To the Student

This *Skills Practice Workbook* gives you additional examples and problems for the concept exercises in each lesson. The exercises are designed to aid your study of mathematics by reinforcing important mathematical skills needed to succeed in the everyday world. The materials are organized by chapter and lesson, with one Skills Practice worksheet for every lesson in *IMPACT Mathematics, Course 2.*

Always keep your workbook handy. Along with your textbook, daily homework, and class notes, the completed Skills Practice Workbook can help you in reviewing for quizzes and tests.

To the Teacher

These worksheets are the same ones found in the Chapter Resource Masters for *IMPACT Mathematics, Course 2*. The answers to these worksheets are available at the end of each Chapter Resource Masters Booklet.

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COURSE 2

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Lesson 1.1 Skills Practice

Variables and Expressions

Evaluate each expression for $w = 2$, $x = 3$, $y = 5$, and $z = 6$.

1. $2w$

2. $y + 5$

3. $9 - z$

4. $\frac{z}{3}$

5. $3 + 4z$

6. $6y - 5$

7. y^2

8. $2x^3$

9. $\frac{z}{2}$

Evaluate each expression for $m = 3$, $n = 7$, and $p = 9$.

10. $2m + 7$

11. $12 - 3m$

12. $5p$

13. $3.3p$

14. $3.3p + 2$

15. $2p + 3.3$

16. $20 + 2n$

17. $20 - 2n$

18. $\frac{n}{7}$

19. n^2

20. $6m^2$

21. $\frac{p^2}{3}$

22. $1.1 + n$

23. $p - 8.1$

24. $3.6m$

25. $3n^2 - 2$

26. $3 + m^3$

27. $2.1 + p^2$

28. $\frac{m^2}{9}$

29. $\frac{2.5m + 2.5}{5}$

30. $\frac{(n+2)^2}{3}$

Name **Date**

Lesson 1.2 Skills Practice

Expressions and Formulas

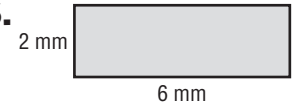
Solve.

1. Air Travel A plane is traveling 9 miles per minute. How much time is needed to travel 216 miles?

2. Jogging What is the rate, in feet per second, of a girl who jogs 315 feet in 45 seconds?

Find the perimeter and area of each rectangle.

3.



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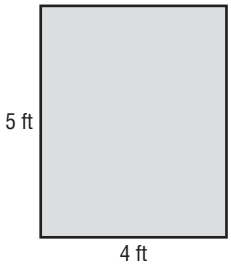

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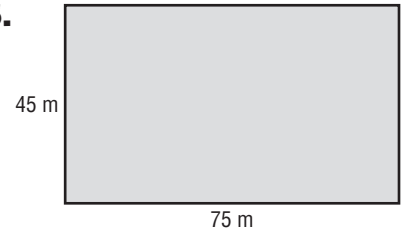

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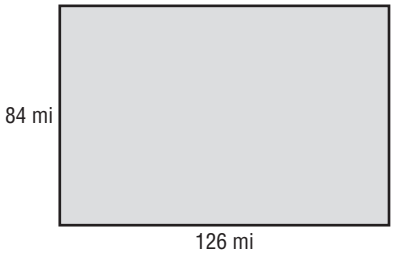
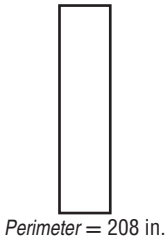


7. a rectangle that is 21 inches long and 13 inches wide

8. a square that is 25 centimeters on each side

Find the missing dimension of each rectangle.

9.



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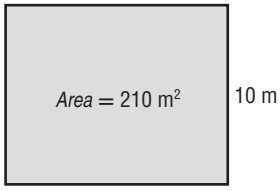

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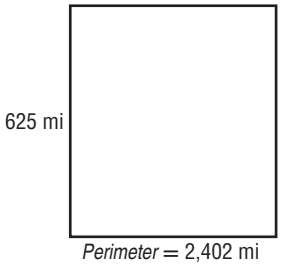

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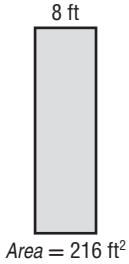

13. The perimeter of a rectangle is 100 centimeters. Its width is 9 centimeters. Find its length.

14. The area of a rectangle is 319 square kilometers. Its width is 11 kilometers. Find its length.

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Lesson 1.3 Skills Practice

The Distributive Property

Use the distributive property to expand each expression. Then evaluate the expression.

1. $8(50 + 4)$ **2.** $(20 + 9)5$ **3.** $2(60 + 4)$ **4.** $7(40 - 2)$

5. $4(400 - 2)$ **6.** $4(16 + 5)$ **7.** $8(4 + 1)$ **8.** $9(24 - 19)$

9. $3(7 + 11)$ **10.** $10(12 - 4)$ **11.** $(21 + 9)5$ **12.** $7(1 + 10)$

13. $2(1 + 6)$ **14.** $4(15 + 25)$ **15.** $15(100 + 6)$ **16.** $12(22 + 52)$

Use the distributive property to expand each expression.

17. $4(d + 2)$ **18.** $1(u - 3)$ **19.** $6(f + 5)$ **20.** $2(g - 3)$

21. $3(x - 7)$ **22.** $8(b + 4)$ **23.** $(9 - h)5$ **24.** $4(c + 1)$

25. $12(2 - y)$ **26.** $7(a + 1)$ **27.** $11(k - 20)$ **28.** $9(r - 1)$

Use the distributive property to factor each expression.

29. $3x + 27$ **30.** $15 - 35y$ **31.** $42q - 21$ **32.** $36 - 60m^2$

33. $48b^2 + 64$ **34.** $24r - 32r^2$ **35.** $18w^2 + 30w$ **36.** $40a + 60a^2$

37. $66d^2 - 11d$ **38.** $28g + 42g^2$ **39.** $54h^2 - 18h$ **40.** $24s + 96s^2$

Name *Date*

Lesson 2.1 Skills Practice

Factors and Multiples

Find the GCF of each set of numbers.

1. 14, 20

2. 16, 42

3. 8, 18

4. 24, 36

5. 72, 22

6. 77, 15

7. 32, 80

8. 90, 120

9. 45, 30

10. 12, 62

11. 15, 27

12. 21, 28

Find the LCM of each set of numbers.

13. 2, 8

14. 6, 10

15. 10, 11

16. 10, 12

17. 9, 18

18. 4, 22

19. 12, 30

20. 4, 13

21. 25, 30

22. 250, 30

23. 200, 18

24. 70, 90

Name **Date**

Lesson 2.2 Skills Practice

Exponent Machines

Rewrite each expression using a single base.

1. $2^3 \cdot 2^5$

2. $10^2 \cdot 10^7$

3. $1^4 \cdot 1$

4. $6^3 \cdot 6^3$

5. $4^2 \cdot 4^3$

6. $9^8 \cdot 9^6$

7. $7^4 \cdot 7^2$

8. $13^2 \cdot 13^4$

9. $(3^2)(3^3)$

10. $(9^2)(9^2)$

11. $a^2 \cdot a^3$

12. $n^8 \cdot n^3$

13. $(p^4)(p^4)$

14. $(z^6)(z^7)$

15. $(6b^3)(3b^4)$

16. $(v^3)(v^7)$

17. $11a^2 \cdot 3a^6$

18. $10t^2 \cdot 4t^{10}$

19. $(8c^2)(9c)$

20. $(4f^8)(5f^6)$

21. $(8^5)(8^3)$

22. $(21^9)(21^5)$

23. $t^9 \cdot t^3$

24. $h^4 \cdot h^{13}$

25. $(m^6)(m^6)$

26. $(u^{11})(u^{10})$

27. $(r^7)(r^{20})$

28. $(w)(w^9)$

29. $4d^5 \cdot 8d^6$

30. $7j^{50} \cdot 6j^{50}$

31. $(5b^9) \cdot (6b^2)$

32. $12^1 \cdot 12^2$

Name **Date**

Lesson 2.3 Skills Practice

More Exponent Machines

Rewrite each expression using a single base.

1. $5^{10} \div 5^{2}$

2. $\frac{10^{6}}{10^{2}}$

3. $\frac{7^{9}}{7^{6}}$

4. $12^{8} \div 12^{3}$

5. $\frac{100^{9}}{100^{8}}$

6. $\frac{2^{3}}{2}$

7. $r^{8} \div r^{7}$

8. $z^{10} \div z^{8}$

9. $\frac{q^{8}}{q^{4}}$

10. $\frac{g^{12}}{g^{8}}$

11. $y^{7} \div y^{2}$

12. $\frac{z^{12}}{z^{5}}$

13. $\frac{6^{11}}{6^{3}}$

14. $\frac{15^{3}}{15^{2}}$

15. $\frac{9^{9}}{9^{7}}$

16. $\frac{18^{4}}{18^{4}}$

17. $\frac{7^{6}}{7^{5}}$

18. $\frac{95^{21}}{95^{18}}$

19. $\frac{v^{30}}{v^{20}}$

20. $\frac{n^{19}}{n^{11}}$

21. $(2^{4})^{5}$

22. $(5^{18})^{1}$

23. $(7^{8})^{8}$

24. $(4^{9})^{11}$

25. $(10^{10})^{10}$

26. $(12^{15})^{0}$

27. $(x^{15})^{3}$

28. $(s^{5})^{14}$

29. $(a^{8})^{12}$

30. $(9^{x})^{y}$

31. $(z^{2})^{r}$

32. $(b^{y})^{7}$

Lesson 3.1 Skills Practice

Add and Subtract with Negative Numbers

Draw chip models to show how to find each sum or difference.

1. $5 + (-8)$

2. $-3 - 3$

Walk the number line to find each sum or difference.

3. $-3 - (-8)$

4. $-7 + (-7)$

5. $-8.5 - 10.25$

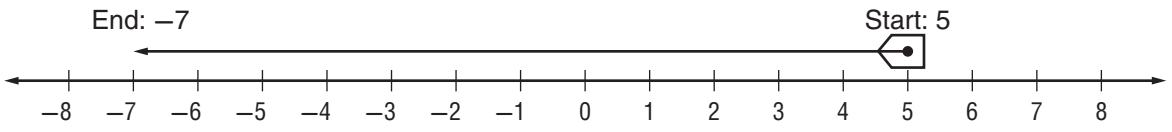
6. $7\frac{1}{3} - 9\frac{2}{3}$

7. $-2.5 - 2.5$

8. $-11 + (-12)$

Write the addition or subtraction equation represented by the drawing.

9.



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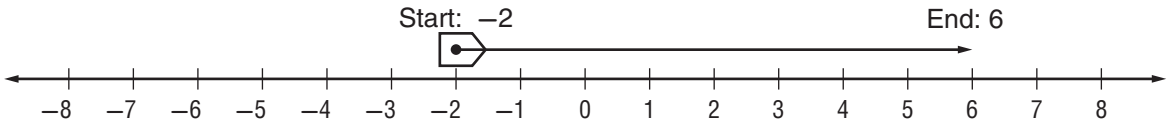

Compute the sum or difference. Then write an equivalent expression.

11. $14 + (-27)$

12. $-2.8 - 1.6$

13. $-2 + 3\frac{1}{2}$

14. $\frac{21}{4} - (-\frac{7}{4})$

In Exercises 15 and 16, find three positive and three negative values that make the inequality true. Describe all the values of y that make the inequality true.

15. $4 - y > 0$

16. $y - 6 < 0$

Name **Date**

Lesson 3.2 Skills Practice

Multiply and Divide with Negative Numbers

Compute each product.

1. $-4(\frac{2}{3})$

2. $-2(-8)$

3. $12\frac{3}{4}(-4)$

4. $-6(5.125)$

5. $-10(-9)$

6. $-(5)^2$

7. $(-5)^2$

8. $-3.2(5)$

9. $8.4(-6)$

10. $(-6)^3$

Find each quotient.

11. $-15 \div 3$

12. $-24 \div (-8)$

13. $22.48 \div (-2)$

14. $\frac{-49}{-0.7}$

15. $-8 \div (-8)$

16. $\frac{36}{-4}$

17. $2.25 \div (-1.5)$

18. $\frac{0}{-9}$

19. $-36 \div 2.4$

20. $\frac{-8^2}{4}$

Without calculating each product, predict whether it is less than 0 or greater than 0.

21. $5 \cdot (-4)$

22. $-5 \cdot (-9)$

23. $(-5)^2$

24. $(-5)^3 \cdot (-9)^3$

25. $(-3)^4 \cdot (-7)^9$

26. $(-6)^3 \cdot (-1)^8$

Name **Date**

Lesson 4.1 Skills Practice

Scientific Notation

Write each number in standard notation.

1. 3.1×10^2

2. 2.3×10^3

3. 6.10×10^5

4. 7.87×10^4

5. 1.06×10^7

6. 2.11×10^{10}

Find the value of *N* in each equation.

7. $11 \times 10^N = 11{,}000$

8. $N \times 10^9 = 6{,}787{,}000$

9. $1.6 \times 10^4 = N$

10. $0.0921 \times 10^N = 9.21$

11. $4.05 \times 10^3 = N$

12. $N \times 10^2 = 0.098$

Write each number in scientific notation.

13. 230

14. 3 hundred

15. 720

16. 2,790

17. 5 million

18. 8,800

Estimate the value of each expression. Then use your calculator to evaluate it. Give your answers in scientific notation.

19. $5 \times 10^2 + 42 \times 10^2$

20. $6.2 \times 10^{16} - 1.1 \times 10^{12}$

21. $(1.05 \times 10^8) \div 2$

22. $(2.1 \times 10^4) \cdot 4$

23. $25 \cdot (5.68 \times 10^8)$

24. $18 \times 10^8 - 6.8 \times 10^6$

25. $2.7 \times 10^3 + 9.8 \times 10^4$

26. $(24 \times 10^8) \div 50$

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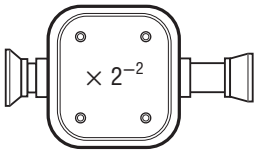
Lesson 4.2 Skills Practice

Negative Exponents

Find the length of the output if a 24-inch input is sent through each connection.

1.



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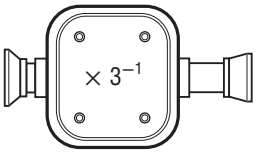

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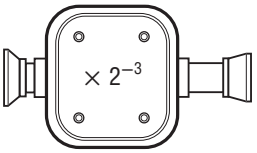


Evaluate each expression.

4. $3^5 \cdot 2^{-5}$

5. $72 \cdot (-2)^3$

6. $a^{-7} \div b^{-7}$

7. 6^{-3}

8. $(-5)^{-4}$

9. -10^5

10. $(10^3)^{-4}$

11. $9^3 \cdot 9^{-2}$

12. $\left(\frac{1}{2}\right) \cdot 4^{-1}$

13. $-64 \cdot 8^{-2}$

14. $5^2 \div 5^{-3}$

15. $x^{-4} \cdot x^5$

Write each expression using only positive exponents.

16. $3^{-4} \div 3^{-6}$

17. 8^{-7}

18. $(10^{-4})^2$

19. $(-2)^{-6}$

20. $(-40)^{-3} \times (-40)^4$

21. $18^{-5} \div 6^{-5}$

22. $(n^{-10})^{-3}$

23. $(b^{-8})^{-2}$

24. $q^{-5} \cdot q^7$

25. $(-7)^{-2}$

26. $11^2 \times 11^{-10}$

27. $27^9 \div 27^{12}$

Name **Date**

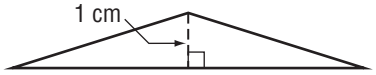
Lesson 5.1 Skills Practice

Surface Area and Volume

Solve.

1. How much wood will be needed to make a toy box that is 3 feet by 1 foot by 1.5 feet?

2. Consider the triangle shown at the right.

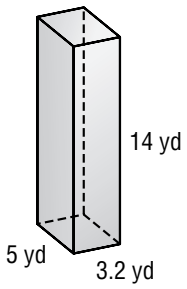


a. What is the area of the triangle?

b. If you built a prism 15 cm high using this triangle as a base, what would be its volume?

Find the volume and surface area of each solid. Round to the nearest tenth if necessary.

3.



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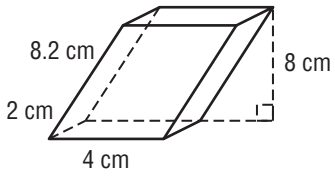

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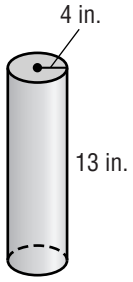
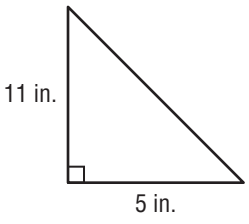


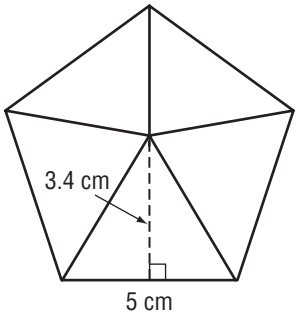
6. Consider the triangle shown at the right.



a. What is the area of the triangle?

b. If you built a prism 7 centimeters high using this triangle as a base, what would be its volume?

7. Consider the pentagon shown at the right.



a. What is the area of the pentagon?

b. If you built a prism 3 inches high using this pentagon as a base, what would be its volume?

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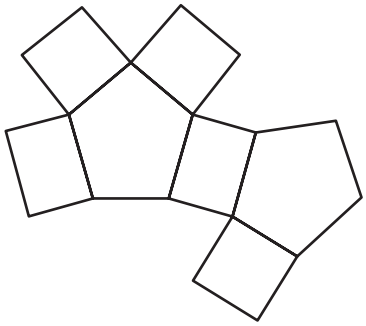
Lesson 5.2 Skills Practice

Nets and Solids

Decide whether the figure is a net. If it is a net, describe what shape it creates. If it is not a net, give an explanation.

1.



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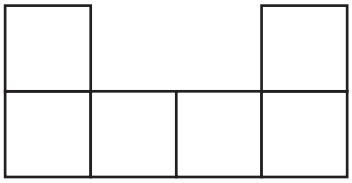
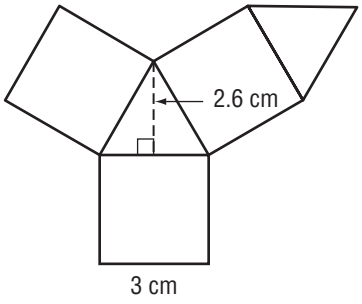
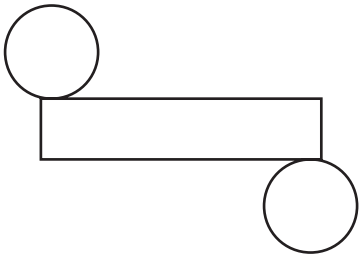


Find the surface area of the solid that can be created from the net.

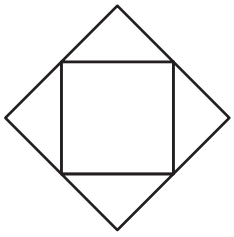
3. Each equilateral triangle in the net below has a side length of 3 centimeters. The squares also have side lengths of 3 centimeters.



4. Each circle in the net below has a radius measure of 4 inches. The width of the rectangle is 6 inches.



5. Each triangle in the net below is isosceles with a base of 8 feet and a height of 4 feet. The figure in the center is a square.



Lesson 5.3 Skills Practice

Mass and Weight

Convert each quantity to grams. Write your answers in scientific notation.

1. 26,000 centigrams

2. 10 milligrams

3. 1,672 kilograms

4. 39,720 milligrams

5. 0.5 decigrams

6. 25 hectograms

Write the metric unit that you would use to measure the mass of each of the following. Then estimate the mass.

7. leaf

8. feather

9. crayon

10. mosquito

11. penny

12. bowling ball

13. rectangular eraser

14. banana

Fill in the blanks to make each equation true.

15. 2 lb = ____ oz

16. 40 oz = ____ lb ____oz

17. $1\frac{1}{2}$ T = ____ lb

18. 10,000 lb = ____ T

19. 2 T = ____ oz

20. 96 oz = ____ lb

21. 32,000 oz = ____ T

22. 2 lb 5 oz = ____ oz

Choose the better estimate for each measure.

23. the weight of a bag of potatoes: 5 tons or 5 pounds

24. the weight of an apple: $\frac{1}{2}$ pound or 32 ounces

Lesson 6.1 Skills Practice

Dependence

1. You toss a coin and roll a number cube labeled 1, 2, 3, 4, 5, and 6. Find the probability of getting each outcome.

a. rolling an even number and tossing heads

b. rolling a multiple of 3

2. There are 2 yellow marbles, 1 purple marble, 1 green marble, and 2 red marbles in a bag. You draw one marble, record its color, and put it back in the bag. Then you draw a second marble. Find the probability of getting each outcome.

a. a purple, then a red marble

b. two yellow marbles

3. Using the bag of marbles in Exercise 2, you draw one marble, put it in your pocket, and then draw a second marble. Find the probability of getting each outcome.

a. two red marbles

b. a yellow marble on the second draw

4. **Lunch** Tom is making a sandwich. He can have ham, turkey, or roast beef; Swiss or provolone cheese; and, mustard or mayonnaise.

a. Make a tree diagram to show all the possible sandwiches he can make with one meat, one cheese, and one condiment.

b. If he chooses his sandwich fixings randomly, what is the probability that he makes a sandwich with ham and Swiss cheese?

5. **Game** Derek and Latanya are playing a game with 4 chips numbered 1, 2, 3, and 4. Derek chooses two chips randomly. If the sum less than 6, he gets 1 point. If the sum is 6 or greater, Latanya gets 1 point.

a. List all the possible combinations that Derek could choose.

b. Is this a fair game? Explain.

Lesson 6.2 Skills Practice

Make Predictions

1. Game Becky and Kevin were playing *What's in the Bag* From 15 hidden tiles, they took four samples of 4. The tiles were red, yellow, green, and blue.

Sample 1: Y G B B

Sample 2: G B R B

Sample 3: B B B Y

Sample 4: B G Y B

How many of each color do you predict were in the group of 15 tiles?

2. Game Louisa and Wyndel were playing *What's in the Bag* From 20 hidden chips, they took four samples of 6. The chips were red, yellow, green, and blue.

Sample 1: R Y G B G Y

Sample 2: B G Y G G Y

Sample 3: R Y G Y G G

Sample 4: G B G Y Y R

How many of each color do you predict were in the group of 20 chips?

3. Typing Mr. Jacobson decided to survey students at Westview Junior High School to determine the skill levels at which students were typing. He is considering the following suggested strategies for conducting the survey. For each strategy, respond to these three questions.

Is the sample large enough?

Is the sample representative?

Is the survey method practical?

Strategy 1 Hand out a survey to all students.

Strategy 2 Hand out a survey to all students who use the computer lab one Friday.

Strategy 3 Publish a questionnaire in the school newspaper that students can fill out and turn in to a teacher.

Strategy 4 Choose every 10^{th} student on an alphabetical list of all the students in the school to fill out a questionnaire.

Name *Date*

Lesson 6.3 Skills Practice

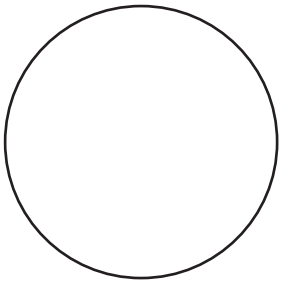
Data Graphs

1. Make a double-bar graph of the data in the table.

Points Earned		
Game	Lois	Marsha
1	8	12
2	5	8
3	10	6
4	8	7

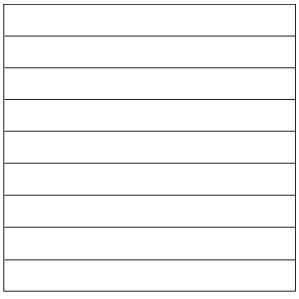
2. Make a circle graph of the data in the table.

Preferred Car Color	
Color	Automobile Owners
White	12
Silver	50
Gold	10
Black	22
Red	6



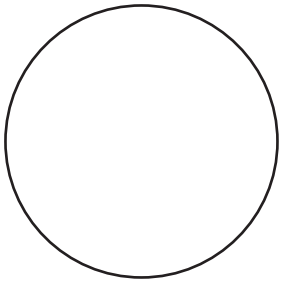
3. Make a double-bar graph of the data in the table.

Number of Sweaters Sold		
Color	Fall	Spring
Red	24	20
White	10	22
Blue	18	35
Brown	42	12



4. Make a circle graph of the data in the table.

Enrollment	
Subject	Students
Math	60
English	140
Social Studies	120
Science	80



Lesson 7.1 Skills Practice

Rational Numbers

Write a number that fits the conditions given. If no such number exists, write "impossible."

1. a natural number between 5 and 7

2. an integer that is less than –2

3. a rational number that is a whole number

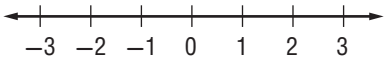
4. an integer between –7.45 and –8.16

5. a rational number between $\frac{1}{2}$ and $\frac{3}{4}$

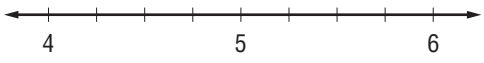
6. a counting number between 12.68 and 13.24

Graph the numbers on the number line. Then write the numbers in order from least to greatest.

7. $\frac{3}{2}$, -0.25, 0.8

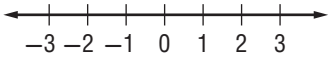


8. 5.7, $5\frac{1}{3}$, 5.01

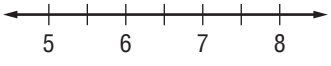


Draw a number line to graph the numbers. Label the number line to indicate its scale.

9. 0.85, -2, $1\frac{1}{3}$, $-\frac{9}{10}$, 1.4



10. 6.3, $6\frac{3}{8}$, 6.02, $\frac{37}{6}$, 7



Name *Date*

Lesson 7.2 Skills Practice

Irrational Numbers

Find the square of each number.

1. 3

2. 22

3. 0.04

4. $\frac{3}{8}$

Find each square root.

5. $\sqrt{25}$

6. $\sqrt{100}$

7. $\sqrt{\frac{81}{169}}$

8. $\sqrt{64}$

Find the two whole numbers that each square root lies between without using your calculator.

9. $\sqrt{28}$

10. $\sqrt{59}$

11. $\sqrt{200}$

12. $\sqrt{72}$

Determine whether each number is rational or irrational. If it is rational, write it as a ratio of two integers. If it is irrational, explain how you know.

13. $\sqrt{\frac{2}{5}}$

14. –5.36

15. $\sqrt{81}$

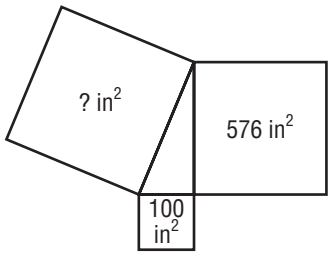
16. 0.07

Lesson 7.3 Skills Practice

The Pythagorean Theorem

Find each missing area.

1.



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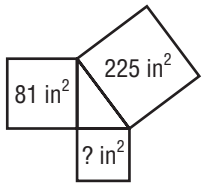
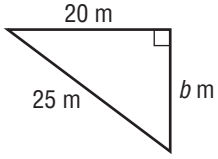


Find each missing side length.

3.



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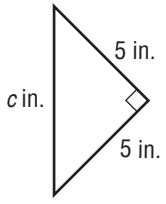

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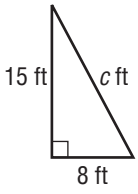

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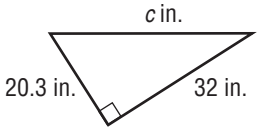

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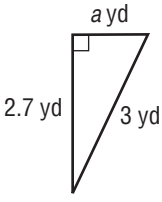

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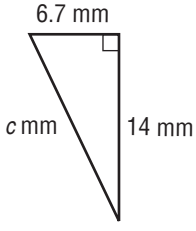


Use the distance formula or the Pythagorean Theorem to find the distance between the given points.

9. (5, 6) and (0, –6)

10. (–1, 9) and (2, 5)

11. (10, –14) and (3, 10)

12. (0, 0) and (–4, –4)

Name **Date**

Lesson 8.1 Skills Practice

Rates

Write a rule describing the relationship in words using the word *per*. Then write a rule using variables.

1. Each week Alawahi jogs 20 miles.
m = miles and w = weeks

2. Sunil earns $12 in one hour.
d = dollars and h = hours

3. An elephant's trunk holds 2 gallons of water.
g = gallons and t = trunks

4. Gloria worked 60 problems in one hour.
p = problems and h = hours

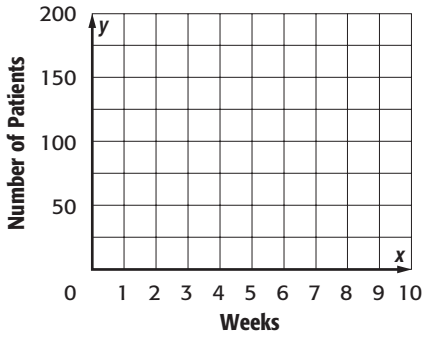
Solve.

5. Dr. Santiago sees 120 patients every 4 weeks.

a. Use $p = 30w$ to complete the table.

Week, w	1	2	3	4	5
Patients, p				120	

b. Use the table to graph $p = 30w$.



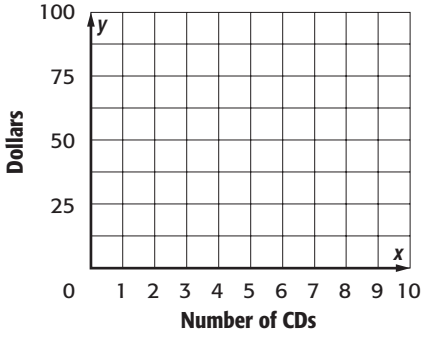
c. Should the points of this graph be connected? Explain.

6. George purchased 12 CDs for $99.

a. Use $d = 8.25c$ to complete the table.

CDs, c	2	4	6	8	10
Dollars, d					

b. Use the table to graph $d = 8.25c$.



c. Use your graph to estimate the cost of 5 CDs.

Name **Date**

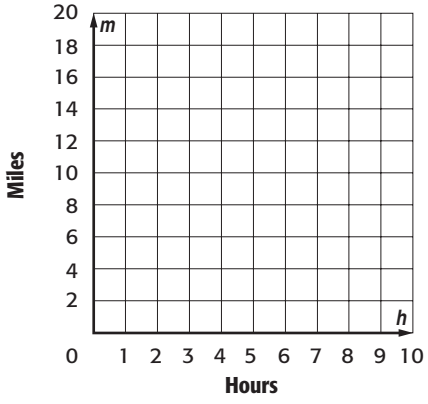
Lesson 8.2 Skills Practice

Speed and Slope

Draw a graph of the data. Write a rule for the relationship between hours and miles.

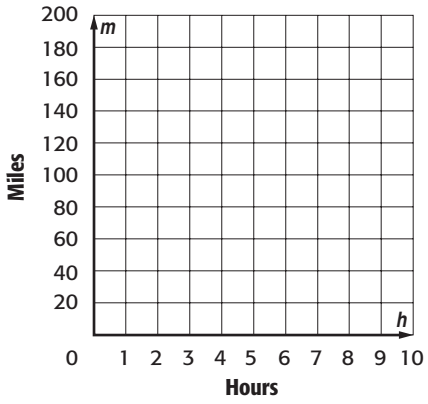
1. The average turtle's speed is about 4 miles per hour.

Hours, *h*	1	2	3	4
Miles, *m*	4	8	12	16



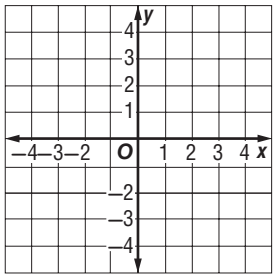
2. The average hare's speed is about 40 miles per hour.

Hours *h*	1	2	3	4
Miles, *m*	40	80	120	160

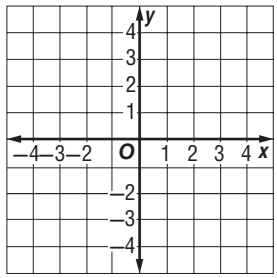


Graph the line and identify its slope.

3. $y = \frac{1}{3}x + \frac{2}{3}$



4. $y = \frac{3}{2}x - 2$



For each equation, give the *y*-intercept.

5. $y = 4x + 1$

6. $y = -\frac{4}{5}x - 3$

7. $y = 3x$

8. $y = -4x + \frac{1}{2}$

Name **Date**

Lesson 8.3 Skills Practice

Recognize Linear Relationships

Complete the table. Then write a rule for the input/output pairs.

1.

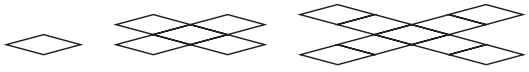
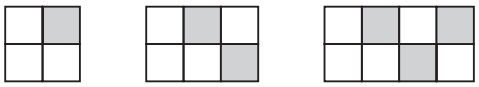


Figure number, *f*	1	2	3	4	5
Perimeter of figure, *p*	4	12			

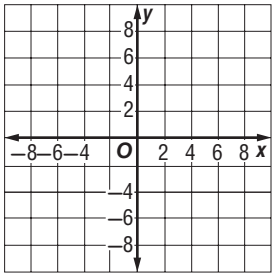
2.



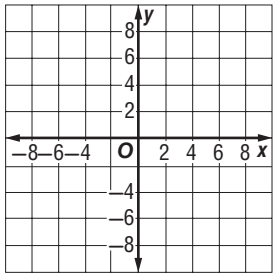
Number of squares, *s*	4	6	8	10	12
Number of shaded squares, *h*	1	2			

For each equation, draw a graph with *x* on the horizontal axis and *y* on the vertical axis. Include negative values for *x* and *y*.

3. $0.2y = -0.5x + 1$

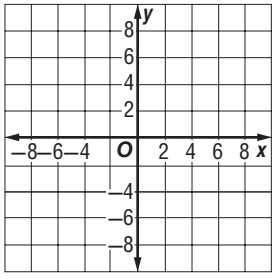


4. $4(x - 1) - y = 0$

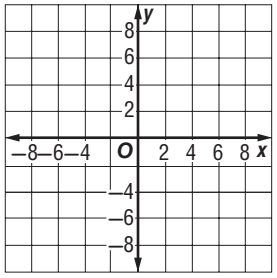


Plot the input/output pairs. Decide whether the rule could be linear. If you think the rule could be linear, find the rule that fits the numbers and write it in symbols.

5. (–2, 6), (0, 2), (1, 3), (2, 6)



6. (–2, 8), (1, –1), (1.5, –2.5), (3, –7)



Name **Date**

Lesson 9.1 Skills Practice

Find a Solution Method

Use backtracking to solve each equation.

1. $2x + 1 = 9$

2. $7k - 3 = 32$

3. $\frac{3w + 5}{7} = 23$

4. $5(n - 8) = 25$

5. $2(2t - 1) = 14$

6. $\frac{7b + 1}{4} = 2$

7. $8x - 1 = 63$

8. $2x - 5 = 15$

9. $54 = 6\left(\frac{4 - 7v}{2}\right)$

10. $8\left(\frac{5b + 12}{3} - 1\right) = 64$

11. $4\left(20 - \frac{4n + 27}{3}\right) = 40$

12. $\frac{10r - 2}{5} + 8 = 11$

13. $3 = \frac{2 - 4p}{9}$

14. $2 = 6 - \left(\frac{7 - 15z}{10}\right)$

Use guess-check-and-improve to solve each equation.

15. $2(p + 7) = 5p + 2$

16. $3y + 10 = y + 2$

17. $4g - 8 = 5g - 11$

18. $24 - 8g = 2 - 30g$

19. $18 - 3w = w - 6$

20. $9(2d + 5) = 3d$

21. $\frac{7x + 2}{4} = \frac{13x - 2}{6}$

22. $\frac{4m - 8}{3} = 2m - 6$

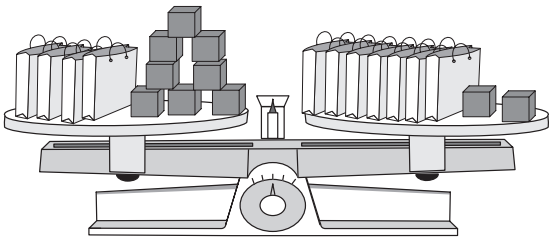
Name **Date**

Lesson 9.2 Skills Practice

A Model for Solving Equations

Write an equation to fit the balance puzzle. Let x represent the number of blocks in each bag. Then use the puzzle to find the value of x.

1.



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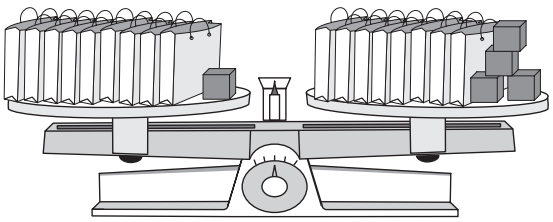
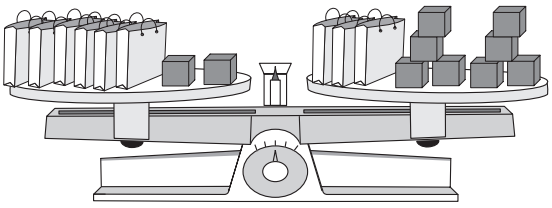
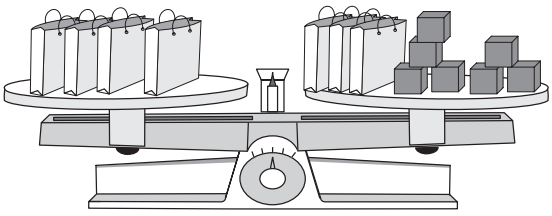


3.



4.



Draw a balance puzzle to represent the equation. Use your puzzle to solve the equation. Check your solution by substituting it into the equation. (Hint: In these puzzles, the bags might hold fractions of blocks.)

5. $2x + 7 = 4x + 3$

6. $3x + 6 = 5x + 1$

7. $2n + 6 = 8n + 3$

8. $6n + 9 = 9n + 6$

Name **Date**

Lesson 9.3 Skills Practice

Solve Equations

Solve each equation.

1. $8z + 6 = 7z + 4$

2. $12k + 5 = 8k + 25$

3. $2d + 10 = 6d + 2$

4. $3a - 9 = 6a + 15$

5. $8 - 3k = 3k + 2$

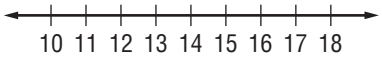
6. $7t = 10t + 18$

7. $3y - 5.2 = 10.8 - 5y$

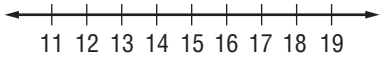
8. $\frac{3}{5}w + 1 = -2$

Solve and graph each inequality.

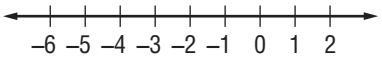
9. $v + 9 > 23$



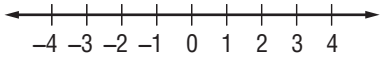
10. $w + 4 \geq -3$



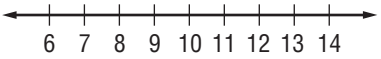
11. $1 > z + 5 < 1$



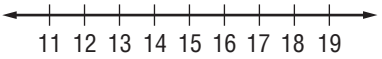
12. $s - 7 \geq -6$



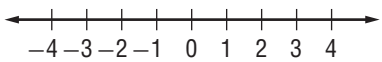
13. $3b - 3 \leq 27$



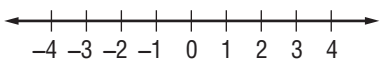
14. $\frac{z}{8} - 5 > -3$



15. $3a + 2 < 2a$



16. $v - 6 \leq 5v - 2$



Name **Date**

Lesson 9.4 Skills Practice

Solve Equations with Parentheses

Solve each equation. Check your solution.

1. $2(g - 7) = 16$

2. $5(x + 2) = 30$

3. $3(2d + 7) = 39$

4. $4(a - 2) = 3(a + 4)$

5. $3(f + 2) + 9 = 13 + 5f$

6. $2(x - 4) = 3(1 + x)$

7. $2n + 2.5 = 4(n + 2) - n$

8. $4(x + 3) = x$

9. $2(6x + 1) = 4(x - 5) - 2$

10. $3(4k + 14) = 10k - 2(k - 7)$

Evaluate each expression.

11. $1.7 - (1.6 - 20.2)$

12. $4 - (28 + 3)$

13. $25 - (17 - 15)$

14. $14 - (6 + 28)$

Rewrite each expression without parentheses. Simplify.

15. $22 - (60x - 41)$

16. $56f - (23 + 5f)$

17. $3 - (x - 34) + x$

18. $7s + 6(3s + 1)$

19. $y + 5(y + 5x)$

20. $13p - \frac{1}{4}(4p - 16m)$

Lesson 10.1 Skills Practice

Ratios

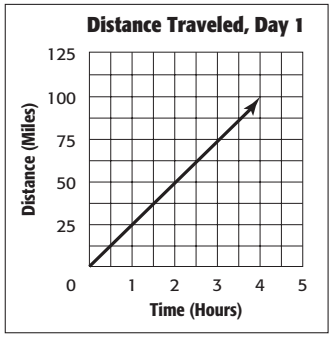
A beaded rug has 500 beads. There are 150 black beads, 140 green beads, and 210 white beads in the rug. Find the ratio.

1. black beads to white beads

2. green beads to total beads

A group of students is traveling to Washington, DC. They graph their progress for two days. At what rate did the group travel each day?

3.



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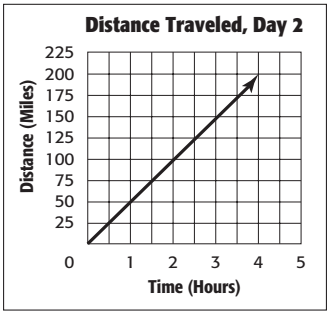
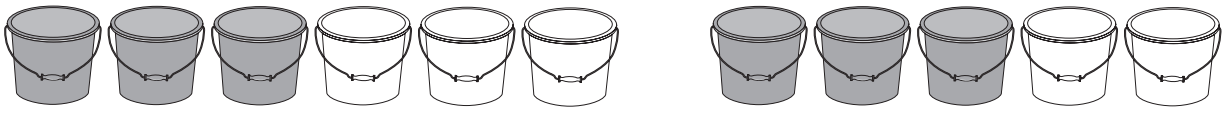


Which mixture is a darker blue? Describe a larger batch that will match the darker mixture's shade.

5.



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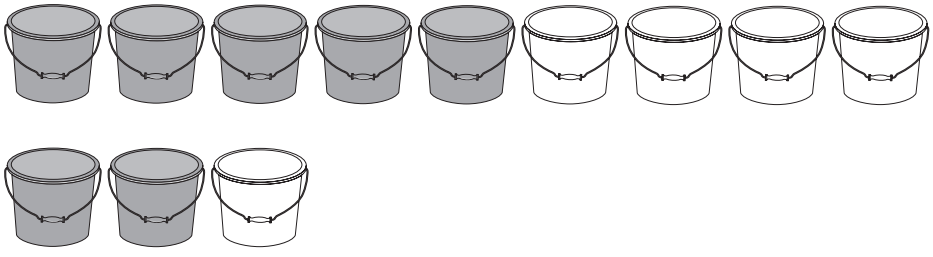


Name **Date**

Lesson 10.2 Skills Practice

Proportions and Similarity

A proportion is formed when two ratios are equal. Determine whether each pair of ratios forms a proportion. Write *yes* or *no*.

1. $\frac{17}{10}, \frac{12}{5}$

2. $\frac{6}{9}, \frac{12}{18}$

3. $\frac{8}{12}, \frac{10}{15}$

Solve each proportion.

4. $\frac{5}{8} = \frac{s}{12}$

5. $\frac{a}{26} = \frac{24}{13}$

6. $\frac{2.8}{4} = \frac{7}{q}$

7. $\frac{8}{m} = \frac{120}{75}$

8. $\frac{4.2}{t} = \frac{8}{5}$

9. $\frac{b}{0.5} = \frac{3.6}{9}$

On a map, the scale is 5 centimeters = 2 kilometers. Find the missing distances.

10. Map Distance: 10 centimeters

Actual Distance: _____

11. Map Distance: _____

Actual Distance: 3.2 kilometers

12. Map Distance: _____

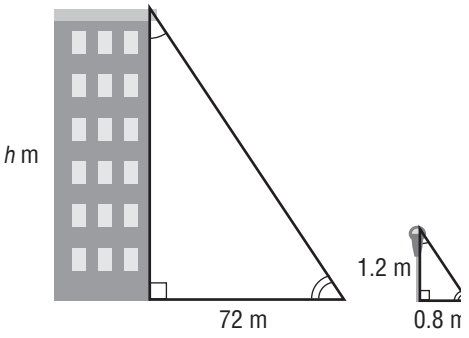
Actual Distance: 5.6 kilometers

13. Map Distance: 2.5 centimeters

Actual Distance: _____

Estimate the height of the tall object.

14.



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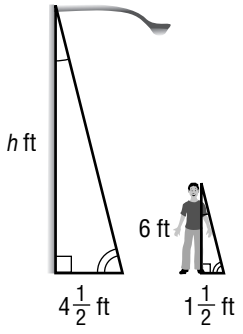


Name **Date**

Lesson 10.3 Skills Practice

Percents and Proportions

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

1. Fifty is 20% of what number?

2. What percent of 20 is 4?

3. What number is 70% of 250?

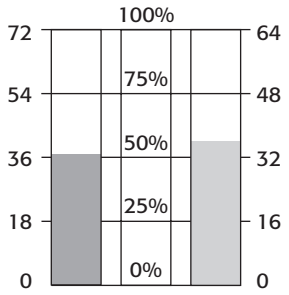
4. Ten is 5% of what number?

5. What number is 45% of 180?

6. What percent of 90 is 36?

Use the percent diagram to determine the greater number or percent.

7. 50% of 72 or 50% of 64



8. *P*% of 72 or *P*% of 64

9. 48 out of 72 or 48 out of 64

10. *t* out of 72 or *t* out of 64

For each pair of ratios, determine which is greater by finding the percentages they represent.

11. $\frac{6}{18}$ and $\frac{9}{25}$

12. $\frac{14}{17}$ and $\frac{19}{35}$

13. $\frac{22}{36}$ and $\frac{32}{48}$

14. $\frac{42}{63}$ and $\frac{8}{15}$

15. $\frac{5}{9}$ and $\frac{14}{27}$

16. $\frac{24}{75}$ and $\frac{18}{50}$

Name *Date*

Lessons 10.4 Skills Practice

Rates

Find each unit rate.

1. $118 in 8 hours

2. 150 miles in 6 gallons

3. 49 points in 7 games

4. 105 students in 3 classes

5. 112 patients in 4 weeks

6. $8.43 for 3 pounds

Choose the better unit price.

7. $4.99 for 6 cans or $7.99 for 10 cans

8. $21.50 for 4 pounds of lunch meat or $15.10 for 3 pounds of lunch meat

9. $99 for 12 DVDs or $58 for 7 DVDs

10. $0.89 for 0.65 pounds or $1.29 for 0.95 pounds

11. Shopping Robbie went shopping in Quebec, Canada. The exchange rate was 1 U.S. dollar equals 1.02969 Canadian dollars. Complete the table.

Item	Cost in Canadian dollars	Cost in U.S. dollars
Book	28.95	
Taxi Fare	45.60	
Lunch	15.82	
Pants	68.45	
Coffeemaker	125.10	
Lamp	96.54	