

CHAPTER 1 Whole Numbers

Lesson 1.1

Key Concept, page 12

- 9
- 72
- 70
- 35

Think About Math, page 14 (top)

- 7 tens or 70
- 8 ten thousands or 80,000
- 6 ones or 6
- 3 hundred millions or 300,000,000
- 8 billions or 8,000,000,000

Think About Math, page 14 (bottom)

- E.
- D.
- A.
- C.
- B.

Think About Math, page 16

- Compare the digits of the numbers from left to right until the digits in the same column are different. The digits in the thousands place, 3 and 4, are not the same. Compare those digits. $204,210 > 203,478$.
- 698,321; 698,432; 701,286

Vocabulary Review, page 16

- value
- whole numbers
- periods
- digits
- approximate
- number line

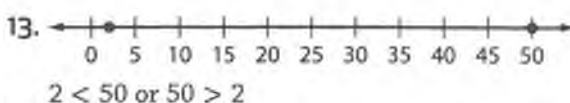
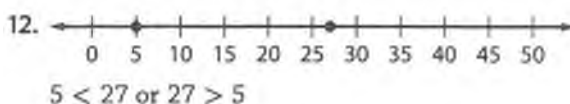
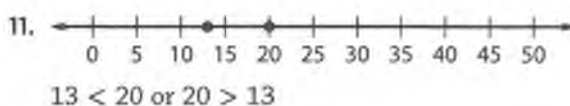
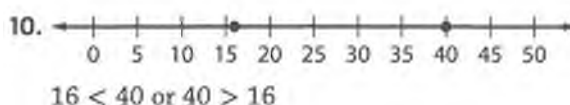
Skill Review, pages 16-17

- 2 millions or 2,000,000
- 4 hundred thousands or 400,000
- 7 ten thousands or 70,000
- 3 thousands or 3,000
- 0 hundreds
- 1 ten or 10
- 5 ones or 5

Thousands	Hundreds	Tens	Ones
6	7	2	9

9.

Millions	Hundred thousands	Ten thousands	Thousands	Hundreds	Tens	Ones
1	0	0	0	0	3	5



14. There are several ways to compare numbers correctly.

15. Digits represent numbers.

Answer Key

(Lesson 1.1 cont.)

Skills Practice, page 17

1. C. Answers (A) and (D) are in order from least to greatest. Answer (B) is not in any order.
2. A. Answer (B) written as a standard number is 240, Answer (C) is 214, and Answer (D) is 21.
3. D. $22,201 < 22,345 < 23,456 < 23,712$ so Car D at \$23,712 is the most expensive.
4. B. 0 is in the ten thousands place.

Lesson 1.2

Key Concept, page 18

- | | |
|--------------------------|------|
| 1. thirty-seven | 5. < |
| 2. one thousand, eight | 6. > |
| 3. one hundred fifty-two | 7. > |
| 4. thirty-two thousand | 8. < |

Think About Math, page 19

1. 79
2. 85
3. 553

Think About Math, page 20

1. 25
2. 1,932
3. 629

Vocabulary Review, page 20

1. difference
2. calculate
3. sum
4. operations

Skill Review, page 21

1. increased by; 3,642
2. combined; 6,063
3. deductions; \$387
4. depreciated; \$6,850
5. withdraws; \$466
6. total; 806
7. greater than; \$5,334

Skill Practice, page 21

1. D. add 456, 482, 449, 479, and 468 to find the total miles for the week
2. A. subtract 937,642 from 1,000,000 to find how many more
3. A. subtract 23,470 from 31,067 because *how much more* means to find a difference
4. B. add 380, 407, 298, and 321 because *how many in total* means to find a sum

Lesson 1.3

Key Concept, page 22

- | | |
|----------|--------|
| 1. 12 | 5. 33 |
| 2. 70 | 6. 637 |
| 3. 231 | 7. 46 |
| 4. 1,020 | 8. 12 |

Think About Math, page 23

- | | |
|-----------|------------|
| 1. 68 | 6. 684 |
| 2. 414 | 7. 3,552 |
| 3. 1,560 | 8. 9,936 |
| 4. 19,593 | 9. 48,200 |
| 5. 11,426 | 10. 51,345 |

Think About Math, page 24

- | | |
|------------|-----------|
| 1. 13 R2 | 6. 34 R1 |
| 2. 31 | 7. 20 |
| 3. 32 | 8. 15 R8 |
| 4. 202 R14 | 9. 109 R3 |
| 5. 200 | 10. 16 R1 |

Vocabulary Review, pages 24–25

- | | |
|-------------|-------------------|
| 1. divisor | 5. multiplication |
| 2. factor | 6. quotient |
| 3. product | 7. division |
| 4. dividend | |

Skill Review, page 25

1. same amount, each month; \$40
2. how much money did he collect; \$540
3. equally divided; 811 stamps
4. monthly; after two years; \$1,800
5. per ticket; \$1,748,250
6. tickets are \$3 each; 144 tickets
7. each table; 510 petals

Answer Key

(Lesson 1.3 cont.)

Skill Practice, page 25

1. C. Multiply the number of employees by their pay.
 $5 \times 589 = 2,945$
2. D. 1 year is equal to 12 months. Multiply 12 by the rent per month, \$525, to get \$6,300.
3. B. Divide the number of tables by the number of people at the table. $320 \div 16 = 20$
4. A. Divide the amount in ticket sales by the amount the band earns per ticket. $1,315 \div 5 = 263$

Lesson 1.4

Think About Math, page 29

The factors of 63 are: 3, 7, 9, and 21.

The factors of 28 are: 2, 4, 7, 14, and 28.

The only common factor is 7.

So, the greatest common factor is 7.

$$63 - 28 = (7 \times 9) - (7 \times 4)$$

$$(7 \times 9) - (7 \times 4) = 7 \times (9 - 4)$$

Finally, you can rewrite the original expression as:

$$63 - 28 = 7 \times (9 - 4)$$

Math Link, page 30

$$2 \times 10 = 20$$

$$4 \times 5 = 20$$

$$5 \times 4 = 20$$

$$10 \times 2 = 20$$

The factors of 20 are 2, 4, 5, and 10.

The Commutative Property of Multiplication states that the product remains the same regardless of the order of the numbers that are multiplied. During factoring, the Commutative Property becomes evident in the list of equations. Its appearance tells you that you have found all of the factors for a number and need not go any further.

Vocabulary Review, page 30

1. C.
2. A.
3. E.
4. B.
5. F.
6. G.
7. D.
8. H.

Skill Review, page 30

1. 2, 3, 4, 6
2. 2, 4, 8, 16
3. 3, 5, 9, 15
4. 2, 4, 11, 22
5. 2, 4, 8, 11, 22, 44
6. 4
7. 6
8. 7
9. 22
10. 50
11. $12 \times (2 + 3)$
12. $9 \times (5 - 3)$
13. $4 \times (5 + 16)$
14. $24 \times (2 + 3)$
15. $22 \times (3 - 2)$

Skill Practice, page 31

1. List the equations with the number as a product.

↓

Apply the Commutative Property of Multiplication to cross out equivalent equations.

↓

Cross out equations containing the factors 1 and the number itself.

↓

Order the remaining factors.

2. B.
3. B.
4. C.
5. B.
6. D.
7. E.

Answer Key

Lesson 1.5

Math Review, page 32

- | | |
|----------|-----------|
| 1. 898 | 5. 11 |
| 2. 2,300 | 6. 16,416 |
| 3. 560 | 7. 376 |
| 4. 7 | 8. 45 |

Think About Math, page 32

- 60
- 90
- 130
- 1,350

Think About Math, page 34

Sample answers:

- 700
- 5
- 1,100
- 110

Vocabulary Review, page 35

- D.
- B.
- A.
- C.

Skill Review, page 35

- Since Jamie is overestimating the number of people as 60 for each bus and underestimating the number of people going to the picnic, 1,200, he will get 20 buses. The actual answer of 24 buses means that Jamie will not have enough buses. Jamie should choose another method of estimating.
- Mai will use the numbers 400 and 200 for her estimation and subtract. The estimate will be \$200, which would mean she could not write the check. The actual amount is \$274, so she could write the check. The conclusion is that Mai should not use front-end estimation.

Skill Practice, page 35

- C. Round 2,067 to 2,000 and 478 to 500. Then subtract to get 1,500.
- C. Divide with compatible numbers
 $5,400 \div 90 = 60$
- A. Round the numbers up so he knows he can cover the cost of the items he buys.
- D. Round 365 to 400 and multiply by 6 to get 2,400.

Lesson 1.6

Key Concept, page 36

- | | |
|-----------|------------|
| 1. 97 | 5. 1,013 |
| 2. 29,887 | 6. 200 R13 |
| 3. 2,580 | 7. 42 |
| 4. 7,344 | 8. 2,304 |

Think About Math, page 37

- 2
- 16
- 7
- 44

Think About Math, page 39

- 336
- 4,500

Vocabulary Review, page 39

- compensation
- strategy
- order of operations
- mental math

Skill Review, page 39

- 1,115; a week is 7 days
- \$712; a car has 4 tires
- \$53; there are 12 months in a year

Answer Key

(Lesson 1.6 cont.)

Skill Practice, Page 39

1. D. Use the order of operations: $(8 + 3) = 11$,
 $11 \times 4 = 44$; $44 - 1 = 43$.
2. 10 Use the order of operations, $2 \times 14 = 28$, $3 + 5 = 8$, $44 - 28 = 16$, $16 \div 8 = 2$; $2 + 8 = 10$
3. C. $100 \times 36 = 3,600$

Lesson 1.7

Key Concept, page 40

- | | |
|------------|--------------|
| 1. 28,033 | 5. 21,967 |
| 2. 323,850 | 6. 5,473,269 |
| 3. 945 | 7. 24 |
| 4. 19 | 8. 4,683 |

Think About Math, page 42

addition; \$7

Think About Math, page 43

1. guess and check; 4
2. draw a picture; 25 times

Vocabulary Review, page 44

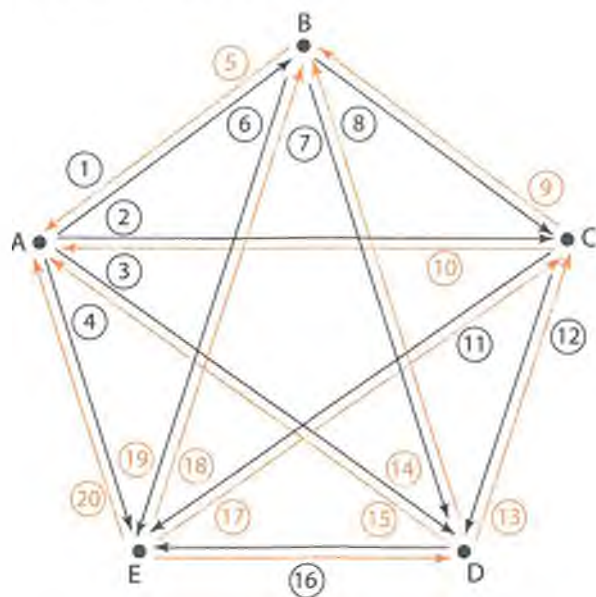
1. solution
2. reasonable
3. irrelevant

Skill Review, page 45

1. Manny spent \$3.15; 12 pieces
2. Mr. Martinez worked 32 hours; 13 hours
3. He handed the clerk \$12.43; 10 pounds
4. He also sold his DVD player for \$20; \$36

Skill Practice, page 45

1. B. $88 + 77 = 165$.
 $87 + 65 = 152$.
 $86 + 75 = 161$.
 $85 + 67 = 152$
2. 445 The current rent \$415 plus the increase \$30 is
 $415 + 30 = 445$.
3. B. *How many more* indicates subtraction.
4. There are 12 months in one year. Divide the cost of
garbage service for one year by the number of months
in one year, 12.
 156 divided by 12 is equal to 13 .



Answer Key

Chapter 1 Review, pages 46–47

1. C. 3 is in the ten thousands place, so its value is 30,000.
2. C. Factors of 36 are 2, 3, 4, 6, 9, 12, 18. Factors of 48 are 2, 3, 4, 6, 8, 12, 16, and 24. Factors of 60 are 2, 3, 4, 5, 6, 10, 12, 15, 20, and 30.
3. B. In the order of operations, parentheses come first.
4. A. $124 - 14 - 12 = 98$
5. C. 2 is in the thousands place in 4,572,013. The digit to the right is 0, so 2 stays the same. The number rounds to 4,572,000.
6. D. Round \$2.79 to \$3.00. Subtract \$3.00 from \$5.00. $\$5.00 - \$3.00 = \$2.00$.
7. B. Factors of 14 are 2 and 7. Factors of 21 are 3 and 7. Factors of 42 are 2, 3, 6, 7, 14, and 21. The greatest factor is 21.
8. C. 11,260 rounds to 11,000; $5 \times 11,000 = 55,000$.
9. B. $215 + 3 \times 65 = 410$
10. C. Multiplication undoes division because they are inverse operations.
11. D. Scores in order of greatest to least are 248, 187, 114. The people who match these scores are Uppinder, Marietta, James.
12. A. $8 \div 4 = 2$, $7 - 2 = 5$, $26 - 6 = 20$,
 $20 \div 5 = 4$, $15 + 4 = 19$
13. D. $842 \div 27 = 31 \text{ R}5$
14. A. $2,000 - 582 - 491 - 361 - 500 = 66$
15. B. $12,398 - 762 = 11,636$

CHAPTER 2 Decimals

Lesson 2.1

Key Concept, page 50

1. 7 hundreds or 700
2. 0 thousands or 0
3. 8 ones or 8
4. 2 millions or 2,000,000
5. 60
6. 190
7. 300
8. 6,380

Think About Math, page 51

1. >
2. >
3. =
4. <
5. =

Think About Math, page 52

1. 6.1
2. 3.0
3. 16
4. 5.01
5. 4.24
6. 12.37

Vocabulary Review, page 53

1. decimals
2. tenth
3. decimal point
4. hundredths
5. cent

Skill Review, page 53

1. 2 thousands or 2,000
2. 4 hundreds or 400
3. 6 tens or 60
4. 1 one or 1
5. 8 tenths or 0.8
6. 5 hundredths or 0.05

7.

Ones	.	Tenths	Hundredths
1	.	4	5

8.

Tens	Ones	.	Tenths	Hundredths	Thousandths
3	2	.	0	9	1

9.

Tens	Ones	.	Tenths	Hundredths
2	4	.	3	1

10.

Hundreds	Tens	Ones	.	Tenths	Hundredths
1	0	0	.	0	2

Skill Practice, page 53

1. C. The digit in the thousandths place is 6. The digit to the right of it is 7. Since $7 > 5$, round the digit in the thousandths place up to 7. So 5412.8367 rounds to 5412.837.
2. C. $2.99 > 2.45 > 2.39 > 1.89$. Mocha at \$2.99 costs the most.

Answer Key

Lesson 2.2

Key Concept, page 54

- | | |
|----------|------|
| 1. 70 | 5. > |
| 2. 176 | 6. < |
| 3. 6,941 | 7. > |
| 4. 6,066 | 8. = |

Think About Math, page 56

- \$0.60
- 7.9
- 2.005

Think About Math, page 57

- 3.3
- 8.53
- 1.985

Vocabulary Review, page 57

- place value
- vertically
- align
- organize
- annexed

Skill Review, pages 58

$$\begin{array}{r} 1. \quad 17.350 \\ + 50.927 \\ \hline \end{array}$$

$$\begin{array}{r} 5. \quad 1.563 \\ + 8.030 \\ \hline \end{array}$$

$$\begin{array}{r} 2. \quad 42.000 \\ - 36.498 \\ \hline \end{array}$$

$$\begin{array}{r} 6. \quad 29.00 \\ - 0.25 \\ \hline \end{array}$$

$$\begin{array}{r} 3. \quad 3.890 \\ - 1.426 \\ \hline \end{array}$$

$$\begin{array}{r} 7. \quad 7.500 \\ - 1.004 \\ \hline \end{array}$$

$$\begin{array}{r} 4. \quad 0.180 \\ 8.921 \\ + 39.600 \\ \hline \end{array}$$

$$\begin{array}{r} 8. \quad 0.230 \\ 1.006 \\ + 80.000 \\ \hline \end{array}$$

- Marco is incorrect. The difference he got, 4.31, is greater than number he subtracted from, 4.28.
- Lucy is incorrect. She did not regroup when adding the digits in the tenths place and ones place.

Skill Practice, page 59

$$1. \text{ D. } 1.5 + 1.8 + 2.75 + 2.9 = 8.95$$

$$\begin{array}{r} 2. \text{ C. } \quad 2.40 \\ - 0.35 \\ \hline 2.05 \end{array}$$

$$3. \quad 13.1 - 2.4 = 10.7$$

$$4. \quad 12 + 15.25 = 27.25$$

Answer Key

Lesson 2.3

Key Concept, page 60

- | | |
|--------|------------|
| 1. 36 | 4. 199,076 |
| 2. 160 | 5. 6 |
| 3. 456 | 6. 12.6 |

Think About Math, page 61

- | | |
|-----------|-----------|
| 1. \$2.30 | 5. 0.15 |
| 2. \$10 | 6. 20.4 |
| 3. \$3.75 | 7. 0.0325 |
| 4. \$3.50 | 8. 2.294 |

Vocabulary Review, page 62

- factor
- product
- multiplication

Skill Review, page 63

- | | |
|------|-------------------|
| 1. 3 | 5. 180; 1.8 |
| 2. 6 | 6. 984; 0.984 |
| 3. 3 | 7. 63; 6.3 |
| 4. 2 | 8. 1,457; 0.01457 |

Skill Practice, page 63

- C. The product, 0.036, has three decimal places. To place the decimal point three places to the left of 6 in the product, a zero needs to be inserted.
- A. She should place the decimal point two places from the far right of the product because the sum of the decimal places in the product is two.
- B. $2.5 \times 2.38 = 5.95$

Lesson 2.4

Key Concept, page 64

- | | |
|----------|----------|
| 1. 167 | 5. 5 |
| 2. 17 | 6. 50 |
| 3. 3,709 | 7. 500 |
| 4. 400 | 8. 5,000 |

Think About Math, page 67

- | | |
|---------|-----------|
| 1. 0.09 | 5. 4.8 |
| 2. 30 | 6. \$6 |
| 3. 60 | 7. 23 |
| 4. 0.9 | 8. \$0.80 |

Vocabulary Review, page 68

- dividend
- quotient
- divisor
- evaluate
- reasoning

Skill Review, page 68

- Correct
- Correct
- Error, the incorrect answer is based on the dividend, not the divisor; 1 place to the right.
- Correct
- Error; the incorrect answer is based on the dividend, not the divisor; the dividend is already a whole number, so the decimal does not need to move.
- Error, the incorrect answer is based on the dividend, not the divisor; 1 place to the right.
- Correct
- Error, the answer is based on incorrect counting; 2 places to the right.
- When dividing a decimal by a whole number, first place the decimal point in the quotient directly above the decimal point in the dividend. Then divide as you would with whole numbers.
- To check a division problem, multiply the quotient you got times the original divisor. If you did the division correctly, the product you get should equal the original dividend.

Answer Key

(Lesson 2.4 cont.)

Skill Practice, page 69

1. B. $5.44 \div 8 = 0.68$
2. A.
$$\begin{array}{r} 18.4 \\ 9 \overline{)165.6} \end{array}$$
3. A. $2.34 \div 6 = 0.39$
4. B. $227.25 \div 4.5 = 50.5$

Chapter 2 Review, pages 70–71

1. C. 0.7 is 100 times greater than 0.007.
2. B. $5.43 \div 1.2 = 4.525$
3. C. $3 \times 0.69 + 1.2 \times 3.95 + 2.5 \times 4.50 = 18.06$
4. C. $0.315 - 0.206 = 0.109$
5. B. $2.5 + (0.1 \times 56) \div (3 + 5) = 2.5 + 5.6 \div 8 = 2.5 + 0.7 = 3.2$
6. D. $1.3 + 12.502 + 0.045 = 13.847$
7. B. to make it easier to align addition and subtraction
8. D. 10.5
9. D. 7 is in the hundredths place so its value is 0.07.
10. C. The answer should be 4.294.
11. B. $\$64.54 < \$65.97 < \$71.90 < \90.15 ; May is the month with the smallest amount.
12. D. In 67.142, 4 is the digit to the right of the tenths place. So, the digit in the tenths place stays the same.
13. B. Subtract the amount in April from the amount in July; $\$90.15 - \$65.97 = \$24.18$.
14. B. $7.25 \times 22 = 159.50$

CHAPTER 3 Fractions

Lesson 3.1

Key Concept, page 74

1. 0.3
2. 0.23
3. <
4. >
5. =

Think About Math, page 76

1. $\frac{5}{8}$
2. $\frac{1}{8}$
3. $\frac{3}{10}$
4. $\frac{11}{12}$

Think About Math, page 78

1. C.
2. A.
3. E.
4. D.
5. B.

Think About Math, page 79

1. Draw a number line from 0 to 1 and divide it into fourths and eighths. Locate each fraction on the line. The fraction farther to the right is the greater fraction.
2. After finding a common multiple to rewrite the fractions with a common denominator, compare the numerators. The fraction with the smaller numerator is less than the fraction with the greater numerator.
3. $\frac{5}{6}, \frac{7}{9}, \frac{2}{3}$

Vocabulary Review, page 80

1. fraction
2. denominator
3. lowest terms
4. numerator
5. common multiple
6. equivalent fractions

Skill Review, page 80

1. 1: One way to find an equivalent fraction is to multiply a fraction by a form of 1; 2: A form of 1 is any fraction in which the numerator and denominator are the same, such as $\frac{5}{5}$; 3: Another way to find an equivalent fraction is to divide by a form of 1. The main idea is that equivalent fractions have the same value. Sentences 1 and 3 explain how to find equivalent fractions; 2 is a detail, but it does not support the main idea.

2. 1: One way is by finding a common denominator; 2: List the multiples of each denominator; 3: The first common multiple is the least common denominator of the two fractions; 4: Rewrite the fractions with the common denominator. 5: Then compare the numerators of the fractions to determine the lesser or greater fraction.

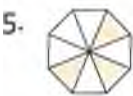
The main idea is that there are several ways to compare fractions. Sentences 1, 2, 3, 4, and 5 are all details that describe one way to compare fractions.



6 out of 7 sections in the diagram are shaded. The shaded sections represent the numerator of the fraction, and the total sections represent the denominator.



5 out of 6 sections in the diagram are shaded. The shaded sections represent the numerator of the fraction, and the total sections represent the denominator.



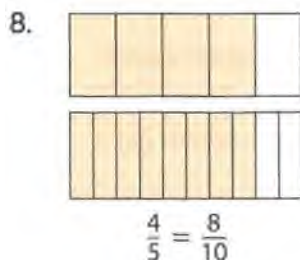
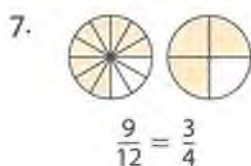
3 out of 8 sections in the diagram are shaded. The shaded sections represent the numerator of the fraction, and the total sections represent the denominator.



4 out of 9 sections in the diagram are shaded. The shaded sections represent the numerator of the fraction, and the total sections represent the denominator.

Answer Key

(Lesson 3.1 cont.)



Skill Practice, page 81

1. A. $\frac{2}{5} = \frac{16}{40}$, $\frac{1}{2} = \frac{20}{40}$, $\frac{5}{8} = \frac{25}{40}$; $16 < 20 < 25$,
so $\frac{2}{5} < \frac{1}{2} < \frac{5}{8}$
2. C. $\frac{5}{6}$: 5 out of 6 parts are shaded.
3. B. $\frac{4}{7} \times 42 = 24$
4. D. $\frac{14}{25}$

Lesson 3.2

Key Concept, page 82

1. C.
2. B.
3. A.
4. $\frac{4}{5}$
5. $\frac{3}{7}$
6. $\frac{13}{25}$

Think About Math, page 83

1. $\frac{2}{3}$
2. $\frac{13}{18}$
3. $\frac{1}{3}$
4. $\frac{9}{10}$

Think About Math, page 85

1. 8; 3; 24; $\frac{17}{24}$
2. 6; 3; 6; $\frac{1}{2}$

Vocabulary Review, page 86

1. C.
2. D.
3. A.
4. B.

Skill Review, page 86

1. 1. Check the denominators. The denominators are different, so find a common denominator.
2. Rewrite the fractions using the common denominator.
3. Add the new numerators.
4. Simplify, if necessary. The fraction is already in lowest terms.
 $\frac{7}{10}$
2. 1. Check the denominators. They are the same.
2. Subtract the numerators.
3. Simplify. Divide by $\frac{3}{5}$.
3. 1. Press the on button.
2. Press the fraction button, then 7, the down button, then 8
3. Press the right button, then press the subtraction button.
4. Press the fraction button, then 3, the down button, then 10
5. Press the equal button.
6. Read the fraction in the lower right corner of the screen. $\frac{23}{40}$

Skill Practice, page 87

1. A. $\frac{7}{12} - \frac{1}{6} = \frac{5}{12}$
2. B. $\frac{3}{4} - \frac{1}{4} = \frac{1}{2}$
3. $\frac{1}{2} - \frac{3}{12} = \frac{6}{12} - \frac{3}{12} = \frac{1}{4}$
4. $\frac{3}{4} + \frac{1}{8} = \frac{6}{8} + \frac{1}{8} = \frac{7}{8}$

Lesson 3.3

Key Concept, page 88

- $\frac{4}{7}$
- $\frac{9}{16}$
- $\frac{11}{12}$
- $\frac{3}{4}$

Think about Math, page 89

- C.
- D.
- A.
- B.

Think About Math, page 90

- $9 \div \frac{1}{3}; 9 \times \frac{3}{1} = 27$; There are 27 thirds in 9.
- 18

Vocabulary Review, page 90

- multiplicative inverse
- reciprocal
- invert

Skill Review, pages 90–91

- Enter the numerator and denominator of the dividend. Select the division sign. Then enter the numerator and denominator of the divisor. Select the equals sign. Then the quotient will appear on screen.
- Divide the Celsius temperature by $\frac{5}{9}$, and then add 32 to find the temperature in Fahrenheit since multiplication and division, as well as addition and subtraction, are inverse operations.
 $104 - 32 = 72$, and $72 \times \frac{5}{9} = 40^\circ\text{C}$
 $40 \div \frac{5}{9} = 40 \times \frac{9}{5} = 72$, and $72 + 32 = 104^\circ\text{F}$

Skill Practice, page 91

- B. $\frac{2}{3} \div \frac{4}{5} = \frac{2}{3} \times \frac{5}{4} = \frac{10}{12} = \frac{5}{6}$
- D. $10 \div \frac{1}{2} = 10 \times 2 = 20$
- A. $15 \div \frac{3}{5} = 15 \times \frac{5}{3} = 25$
- B. $\frac{1}{4} \div \frac{5}{8} = \frac{1}{4} \times \frac{8}{5} = \frac{8}{20} = \frac{2}{5}$

Lesson 3.4

Key Concept, page 92

- $\frac{9}{10}$
- $\frac{13}{24}$
- $\frac{5}{21}$
- $\frac{4}{5}$

Think About Math, page 95

- division; 22,000 pound

Vocabulary Review, Page 96

- improper
- mixed numbers
- rename
- proper fraction
- reduce

Skill Review, pages 96

Sample answers:

- When dividing fractions or mixed numbers, change mixed numbers to improper fractions. Then, invert the divisor and multiply. Simplify the result and rewrite improper fractions as mixed numbers or whole numbers. The summary gives the steps to follow when dividing fractions or mixed numbers, so details about specific fractions and definitions are not necessary.
- Adding fractions and mixed numbers are nearly the same. Check whether the denominators in the fractions are the same or different. If different, rewrite the fractions with common denominators. Then add the numerators, and for mixed numbers, the whole numbers. Finally, simplify the results by writing the fraction in lowest terms and/or rewriting the improper fraction as a mixed number or whole number.
- I already knew that multiplying fractions consists of multiplying the numerators and multiplying the denominators, and then simplifying the results if necessary. All I had to learn for multiplying mixed numbers is to first change the mixed number to an improper fraction. Once I do that, the steps are exactly the same. So, making the connections made it easier to learn how to multiply mixed numbers.

Answer Key

(Lesson 3.4 cont.)

Skill Practice, page 97

1. C. $2\frac{2}{3} \times 1\frac{1}{2} = \frac{8}{3} \times \frac{3}{2} = \frac{24}{6} = 4$
2. A. $10\frac{3}{4} = 10\frac{15}{20} = 9\frac{35}{20}$
 $-\frac{64}{5} = 6\frac{16}{20} = 6\frac{16}{20}$
 $3\frac{19}{20}$
3. D. Change the mixed numbers to improper fractions.
4. B. $6\frac{1}{2} \div \frac{3}{4} = \frac{13}{2} \times \frac{4}{3} = \frac{52}{6} = 8\frac{4}{6} = 8\frac{2}{3}$ This means
 8 full recipes can be made from the secret sauce.

Chapter 3 Review, pages 98-99

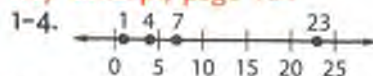
1. C. 4 and 15 do not have any common factors
2. D. Fractions must have a common denominator to be added. Find a common denominator.
3. A. $4\frac{2}{3} + 2\frac{7}{8} = 4\frac{16}{24} + 2\frac{21}{24} = 6\frac{37}{24} = 7\frac{13}{24}$
4. D. Multiply $2\frac{3}{8}$ and $7\frac{1}{2}$. $2\frac{3}{8} \times 7\frac{1}{2} = \frac{19}{8} \times \frac{15}{2} =$
 $\frac{285}{16} = 17\frac{13}{16}$
5. A. a fraction whose value is less than either factor
6. B. Write mixed numbers as improper fractions.
7. B. $2\frac{2}{3} \times 2 = \frac{8}{3} \times \frac{2}{1} = \frac{16}{3} = 5\frac{1}{3}$
8. B. Rename $2\frac{1}{5}$ as $1\frac{6}{5}$ so the fractional part of the mixed number can be subtracted.
9. D. $6 \times 3\frac{1}{3} = \frac{6}{1} \times \frac{10}{3} = \frac{60}{3} = 20$
10. B. $7\frac{3}{5} - 5\frac{2}{3} = 7\frac{9}{15} - 5\frac{10}{15} = 6\frac{24}{15} - 5\frac{10}{15} = 1\frac{14}{15}$
11. C. She did not rename the fractions correctly.
 $10\frac{5}{7} - 8\frac{2}{9} = 10\frac{45}{63} - 8\frac{16}{63} = 2\frac{31}{63}$
12. B. $4\frac{2}{7} = 7 \times 4 + \frac{2}{7} = \frac{30}{7}$
13. A. $\frac{4}{5} = \frac{144}{180}$; $\frac{7}{9} = \frac{140}{180}$; $\frac{3}{4} = \frac{135}{180}$; $\frac{4}{6} = \frac{120}{180}$
14. C. Change any mixed numbers to improper fractions.

Answer Key

CHAPTER 4 Integers

Lesson 4.1

Key Concept, page 104



5. <
6. >
7. >
8. =

Think About Math, page 106

1. -4
2. +19
3. not an integer
4. -3
5. not an integer
6. >
7. <
8. >
9. <

Think About Math, page 106

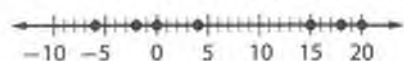
1. 9
2. 12
3. 13
4. 25

Vocabulary Review, page 106

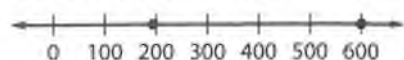
1. opposite
2. integer
3. infinite
4. absolute value

Skill Review, page 107

1. less than
2. greater than
3. greater than
4. less than
5. -6°F , -2°F , 0°F , 4°F , 15°F , 18°F , 20°F



6. $+194 < +600$ or $+600 > +194$



Skill Practice, page 107

1. C. The opposite of -3 is $-(-3) = +3$.
2. D. $-32, -10, 0, +24, +316$; They order from left to right on a number line with value increasing from left to right.
3. B. Ariana was 89 feet *below* the surface, which is represented by -89 .
4. C. The absolute value of an integer is the distance that integer is from 0.

Lesson 4.2

Key Concept, page 108

- | | |
|-------|------|
| 1. 9 | 5. < |
| 2. 10 | 6. > |
| 3. 2 | 7. > |
| 4. 6 | 8. > |

Think About Math, page 110

- | | |
|-------|-------|
| 1. D. | 4. B. |
| 2. A. | 5. C. |
| 3. E. | 6. F. |

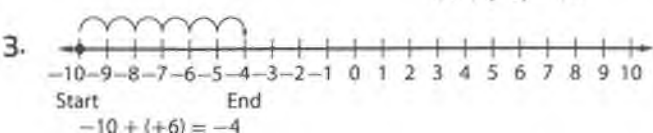
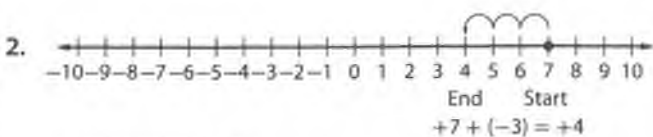
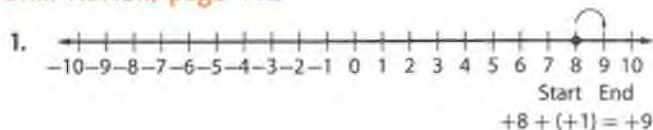
Think About Math, page 111

- | | |
|-------|-------|
| 1. E. | 4. C. |
| 2. A. | 5. D. |
| 3. F. | 6. B. |

Vocabulary Review, page 112

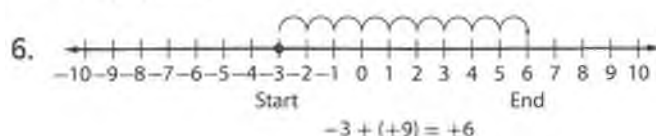
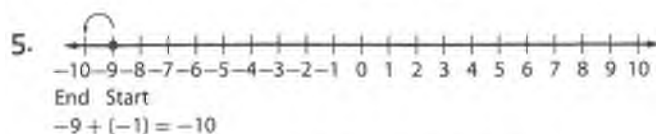
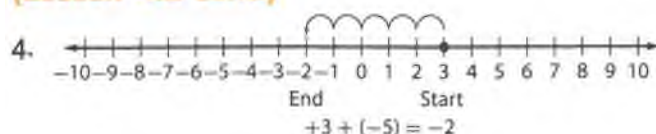
1. negative
2. positive
3. addends
4. sign

Skill Review, page 112



Answer Key

(Lesson 4.2 cont.)



7. First, determine that the addends have the same sign. Then add the absolute values of +8 and +12 to get 20. Finally, use the sign of the addends, so the result is +20.
8. First, determine that the addends have different signs. Then subtract the absolute values of +14 and -9 to get 5. Finally, use the sign of +14 since it has the greater absolute value, so the result is +5.
9. First, determine that the addends have different signs. Then subtract the absolute values of -15 and +7 to get 8. Finally, use the sign of -15 since it has the greater absolute value, so the result is -8.
10. (1) First; (2) Then; (3) After that; (4) finally
11. (3) had wanted; (2) earlier; (1) would have; (5) had subtracted; (4) After all

Skill Practice, page 113

1. D. +16 has a greater absolute value than -9, and its sign is positive.
2. C. $-5 + (+6) = +1$
3. B. $-8 + (+4)$; -8 has a greater absolute value than +4. The sum is negative.
4. B. $-35 + 10 = -25$

Lesson 4.3

Key Concept, page 114

- | | |
|-------|--------|
| 1. -6 | 5. -5 |
| 2. -2 | 6. +6 |
| 3. -8 | 7. +2 |
| 4. -6 | 8. -10 |

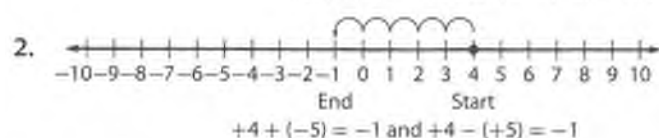
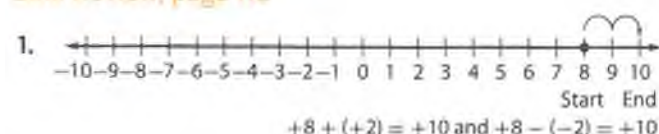
Think About Math, page 116

- | | |
|-------|-------|
| 1. E. | 4. D. |
| 2. F. | 5. A. |
| 3. C. | 6. B. |

Vocabulary Review, page 116

1. tic mark(s)
2. point(s)
3. solve

Skill Review, page 116



3. $+12 + (+11) = +23$ and $+12 - (-11) = +12 + (+11) = +23$; Compare: they both are solved as addition problems and have the same answer; Contrast: the first is a positive plus a positive, and the second is a positive minus a negative.
4. $+7 + (-3) = +4$ and $+7 - (+3) = +7 + (-3) = +4$; Compare: they both are solved as addition problems and have the same answer; Contrast: the first is a positive plus a negative, and the second is a positive minus a positive.
5. Since a positive minus a negative is the same as adding a positive and a positive, and since a positive plus a positive is always a positive, I know that $+10 - (-3)$ equals a positive number.

Skill Practice, page 117

1. C. $3 - 8 = -5$
2. B. Locate +7 on a number line, then move right 5 units.
3. D. $-40 - 8 = -48$
4. A. $245 - 302 = -57$
5. B. $231 - (-218) = 231 + 218 = 449$
6. A. $-92 - 114 = -206$
7. D. $-23 - 24 = -47$
8. C. A negative number minus a positive number is the same as adding two negative numbers.

Answer Key

Lesson 4.4

Key Concept, page 118

- | | |
|--------|--------|
| 1. -8 | 5. -6 |
| 2. -16 | 6. -5 |
| 3. +18 | 7. +7 |
| 4. +8 | 8. +10 |

Think About Math, page 120

1. B.
2. A.
3. D.
4. C.

Think About Math, page 121

1. D.
2. C.
3. B.
4. A.

Vocabulary Review, page 121

1. title
2. inverse
3. repeated
4. columns
5. rows
6. table

Skill Review, page 122

1. +63
2. +16
3. +9
4. +2
5. -6
6. The second column tells you the population of Smithville in 1990 was 4,200.
7. The second row tells the population count for each of the years 1990, 2000, and 2010.
8. 1,300 people
9. 8,100 people

Skill Practice, page 123

1. D. -3×2 is equal to $-3 + (-3)$. The sum of $-3 + (-3)$ is a negative number.
2. B. $-36 \div -2$
3. A. A negative integer times a negative integer is a positive integer, and 12 times 7 is 84.
4. A. Divide 120 by 20 to find how many times the diver goes down 10 feet. Then multiply this number, 6, by -10 to get -60.

Lesson 4.5

Key Concept, page 124

1. to the right of 0
2. to the left of 0

Think About Math, page 127

1. J
2. H
3. M
4. B
5. (2, 1)
6. (-8, 3)
7. (-4, -9)
8. (5, -8)

Vocabulary Review, page 128

1. A.
2. H.
3. F.
4. G.
5. C.
6. D.
7. B.
8. E.

Skill Review, page 128

1. A.
2. Start at the origin, go right 9 units and then move up 2 units.
3. A.

Skill Practice, page 129

1. D. The x-coordinates are the same, so the line that contains both points is vertical.
2. C. Start at the origin. Move 3 units to the right and 7 units down to get to the point (3, -7).
3. Point A is 6 units to the left of the origin and 5 units up from there.
4. The location of point B is 4 units to the right of the origin and 3 units down from there.

Answer Key

Chapter 4 Review, pages 130–131

1. D. From the origin, move 3 to the left. Then from there, move 4 down to point B .
2. A. Move down from point E to find the x -coordinate, -3 . Then move to the right from point E to find the y -coordinate, 4. So, the coordinates of point E are $(-3, 4)$.
3. D. All four of the integers are negative. Example:
 $-2 \times (-3) \times (-4) \times (-5) = 6 \times (-4) \times (-5) = -24 \times (-5) = 120$
4. B. $102 + (-24) + 89 + (-225) = -58$
5. D. To find $(-8, 9)$, from the origin, move 8 units to the left, then from there, move 9 units up.
6. D. $-300 \times 10 = -3,000$
7. A. $5,280 - (-10) = 5,280 + 10 = 5,290$
8. C. $-120 \div (-20)$
9. A. $178 + (+250) + (-60) + (-2) + (-187) = 179$;
The starting balance and deposit are represented by positive integers. The withdrawal, fee, and check are represented by negative integers.
10. B. $-35, -2, 0, 14, 31$
11. C. 7 and 5
D. 0 and -2

Answer Key

CHAPTER 5 Expressions and Equations

Lesson 5.1

Key Concept, page 134

- | | |
|---------|--------|
| 1. 9.54 | 4. 4.2 |
| 2. -9 | 5. 14 |
| 3. -15 | 6. 18 |

Think About Math, page 137

Note: Any variable is acceptable.

- $p + 12$
- $2s - 250$

Sample answers:

- four times a number t divided by two
- a number c minus nine

Think About Math, page 138

- 10.7
- 6
- 3
- 4

Vocabulary Review, page 138

- | | |
|-------|-------|
| 1. D. | 5. F. |
| 2. E. | 6. B. |
| 3. A. | 7. C. |
| 4. G. | |

Skill Review, page 139

- algebraic expression, verbal expression, key words
 - unknown, variable
 - numbers, operations
- evaluating, expression, substitute, given values, variables
 - substituted, correct values, variable
 - operation, order of operations
- Sample answer: I would apply the definitions of *evaluate* and *expression* and the knowledge of how to multiply and add integers. The value of the expression is -2.

Skill Practice, page 139

- B. Substitute for s and t to get $3 + 5(-2)$. Then multiply 5 times -2 first and add 3 to get -7.
- C. Translate each verbal expression to an algebraic expression.
- D. The expression shows the cost of the ladder (\$48.75) plus the cost of the rototiller per day (\$18) times the number of days it is needed (d).
- C. Translate -17 less than the product of -12 and some number. *The product of -12 and some number is $-12x$. -17 less than is $-(-17)$.* So the entire expression is $-12x - (-17)$.

Lesson 5.2

Key Concept, page 140

- | | |
|--------------------------------|-------|
| 1. $n + 4$ | 4. -4 |
| 2. $3n - 1$ | 5. 5 |
| 3. $n \div 8$ or $\frac{n}{8}$ | 6. 6 |

Think About Math, page 141

- $n + 2 = 3$
- $a - 5 = 12$
- $7(8)$ is not equal to 42, so $c = 8$ is not a solution for the equation.
- $-4 + 7 = 3$, so $y = -4$ is a solution for the equation.

Think About Math, page 142

- 7
- 11
- 6
- 1

Vocabulary Review, page 143

- D.
- C.
- A.
- E.
- B.

Answer Key

(Lesson 5.2 cont.)

Skill Review, page 143

Sample answers:

- To solve equations you need to understand that you use inverse operations to solve the equation and that you perform the same operation on each side of the equation. For example, if the equation is $x + 2 = 3$, subtract 2 from both sides of the equation to solve it.
- inverse operations

Skill Practice, page 143

- A. To find the total number of lunches, 80, Maemi ordered, multiply the cost of each lunch, 16, times the number of lunches ordered. $16t = 80$
- C. $2 + b = 14$

$$\begin{array}{r} -2 \quad -2 \\ b = 12 \end{array}$$
- D. To check the solution, $n = 36$, Nizioni should substitute 36 for n in the equation. $\frac{36}{6} = 6$.
- A. Solve the equation $7x = 84$ by dividing both sides by 7 to get $x = 12$.

Lesson 5.3

Key Concept, page 144

- B.
- D.
- A.
- C.

Think About Math, page 148

- $x = 8$
- $x = 12$
- $x = -64$
- $x = 1$

Vocabulary Review, page 148

- two-step equation
- isolate
- affect

Skill Review, page 148

- Sample answer: Understanding sequence in solving equations helps me to determine which inverse operation to do first and which to do second. Knowing this allows me to correctly solve two-step equations.
- Sample answer: Since the operations in the equation are multiplication and addition, I would first subtract 3 from both sides of the equation and then divide both sides of the equation by 6.
- Sample answer: To solve any two-step equation, I would follow this sequence:
 - Identify the two operations in the equation.
 - Identify the inverse operations.
 - Do the inverse operations in the reverse order, usually addition or subtraction first and division or multiplication second.

Skill Practice, page 149

- C. A number divided by eight plus three is fifty-one is $\frac{n}{8} + 3 = 51$.
- A. $2m - 7 = 49$
- $\frac{n}{7} + 12 = 58$
 $\frac{n}{7} + 12 - 12 = 58 - 12$
 $(7)\frac{n}{7} = (7)46$
 $n = 322$
- $150t + 2,000 = 3,650$
 $150t + 2,000 - 2,000 = 3,650 - 2,000$
 $\frac{150t}{150} = \frac{1,650}{150}$
 $t = 11$

Lesson 5.4

Key Concept, page 150

- $=$
- $<$
- $>$
- $>$
- $<$
- $>$

Think About Math, page 151

- $n - 8 > 12$
- $c + 3 \geq 10$
- $2n + 4 < 25$
- $3h + 25 \geq 310$

(Lesson 5.4 cont.)

Think About Math, page 153

1. $t < -5$
2. $x \leq 2$
3. $a \leq -6$
4. $c < 7$

Think About Math, page 154

1. $x < -1$
2. $y < 45$
3. $m \leq -28$
4. $b < -3$

Vocabulary Review, page 155

1. B.
2. A.
3. C.

Skill Review, page 155

1. By connecting what I know about translating a verbal statement into an inequality, I know that x is a variable that stands for an unknown number, the symbol $-$ means subtraction, and the symbol $>$ means greater than. I can use these connections to write *a number minus four is greater than six*.
2. By connecting the ideas for solving equations and inequalities, I learned that I can solve both for the variable by using the inverse operations of addition and subtraction and multiplication and division to isolate the variable on one side of the equation or inequality. The only difference I had to learn is that you reverse the direction of the inequality symbol if you multiply or divide by a negative number.

Skill Practice, page 155

1. B. \leq means at most.
2. C. $4s + 35 \geq 180$
 $4s + 35 - 35 \geq 180 - 35$
 $\frac{4s}{4} \geq \frac{145}{4}$
 $s \geq 36.25$
3. D. Remember that when dividing by a negative number, the inequality sign must be reversed.
 $-5x > 5$
 $\frac{-5x}{-5} < \frac{5}{-5}$
 $x < -1$
4. A. To represent *no more than*, use \leq .
 $100f + 15 \leq 65$

Lesson 5.5

Key Concept, page 156

1. $2n = 10$
2. $3n - 5$
3. 48
4. 30

Think About Math, page 158

1.

Position of Term, n	1	2	3	4	5	6
Number in Sequence	4	8	12	16	20	24

$$4n$$

2.

Position of Term, n	1	2	3	4	5	6
Number in Sequence	5	8	11	14	17	20

$$3n + 2$$

Vocabulary Review, page 160

1. generalize
2. term
3. output variable; input variable
4. common difference
5. numerical pattern

Skill Review, page 160

1. To make it easier to find the pattern, I would make a table that relates the position of each term and the number in the sequence. Then I would look at the common differences in both rows and use that to find a rule. Then I would test the rule on several numbers in the sequence. The rule is multiply the position number by 3 and subtract 2 to get the next term; $3n - 2$.
2. If you know the rule, then you can substitute any term in the expression to find its value in the sequence. In an equation, you can substitute any value for the input variable to get the output variable.

Skill Practice, page 161

1. D. Test the all of the numbers in the table with each equation.
2. B. $4n + 1$ is the rule for the table.
3. C. The rule is to multiply the number of each term by 38 and add 1.
 $6 \times 38 + 1 = 228 + 1 = 229$
4. A. Test each set of data with the equation.

Answer Key

Chapter Review, pages 162–163

1. B. $-8x + 11 = 35$
 $-8x + 11 - 11 = 35 - 11$
 $\frac{-8x}{-8} = \frac{24}{-8}$
 $x = -3$
2. C. $5(7) - 3(-8) = 35 - (-24) = 59$
3. B. Let x stand for Atian's son's age. The equation to solve is
 $5x - 7 = 43$
 $5x - 7 + 7 = 43 + 7$
 $\frac{5x}{5} = \frac{50}{5}$
 $x = 10$
4. A. $t = 13d + 45$
5. D. To undo division by -12 , you must multiply by -12 on both sides of the equation.
6. D. $y = 5x + 2$. Replace x and y with values in table.
7. C. $5(10) + 2 = 52$. You can also count by 5's starting with 7. The tenth number will be 52.
8. C. The rule is to multiply the term by 3 and then add 1.
9. C. $-5(-11) - 23 = 55 - 23 = 32$
10. D. One value for one set of brakes that fits the solution of the inequality, $2b + 85 \leq 265$ is \$90.
11. A. Solve each inequality to find the one that has the solution $x \geq -8$.
12. B. Solve $465 = 2w + 15$ to get \$225.
13. D. The one equation that fits is $c = 45t$.
14. A. Undo addition, then undo division by subtracting 17 and multiplying by 6 on both sides of the equation.

CHAPTER 6 Linear Equations and Functions

Lesson 6.1

Complete a Data Table, p.169

Number of Extra Text Messages	Text-Message Charge	Coordinate Pair
0	5	(0, 5)
5	6	(5, 6)
10	7	(10, 7)
15	8	(15, 8)
20	9	(20, 9)
25	10	(25, 10)
30	11	(30, 11)

Think About Math, p. 171

The slope of the line is 25.

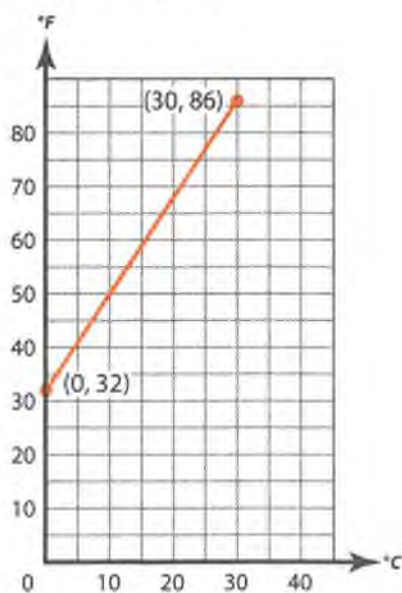
Vocabulary Review, p. 173

1. E.
2. B.
3. D.
4. A.
5. G.
6. F.
7. C.

Skill Review, p. 173

1. linear because a straight line connects the points
2. linear because a straight line connects the points
3. nonlinear because a straight line cannot connect the points

4. The independent variable is degrees Celsius.
5. The dependent variable is degrees Fahrenheit.
6. The slope is 1.8.
7. The y-intercept is 32.



Skill Practice p. 175

1.

1. Select two points on the line.

2. Determine the horizontal distance between the points to identify the run.

3. Determine the vertical distance between the points to identify the rise.

4. Calculate the slope.
 $\text{Slope} = \frac{\text{rise}}{\text{run}}$
2. C
3. B
4. D

Answer Key

CHAPTER 6

Lesson 6.2

Think About Math, p. 178

The rise = $45 - 35 = 10$.

The run = $10 - 5 = 5$.

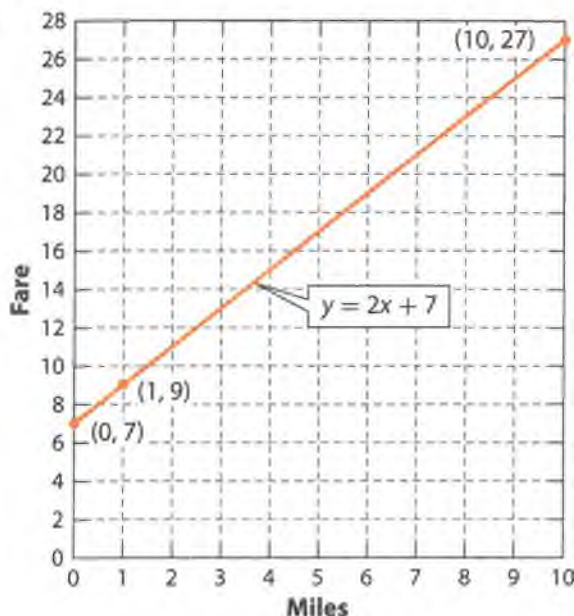
The slope = $\frac{10}{5} = 2$.

Vocabulary Review, p. 181

1. point-slope form
2. intersects
3. slope-intercept form
4. two-point form
5. subscript

Skill Review, p. 181-182

1. A.
2. C.
3. B.
- 4.



Skill Practice, p. 183

1. The statement is incorrect. If you know only the slope of the line, there are many different lines that you can draw, so you cannot plot a line with so little information. Besides the slope, you also need to know a point that the line goes through.
2. It will take five months to pay off the credit card. At the end of month 4, the balance is \$100, so the next month (the fifth month), you pay the balance.
3. The slope of the line is -150 . As each month passes (run = 1), the balance (rise) decreases by 150.
 $\text{slope} = \frac{\text{rise}}{\text{run}} = \frac{-150}{1} = -150$
4. The y-intercept is 700. This represents the starting balance on the credit card (at month 0), which is \$700 – the cost of the mountain bike.

Lesson 6.3

Think About Math, p. 186

Option 1: The total monthly cost would be \$105.00. Your half of the bill would be \$52.50.
Option 2: The total monthly cost would be \$45.00. Your half of the bill would be \$22.50.

Vocabulary Review, p. 188

1. B.
2. A.
3. E.
4. C.
5. F.
6. D.

Skill Review, p. 188-189

1. 1 solution
2. 0 solutions
3. infinite number of solutions
4. $x + y = 100,000$
5. $0.03x + 0.01y = 1,800$
6. \$40,000
7. \$60,000

Skill Practice, p. 189

1. D.
2. B.
3. D.
4. $20,000 = x + y$; $0.06x + 0.04y = 1,000$

Lesson 6.4

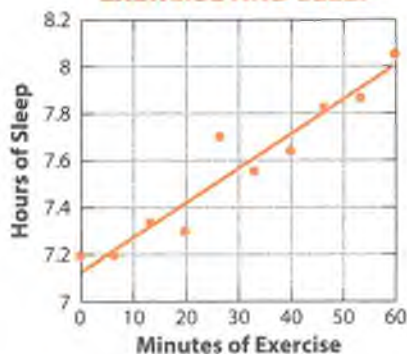
Think About Math, p. 195

In general, as height increases, so does weight. There is a positive linear relationship between the variables.

Vocabulary Review, p. 196

1. If the value of one variable increases while the value of the second variable decreases, there is a negative correlation between the variables.
2. If the value of one variable increases as the value of the other variable increases, there is a positive correlation between the variables.
3. A scatter plot is a visual display of the relationship between two variables.

EXERCISE AND SLEEP

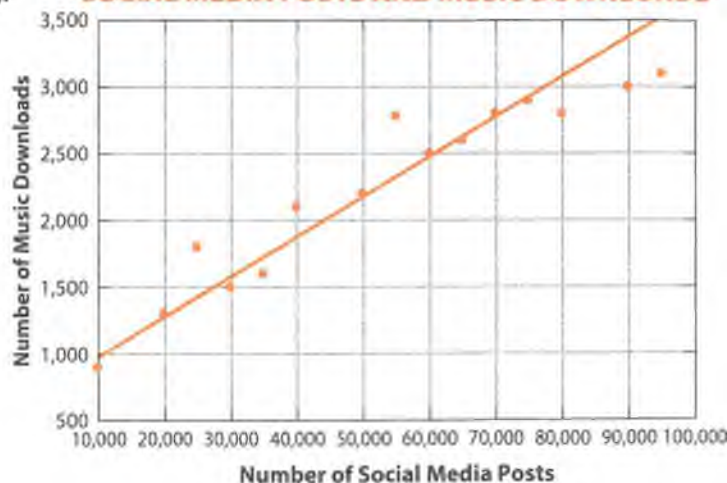


4. If two variables follow a clearly recognizable pattern, then there is a correlation between the two variables.
5. If points in a scatter plot increase or decrease proportionally, then there is a linear correlation between the variables that they represent.
6. An outlier is located further away from the trend line than the other points in a scatter plot.
7. A cluster is a grouping together of points on a scatter plot.
8. If the trend line on a scatter plot is exponential or quadratic, then there is a nonlinear correlation between the variables.
9. The line or curve around which the points in a scatter plot appear is called a trend line.

Skill Review, p. 196-197

1. There are two outliers in the scatter plot. They are outliers because they are farther away from the trend line than the other points.
2. There is a positive linear correlation between the variables of length and width.

3. SOCIAL MEDIA POSTS AND MUSIC DOWNLOADS



Answer Key

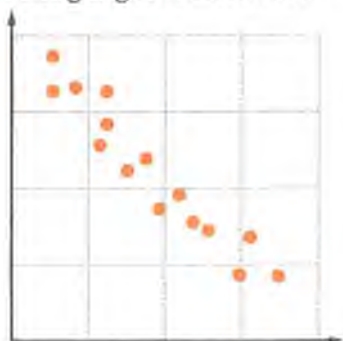
CHAPTER 6

(Lesson 6.4 cont.)

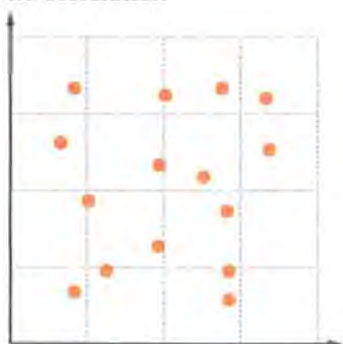
Skill Practice, p. 198

1. Scatter Plots

3. A. strong negative correlation



1. B. no correlation

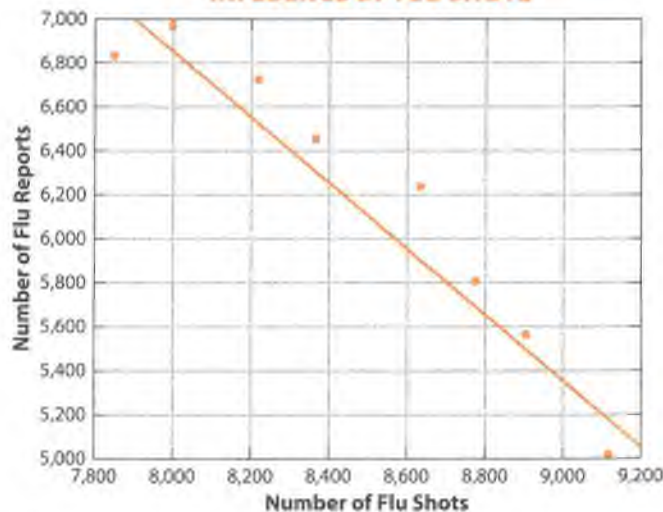


2. C. weak positive correlation



2.

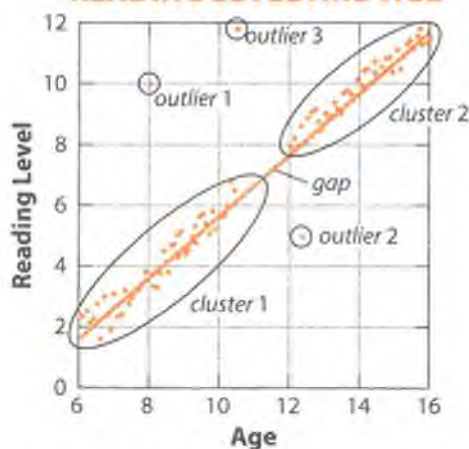
INFLUENCE OF FLU SHOTS



There is a negative linear correlation between the number of reported cases of flu and the number of flu shots.

3.

READING LEVEL AND AGE



Outlier #1 represents an 8-year old student who has a higher than average reading level for her age.

Outlier #2 represents an 11-year old student who has a higher than average reading level for his age.

Outlier #3 represents a $12\frac{1}{2}$ year old student who has a lower than average reading level for her age.

Answers will vary. Sample answer: Possible explanations for the outliers include there was an error in the age or score of the student representing each outlier. Other influencing factors could include the possibility of poor physical health on testing day, students were absent for part of the testing period, or those students experience test anxiety.

Answer Key

Lesson 6.5

Think About Math, p. 203

- Function
- Not a Function
- Not a Function
- Not a Function

Vocabulary Review, p. 204

- An equation is a function if there is only one output for each input.
- A linear function has the form $y = mx + b$.
- The points of a nonlinear function are not all on a straight line.
- A vertical line test can help determine whether the graph of an equation is a function or not.

Skill Review, p. 204

- B.
- B.
- Square the input, x
Multiply the input, x , by 2
Add the two numbers
Add 1
The result is the output, y .

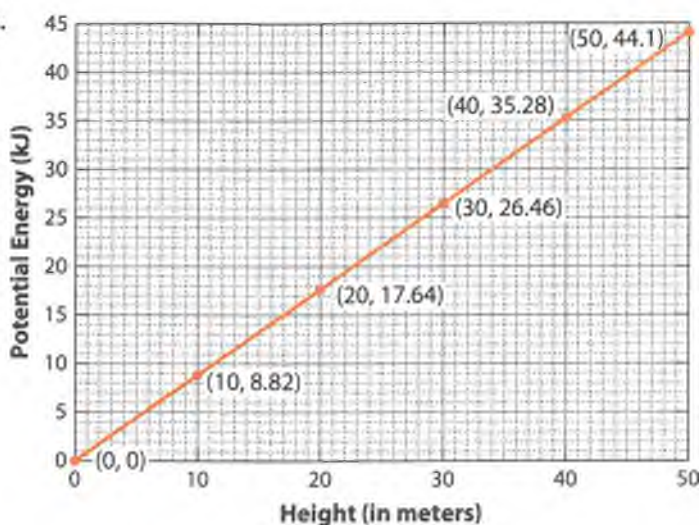
Skill Practice, p. 205

- Nonlinear Function
 - Nonlinear Function
 - Linear Function

2.

Mass (in kg)	g	Height (in m)	PE (in kJ)
90	9.8	0	0
90	9.8	10	8.82
90	9.8	20	17.64
90	9.8	30	26.46
90	9.8	40	35.28
90	9.8	50	44.1

3.



- This graph represents a function because it passes the vertical line test. The function is linear because all the points lie on a straight line.

Answer Key

Chapter 6 Review, pages 206-208


1. D. the term $\frac{1}{x}$ makes this equation nonlinear.
2. D. the slope, m , is the coefficient of D in the equation $C = 0.1D + 5$, thus $m = 0.1$. The y -intercept, b , is the constant term in the equation, thus $b = 5$.
3. B. the time and temperature data both increase proportionally, that is, the temperature increases 4 degrees each hour. Thus this data set follows a linear pattern.
4. D. a line with a positive slope means that the ratio of the rise over the run is positive. Thus as the independent variable increases (or decreases), the dependent variable increases (or decreases).
5. C. use the formula for the slope of a line:
 $m = \frac{\text{rise}}{\text{run}} = (y_2 - y_1)/(x_2 - x_1)$, where $(x_1, y_1) = (5, 9)$ and $(x_2, y_2) = (-1, -3)$; $m = \frac{(-3-9)}{(-1-5)} = \frac{-12}{-6} = 2$.
6. (3, 4): to check: $2(3) - 2(4) = -2$; $6 - 8 = -2$
 $4(3) + 4 = 16$; $12 + 4 = 16$
7. B. select two points on the graph to calculate the slope: $(x_1, y_1) = (0, 70)$ and $(x_2, y_2) = (30, 130)$.
 Use the formula for slope: $m = (y_2 - y_1)/(x_2 - x_1)$
 $= \frac{(130 - 70)}{(30 - 0)} = 60/30 = 2$.
8. B. is the only graph that passes the vertical line test.
9. C. is the only data set whose values do not increase proportionally. Thus it is nonlinear.
10. C. is the only equation that has a linear term, r . All others have their independent variables raised to a power (and are thus nonlinear).
11. B. since the trend line is linear and the slope is negative, the data are linearly and negatively correlated.
12. C. is the trend line, since it minimizes the average distance between the points and the trend line.

Answer Key

CHAPTER 7 Ratios, Proportions, and Percents

Lesson 7.1

Key Concept, page 212

- $\frac{3}{5}$
- $\frac{1}{2}$
- $\frac{2}{3}$
- $\frac{3}{5}$
- 

Think About Math, page 214

- 6:7, $\frac{6}{7}$
- 1 to 50, $\frac{1}{50}$
- 10 to 19, 10:19
- $\frac{1 \text{ can concentrate}}{3 \text{ cans water}}$, $\frac{1}{3}$, 1:3, or 1 to 3
- $31 - 23 = 8$, so the ratio is $\frac{23 \text{ snow days}}{8 \text{ no-snow days}}$, $\frac{23}{8}$, 23:8, or 23 to 8.

Think About Math, page 215

- 22.5 miles per gallon
- \$6.50 per hour
- \$0.30
- \$0.09

Vocabulary Review, page 216

- rate
- unit price
- unit rate
- ratio

Skill Review, page 216

- B.
- D.
- E.
- A.
- C.

Skill Practice, page 217

- A. Divide 2.79 by 15 to get unit price.
- C. The total number of people is 3. So, 2 out of 3 are female.
- C. $\frac{366}{582} = \frac{366 \div 6}{582 \div 6} = \frac{61}{97}$; So, the ratio of Emilio's votes to Marshall's votes is 61 to 97.
- B. Divide 50 by 6 to get miles per minute.

Lesson 7.2

Think About Math, page 219

The unit rate is $3 \div \frac{1}{2} = 6$ miles/hour

Think About Math, page 221

To calculate the time it will take to fill the pool:

$$x = \frac{y}{k} = \frac{12,000 \text{ gallons}}{1,200 \text{ gallons/hour}} = 10 \text{ hours}$$

Vocabulary Review, page 222

- A *proportional relationship* exists between two variables if the ratio between them is always the same.
- The *constant of proportionality* is the value of the ratio between two variables that are proportionally related.

Skill Review, page 222

- D.
- A.
- C.
- B.

Skill Practice, page 223

- unit rate = scale of map = $\frac{200 \text{ miles}}{2.5 \text{ inches}} = \frac{80 \text{ miles}}{\text{inch}}$
 - $y = 80x$
 - $y = \frac{80 \text{ miles}}{\text{inch}} \times 8.75 \text{ inches} = 700 \text{ miles}$
- The slope of a line that represents a proportional relationship is equal to the unit rate, which is equal to the constant of proportionality. Therefore line A has a greater constant of proportionality, since it has a greater slope.
- Model A
 $\frac{30 \text{ miles}}{0.7 \text{ gallons}} = \frac{42.9 \text{ miles}}{\text{gallon}}$
 Model B
 $\text{slope} = \frac{\text{rise}}{\text{run}} = \frac{20 \text{ miles}}{1.5 \text{ gallons}} = \frac{13.3 \text{ miles}}{\text{gallon}}$

Answer Key

Lesson 7.3

Key Concept, page 224

1. 3:5, 3 to 5
2. 9 to 4, $\frac{9}{4}$
3. 5:9, $\frac{5}{9}$
4. $\frac{3}{5}$
5. $\frac{2}{5}$
6. $\frac{3}{13}$

Think About Math, page 226

1. yes, $\frac{50}{20} = \frac{10}{4}$
2. yes, $\frac{8}{3} = \frac{24}{9}$
3. no

Sample Answers:

4. $\frac{12}{13} = \frac{24}{26}$
5. $\frac{6}{3} = \frac{2}{1}$
6. $\frac{25}{20} = \frac{5}{4}$

Think About Math, page 227

1. $a = \frac{1}{30}$
2. $b = 54$
3. $c = 36$
4. $d = 21$

Vocabulary Review, page 228

1. cross multiplication
2. equivalent
3. value
4. proportion

Skill Review, page 228

1. $\frac{5 \text{ circles}}{8 \text{ triangles}} = \frac{10 \text{ circles}}{16 \text{ triangles}}$
 $\frac{8 \text{ triangles}}{16 \text{ triangles}} = \frac{5 \text{ circles}}{10 \text{ circles}}$
 $\frac{8 \text{ triangles}}{5 \text{ circles}} = \frac{16 \text{ triangles}}{10 \text{ circles}}$
 $\frac{5 \text{ circles}}{10 \text{ circles}} = \frac{8 \text{ triangles}}{16 \text{ triangles}}$
2. $\frac{\$2}{7 \text{ miles}} = \frac{\$6}{21 \text{ miles}}$, $\frac{\$2}{\$6} = \frac{7 \text{ miles}}{21 \text{ miles}}$
 $\frac{7 \text{ miles}}{\$2} = \frac{21 \text{ miles}}{\$6}$
 $\frac{\$6}{\$2} = \frac{21 \text{ miles}}{7 \text{ miles}}$

$$3. \frac{80 \text{ seeds}}{15 \text{ feet}} = \frac{32 \text{ seeds}}{6 \text{ feet}}, \frac{80 \text{ seeds}}{32 \text{ seeds}} = \frac{15 \text{ feet}}{6 \text{ feet}}$$

$$\frac{6 \text{ feet}}{15 \text{ feet}} = \frac{32 \text{ seeds}}{80 \text{ seeds}}$$

$$\frac{15 \text{ feet}}{80 \text{ seeds}} = \frac{6 \text{ feet}}{32 \text{ seeds}}$$

$$4. \frac{7 \text{ cups flour}}{5 \text{ T. sugar}} = \frac{10.5 \text{ cups flour}}{7.5 \text{ T. sugar}}$$

$$\frac{7 \text{ cups flour}}{10.5 \text{ cups flour}} = \frac{5 \text{ T. sugar}}{7.5 \text{ T. sugar}}$$

$$\frac{5 \text{ T. sugar}}{7 \text{ cups flour}} = \frac{7.5 \text{ T. sugar}}{10.5 \text{ cups flour}}$$

$$\frac{10.5 \text{ cups flour}}{7 \text{ cups flour}} = \frac{7.5 \text{ T. sugar}}{5 \text{ T. sugar}}$$

$$5. \frac{72 \text{ chairs}}{8 \text{ tables}} = \frac{126 \text{ chairs}}{14 \text{ tables}}$$

$$\frac{14 \text{ tables}}{8 \text{ tables}} = \frac{126 \text{ chairs}}{72 \text{ chairs}}$$

$$\frac{72 \text{ chairs}}{126 \text{ chairs}} = \frac{8 \text{ tables}}{14 \text{ tables}}$$

$$\frac{8 \text{ tables}}{72 \text{ chairs}} = \frac{14 \text{ tables}}{126 \text{ chairs}}$$

$$6. \text{ no; } \frac{3}{5} \neq \frac{4}{6} \text{ because } 3 \times 6 \neq 4 \times 5$$

$$7. \text{ yes; } \frac{3 \text{ blue}}{1 \text{ yellow}} = \frac{6 \text{ blue}}{2 \text{ yellow}} \text{ because } 3 \times 2 = 6 \times 1$$

$$8. \text{ yes; } \frac{650 \text{ words}}{10 \text{ minutes}} = \frac{780 \text{ words}}{12 \text{ minutes}} \text{ because } 650 \times 12 = 780 \times 10$$

Skill Practice, page 229

1. D.
 $\frac{1 \text{ in.}}{50 \text{ mi.}} = \frac{2\frac{1}{2} \text{ in.}}{x \text{ mi.}}$
 $2\frac{1}{2} \times 50 = 1(x)$
 $125 = x$
2. D. $\frac{100}{8} = \frac{d}{10}$
3. B. This is the only true statement because a proportion is formed by equivalent fractions. The statements (A), "2:3 and 15:10 are equal ratios," and (C), "2 × 10 and 3 × 15 are equal," are both false because 2 × 20 is not equal to 3 × 15. Because $\frac{2}{3} = \frac{10}{15}$ is a proportion, (D) is false.
4. C. Use the proportion $\frac{3}{8} = \frac{x}{400}$ to find the number of rock songs. So,
 $\frac{3}{8} = \frac{x}{400}$
 $3 \times 400 = 8 \cdot x$
 $1,200 = 8x$
 $150 = x$

Answer Key

Lesson 7.4

Key Concept, page 230

- 46
- 4.6
- 0.46
- 0.046

Think About Math, page 232

- 0.67
- $3\frac{4}{6}$
- 0.03
- $\frac{4}{10}$

Think About Math, page 234

- $0.25, \frac{3}{12} = \frac{1}{4}$
- $66\frac{2}{3}\%, 0.\overline{6}, \frac{2}{3}$
- $6.8\%, 0.068, \frac{68}{1,000} = \frac{17}{250}$
- $240\%, 2.4, 2\frac{4}{10} = 2\frac{2}{5}$
- $37\%, 0.37, \frac{37}{100}$
- $0.2\%, 0.002, \frac{2}{1,000} = \frac{1}{500}$

Vocabulary Review, page 234

- percent
- similarity
- repeating decimal

Skill Review, page 235

1-6

Percent	Decimal	Fraction
45%	0.45	$\frac{45}{100} = \frac{9}{20}$
80%	0.8	$\frac{8}{10} = \frac{4}{5}$
35%	0.35	$\frac{7}{20}$
206%	2.06	$2\frac{6}{100} = 2\frac{3}{50}$
24.1%	0.241	$\frac{241}{1,000}$
137.5%	1.375	$1\frac{3}{8}$

45% and 24.1% were similar because they changed to decimals and fractions. 0.8 and 2.06 were similar because they changed to fractions and percents. $\frac{7}{20}$ and $1\frac{3}{8}$ were similar because they changed to decimals and percents.

- These are both the same number. The first is written as a decimal, and the second is a fraction. Both are equal to 75%.
- These are both the same number. The first is written as a mixed number, and the second is a repeating decimal. Both are equal to $783\frac{1}{3}\%$.
- These are both the same number. The first is written as a fraction, and the second is a percent. Both are equal to $0.\overline{6}$.
- These are both the same number. The first is written as a fraction, and the second is a repeating decimal. Both are equal to $11\frac{1}{9}\%$.

Skill Practice, page 235

- B. $2\% = \frac{2}{100} = \frac{1}{50}$
- C. $\frac{3}{10} = \frac{30}{100} = 30\%$
- B. $\frac{4}{5} = \frac{4 \times 20}{5 \times 20} = \frac{80}{100} = 80\%$
- D. $\frac{12}{30} = \frac{4}{10} = 0.4 = 40\%$

Lesson 7.5

Key Concept, page 236

- 81.7
- 2.8
- 7
- 120
- 21
- 2
- 6
- 240

Think About Math, page 237

- 87
- 470
- 12
- \$25

Think About Math, page 239

- 9
- 62.5%
- 35

Vocabulary Review, page 240

- portion
- means
- extremes

Answer Key

(Lesson 7.5 cont.)

Skill Review, page 240

1. What number is 25% of 80? $\frac{\square}{80} = \frac{25}{100}$; 20
2. 10% of what number is 8? $\frac{8}{\square} = \frac{10}{100}$; 80
3. What percent of 44 is 11? $\frac{11}{44} = \frac{\square}{100}$; 25%
4. 9 is what percent of 100? $\frac{9}{100} = \frac{\square}{100}$; 9%
5. 16% of what number is 200? $\frac{200}{\square} = \frac{16}{100}$; 1,250
6. 3% of 500 is what number? $\frac{\square}{500} = \frac{3}{100}$; 15
7. 7 is 1% of what number? $\frac{7}{\square} = \frac{1}{100}$; 700
8. What percent of 16 is 12? $\frac{12}{16} = \frac{\square}{100}$; 75%
9. Annabelle drank 340 cups of coffee in one year. She drank 73 cups during January alone. What percent of cups of coffee did Annabelle drink during January?
 $\frac{73}{340} = \frac{\square}{100}$; about 21.47%
10. Lucio received 52% of the votes to win an election. There were 215,400 voters. How many people voted for Lucio?
 $\frac{\square}{215,400} = \frac{52}{100}$; 112,008
11. Panya bought some mittens on sale for \$12. She paid only 80% of the original price. What was the original price of the mittens? How much money did she save by buying the mittens on sale? $\frac{12}{\square} = \frac{80}{100}$; \$15. She saved \$3.

Skill Practice, page 241

1. C.
 $\frac{x}{12,500} = \frac{6}{100}$
 $12,500 \times 6 = 100x$
 $75,000 = 100x$
 $750 = x$
2. B. $25\% = \frac{1}{4}$, find $\frac{1}{4}$ of 80 or $\frac{1}{4} \times 80$
3. D.
 $\frac{70}{100} = \frac{x}{30}$
 $x = 70 \times \frac{30}{100}$
 $x = 21$
4. C.
 $\frac{x}{100} = \frac{16}{24}$
 $x = 16 \times \frac{100}{24}$
 $x = 66.\overline{6}$ or about 67%

Lesson 7.6

Key Concept, page 242

1. $\frac{28}{52} = \frac{7}{13}$
2. $\frac{55}{365} = \frac{11}{73}$
3. $\frac{9}{12} = \frac{3}{4}$
4. \$27.50
5. 0.04
6. 2.5

Think about Math, page 243

1. \$4,000
2. \$50
3. \$324,000
4. \$9.04

Vocabulary Review, page 244

1. principal
2. time
3. formula
4. convert
5. rate
6. interest

Skill Review, page 244

1. \$200
2. about \$150.68
3. \$7,492.50
4. \$1,770

Skill Practice, page 245

1. B. $4,000 \times 0.04 \times 3 = 480$
2. A. $75,000 \times 0.08 \times 30 = 180,000$
3. A. Loan A: time $\frac{26}{52} = \frac{1}{2}$
 $0.05 \times \frac{1}{2} \times 12,500 = 312.50$
Loan B: time $\frac{18}{52} = \frac{9}{26}$
 $0.065 \times \frac{9}{26} \times 12,500 = 281.25$
 $312.50 - 281.25 = 31.25$
4. B. $100 \times 0.24 \times \frac{12}{73} = 3.95$

Answer Key

Chapter 7 Review, pages 246-247

1. D. 12 black cars:20 total cars,
 $12 \div 4:20 \div 4 = 3:5$
2. C. To find x , multiply 6 times 32, then divide by 24. To solve a proportion, cross multiply opposite numerator and denominator, then divide by the number that is cross multiplied by the variable.
3. B. $15\% = 0.15$
 $0.15 \times 40 = 6$
4. B. $\frac{12}{14} = \frac{x}{100}$
 $12 \times 100 = 14x$
 $\frac{1,200}{14} = \frac{14x}{14}$
 $85.71 = x$
 85.71 compared to 100 is about equal to 86%.
5. B. $\frac{2}{47} = \frac{130}{x}$
 $47 \times 130 = 2x$
 $\frac{6,110}{2} = \frac{2x}{2}$
 $3,055 = x$
6. A. 6 years, 3 months is equal to 6.25 years.
 $3\% = 0.03$ so $I = 6,700 \times 0.03 \times 6.25$
7. C. $\frac{8}{15,000} = \frac{7}{x} = \frac{\text{hours}}{\text{boxes of candy}}$
8. D. $0.73 \times \$12,455 = \$9,092.15$
9. D. 8:3, 24:9 because $3 \times 24 = 8 \times 9$
10. A. $12,5000 \times 0.065 = 812.5$ or \$812.50
11. B. 133 miles/minutes
12. B. 19.6 gallons
13. $0.68 \times 50 = 34$
14. C. $0.15 \times 19 + 19 = 2.85 + 19 = 21.85$
15. D. 275 miles at 55 miles per hour is equal to 5 hours driving time. One hour of stops makes the trip 6 hours. 6 hours before 4:00 P.M. is 10:00 A.M.
16. 56
 $\frac{8}{y} = \frac{3}{21}$
 $21 \times 8 = 3y$
 $\frac{168}{3} = \frac{3y}{3}$
 $56 = y$

Answer Key

CHAPTER 8 Exponents and Roots

Lesson 8.1

Key Concept, page 250

- | | |
|-------|--------|
| 1. 1 | 4. 28 |
| 2. 3 | 5. -4 |
| 3. -2 | 6. -22 |

Think About Math, page 251

- | | |
|-------|--------------|
| 1. 64 | 5. 2,097,152 |
| 2. 32 | 6. 7,962,624 |
| 3. 25 | 7. 3,418,801 |
| 4. 27 | 8. 2,985,984 |

Think About Math, page 252

- | | |
|-------|-------|
| 1. 36 | 4. 14 |
| 2. 21 | 5. 4 |
| 3. 5 | 6. 18 |

Vocabulary Review, page 252

- B.
- C.
- A.

Skill Review, page 253

- By understanding that there is a sequence, or order of operations, for finding the value of an expression, I can apply that order to find the correct value of the expression. If I did not understand the sequence, then I would probably perform the operations from left to right and get an incorrect value.
- For the expression $4^2 + 3^3 \div 9$, I would first find the value of the exponents, from left to right. Next, I would divide by 9. Then I would add. The value of the expression is 19: $16 + 27 \div 9$; $16 + 3$; 19.
- For the expression $2 \times (14 - 7^0) + 28 \div 2^2$, I would first evaluate the exponent in the parentheses; second, do the operations in the parentheses; third, evaluate the other exponent; and last, multiply, divide, and add.

The value of the expression is 33: $2 \times (14 - 1) + 28 \div 2^2$; $2 \times 13 + 28 \div 2^2$; $2 \times 13 + 28 \div 4$; $26 + 28 \div 4$; $26 + 7$; 33.

Skill Practice, page 253

- B. $4^3 = 4 \times 4 \times 4 = 64$; $8^2 = 64$ so $4^3 = 8^2$
- D. Addition in parentheses should be first.
- D. $2s \times 2s \times 2s = 8s^3$
- C. $2^5 = 32$, $3^3 = 27$, $32 - 27 = 5$

Lesson 8.2

Key Concept, page 254

- | | |
|--------|----------------|
| 1. 49 | 5. 15,625 |
| 2. 32 | 6. 16,777,216 |
| 3. 81 | 7. 20,736 |
| 4. 216 | 8. 115,856,200 |

Think About Math, page 257

- | | |
|-------|-------|
| 1. 2 | 5. 6 |
| 2. 10 | 6. 25 |
| 3. 3 | 7. 4 |
| 4. 15 | 8. 18 |

Vocabulary Review, page 258

- | | |
|-------------------|-----------------|
| 1. radical sign | 4. squared |
| 2. square root | 5. cube root |
| 3. perfect square | 6. perfect cube |

Answer Key

(Lesson 8.2 cont.)

Skill Review, page 258

- The labels in the columns show that columns 1 and 3 are whole numbers that are perfect cubes, and columns 2 and 4 are the cube roots of the whole numbers. The numbers in the rows show that the first two columns are perfect cubes and cube roots, respectively, from 1–10; and the third and fourth columns are perfect cubes and cube roots, respectively, from 11–20.
- One pattern in the table is that the cubes increase more rapidly than the cube roots. The cube roots are consecutive numbers while the cubes are not. Another pattern is that if the ones digit in the cube is 1, 4, 5, 6, 9, or 0, the ones digit in the cube root is also 1, 4, 5, 6, 9, or 0. If the ones digit in the cube is 8, 7, 3, or 2, then the ones digit in the cube root is 2, 3, 7, or 8.
- If you know a number is a perfect cube and the cube root is a number from 1–20, you could use the data in the table to find the cube root. You can use the data to approximate cube roots, and you might be able to use the patterns in the table to find cube roots of numbers not in the table.
- You could look in column 1 to find the perfect cubes between which 326 lies. The number 326 falls between 216 and 343. Then you could look in the second column to find that the cube roots of 216 and 343 are 6 and 7. This means that the cube root of 326 is between 6 and 7.

Skill Practice, page 259

- C. The number 33 lies between the perfect squares 25 and 36. So the square root of 33 lies between the square roots of 25 and 36, which are 5 and 6.
- B. $\sqrt{289 - 225} = \sqrt{64} = 8$
- $\sqrt{6,400} = 80$
- $\sqrt[3]{2,744} = 14$

Lesson 8.3

Key Concept, page 260

- | | |
|-----------|--------|
| 1. 20,736 | 4. 10 |
| 2. 100 | 5. 64 |
| 3. 64 | 6. 243 |

Think About Math, page 261

- | | |
|-------------------------|---------------------------|
| 1. 1.84×10^4 | 4. 8.7×10^5 |
| 2. 4.5326×10^8 | 5. 1.265×10^{10} |
| 3. 2×10^7 | 6. 9.348×10^6 |

Think About Math, page 262

- | | |
|----------------------|------------------|
| 1. 310,000 | 5. 664,100,000 |
| 2. 7,000,000,000,000 | 6. 10,020,000 |
| 3. 4,060,000 | 7. 5,900,000,000 |
| 4. 291,300,000 | 8. 82,200 |

Vocabulary Review, page 262

- scientific notation
- powers of ten
- standard notation
- annex zeros

Skill Review, page 262

- The numbers in scientific notation are 3.786×10^8 and 9.2433×10^4 .
- The numbers in standard notation are 4,000,000,000,000 and 19,236,000.

Skill Practice, page 263

- B.
- A.
- C.
- D.
- C.

Answer Key

Chapter 8 Review, pages 264–265

1. D. $2^{10} = 1,024$, $5^4 = 625$, $1^{200} = 1$, $200^1 = 200$
2. D. $3,245 \times 10^2$ and 324.5×10^3 are not in scientific notation because 3,245 and 324.5 are not numbers greater than or equal to 1 and less than 10. 3.245×10^3 is in scientific notation, but is not equal to 32,450.
3. B. Find the two perfect squares closest to 90. The number $\sqrt{90}$ is between the square roots of those perfect squares.
4. A. $\sqrt[3]{64} = 4$ because $4 \times 4 \times 4 = 64$.
5. A. $3^2 + 4^2 = 9 + 16 = 25$ and $5^2 = 25$
6. D. $1.2 \times 10^5 = 120,000$; $8.3 \times 10^4 = 83,000$;
 $6.7 \times 10^3 = 6,700$; $4.3 \times 10^3 = 4,300$
7. D. $9.3 \times 10^7 = 93,000,000$
8. B. Move the decimal point five places to the right and annex 3 zeros to the right of the 4.
 $6.04 \times 10^5 = 604,000$
9. B. $25^2 = 625$
10. D. 6 is the base, and 3 is the number of times the base is multiplied: $6 \times 6 \times 6$.
11. $3^2 + 6 \times 2 - 15 = 9 + 12 - 15 = 6$
12. D. $5^3 = 125$; $6^3 = 216$; $125 < 145 < 216$;
so $5 < \sqrt[3]{145} < 6$
13. A. $\sqrt[3]{3,375} = 15$
14. D. $12 \times 12 = 144$ square inches

CHAPTER 9 Data

Lesson 9.1

Key Concept, page 270

1. 104
2. 37
3. 45
4. 70
5. 18
6. 9.2 or $9\frac{1}{5}$

Think About Math, page 272

1. mean: 3, median: 3, mode: 3 and 4
2. mean: 37.6, median: 34, mode: 35
3. \$525
4. 21

Vocabulary Review, page 272

1. mean
2. data
3. mode
4. median
5. measures of central tendency
6. range

Skill Review, page 273

1. median: 65; modes: 67 and 92
2. median: 60.5; modes: 37 and 95
3. median: 42; no mode
4. The mean, median, and mode of a data set can be equal when all of the values in a data set are the same; for example, 24, 24, 24.

Skill Practice, page 273

1. B. List the house selling prices in order from least to greatest. Since there are an odd number of data, 7, find the middle value. 85,000, 95,500, 99,900, 105,000, 108,000, 120,000, 124,000. The middle value is 105,000.
2. C. Add the grades, then divide by 8.

$$\frac{75 + 72 + 88 + 90 + 85 + 100 + 77 + 86}{8} = \frac{673}{8} = 84.125$$
 to the nearest percent is 84%.
3. A. Add the age range to the youngest age to find the greatest age. $10 + 15 = 25$.
4. D. Swimming occurs 2 times, skiing occurs 3 times, and scuba diving, fishing, rafting, and sailing each occur once. Since the sport *skiing* occurs more often than any other sport, skiing is the mode of the data set.

Lesson 9.2

Key Concept, page 274

1. mean: \$17, median: \$16, mode: \$14, range: \$8
2. mean: 58, median: 58.5, mode: 35, 63, range: 58

Think About Math, page 279

1. nitrogen and carbon dioxide
2. 78%

Vocabulary Review, page 280

1. circle graph
2. line graph
3. horizontal axis
4. vertical axis
5. bar graph
6. line plot
7. graph
8. trend

Skill Review, page 281

1. The amount of money will be exactly \$46,609.57. The graph supports this, so any number in the range of \$45,000–\$48,000 would be an acceptable answer.
2. The amount of money at 30 years will be exactly \$100,626.57. An estimate between \$100,000–\$105,000 is appropriate due to the labeling of the graph. Therefore, the number of times greater than before any interest is calculated will be $100,626.57/10,000 = 10.062657$. Using the estimate range stated before can give a range of 10–10.5.

Skill Practice, page 281

1. D.

$$\frac{x}{12,383} = \frac{13}{100}$$

$$100x = 12,383 \times 13$$

$$x = \frac{160,979}{100}$$

$$x = 1,609.79 \text{ or about } 1,610$$
2. D. The 2005 stock price was closest \$20.
3. B. $5 - 2 = 3$
4. C. Look at the item with the greatest number of X's above it. The mode is the item that appears most often.

Answer Key

Lesson 9.3

Key Concept, page 282

- mean: 36.7; median: 34; mode: 28; range: 33
- 50
- 24

Think About Math, page 286

- A circle graph could be misleading if the percents do not add up to 100%.
- The scale does not increase evenly.
- 16.9

Vocabulary Review, page 286

- | | |
|-----------------------|------------|
| 1. stem-and-leaf plot | 4. outlier |
| 2. stem | 5. key |
| 3. leaf | 6. mislead |

Skill Review, page 286

- Ian may be trying to show that Dora, Elly, and Ian all walked nearly the same number of miles. He used a scale that had large gaps, thereby making the data appear to be all pretty much in the same range.
- Dora may be trying to show that she walked twice as many miles as Ian. She did not start her scale at 0.

Skill Practice, page 287

- D. The scale is numbered in reverse order. This makes it look as if the boys had the greater number of summer jobs.
- B. Key: $131|4$ means 1,314. There should be only one leaf for each piece of data.
- A. The percents do not add up to 100%.
 $30\% + 18\% + 10\% + 35\% = 93\%$
- B. The scale does not begin at 0. It looks as if there are no senior citizens in Millvale in 2010.

Chapter 9 Review, pages 288–289

- B. The temperature went up from 10° to 19° , a difference of 9° .
- D. The temperature either dropped or stayed the same between 1 A.M. and sunrise.
- D. Both \$150 and \$300 have 4 Xs.
- C. There are 9 Xs for amounts paid that are less than \$300.
- B. Multiply each money amount by the number of X's and add, then divide by 16 to get \$253.13 (rounded to the nearest penny).
- D. The outlier is 18; the median is 35 whether the outlier is one of the data or not.
- D. Office has 6 employees, press has 6 employees, and the Editorial department has 22 employees;
 $6 + 6 + 22 = 34$.
- C. Subtract the department with the fewest number of employees, 6, in the Press or Office departments, from the department with the most employees, 23, in the Mail department, to get the range.
- D. The graph is misleading because the scale does not start at 0.

CHAPTER 10 Probability

Lesson 10.1

Key Concept, page 292

1. 112
2. 180
3. 168
4. 120

Think About Math, page 294

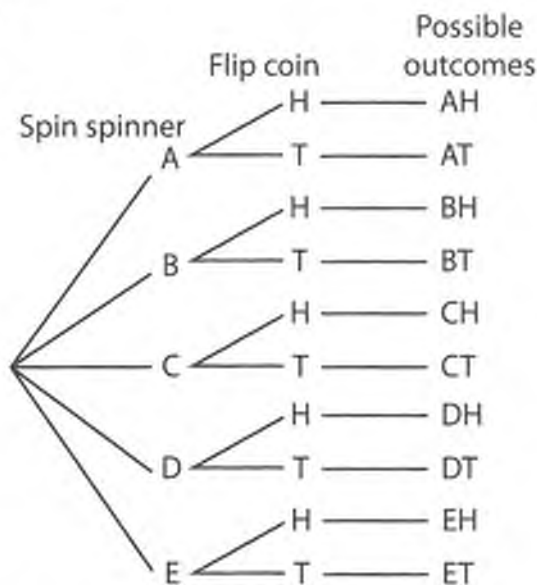
1. 36
2. 125

Vocabulary Review, page 294

- | | |
|-------|-------|
| 1. E. | 4. C. |
| 2. F. | 5. D. |
| 3. A. | 6. B. |

Skill Review, page 295

1. A tree diagram allows you to visually see every combination possible and allows you determine the outcome by a visual display.
2. The tree diagram confirms the statement in the text that there are 8 possible outcomes. The tree diagram expands upon the text by showing all of the specific outcomes.
- 3.



10 possible outcomes

Skill Practice, page 295

1. B. There should be 3×3 or 9 outcomes in the sample space: 1, 1; 1, 2; 1, 3; 2, 1; 2, 2; 2, 3; 3, 1; 3, 2; 3, 3.
2. C. There are two possible outcomes (boy or girl) used as a factor three times (three children):
 $2 \times 2 \times 2 = 8$.
3. A. There are 6 outcomes for the cube and 4 outcomes for the spinner: $6 \times 4 = 24$.
4. C. There are 10 possible outcomes (digits 0–9) used as a factor 4 times (4-digit PIN number):
 $10 \times 10 \times 10 \times 10 = 10,000$.

Lesson 10.2

Key Concept, page 296

1. 36
2. 27
3. 8
4. 12

Think About Math, page 299

1. 0
2. $\frac{1}{3}$, about 0.33, or about 33%
3. $\frac{1}{28}$, about 0.036, or about 3.6%

Vocabulary Review, page 300

1. trials
2. impossible event
3. permutation
4. probability
5. combination
6. certain event
7. theoretical probability
8. experimental probability

Answer Key

(Lesson 10.2 cont.)

Skill Review, page 300

1. Yes; the probability of drawing a red marble out of the bag is $\frac{4}{9}$ or about 44%, and 44% of 150 is about 67.
2. The probability is $\frac{1}{120}$. The brochures are placed in an arrangement in which order is important. This means that the number of possible outcomes is a permutation. So you use permutations to find the number of possible outcomes. There are 5 choices for the first brochure, 4 for the second, 3 for the third, 2 for the fourth, and 1 for the fifth. If you multiply those numbers together, you get 120 as the number of possible outcomes. Since there is only 1 favorable outcome, the probability is $\frac{1}{120}$.
3. To predict an outcome, you first find the probability of the particular outcome, and then you use the probability to make a prediction. For theoretical probability, you use the ratio of favorable outcomes to total possible outcomes to find the probability. For experimental probability, you use the ratio of the number of successes to the number of trials to find the probability. Theoretical probability and experimental probability will differ because theoretical probability is based on equally likely results, while experimental probability is based on actual results.

Skill Practice, page 301

1. A. If she buys 5 out of the 100 tickets sold, she has a 1 in 20, or 0.05, or 5% chance of winning the car.
2. D. This is permutation since the order matters. There are 10×9 or 90 possible outcomes. There is 1 favorable outcome, so the probability is $\frac{1}{90}$.
3. $\frac{8 \text{ successes}}{20 \text{ trials}} = 8 \div \frac{4}{20} \div 4 = \frac{2}{5} = 0.40$ or 40%
4. $\frac{42 \text{ favorable}}{150 \text{ possible}} = \frac{7}{25} = 0.28$
 $0.28 \times 50 = 14$

Lesson 10.3

Key Concept, page 302

1. $1\frac{1}{10}$
2. $\frac{1}{4}$
3. $\frac{5}{14}$
4. $\frac{1}{24}$
5. $\frac{6}{8} = \frac{3}{4}$, 0.75, or 75%
6. $\frac{4}{6} = \frac{2}{3}$, about 0.67, or about 67%

Think About Math, page 304

1. overlapping; $\frac{7}{12} + \frac{6}{12} - \frac{3}{12} = \frac{10}{12} = \frac{5}{6}$
2. mutually exclusive; $\frac{1}{12} + \frac{6}{12} = \frac{7}{12}$
3. mutually exclusive; $\frac{3}{12} + \frac{1}{12} = \frac{4}{12} = \frac{1}{3}$
4. overlapping; $\frac{6}{12} + \frac{5}{12} - \frac{2}{12} = \frac{9}{12} = \frac{3}{4}$

Vocabulary Review, page 305

1. E.
2. C.
3. A.
4. D.
5. B.

Skill Review, page 306

Sample answers:

1. For color tiles that are not the same color as the tile selected in the first pick, the likelihood goes up. This is because every time you remove a tile, the number that goes in the denominator is reduced by one, but the number in the numerator remains the same, so the percentage increases. For color tiles that are the same color as the tile selected in the first pick, the likelihood goes down. This is because the numbers in both the numerator and denominator are reduced by one, leading to a lower percentage. For example, if the probability in the first pick was $\frac{2}{3}$, or about 67 percent, the probability in the second pick would be $\frac{1}{2}$, or 50 percent.

Answer Key

Chapter 11 Review, pages 322–323

1. D. Multiply the number of yards by the number of inches in one yard. Multiply 12 by 36.
2. C. kilometer, meter, centimeter, millimeter
3. B. Betina has lived $5 \text{ months} \times 30 \text{ days per month}$ in Tucson or 150 days. Mavis has lived there 136 days. Hector has lived there $18 \text{ weeks} \times 7 \text{ days per week}$ or 126 days. Jumah has lived there $0.25 \times 365 \text{ days}$ or 91.25 days.
4. B. 2 cups equal 1 pint, and 2 pints equal one quart. There are 4 cups in one quart and 2×4 or 8 cups in 2 quarts.
5. B. Divide 75 inches by 12 inches per foot to get 6 feet 3 inches.
6. C. There are 1,000 mL in 1 liter. Divide 300 by 1,000 to get 0.3 liters.
7. A. Multiply 5,280 by 5 to get 26,400 feet.
8. Multiply 4 pounds times 16 ounces per pound to get 64.
9. C. There are 1,000 liters in 1 kiloliter, so $15 \times 1,000 = 15,000$.
10. D. Write both times in terms of minutes. Then compare the times.
11. B. $(12 \times 3) - 5 = 31$ feet.
12. C. *Kilo-* means 1,000, so 35 kilometers is equal to 35,000 meters.
13. A. $6,500 \text{ kilograms} = 6,500 \times 1,000 \text{ grams}$
14. D. Multiply 450 yards by 3 feet per yard to get 1,350 feet.

Answer Key

CHAPTER 12

CHAPTER 12 Geometry



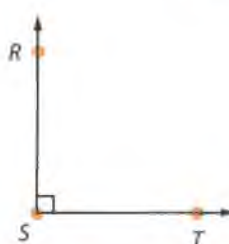
Lesson 12.1

Key Concept, page 326

1. square
2. circle
3. triangle
4. rectangle

Think about Math, page 327

Sample answers:

1. 
2. 
3. 

Think about Math, page 328

1. acute equilateral triangle
2. obtuse scalene triangle

Vocabulary Review, page 330

- | | |
|------------------|------------------------|
| A. segment | E. rectangle |
| B. circle | F. perpendicular lines |
| C. quadrilateral | G. parallel lines |
| D. angle | H. square |

Skill Review, page 331

1. Archimedes found better approximations of pi by finding the perimeter of inscribed and circumscribed regular polygons with more and more sides. In other words, he found approximations of pi by finding the perimeter of regular polygons that were placed inside and outside of the circle, but only touched the circle. He then used more and more sides for these polygons to find better and better approximations of pi.
2. Rectangles and squares both have 4 sides and 4 angles. Both figures have all angles measuring 90 degrees. However, a square has all four sides measuring the same length, whereas a rectangle has opposite sides measuring the same length.
3. No; The sum of the measures of the three angles of a triangle is 180° . One right angle is 90° . One obtuse angle is greater than 90° , let us say 91° . $90 + 91 = 181$. This measure for two angles is already greater than the total sum for three angles, so a triangle cannot have a right angle and an obtuse angle.

Skill Practice, page 331

1. D. The diameter is the distance across a circle through its center. Line segment ST is the diameter.
2. C. The measure of the angle is 45° , so it is acute.
3. C. One of the angles is equal 90° , and no sides are congruent. So, the triangle is a right scalene triangle.
4. A. The figure is a ray: a set of points continuing in one direction only, and it is named by the points MP .

Answer Key

Lesson 12.2

Key Concept, page 332

1. square
2. triangle

Think about Math, page 334

1. 100 yd.
2. 40 cm
3. 46 m

Think about Math, page 336

1. 62.8 m
2. 43.96 m or 44 m

Vocabulary Review, page 336

1. perimeter
2. radius
3. circumference
4. pi
5. diameter

Skill Review, page 336

1. There are two missing side lengths. Add 7 cm and 4 cm to find one missing side length. Subtract 10 cm from 15 cm to find the other side length.
 $15 + 7 + 5 + 4 + 10 + 11 = 52$
 The perimeter is 52 cm.
2. The radius given, and it is half of the diameter. To find the diameter, multiply the radius by 2. Then multiply the diameter by π to find the circumference. The circumference is 62.8 cm.

Skill Practice, page 337

1. B. To find the perimeter of the half circle, add the diameter, 1 m, to one-half of the circumference of the circle. $1 + (3.14 \div 2) = 2.57$ m
2. B. $8 \text{ sides} \times 8 \text{ mm} = 64 \text{ mm}$
3. C. To find perimeter add the sides:
 $15 + 15 + 9 + 9 = 48$
4. B. 5
 $7 + 7 + x + x = 24$
 $14 + 2x = 24$
 $2x = 10$
 $x = 5$

Lesson 12.3

Think About Math, page 340

No, the answer does not make sense.

In the drawing, the table is 1.5 in. long. The scale is 1 in. = 4 ft. A dining room table would likely be longer than 0.375 feet. It may be necessary to revise the scale or the drawing.

Vocabulary Review, page 343

1. C.
2. B.
3. A.

Skill Review, page 343-344

1. 12
2. 22
3. 1.5 in.
4. 2 feet, 7 feet
5. A.
6. B.

Answer Key

(Lesson 12.3 cont.)

Skill Practice, page 345

- height = 3 in.
 - width = 4.5 in.
 - diameter = $\frac{3}{4}$ in.
- A.
- 5 cm = 6 in.
- In order to draw a triangle with side lengths 3 inches, 4 inches, 5 inches, first draw a line segment that measures the longest side (5 inches) using a ruler. Then from the one endpoint, draw a circle with radius 4 inches using a compass. From the other endpoint, draw a circle of radius 3 inches using a compass. The two circles created will intersect twice. Choose one intersection point to complete the triangle (the initial line segment is a side of the triangle). The drawn triangle will have side lengths 3 inches, 4 inches, and 5 inches.
- In order for the new scale drawing to be to the same proportion, the ratio of the door lengths must be multiplied to every length. The ratio from new:old is 3:2 or 1.5:1. So multiply the old lengths by 1.5 to find the new lengths.

Lesson 12.4

Key Concept, page 346

- 44 m
- 12 cm
- 18.8 mm
- 44 ft

Think about Math, page 349

- 60 cm²
- 154 ft²
- 153.9 in.²
- 64 mm²

Vocabulary Review, page 350

- height
- length
- area
- width
- base

Skill Review, page 351

- 64 mm²
- 75 cm²
- 38.1 m²

Skill Practice, page 351

- D.
- $B. \quad 96 \times 2 = 192$
 $72 \times 2 = 144$
 $192 + 144 = 336$
- $D. \quad 25 \times 30 = 750$
 $750 - 100 = 650$
- $C. \quad 30 = \frac{1}{2}(6)(h)$
 $10 = h$

Lesson 12.5

Think About Math, page 356

5

Vocabulary Review, page 357

1. G.
2. B.
3. A.
4. D.
5. E.
6. F.
7. C.

Skill Review, page 358-359

1. 6, -6
2. 11, -11
3. 3, -3
4. not a triple
5. Pythagorean triple
6. not a triple
7. $369 \approx 19.2$
8. $244 \approx 15.6$ ft.
9. 5 ft.

Skill Practice, page 359

1. $b^2 = 95$, -95
2. $a^2 = 45$, -45
3. $x^2 = 24$, -24
4. a Pythagorean triple
5. not a triple
6. a Pythagorean triple
7. $\sqrt{48} \approx 6.9$
8. $\sqrt{161} \approx 12.7$
9. $\sqrt{40} \approx 6.3$
10. 10
11. $\sqrt{544} \approx 23.3$
12. $\sqrt{20} \approx 4.5$

Lesson 12.6

Key Concept, page 360

1. right triangle
2. rectangle
3. circle

Think about Math, page 363

1. 288 m^3
2. 512 cm^3

Vocabulary Review, page 364

- | | |
|-------|-------|
| 1. C. | 5. F. |
| 2. B. | 6. G. |
| 3. E. | 7. H. |
| 4. D. | 8. A. |

Skill Review, page 364

1. A square and a cube are similar in that they are both figures whose sides have equal lengths. The angles of both figures are right angles. They are different in that a square is a two-dimensional figure, and a cube is a three-dimensional figure. You square the length of side ($s \times s$) to find the area of a square, while you cube the length of a side ($s \times s \times s$) to find the volume of a cube.
2. A cube is a type of rectangular solid in which all of the edges are equal in length.

(Lesson 12.6 cont.)

Skill Practice, page 365

- D. $V = l \times w \times h$
 $126 = 7 \times 3 \times h$
 $126 = 21 \times h$
 $\frac{126}{21} = \frac{21 \times h}{21}$
 $6 = h$
- A. $V = s \times s \times s$
 so $V = 14 \times 14 \times 14$
 and $V = 2,744 \text{ in.}^3$
- C. $1,728 = s^3$
 $\sqrt[3]{1,728} = s$
 $12 = s$
- D. $V = 18 \times 15 \times 8 = 2,160 \text{ in.}^3$

Lesson 12.7

Think About Math, page 367

The package is a cylinder. $V = \pi r^2 h$

$$r = \frac{d}{2} = \frac{6}{2} = 3$$

$$V = (3.14) (3^2) (12)$$

The cylinder's volume is $\approx 339 \text{ in.}^3$

Think About Math, page 368

The disk is shaped like a cone. $V = \frac{1}{3} \pi r^2 h$

$$r = \frac{d}{2} = \frac{7.5}{2} = 3.75$$

$$V = \frac{1}{3} (3.14) (3.75^2) (2.25)$$

The disc's volume is $\approx 33 \text{ in.}^3$

Vocabulary Review, page 370

- A 3-D shape with one end that ends in a point is a cone.
- A cylinder had two equally sized circular ends.
- The base of a cone is a circle.
- A frustum is a cone with its top cut off.
- The point of a cone is the apex.
- All of the points on the outside surface of a sphere are the same distance from the shape's center.

Skill Review, page 370

- Only choice C uses cubic units of measurement.
- $V = \pi r^2 h$
 $= (3.14) (16) (12)$
 $\approx 603 \text{ cm}^3$
- $\approx 5.96 \text{ in.}^3$
- $V = \pi r^2 h$
 $r = \frac{d}{2} = \frac{32}{2} = 16$
 $= (3.14) (16^2) (81)$
 $\approx 65,111 \text{ m}^3$
- $V = \frac{1}{3} \pi r^2 h$
 $r = \frac{d}{2} = \frac{5.8}{2} = 2.9$
 $= (3.14) (2.9^2) (12.1)$
 $\approx 107 \text{ m}^3$

Skill Practice, page 371

- $V = \text{volume of half-sphere} + \text{volume of cylinder}$
 $V = \frac{1}{2} (\frac{4}{3} \pi r^3) + (\pi r^2 h) = 0.002 \text{ m}^3 + 0.016 \text{ m}^3 = 0.018 \text{ m}^3$
- $V = \text{volume of two half-spheres} + \text{volume of cylinder}$
 $V = (\frac{4}{3} \pi r^3) + (\pi r^2 h) = 268 \text{ mm}^3 + 452 \text{ mm}^3 = 720 \text{ mm}^3$
- $V = (\text{volume of cone 1}) - (\text{volume of cone 2})$
 $V = (\frac{1}{3} \pi r_1^2 h_1) - (\frac{1}{3} \pi r_2^2 h_2) = 105 \text{ in.}^3 - 44 \text{ in.}^3 = 61 \text{ in.}^3$

Chapter 11 Review, pages 372–373

1. A. Multiply the length and width of the side of the truck to find the area of that side.
 $14 \times 13 = 182$ square feet
2. 1,456 Multiply the length and the width and the height to find the volume, or capacity, of the truck.
 $14 \times 13 \times 6 = 1,102$ cubic feet
3. C. All squares are quadrilaterals with only right angles, so they are rectangles. However, there are rectangles with two pairs of congruent sides that are not all the same length. No triangles in the plane have more than one right angle, and there are triangles that are not equilateral.
4. The formula for the perimeter of a rectangle is $2l + 2w$. $15 = 2l + 2(2.5)$, so $2l = 10$, and $l = 5$ feet.
5. D. The formula for the area of a circle is πr^2 .
 $\pi(12)^2 = 144\pi$, or about 452.16 square inches.
6. B. The perimeter is the sum of the length of the sides. $6 + 24 + 18 + 6 + 4 + 6 + 4 + 6 + 12 + 6 = 92$ feet
7. C. One way to find the area is to find the area of the large 24 by 18 rectangle, then subtract the smaller rectangles that are not included.
 $24 \times 18 - (6 \times 12) - (6 \times 4) =$
 $432 - 72 - 24 = 336$
8. B. There are 3 circles in the rectangle, each with a diameter of 18 inches. The length of the rectangle is $18 \times 3 = 54$ inches.
9. A. The length of the rectangle is $18 \times 3 = 54$ inches, and the width is 18 inches. The area of the rectangle is $54 \times 18 = 972$ square inches.