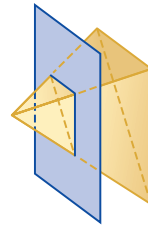
- rectangular prism



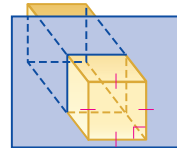
- cone



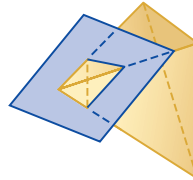
- triangular pyramid



- rectangular prism



- triangular prism



SPORTS For Exercises 10 and 11, use the following information.

A standard basketball is shaped like a sphere.

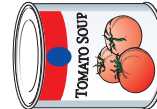
- Draw a basketball with a vertical, angled, and horizontal slice.
- Draw and describe the cross section made by each slice.



SPORTS For Exercises 12 and 13, use the following information.

A soup can is shaped like a cylinder.

- Draw a soup can with a vertical, angled, and horizontal slice.
- Draw and describe the cross section made by each slice.



11 Converting Between Measurement Systems

Dimensional analysis is the process of including units of measurement as factors when you compute. You can use ratios to convert measurements between the two common measurement systems. For example, since 1 in. \approx 2.54 cm, the ratio $\frac{1 \text{ in.}}{2.54 \text{ cm}} \approx 1$. So, you can multiply a measurement by this ratio without changing its value.

Conversion Factors for Length	
1 in. \approx 2.54 cm	1 yd \approx 0.914 m
1 ft \approx 0.305 m	1 mi \approx 1.609 km
Conversion Factors for Capacity and Mass or Weight	
1 fl oz \approx 29.574 mL	1 qt \approx 0.946 L
1 pt \approx 0.473 L	1 gal \approx 3.785 L
1 oz \approx 28.35 g	1 lb \approx 0.454 kg

EXAMPLES Convert Between Systems

1 15 feet to meters

Use 1 ft \approx 0.305 meters.

$$15 \text{ ft} \approx 15 \text{ ft} \cdot \frac{0.305 \text{ m}}{1 \text{ ft}}$$

$$\approx 15 \cancel{\text{ft}} \cdot \frac{0.305 \text{ m}}{1 \cancel{\text{ft}}}$$

$$\approx 15 \text{ ft} \cdot 0.305 \text{ or } 4.58 \text{ m}$$

So, 15 feet is approximately 4.58 meters.

Since 1 ft \approx 0.305 m, multiply by $\frac{0.305 \text{ m}}{1 \text{ ft}}$.

Divide out common units, leaving the desired unit, meter.

Multiply.

2 22 kilograms to pounds.

Use 1 lb \approx 0.454 kg.

$$22 \text{ kg} \approx 22 \text{ kg} \cdot \frac{1 \text{ lb}}{0.454 \text{ kg}}$$

$$\approx 22 \cancel{\text{kg}} \cdot \frac{1 \text{ lb}}{0.454 \cancel{\text{kg}}}$$

$$\approx \frac{22}{0.454} \text{ or } 48.46 \text{ pounds. Divide.}$$

So, 22 kilograms is approximately 48.46 pounds.

Since 1 qt \approx 0.946 L, multiply by $\frac{1 \text{ lb}}{0.454 \text{ kg}}$.

Divide out common units, leaving the desired unit, pound.

Exercises 1–16. See Student Handbook Answer Appendix.

Complete each conversion. Round to the nearest hundredth.

- 17 in. \approx \blacksquare cm
- 13 L \approx \blacksquare gal
- 15 oz \approx \blacksquare g
- 12 m \approx \blacksquare ft
- 10 L \approx \blacksquare pt
- 150 cm \approx \blacksquare in.
- 18 fl oz \approx \blacksquare mL
- 15 km \approx \blacksquare mi
- 8 yd \approx \blacksquare m
- 25 mi \approx \blacksquare km
- 200 mL \approx \blacksquare fl oz
- 12 L \approx \blacksquare qt
- 32 ft \approx \blacksquare m
- 12 gal \approx \blacksquare L
- 575 g \approx \blacksquare oz
- 55 lb \approx \blacksquare kg

17. ANIMALS A peregrine falcon can reach a speed of 250 kilometers per hour. How many miles is this per hour? **155.38 miles per hour**

18. FOOD The heaviest apple ever picked weighed about 4 pounds. About how many kilograms did the apple weigh? **1.82 kg**

12 Volume and Surface Area of Composite Figures

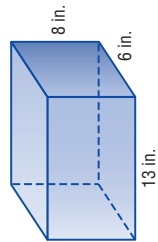
Volume is the measure of space occupied by a three-dimensional figure. The volume of a composite figure can be found by separating the figure into solids whose volumes you know how to find.

EXAMPLE Find the Volume of a Composite Figure

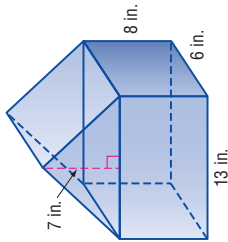
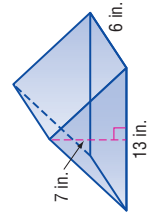
- 1 Find the volume of the toy house shown at the right.

The toy house is made of one rectangular prism and one triangular prism. Find the volume of each prism.

Rectangular Prism



Triangular Prism



$$V = Bh$$

$$V = B/h$$

$$V = (13 \cdot 6) \cdot 8 \text{ or } 624$$

$$V = \left(\frac{1}{2} \cdot 13 \cdot 7\right) \cdot 6 \text{ or } 273$$

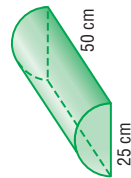
The volume of the toy house is $624 + 273$ or 897 cubic inches.

EXAMPLE Find the Surface Area of a Composite Figure

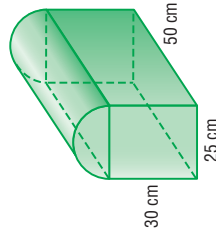
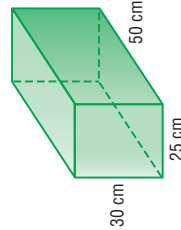
- 2 Max is painting the mailbox shown. What is the area of the surface that is to be painted? Round to the nearest tenth.

The mailbox is made of one half of one cylinder and one rectangular prism.

Cylinder



Rectangular Prism



There is only one base needed. The top is covered by the half cylinder

$$S = \frac{2\pi r^2 + 2\pi rh}{2}$$

$$S = 2\ell w + 2\ell h + wh$$

$$S = \frac{2\pi(12.5)^2 + 2\pi(12.5)(50)}{2}$$

$$S = 2 \cdot 25 \cdot 30 + 2 \cdot 25 \cdot 50 + 30 \cdot 50$$

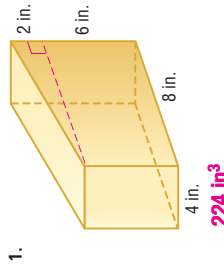
$$S \approx 2,454.4$$

$$S = 5,500$$

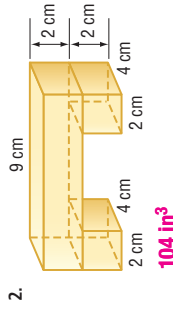
So, the area to be painted is equal to $2,454.4 + 5,500$ or $7,954.4$ square centimeters.

Exercises

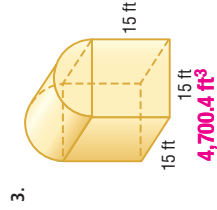
Find the volume of each figure. Round to the nearest tenth if necessary.



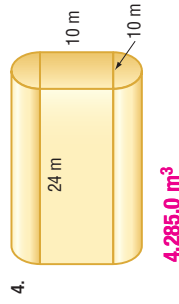
$$224 \text{ in}^3$$



$$104 \text{ in}^3$$

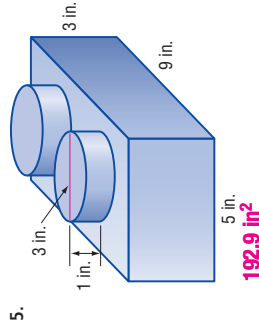


$$4,700.4 \text{ ft}^3$$

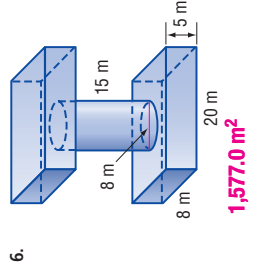


$$4,285.0 \text{ m}^3$$

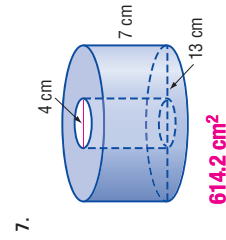
Find the surface area of each figure. Round to the nearest tenth if necessary.



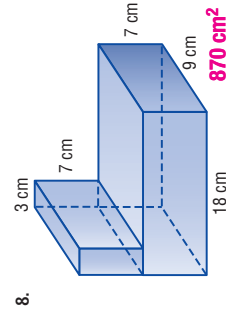
$$192.9 \text{ in}^2$$



$$1,577.0 \text{ m}^2$$



$$614.2 \text{ cm}^2$$



$$870 \text{ cm}^2$$

13 Relative Error and Magnitude

Significant error can occur when estimating or making predictions using large numbers. By comparing estimates to exact calculations, you can identify the amount of error that occurred as a result of rounding or estimating.

The **absolute error** is the magnitude of the difference between the estimate and the actual answer. **Relative error** is the absolute error in estimating a quantity divided by the magnitude of the exact value.

EXAMPLE

Estimate the population increase for New York City from 2003 to 2006. Then find the exact population increase and compare.

Estimate: $8,200,000 - 8,100,000 = 100,000$

Exact: $8,214,426 - 8,085,742 = 128,684$

The estimate is much lower than the exact population increase. The absolute error is the difference between the estimate and the exact answer: $128,684 - 100,000$, or 28,684 people.

The relative error is $\frac{28,684}{128,684}$ or approximately 0.22 or 22%.

New York City	
Year	Population
2006	8,214,426
2005	8,143,197
2004	8,104,079
2003	8,085,742

Exercises

Solve each problem. Compare your estimate to the exact answer by finding the relative error.

- Find the area of a circle with a radius of 14 centimeters. First calculate the area using 3 as an estimate for π . Then use 3.14 to find the area.
Sample answer: estimate: 126; exact: 138.03; relative error ≈ 0.09
- Jennifer is planning a wedding reception for 300 guests. The table shows the cost per person for each part of the meal. She needs to know the total approximate cost of the food for the reception.
Sample answer: estimate: \$4,500; exact: \$4,185; relative error ≈ 0.07
- Antonio is driving 2,452 miles from Albany, New York, to Los Angeles, California. He drives about 68 miles per hour for most of the trip. Antonio estimates how long his trip will take by rounding 68 to 70 and 2,452 to 2,500.
Sample answer: estimate: 35 h 43 min; exact: 36 h 4 min; relative error ≈ 0.01
- As part of their grand opening, a new grocery store decides to give a free gallon of milk to their first 1,500 customers. Normally the milk sells for \$3.49 per gallon. How much will the grand-opening special cost the grocery store?
Sample answer: estimate: \$6,000; exact: \$5,235; relative error ≈ 0.15

Cost (per person)	
Appetizer	\$2.75
Entrée	\$6.75
Beverage	\$1.55
Cake	\$2.90

Extra Practice

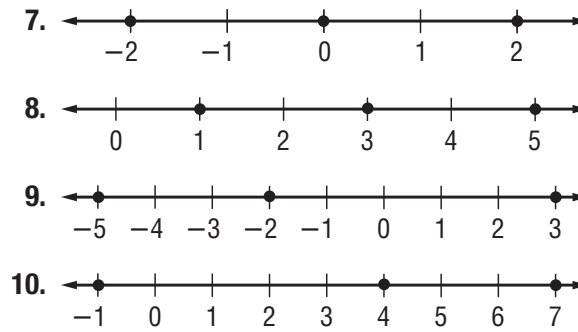
Page 670, Extra Practice, (Lesson 1-8)

- | | |
|------------------------------|------------------------------|
| 13. Distributive | 14. Commutative (\times) |
| 15. Associative (+) | 16. Commutative (+) |
| 17. Distributive | 18. Identity (\times) |
| 19. Associative (\times) | 20. Associative (+) |
| 21. Associative (\times) | 22. Identity (+) |
| 23. Commutative (\times) | 24. Commutative (+) |

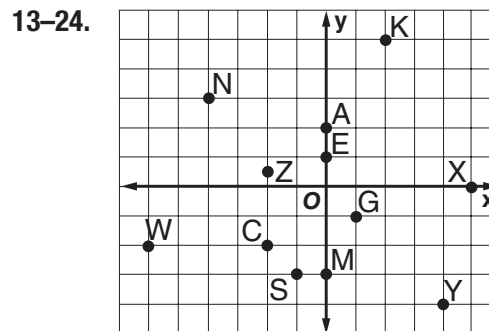
Page 670, Extra Practice, (Lesson 1-9)

- 4 is added to each term; 21, 25, 29
- 2 is added to each term; 11, 13, 15
- 5 is added to each term; 30, 35, 40
- 3 is added to each term; 102, 105, 108
- 6 is added to each term; 32, 38, 44
- 0.9 is added to each term; 8.1, 9.0, 9.9
- 0.1 is added to each term; 0.6, 0.7, 0.8
- 1.1 is added to each term; 6.7, 7.8, 8.9
- 0.2 is added to each term; 9.7, 9.9, 10.1
- 8 is added to each term; 35, 43, 51
- 25 is added to each term; 450, 475, 500
- 15 is added to each term; 680, 695, 710
- 5 is added to each term; 22, 27, 32
- 7 is added to each term; 38, 45, 52
- 7 is added to each term; 28, 35, 42
- 6 is added to each term; 25, 31, 37
- 6 is added to each term; 119, 125, 131
- 81 is added to each term; 333, 414, 495
- 0.2 is added to each term; 3.4, 3.6, 3.8
- 0.5 is added to each term; 6.1, 6.6, 7.1
- 1.1 is added to each term; 11.0, 12.1, 13.2
- 1.5 is added to each term; 25.5, 27, 28.5
- 0.3 is added to each term; 15.7, 16.0, 16.3
- 0.3 is added to each term; 1.3, 1.6, 1.9

Page 671, Extra Practice, (Lesson 2-1)



Page 672, Extra Practice, (Lesson 2-3)



Page 674, Extra Practice, (Lesson 3-1)

- | | |
|---------------------|--------------------------|
| 1. $p - 6$ | 2. $20 + c$ |
| 3. $\frac{a}{b}$ | 4. $a + 6$ |
| 5. $x + 12$ | 6. $\frac{\$1,000}{z}$ |
| 7. $\frac{y}{3}$ | 8. $7m$ |
| 9. $f - 9$ | 10. $26 - q$ |
| 11. $19 - z$ | 12. $x - 2$ |
| 13. $3x - 4 = 17$ | 14. $n + 6 = 5$ |
| 15. $20 + 2n = -30$ | 16. $\frac{n}{-2} = -42$ |
| 17. $4 + 3n = 18$ | 18. $5n - 15 = 92$ |
| 19. $8n + 12 = 36$ | 20. $n - 24 = -30$ |

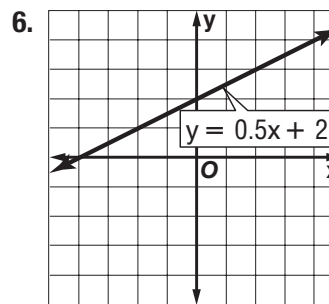
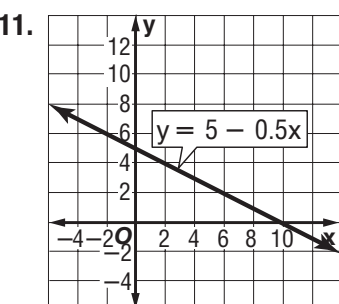
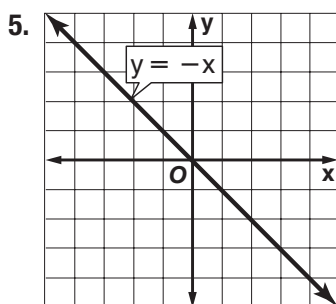
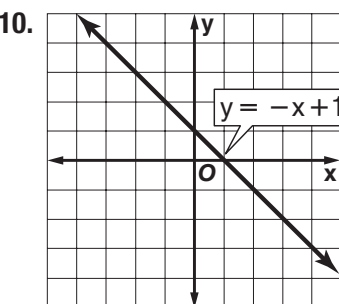
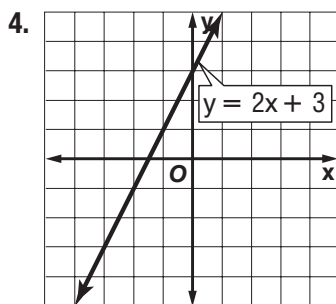
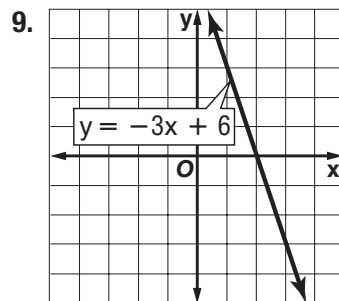
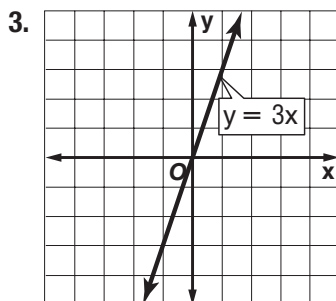
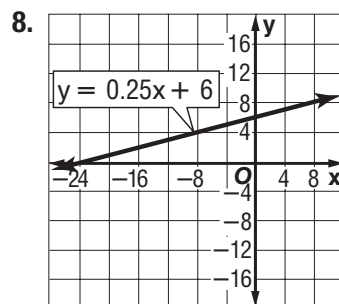
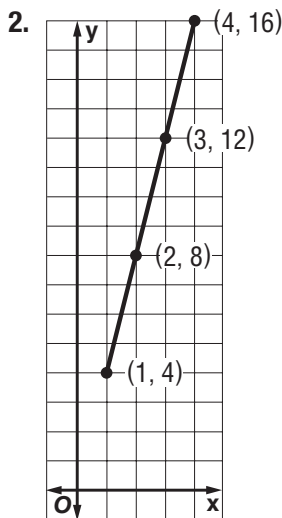
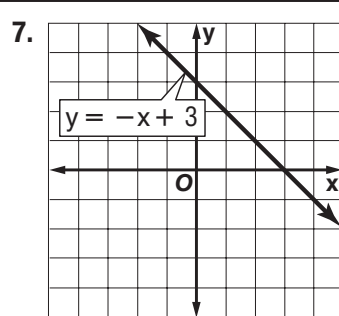
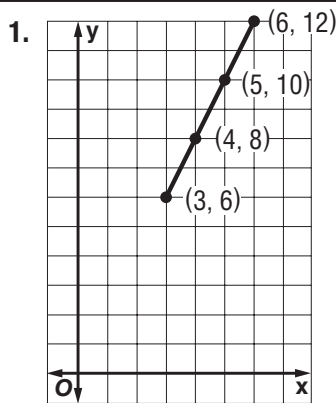
Page 675, Extra Practice, (Lesson 3-4)

3. Greg rented 9 videos, Paloma rented 5, Grace rented 1, and Jack rented 10.

Page 675, Extra Practice, (Lesson 3-6)

6. 13.5 km; 7.875 km² 8. 50 m; 96.1875 m²

Page 676, Extra Practice, (Lesson 3-7)



Page 676, Extra Practice, (Lesson 4-1)

19. $5 \times 7 \times x \times y$ 20. $2 \times 7 \times a \times a$
 21. $2 \times 3 \times 5 \times n$ 22. $3 \times 3 \times 3 \times c \times d \times d$
 23. $2 \times 2 \times s \times s \times t \times t$ 24. $2 \times 2 \times 3 \times 5 \times p \times p \times q \times r$

Page 681, Extra Practice, (Lesson 6-1)

7. yes; $\frac{4}{6} = \frac{2}{3}$ and $\frac{8}{12} = \frac{2}{3}$, so $\frac{4}{6} = \frac{8}{12}$
 8. no; $\frac{20}{25} \neq \frac{16}{30}$ since $\frac{20}{25} = \frac{4}{5}$ and $\frac{16}{30} = \frac{8}{15}$
 9. no; $\frac{20}{15} \neq \frac{30}{25}$ since $\frac{20}{15} = \frac{4}{3}$ and $\frac{30}{25} = \frac{6}{5}$
 10. yes; $\frac{36}{63} = \frac{4}{7}$ since $\frac{28}{49} = \frac{4}{7}$, so $\frac{36}{63} = \frac{28}{49}$

Page 682, Extra Practice, (Lesson 6-2)

8. 3 classes/semester

Page 683, Extra Practice, (Lesson 6-5)

1. yes; $\frac{2}{3} = \frac{6}{9}$ since $2 \times 9 = 18$ and $3 \times 6 = 18$
 2. no; $\frac{3}{1} \neq \frac{15}{6}$ since $3 \times 6 = 18$ but $1 \times 15 \neq 18$
 3. no; $\frac{2}{1} \neq \frac{8}{3}$ since $2 \times 3 = 6$, but $1 \times 8 \neq 6$
 4. yes; $\frac{1}{60} = \frac{6}{360}$ since $1 \times 360 = 360$ and $60 \times 6 = 360$
 5. no; $\frac{4}{1.60} \neq \frac{9}{3.40}$ since $4 \times 3.40 = 13.60$, but $1.60 \times 9 \neq 13.60$
 6. no; $\frac{159.95}{1} \neq \frac{315.90}{2}$ since $159.95 \times 2 = 319.90$, but $1 \times 315.90 \neq 319.90$

Page 683, Extra Practice, (Lesson 6-7)

1. Multiplication followed by subtraction; $12 \times 8 = 96$, $96 - 8 = 88$, $88 - 2 = 86$, 12 correct, 2 incorrect, 1 no answer

Page 684, Extra Practice, (Lesson 6-9)

8. 0.0042; $\frac{21}{5000}$

Page 685, Extra Practice, (Lesson 7-3)

13. $0.1 \times 40 = 4$ and $3 \times 4 = 12$
14. $0.1 \times 100 = 10$ and $7 \times 10 = 70$
15. $0.1 \times 150 = 15$ and $9 \times 15 = 135$
16. $0.1 \times 70 = 7$ and $7 \times 7 = 49$
17. $0.1 \times 90 = 9$ and $8 \times 9 = 72$
18. $0.1 \times 180 = 18$
19. $0.1 \times 220 = 22$ and $5 \times 22 = 110$
20. $0.1 \times 500 = 50$ and $2 \times 50 = 100$
21. $0.1 \times 400 = 40$ and $8 \times 40 = 320$
22. $0.1 \times 60 = 6$ and $4 \times 6 = 24$
23. $0.1 \times 180 = 18$ and $6 \times 18 = 108$
24. $0.1 \times 450 = 45$ and $2 \times 45 = 90$

Page 685, Extra Practice, (Lesson 7-4)

- | | |
|-----------------------------------|--------------------------------------|
| 1. $n = 0.45 \times 50$; 22.5 | 2. $75 = p \times 300$; 25% |
| 3. $2 = 0.16 \times w$; 12.5 | 4. $n = 0.75 \times 80$; 60 |
| 5. $12 = 0.05 \times w$; 240 | 6. $n = 0.60 \times 45$; 27 |
| 7. $90 = p \times 95$; 94.7% | 8. $n = 0.285 \times 64$; 18.2 |
| 9. $n = 0.465 \times 75$; 34.9 | 10. $n = 0.555 \times 70$; 38.9 |
| 11. $80.5 = 0.805 \times w$; 100 | 12. $40 = \frac{2}{3} \times w$; 60 |
| 13. $n = 1.225 \times 80$; 98 | 14. $75 = 2.5 \times w$; 30 |

Page 686, Extra Practice, (Lesson 7-7)

- | | |
|-----------------|--------------|
| 1. \$47.70 | 2. \$16.14 |
| 3. \$179.10 | 4. \$31.03 |
| 5. \$14.25 | 6. \$154.06 |
| 7. \$12.54 | 8. \$719.20 |
| 9. \$112.88 | 10. \$527.12 |
| 11. \$12,968.75 | 12. \$52.57 |

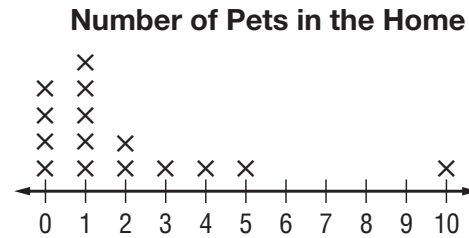
Page 687, Extra Practice, (Lesson 7-8)

- | | |
|----------------|--------------|
| 1. \$800 | 2. \$33.33 |
| 3. \$37.50 | 4. \$17.11 |
| 5. \$28.34 | 6. \$3.34 |
| 7. \$138 | 8. \$6.75 |
| 9. \$1,800 | 10. \$270 |
| 11. \$380 | 12. \$27 |
| 13. \$2,315.63 | 14. \$298.99 |

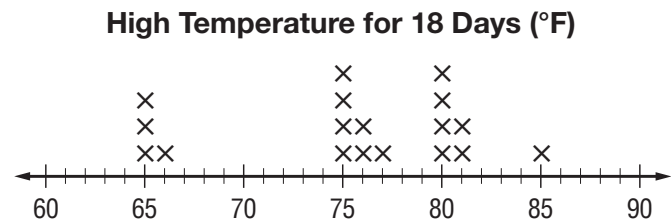
- | | |
|--------------|--------------|
| 15. \$165.36 | 16. \$91.41 |
| 17. \$183.33 | 18. \$680.40 |

Page 687, Extra Practice, (Lesson 8-1)

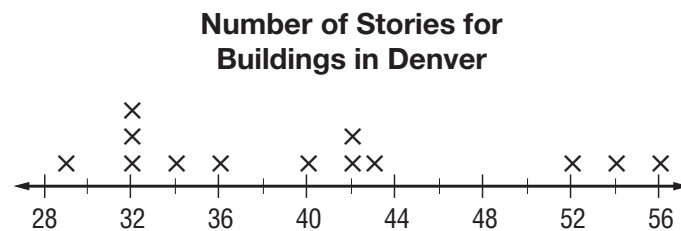
1. Sample answer: cluster 0–2; gap 5–10; outlier 10



2. Sample answer: clusters 65–66, 75–77, 80–81; gaps 66–75, 77–80, 81–85; outlier 85

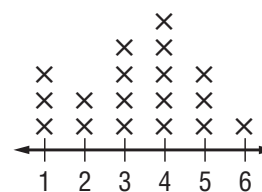


3. Sample answer: clusters 32–36, 40–43; gaps 36–40, 44–52; outlier none



4. Sample answer: cluster 1–9; gap none; outlier none

Ages of Children at Sunny Day Care (years)



Page 688, Extra Practice, (Lesson 8-3)

1. Stem	Leaf	2. Stem	Leaf
1	5 8	18	2 3 4 4 9
2	3 9	19	4 6 6 7
3	9		18 9 = 189
4	1 2		
5	1 2 7		
6	8		
	1 5 = 15		

3. Stem	Leaf
2	1 4 7
3	4
4	0 6
5	0 8
6	1 7
7	0 2

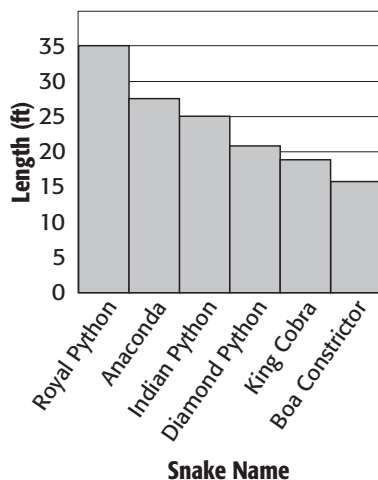
3|4 = 34

4. Stem	Leaf
2	0 0 0 3 7
3	0 1 2 4 4 5 7 9
4	2 8 9
5	2 5

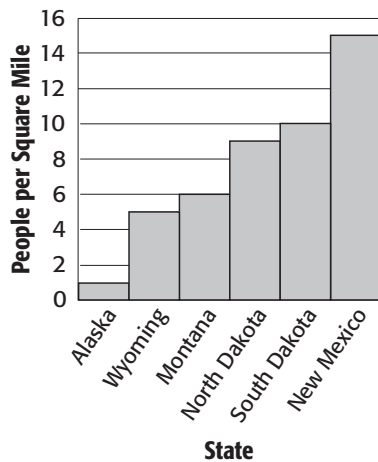
2|0 = 20

Page 688, Extra Practice, (Lesson 8-4)

1. Longest Snakes

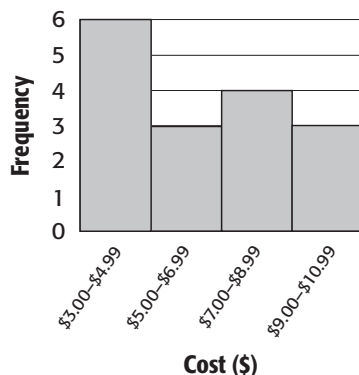


2. Least Densely Populated States



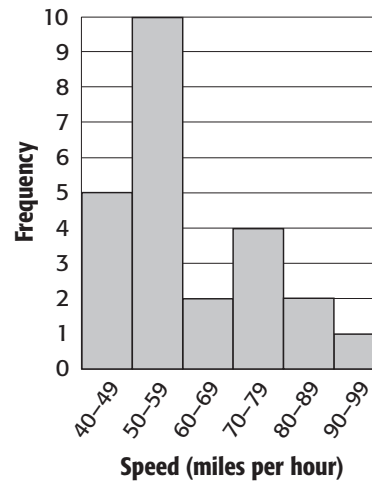
3. Histogram

Cost of a Movie Ticket



4. Histogram

Highest Recorded Wind Speeds

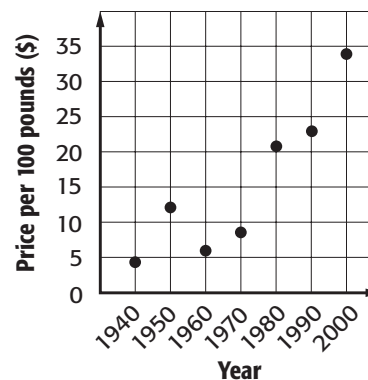


Page 689, Extra Practice, (Lesson 8-6)

2a. Histogram

2b. Sample answer: Except for 1960, the price increases during each ten-year period.

Price for Sheep



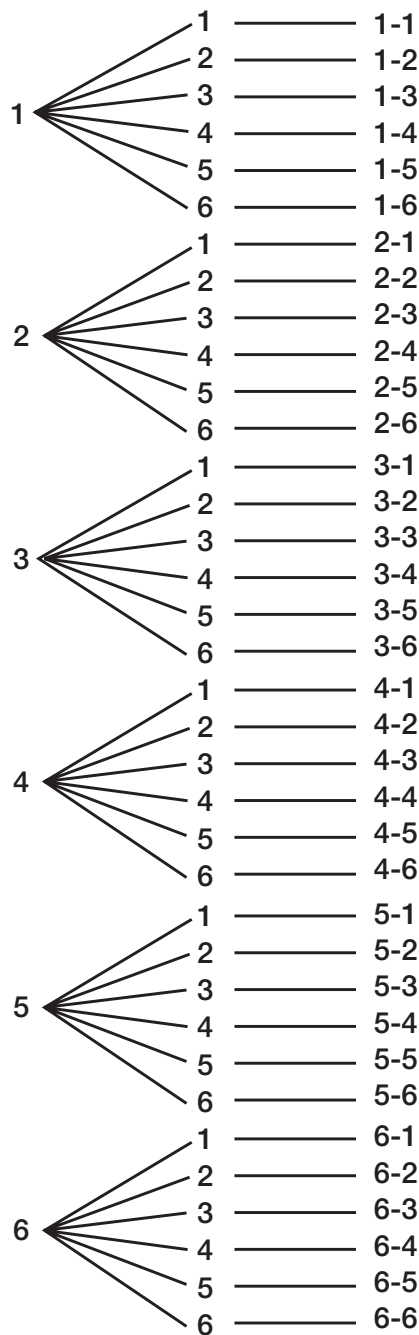
2c. Sample answer: about \$40; if you draw a line lying close to the points from 1960 to 2000, 40 lies at 2010.

Page 690, Extra Practice, (Lesson 8-9)

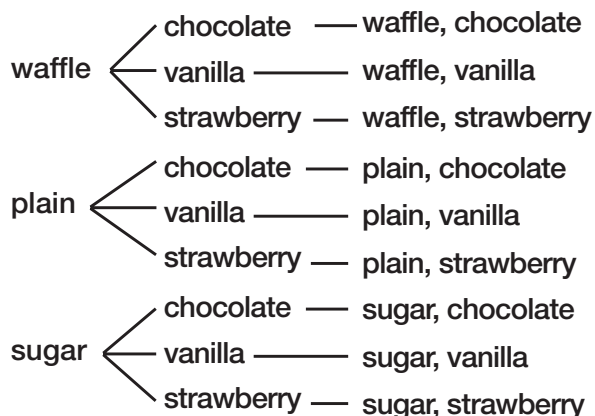
- Graph B is misleading. The change in the vertical scale makes it seem as if the pounds of grapes sold made drastic changes over the course of the week.
- Graph A is misleading. The change in the vertical scale makes it seem as if Mr. Turner made a lot more money in the third week.

Page 691, Extra Practice, (Lesson 9-2)

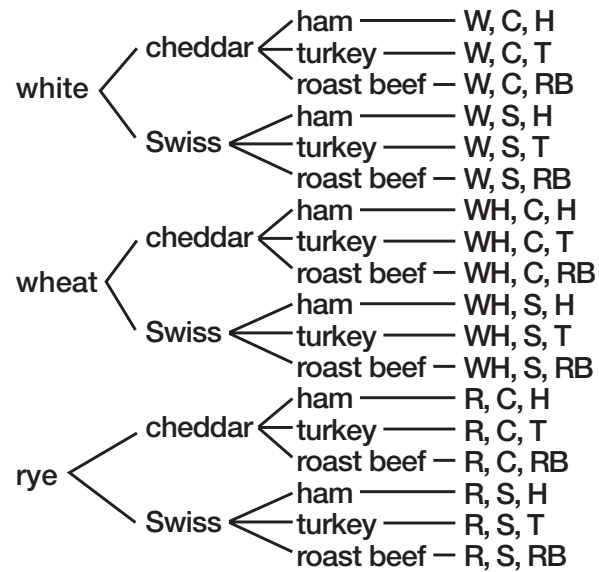
1. Number Cube 1 Number Cube 2 Sample Space



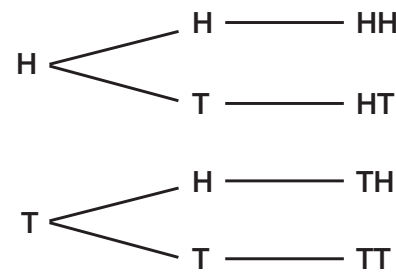
2. Ice Cream Cone Ice Cream Flavor Sample Space



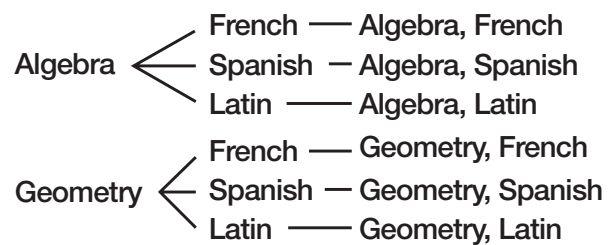
3. Bread Cheese Meat Sample Space



4. Penny 1 Penny 2 Sample Space



5. Math Foreign Language Sample Space

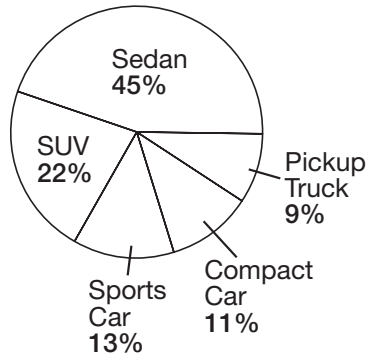


Page 692, Extra Practice, (Lesson 9-5)

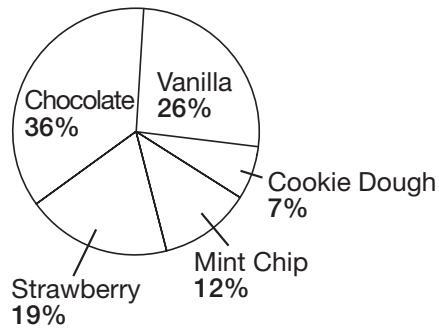
- 2. 924 ways
- 3. 56 ways

Page 694, Extra Practice, (Lesson 10-4)

1. Car Sales

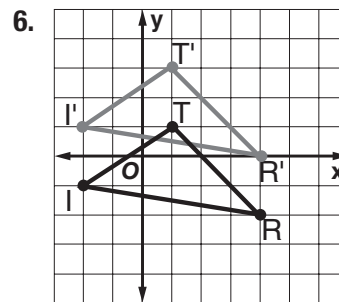
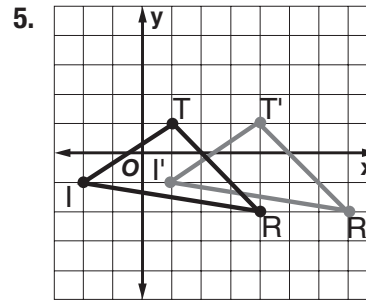
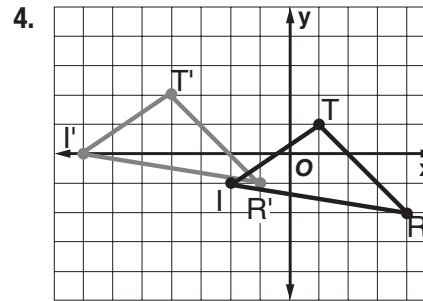
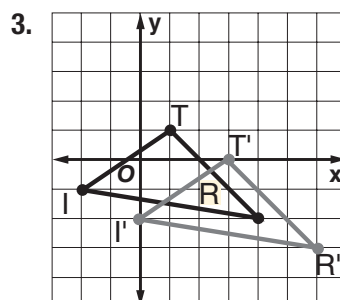
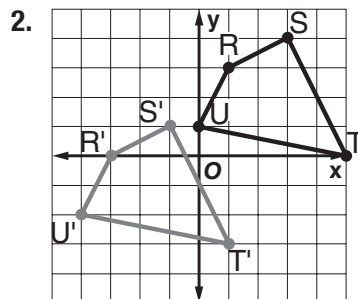
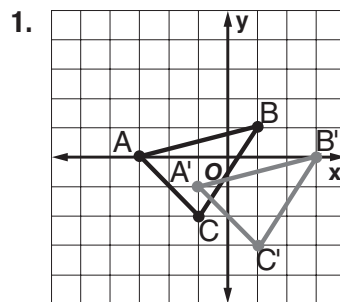


2. Favorite Flavor of Ice Cream



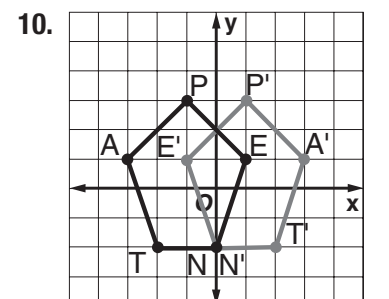
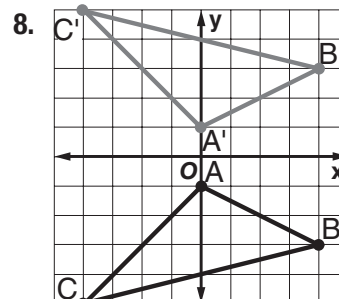
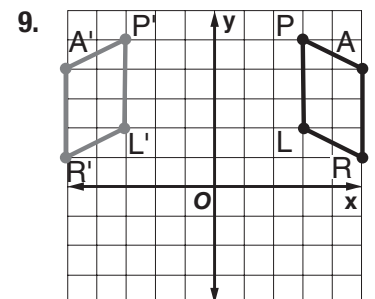
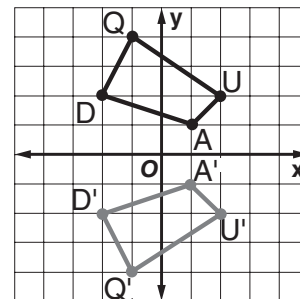
Page 694, E

Page 696, Extra Practice, (Lesson 10-9)



Page 696, Extra Practice, (Lesson 10-10)

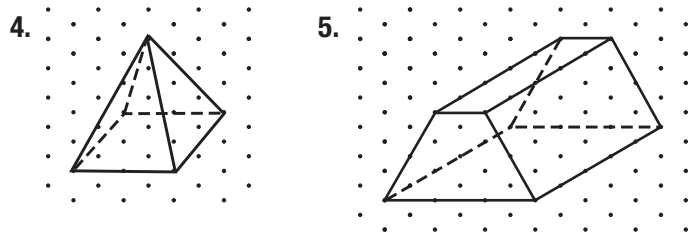
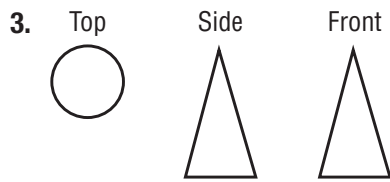
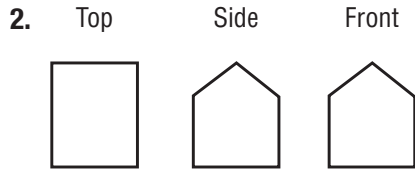
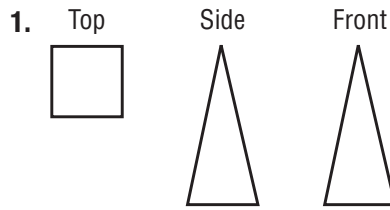
7. $Q(-1, -4)$, $U(2, -2)$,
 $A'(1, -1)$, $D'(-2, -2)$



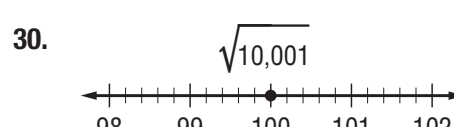
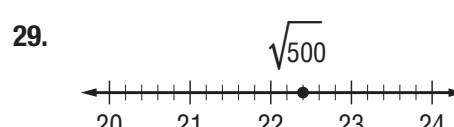
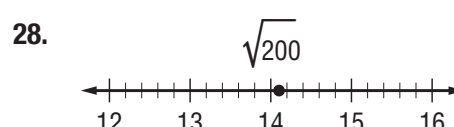
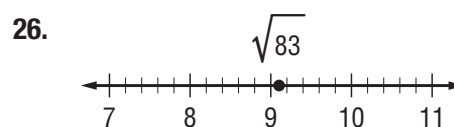
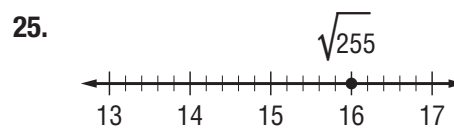
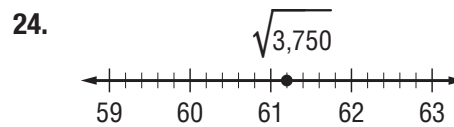
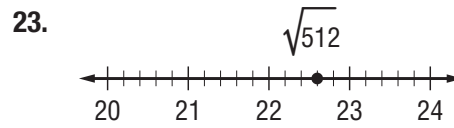
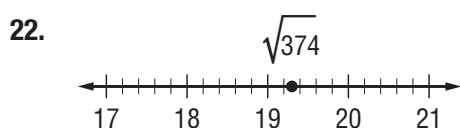
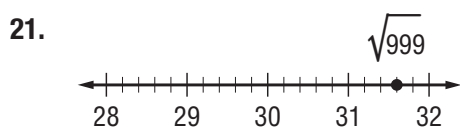
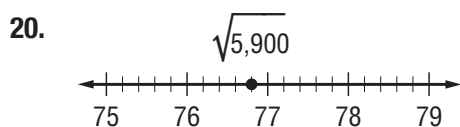
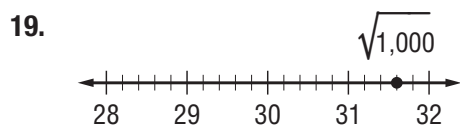
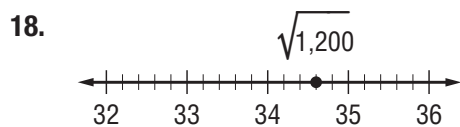
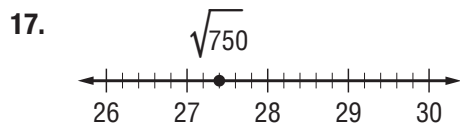
Page 698, Extra Practice, (Lesson 11-4)

- | | |
|-----------------------------|-----------------------------|
| 9. 14,526.7 cm ² | 11. 514.7 m ² |
| 14. 25.2 yd ² | 15. 1,626.0 mi ² |

Page 700, Extra Practice, (Lesson 11-8)



Page 701, Extra Practice, (Lesson 12-1)



Page 703, Extra Practice, (Lesson 12-4)

- | | |
|---------------------------|-----------------------------|
| 8. 13,992 cm ² | 11. 1,264.2 cm ² |
| 12. 184.4 mi ² | 14. 643.8 yd ² |
| 15. 343.8 in ² | 16. 470.6 mm ² |

Page 703, Extra Practice, (Lesson 12-5)

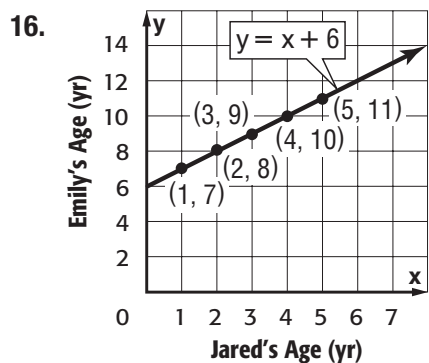
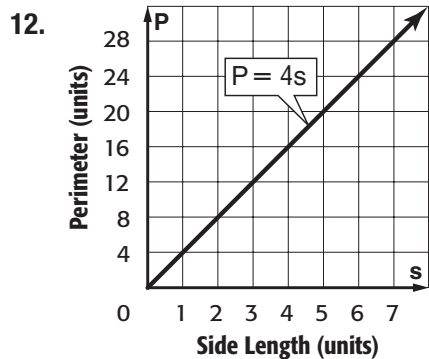
- | | |
|--------------------------|----------------------------|
| 9. 153.3 mi ² | 10. 327.2 cm ² |
| 11. 86.0 km ² | 12. 7,321.8 m ² |

Mixed Problem Solving

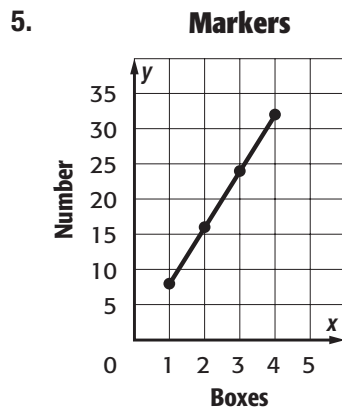
Page 705, Mixed Problem Solving, (Chapter 2)

- −220, −436, −511, −282, −383, −505, −235, −230
- −511, −505, −436, −383, −282, −235, −230, −220
- Hot Tower (0, 3); Ferris Wheel (0, −4)

Page 706, Mixed Problem Solving, (Chapter 3)



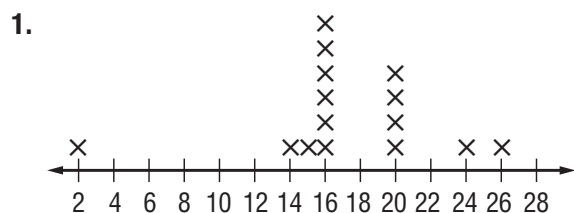
Page 709, Mixed Problem Solving, (Chapter 6)



Page 710, Mixed Problem Solving, (Chapter 7)

3. Sample answer: $0.1 \times 70,000 = 7,000$ and $\frac{1}{2} \times 7,000 = 3,500 \text{ mi}^2$

Page 711, Mixed Problem Solving, (Chapter 8)



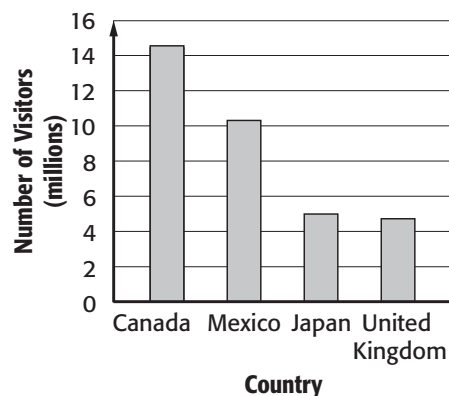
3. Sample answer: cluster 14–16: most of the energy bars have 14–16 grams of carbohydrates; gaps 2–14 and 16–20; outlier 2: one bar has 2 grams which is much less than the rest of the bars.

5.

Stem	Leaf
0	0 0 0 0
1	7
2	
3	
4	
5	
6	0
7	8
8	0 1 2 2 2 2 2 2 2

$7|8 = 78 \text{ games}$

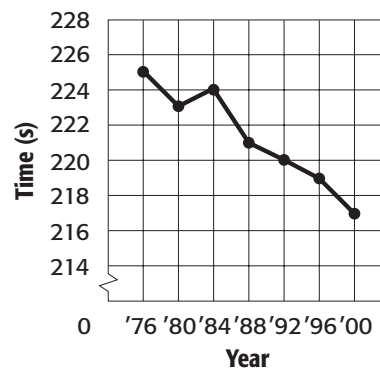
6. **Tourists in U.S.**



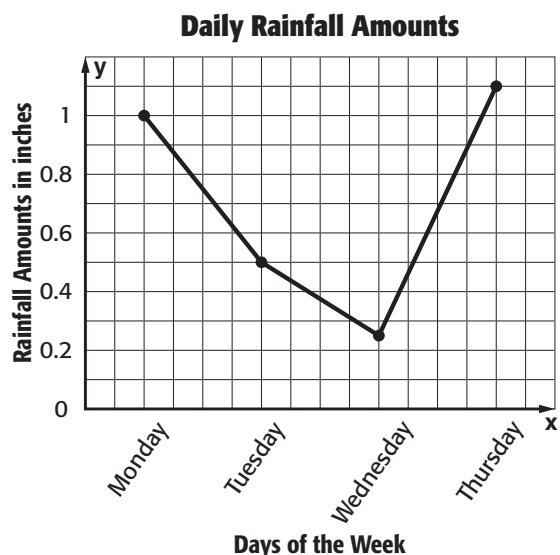
7. The number 144 would be placed in the overlap between Even Numbers and Perfect Squares along with the number 4.

9. Yes; sample answer: the junior high sold approximately 185 lunches on Monday which is about $\frac{3}{4}$ of the number of lunches sold on Thursday, 250.

10. **Winning Times**

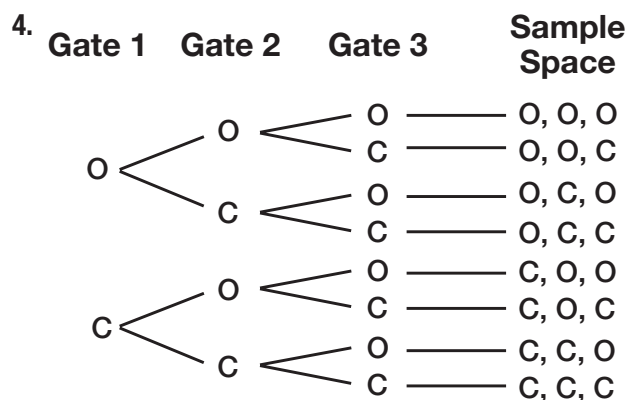


12. Sample answer: line graph



13. Sample answer: Mallory used the mean to calculate her average number number of monthly minutes. This is misleading because of the outlier, 602. A more appropriate measure to use to describe the data would be the median.

Page 712, Mixed Problem Solving, (Chapter 9)

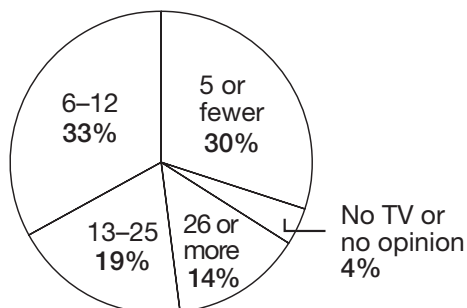


O = Open C = Closed

Page 713, Mixed Problem Solving, (Chapter 10)

2. Sample answer: on the circle between *A* and *B* or between *A* and *D*

4. **Channels that Families Watch**

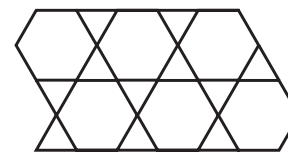


5. Sample answer: Victor could subtract 90° and 55° from 180° , leaving 35° . Thus, the measure of the third angle is 35° .

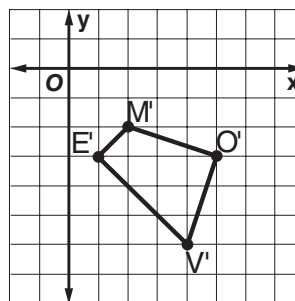
8. $m\angle 1 = 80^\circ, m\angle 2 = 100^\circ, m\angle 3 = 80^\circ, m\angle 4 = 50^\circ, m\angle 5 = 130^\circ, m\angle 6 = 50^\circ, m\angle 7 = 50^\circ, m\angle 8 = 130^\circ, m\angle 9 = 50^\circ, m\angle 10 = 40^\circ$.

9. Rectangle; sample answer: it was four right angles, but the four sides may not be congruent.

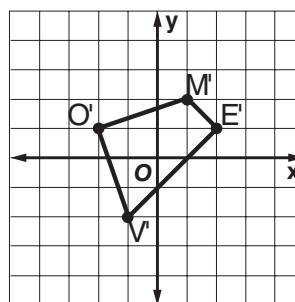
11. Sample answer: triangles and quadrilaterals; the sum of the angles where the vertices meet is 360° .



12. 3 units right, 4 units down

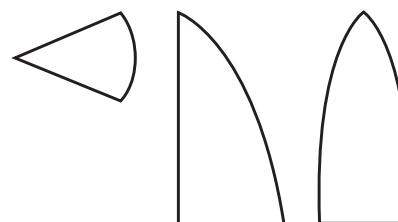


13. $M'(1, 2), O'(-2, 1), V'(-1, -2), E'(2, 1)$



Page 714, Mixed Problem Solving, (Chapter 11)

9. Sample answer: top side front

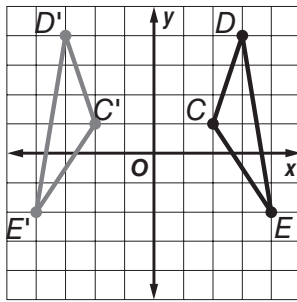


Preparing for Standardized Tests

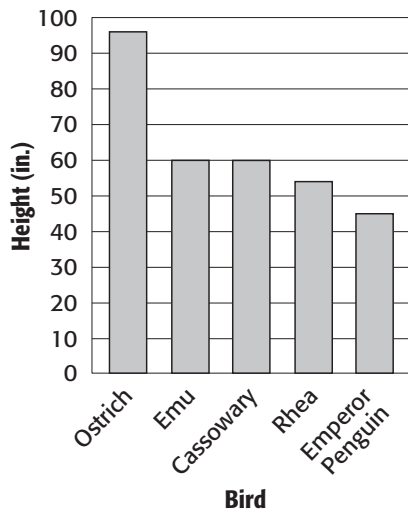
Page 728, Short-Response Practice

8. The slope is 0.2. It means that Tyler charges \$0.20 per mile. The *y*-intercept is \$6. It means that there is an initial charge of \$6 for any delivery in addition to the miles driven.

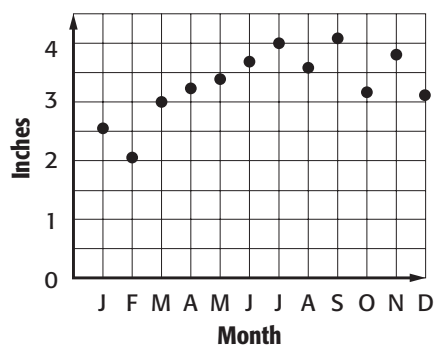
13. $C'(-2, 1)$, $D'(-3, 4)$, $E'(-4, -2)$



20. **World's Largest Flightless Birds**



21. **Precipitation in Syracuse**

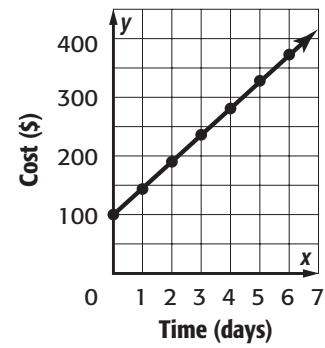


Sample answer: The amount of precipitation is lowest in February and then increases until July.

Page 732, Extended Response Practice

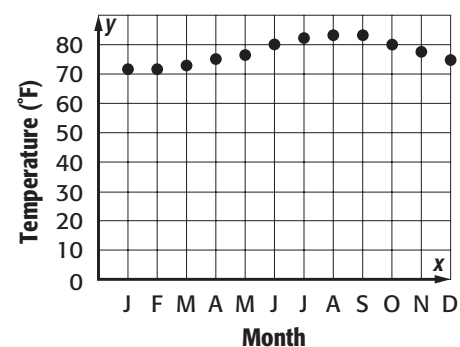
- 1a. Florida: about 10.0%; Colorado: about 0.4%; Alaska: about 7.3%; Iowa: about 0.7%; Rhode Island: about 15.1%
- 1b. Colorado, Iowa, Alaska, Florida, Rhode Island
- 1c. Sample answer: land area of 2,000 square miles, water area of 500 square miles, percent comparing water to total = $500 \div 2,500 \times 100 = 20\%$

2a. **Cost to Rent a Crane**



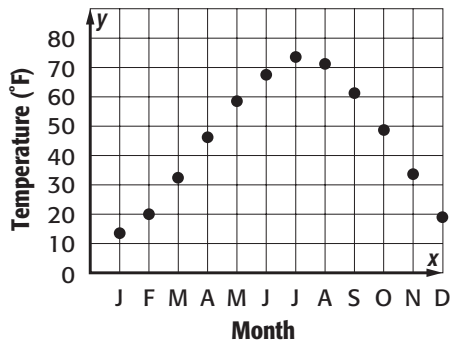
- 2b. The slope of the line is 45. That is the rental fee per day.
- 2c. \$550
- 3a. $2.80 = 0.40 + 0.04x$; 60 minutes.
- 3b. \$3.60
- 3c. Use the service that charges 40 cents per connection and 4 cents per minute.
- 4a. The area is 2,400 square inches.
- 4b. The dimensions are 80 inches by 120 inches. The area is 9,600 square inches.
- 4c. The ratio of the areas is 4 to 1.
- 4d. Sample answer: 60 inches by 80 inches
- 5a. The measure of $\angle 1$ is 60° since the sum of the measures of the angles of any triangle is 180° .
- 5b. The measure of $\angle 2$ is 110° because the two angles are supplementary. The measure of $\angle 3$ is 95° since the sum of the measures of the angles of a quadrilateral is always 360° .
- 6a. The area is about 452 square inches.
- 6b. The area is about 616 square inches.
- 6c. The percent increase in area is about 36%.
- 7a. A: 62.8 in^3 ; B: 78.5 in^3
- 7b. 0.8
- 7c. Sample answer: 5 in. by 4 in. by 7.85 in.

8a. **Normal Temperatures for Honolulu**



Sample answer: The points suggest a curve if connected. The curve is very slight but goes to its highest point during August and September and then curves downward again.

8b. Normal Temperatures for Minneapolis



Sample answer: The points suggest a curve if connected. The curve is fairly steep as it goes up from January to July and then goes back downward to December.

8c. The range for Honolulu is 9, while the range for Minneapolis is 60. Sample reasons: Honolulu is close to the equator and is also an island, which affects the climate. Minneapolis is in the northern portion of the continental United States, so will have more varied temperatures.

9a.

	1	2	3	4
1	1, 1	1, 2	1, 3	1, 4
2	2, 1	2, 2	2, 3	2, 4
3	3, 1	3, 2	3, 3	3, 4
4	4, 1	4, 2	4, 3	4, 4

9b. $\frac{1}{16}$

9c. Using theoretical probability, you would get a sum of 4 threes out of sixteen times. So, $50 \cdot \frac{3}{16} \approx 9$ times

Concepts and Skills Bank

Page 735, Concepts and Skills Bank

16–23. Sample answers are given.

- 16.** $3 \times 20 = 60$
- 17.** $4 \times 60 = 240$
- 18.** $4 \times 40 = 160$
- 19.** $4 \times 80 = 320$
- 20.** $4 \times 240 = 960$
- 21.** $6 \times 10 = 60$
- 22.** $5 \times 50 = 250$
- 23.** $5 \times 100 = 500$

Page 741, Concepts and Skills Bank

- 1.** $x \geq -7$
- 2.** $n < 5.3$

- 3.** $y \leq 34$
- 4.** $p \geq 3.3$
- 5.** $x \geq 2$
- 6.** $r < 14.7$
- 7.** $t \leq 4.7$
- 8.** $f > 9$
- 9.** $p \geq 16$
- 10.** $r \geq 5$
- 11.** $n < 5$
- 12.** $d \leq 1$

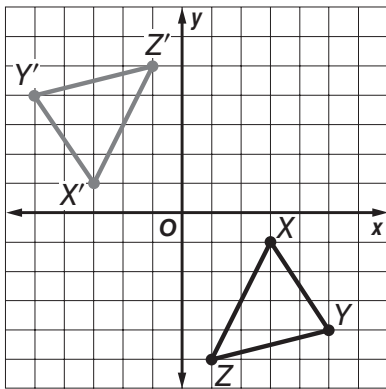
Page 742, Concepts and Skills Bank

- 1.** Yes, there are no denominator variables and no variables under radical signs.; 1 term
- 2.** No, the variable b is under a radical sign.
- 3.** Yes, there are no denominator variables and no variables under radical signs.; 3 terms
- 4.** Yes, there are no denominator variables and no variables under radical signs.; 1 term
- 5.** Yes, there are no denominator variables and no variables under radical signs.; 3 terms
- 6.** No, the variable n is in the denominator.
- 7.** Yes, there are no denominator variables and no variables under radical signs.; 3 terms
- 8.** No, the variable s is under a radical sign.
- 9.** $16r + 9s$

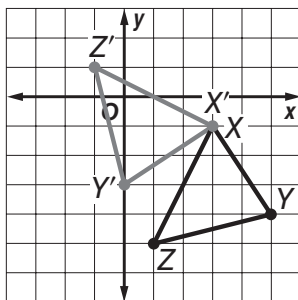
10. $10a + 5b + 10$
11. $9f + 9g$
12. $28x + 33y$
13. $5t + u + 10$
14. $17c + 17d$
15. $11j + 9$
16. $15p + 21q$
17. $21mn + 12m + 4n$
18. $15x + 14y$

Page 744, Concepts and Skills Bank

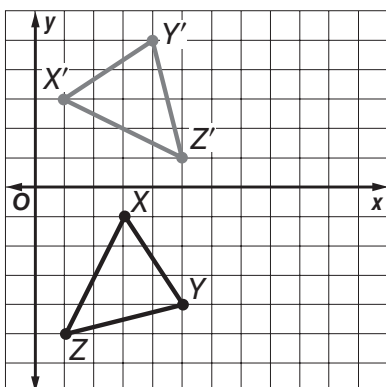
1. $X'(-3, 1)$, $Y'(-5, 4)$, and $Z'(-1, -5)$



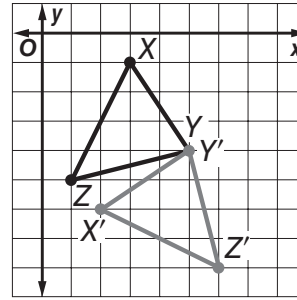
2. $X'(3, -1)$, $Y'(0, -3)$, and $Z'(-1, 1)$



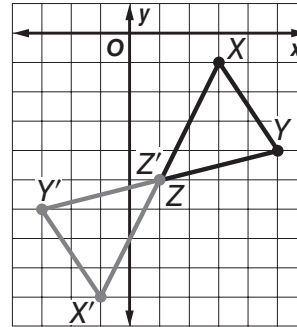
3. $X'(1, 3)$, $Y'(4, 5)$, and $Z'(5, 1)$



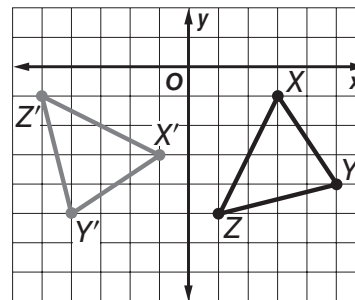
4. $X'(2, -6)$, $Y'(5, -4)$, and $Z'(5, -8)$



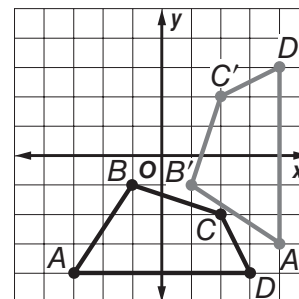
5. $X'(-1, -9)$, $Y'(-3, -6)$, and $Z'(1, -5)$



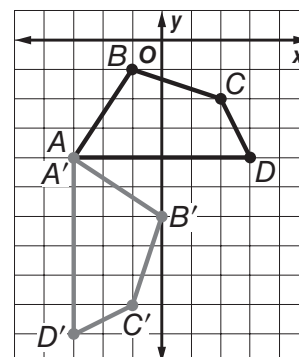
6. $X'(-1, -3)$, $Y'(-4, -5)$, and $Z'(-5, -1)$



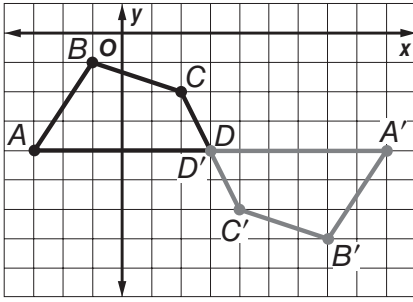
7. $A'(4, -3)$, $B'(1, -1)$, $C'(2, 2)$, and $D'(4, 3)$



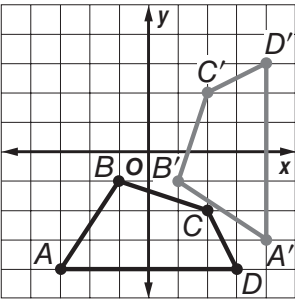
8. $A'(-3, -4)$, $B'(0, -6)$, $C'(-1, -9)$, and $D'(-3, -10)$



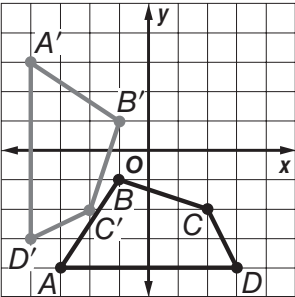
9. $A'(9, -4)$, $B'(7, -7)$, $C'(4, -6)$, and $D'(3, -4)$



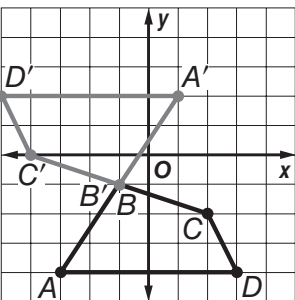
10. $A'(4, -3)$, $B'(1, -1)$, $C'(2, 2)$, and $D'(4, 3)$



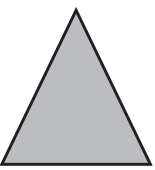
11. $A'(-4, 3)$, $B'(-1, 1)$, $C'(-2, -2)$, and $D'(-4, -3)$




12. $A'(1, 2)$, $B'(-1, -1)$, $C'(-4, 0)$, and $D'(-5, 2)$

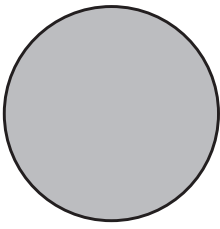


Page 746, Concepts and Skills Bank

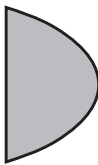
1.  ; triangle

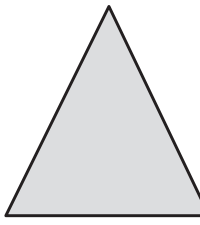
2.  ; triangle

3.  ; square

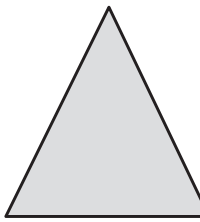
4.  ; circle

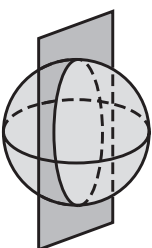
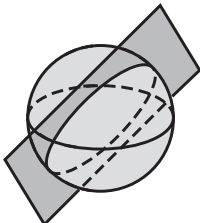
5.  ; rectangle

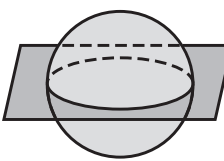
6.  ; curve

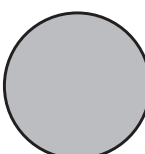
7.  ; triangle

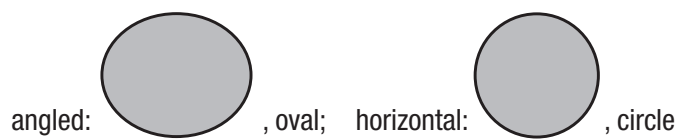
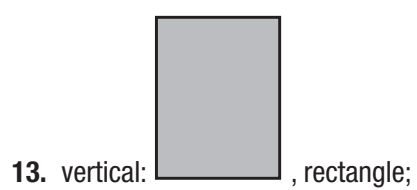
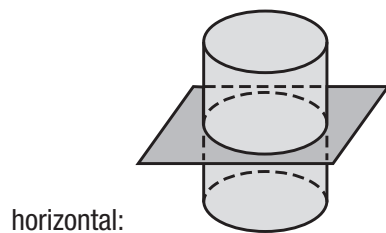
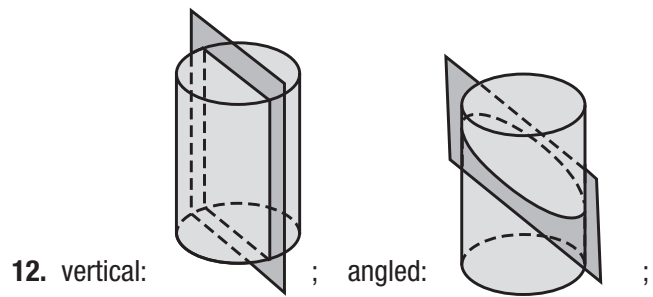
8.  ; square

9.  ; triangle

10. vertical:  ; angled:  ;

horizontal: 

11. All three cross sections are circles.; 



Page 747, Concepts and Skills Bank

1. 43.15
2. 3.43
3. 425.25
4. 39.34
5. 21.14
6. 59.06
7. 532.33
8. 9.32
9. 7.31
10. 40.22
11. 6.76
12. 12.68
13. 9.76
14. 45.42
15. 20.28
16. 24.97