

PRENTICE HALL



MATHEMATICS

COURSE I



***Daily Practice
Version A***

***All-In-One
Workbook***

Practice 1-1

Understanding Whole Numbers

Write each number in words.

1. 1,760

2. 75,398,012

Write each number in standard form.

3. three thousand forty

4. eleven billion

5. one hundred ten

6. $400,000 + 20,000 + 8,000 + 400 + 6$

7. 921 million, 750 thousand, 33

8. eighty-two thousand sixty

Use $<$ or $>$ to make each sentence true.

9. $12,680 \square 12,519 \square 12,299$

10. $25,345 \square 25,391 \square 25,307$

11. $7,657 \square 7,650 \square 7,655$

12. $101,321 \square 141,321 \square 182,321$

Write the value of the digit 6 in each number.

13. 46,051

14. 62,071,357

15. 42,916

16. 1,063,251

17. 816,548

18. 70,642,050

Write in order from least to greatest.

19. 12; 152; 12,512; 12,722

20. 10; 10,113; 113; 10,130

21. 149; 49; 49,149; 14

22. 1,422; 142; 14,222; 247

Practice 1-2

Estimating With Whole Numbers

Estimate by first rounding to the nearest ten, hundred, or thousand.

1. $13 + 29$

2. $348 - 22$

3. $472 - 117$

4. $2,983 + 523$

5. $795 - 323$

6. $743 - 29 + 17$

7. $2 + 23 + 48 + 33$

8. $577 - 124 - 39 + 103$

9. $8,873 - 5,322 + 976$

Estimate using compatible numbers.

10. 24×8

11. $593 \div 6$

12. $1,084 \times 7$

13. $5,974 \div 3$

14. $283 \div 105$

15. $4,832 \div 3$

Solve.

16. With a length of about 458 meters, the *Jahre Viking* is one of the world's largest ships. Football fields have a length of about 91 meters. About how many football fields could fit alongside the *Jahre Viking*?

17. There are 407 seventh graders at Washington Middle School. If there are 18 seventh grade classrooms, about how many students are there per class?

18. Alicia's family decides to visit her grandmother, who lives 163 miles away. If they drive at an average speed of 55 miles per hour, about how long will it take them to arrive at her grandmother's house?

Practice 1-3

Properties of Numbers

Name each property of addition or multiplication used below.

1. $(6 + 3) + 21 = 6 + (3 + 21)$

2. $13 \times 1 = 13$

3. $8 + 20 + 12 = 8 + 12 + 20$

4. $5 \times 2 \times 11 = 2 \times 11 \times 5$

Use mental math to find each sum or product.

5. $53 + 12 + 7$

6. $2 \times 53 \times 5$

7. $8 + 0 + 6$

8. $(19 + 22) + 8$

9. $5 \times (13 \times 20)$

10. $40 \times 31 \times 25$

11. $25 + (13 + 5)$

12. $7 \times 25 \times (1 \times 8)$

13. $7 + 14 + (23 + 6)$

14. $4 \times (25 \times 17)$

15. $43 + 4 + (13 + 3)$

16. $5 \times 1 \times 13 \times 20$

Solve.

17. Mrs. Gauthier plans to take her class on 2 field trips this year. There are 23 students in her class, and each field trip will cost \$5 per student. Use mental math to find the total cost for both field trips.

18. Roshonda's garden produced 25 carrots, 127 blackberries, and 5 pumpkins. What was the total number of fruits and vegetables produced by Roshonda's garden? Use mental math to find the solution.

19. Michael washes the Gomez family's cars once a month. They pay him \$25 every 3 months for his work. At this rate, how much money will Michael earn in one year?

Practice 1-4

Order of Operations

Which operation would you perform first in each expression?

1. $4 + 6 \times 9$

2. $(7 - 5) \times 3$

3. $14 \div 2 \times 3$

4. $18 - 5 + 3$

5. $5 \times 2 + 6$

6. $(9 + 14) - 8 \div 2$

Find the value of each expression.

7. $8 - 3 \times 1 + 5$

8. $(43 - 16) \times 5$

9. $14 \times 6 \div 3$

10. $100 \div (63 - 43)$

11. $9 \times (3 \times 5)$

12. $7 \times (8 + 6)$

13. $15 - (5 + 7)$

14. $(12 - 9) \times (6 + 1)$

15. $(9 - 3) \times 2$

16. $8 - 3 \times 2 + 7$

17. $(9 - 4) \times 6$

18. $(35 - 5) \times 3$

Use $<$, $=$, or $>$ to complete each statement.

19. $5 - 3 \times 1$ $(5 - 3) \times 1$

20. $(4 + 8) \times 3$ $4 + 8 \times 3$

21. $3 \times (8 - 2)$ $3 \times 8 - 2$

22. $(7 + 2) \times 4$ $7 + 2 \times 4$

23. $4 + (20 \div 4)$ $(4 + 20) \div 4$

24. $42 - (35 + 4)$ $42 - 35 + 4$

25. $(9 - 2) \times 3$ $9 - 2 \times 3$

26. $55 + 10 - 7$ $55 + (10 - 7)$

Insert parentheses to make each statement true.

27. $6 + 7 \times 4 - 2 = 26$

28. $14 - 5 \div 3 = 3$

29. $27 \div 4 + 5 - 1 = 2$

30. $6 \times 7 + 2 - 1 = 53$

Write a mathematical expression and solve.

31. Haircuts for boys cost \$7. Haircuts for men cost \$10. If 20 boys and 20 men went to the barber yesterday, how much did the barber earn?

Practice 1-5

Understanding Decimals

Write each decimal in words.

1. 213.23

2. 7,430.25

3. 81.8887

4. 12.873

5. 8.0552

6. 0.00065

Write each decimal in standard form and in expanded form.

7. three tenths

8. eight tenths

9. two hundredths

10. forty hundredths

What is the value of the digit 7 in each number?

11. 0.7

12. 4.00712

13. 2.179

14. 1.8887

15. 15.002237

16. 27.002

Round each decimal to the underlined place.

17. 28,467.089

18. 348.92971

19. 72.14

20. 22.98553

21. 19.82549

22. 1.99928

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Practice 1-6

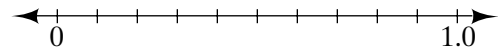
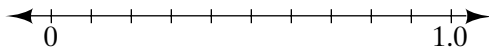
Comparing and Ordering Decimals

Use $<$, $=$, or $>$ to complete each statement.

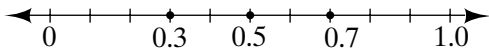
1. 0.62 0.618 2. 9.8 9.80 3. 1.006 1.02 4. 41.3 41.03
 5. 2.01 2.011 6. 1.400 1.40 7. 5.079 5.08 8. 12.96 12.967

Order each set of decimals on a number line.

9. $0.2, 0.6, 0.5$ 10. $0.26, 0.3, 0.5, 0.59, 0.7$



11. Three points are graphed on the number line below. Write statements comparing 0.3 to 0.5 and 0.5 to 0.7 .



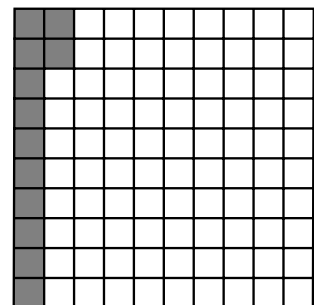
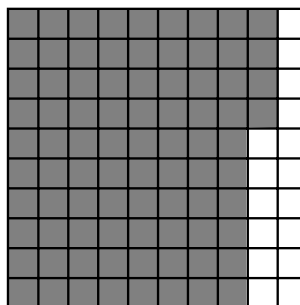
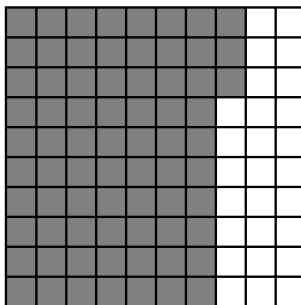
12. Draw a number line. Use 11 tick marks. Label the first tick mark 0.6 and the eleventh tick mark 0.7 . Graph 0.67 and 0.675 .

- a. Which is greater, 0.67 or 0.675 ? _____
 b. How does the number line show which number is greater?

13. Models for three decimals are shown below.

- a. Write the decimal that each model represents.

 b. Order the decimals from least to greatest.



Practice 1-7

Adding and Subtracting Decimals

First estimate. Then find each sum or difference.

1. $0.6 + 5.8$

2. $2.1 + 3.4$

3. $3.4 - 0.972$

4. $3.1 - 2.076$

5. $8.13 - 2.716$

6. $5.91 + 2.38$

7. $3.086 + 6.152$

8. $4.7 - 1.9$

9. $9.3 - 3.9$

10. $5.2 - 1.86$

11. $15.98 + 26.37$

12. $9.27 + 15.006$

13. $5.9 - 2.803$

14. $15.7 - 8.923$

15. $4.19 - 2.016$

16. $14.75 - 6.9264$

Use front-end estimation to estimate each sum.

17. $12 + 0.25 + 4.75$

18. $18.5 + 0.25 + 0.25$

19. $17 + 23 + 10.6$

20. $11.3 + 5.7$

21. $5 + 6.2 + 4.05$

22. $50.6 + 10.4 + 20$

23. $2.1 + 0.6 + 0.3$

24. $14.3 + 16$

25. $4.9 + 0.6 + 4$

Use the table at the right for Exercises 26–28.

26. Find the sum of the decimals given in the chart. What is the meaning of this sum?

27. What part of the hourly work force is aged 25–44?

28. Which three age groups combined represent one-fourth of the hourly work force?

Ages of Workers Earning Hourly Pay

Age of Workers	Part of Work Force
16–19	0.08
20–24	0.15
25–34	0.29
35–44	0.24
45–54	0.14
55–64	0.08
65 & over	0.02

Practice 1-8

Multiplying Decimals

Place the decimal point in each product.

1. $4.3 \times 2.9 = 1247$

2. $0.279 \times 53 = 14787$

3. $4.09 \times 3.96 = 161964$

4. $5.90 \times 6.3 = 3717$

5. $0.74 \times 83 = 6142$

6. $2.06 \times 15.9 = 32754$

Find each product.

7. 43.59×0.1

8. 246×0.01

9. 5.342

$\times 13$

10. 0.19
 $\times 0.05$

11. 240
 $\times 0.02$

12. 43.79
 $\times 42$

Write a multiplication statement you could use for each situation.

13. A pen costs \$.59. How much would a dozen pens cost?

14. A mint costs \$.02. How much would a roll of 10 mints cost?

15. An orange costs \$.09. How much would 2 dozen oranges cost?

Find each product. Tell whether you would use mental math, paper and pencil, or a calculator.

16. $19(0.35)$

17. 30×0.1

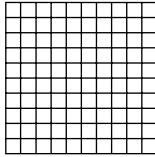
18. 22.62×1.08

Practice 1-9

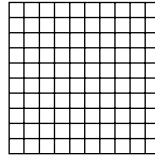
Dividing Decimals

Draw a model to find each quotient.

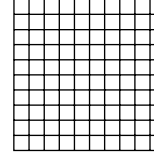
1. $0.4 \div 0.08$ _____



2. $0.8 \div 0.4$ _____



3. $0.9 \div 0.15$ _____



Find each quotient.

4. $1.8 \div 6$

5. $16 \overline{)3.2}$

6. $17 \overline{)5.1}$

7. $9 \overline{)21.6}$

8. $15 \overline{)123}$

9. $108 \div 5$

10. $50 \overline{)17.5}$

11. $14 \overline{)889}$

12. $5 \overline{)316}$

Solve.

13. A package of 25 mechanical pencils costs \$5.75. How much does each pencil cost?

14. A sales clerk is placing books side by side on a shelf. She has 12 copies of the same book. If the books cover 27.6 in. of the shelf, how thick is each book?

15. The salt content in the Caspian Sea is 0.13 kg for every liter of water. How many kg of salt are in 70 liters?

Find each quotient.

16. $0.4 \div 0.02$

17. $3.9 \div 0.05$

18. $0.2 \overline{)26}$

19. $0.68 \div 0.2$

20. $0.02 \overline{)0.06}$

21. $0.09 \overline{)0.108}$

Practice 2-1

Mean

Find the mean of each data set.

1. 4, 5, 7, 5, 6, 3 _____
2. 72, 76, 73, 74, 75 _____
3. 85, 91, 76, 85, 93 _____
4. 2.1, 3.2, 1.6, 2.4 _____

For each set of data, identify any outliers. Then determine the effect that the outlier has on the mean.

5. 64, 65, 62, 69, 59, 23, 61, 67 _____
6. 8.1, 8.3, 7.8, 7.9, 8.4, 6.8, 8.0 _____
7. 1230, 1225, 1228, 1232, 1233, 1321, 1229, 1231 _____
8. 18.66, 18.75, 18.69, 18.67, 18.99, 18.64, 18.73 _____

Use the table for Exercises 9–11.

Name	Hourly Wage
Julia	\$8.75
Ron	7.50
Miguel	25.00
Natasha	11.00
Robert	10.50

9. Whose wage is an outlier in the data set?

10. Find the mean hourly wage with and without the outlier.

11. What effect does the outlier have on the mean?

Fill in the blanks to find the mean of each data set.

12. 4, 6, 2, 8, 5: $\frac{25}{\square} = \square$

13. 10, 4, 2, 12, 6, 8: $\frac{\square}{6} = \square$

Practice 2-2

Median and Mode

Find the median and the mode of each data set.

1. 6, 10, 12, 5, 7, 12, 9

2. 19.32, 19.44, 19.54, 19.44, 19.33, 19.27, 19.31

3. 24, 24, 28, 32, 40, 42

4. 2, 4, 5, 4, 3, 4, 2, 3, 3

5. 86.4, 87.2, 95.7, 96.4, 88.1, 94.9, 98.5, 94.8

6. 12.2, 12.8, 12.1, 12.2, 12.3, 12.5, 12.4

Use the table for Exercises 7–10.

Last Year's Monthly Rainfall	
Month	Rainfall (inches)
January	5
February	4.5
March	6
April	15
May	5
June	3
July	2
August	2
September	1
October	2
November	3
December	4.5

7. What was the mean monthly rainfall last year? _____
8. What is the median rainfall of all the months listed? _____
9. What is the mode of all the months listed? _____
10. Does the mean, median, or mode best describe last year's rainfall? _____

Each student in a class has taken five tests. The teacher allows the students to pick the mean, median, or mode of each set of scores to be their final score. Which measure should each of these students pick in order to have the highest final score?

11. 100, 87, 81, 23, 19

12. 79, 78, 77, 76, 85

13. 80, 80, 70, 67, 68

14. 75, 78, 77, 70, 70

Practice 2-3

Organizing and Displaying Data

1. a. Choose a page from a book you are reading. Choose 50 words on that page. Using these 50 words, complete the frequency table.

Letter	Tally	Frequency
t		
s		
r		
n		
d		

- b. Make a line plot for your frequency table.
 c. Which letter occurred most frequently in your sample? least frequently?

Use the line plot at the right for Exercises 2–5.

2. What information is displayed in the line plot?

3. How many students spent time doing homework last night?

4. How many students spent at least half an hour on homework?

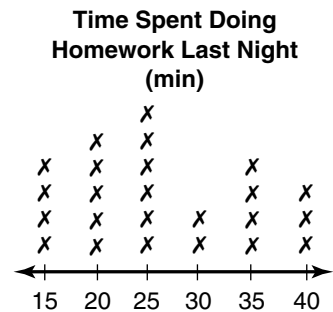
5. What is the range of time spent on homework last night?

6. A kennel is boarding dogs that weigh the following amounts (in pounds).

5 62 43 48 12 17 29 74
 8 15 4 11 15 26 63

- a. What is the range of the dogs' weights?

- b. How many of the dogs weigh under 50 pounds?



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Practice 2-4

Bar Graphs and Line Graphs

Use the table below for Exercises 1–3.

All-Time Favorite Sports Figures	
Sports Figure	Number of Votes
Babe Ruth	29
Babe Didrikson Zaharias	22
Jackie Robinson	18
Billie Jean Moffitt King	17
Muhammad Ali	14
Jim Thorpe	13

1. What would you label the horizontal axis for a bar graph of the data?

2. What interval would you use for the vertical axis of the bar graph?

3. Construct a bar graph displaying the number of votes for all-time favorite sports figures.

Use the table below for Exercises 4–6.

Daily Use of Petroleum in the U.S. (millions of barrels)									
Year	1950	1955	1960	1965	1970	1975	1980	1985	1990
Number	6.5	8.5	9.8	11.5	14.7	16.3	17.1	15.7	16.9

4. Make a line graph for the amount of petroleum used daily in the U.S.
5. What is the range of this data?

6. What does the line graph show?

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Practice 2-5

Using Spreadsheets to Organize Data

Gervase works after school and on weekends at a pet store, where he is paid \$5 per hour. He uses the following spreadsheet to keep track of the time he works and the money he earns.

	A	B	C	D	E
1	Day	Time In (P.M.)	Time Out (P.M.)	Hours Worked	Amount Earned
2	Monday	4	7		
3	Tuesday	4	7		
4	Thursday	4	8		
5	Saturday	1	9		
6			Total		

Write the value for the given cell.

1. A2

2. B2

3. B3

4. C3

5. C4

6. A4

Write a formula to find the value of each cell. Then calculate the value.

7. D5

8. E5

9. D6

10. E6

11. Rosario worked for \$14.50 an hour on the weekdays and \$15.25 an hour on the weekends. On Monday she worked 3 hours, Thursday 5 hours, Saturday 8 hours, and Sunday 8 hours.

a. Make a spreadsheet similar to the one above. Use column B for hourly wage, column C for hours worked, and column D for amount earned.

b. How much money did Rosario make each day and at the end of one week?

Practice 2-6

Stem-and-Leaf Plot

Use the stem-and-leaf plot for Exercises 1–6.

1. What is the age of the youngest grandparent? _____
2. How many grandparents are 79 years old? _____
3. How many grandparents are older than 74? _____
4. What is the range of the data? _____
5. What is the median? _____
6. What is the mode? _____

Ages of Grandparents	
stem	leaf
6	7 8 8
7	0 1 2 3 4 9 9
8	1 3 3 3 4 7
9	0 2 5

Key: 6 | 7 means 67.

Make a stem-and-leaf plot for each set of data.

7. scores on a history test

84, 93, 72, 87, 86, 97, 68, 74, 86, 91, 64, 83, 79, 80, 72, 83, 76, 90, 77

stem	leaf

Key: 6 | 4 means 64.

8. number of badges earned by local scouts

7, 12, 9, 2, 17, 24, 0, 3, 10, 20, 12, 3, 6, 4, 9, 15

stem	leaf

Key: 1 | 0 means 10.

9. minutes to travel to a friend's house

12, 31, 5, 10, 23, 17, 21, 12, 8, 33, 3, 11, 10, 25, 9, 16

stem	leaf

Key: 3 | 1 means 31.

Practice 2-7

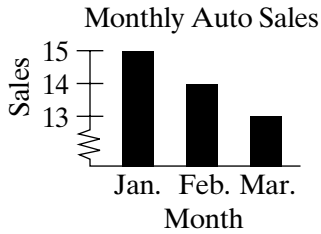
Misleading Graphs and Statistics

Use the information below for Exercises 1–2.

There are only two used car dealers in Auto City. Monthly auto sales for January, February, and March are shown for one dealer.

Monthly Auto Sales	
January	15
February	14
March	13

1. A competitor created the graph below.



- a. What impression is given by the graph?

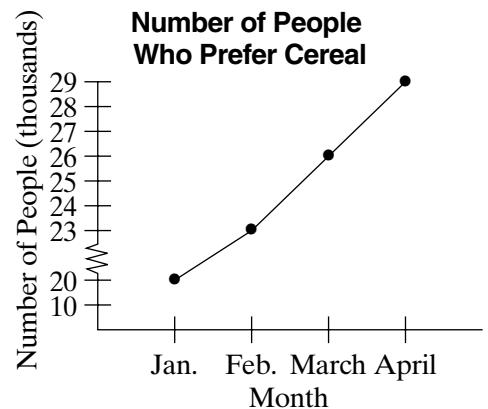
- b. Why is the graph misleading?

2. Suppose 15 cars sell in April and 10 cars in May. Would a salesman use the mean, median, or mode to make sales look greatest?

Use the line graph for Exercises 3–4.

3. What is misleading about the way the graph is drawn?

4. What impression does the graph try to create?

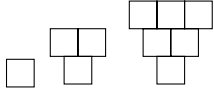


Practice 3-1

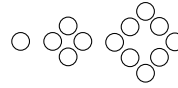
Describing a Pattern

Sketch the next two designs in each pattern.

1.



2.



Write the next three terms in each pattern.

3. 3, 5, 7, 9, _____

4. 34, 31, 28, 25, _____

5. 2, 6, 18, 54, _____

6. 7, 8, 10, 13, _____

Write a rule for each number pattern, and then write the next three terms.

7. 4, 7, 10, 13, ?, ?, ?

8. 2, 4, 8, 16, ?, ?, ?

9. 19, 29, 39, 49, ?, ?, ?

10. 8, 11, 14, 17, ?, ?, ?

11. 135, 125, 115, 105, ?, ?, ?

12. 5, 10, 20, 40, ?, ?, ?

13. Make a number pattern that starts with the number 6. Write the rule for your pattern, and then write the first five terms.

Find the missing term.

14. 7, 21, 63, ?, 567

15. 33, 27, ?, 15, 9

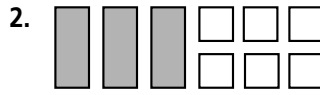
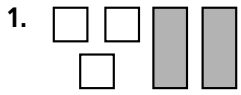
16. ?, 20, 80, 320, 1280

Practice 3-2

Variables and Expressions

Write a variable expression for each model. Squares represent ones.

Shaded rectangles represent variables.



Evaluate each expression.

4. $56 \div b$ for $b = 7$

5. $3m$ for $m = 9$

6. $v + 16$ for $v = 9$

7. $2t - 8$ for $t = 21$

8. $2(4e)$ for $e = 5$

9. $12 - 2g$ for $g = 3$

10. $3pq$ for $p = 3$
and $q = 5$

11. $9r + 16$ for $r = 8$

12. $s(58 + t)$ for $s = 2$
and $t = 7$

13. $24 - 4t$ for $t = 4$

14. $3v + 5k$ for $v = 3$
and $k = 6$

15. $5d - (h + 9)$ for $d = 3$
and $h = 5$

Copy and complete each table.

16.

x	$x + 7$
2	9
5	12
8	
11	
	21

17.

x	$5x$
3	
6	
9	
12	
	75

18.

x	$125 - x$
15	
30	
45	
60	
	50

19.

x	$6x + 5$
2	
4	
	41
8	
10	

20. A cellular phone company charges a \$49.99 monthly fee for 600 free minutes. Each additional minute costs \$.35. This month you used 750 minutes. How much do you owe?

Practice 3-3

Writing Algebraic Expressions

Write two word phrases for each variable expression.

1. $5m$

2. $8 + b$

3. $q \div 15$

4. $c - 10$

5. $18 \div a$

6. $27 - m$

7. You buy 5 bags of peanuts to share with your friends. Each bag contains p ounces of peanuts. How many ounces of peanuts did you buy? Draw a model for this situation. Then write an expression to describe the relationship.

8. Write an expression to describe the relationship of the data in the table.

n	<input type="text"/>
15	19
20	24
25	29

Write a variable expression for each word phrase.

9. nine less than t

10. eleven more than a number

11. the quotient of 700 and a number

12. two times the number of windows

13. b divided by seven

14. 81 increased by n

15. twelve times the number of muffin pans

16. \$15 times the number of hours

17. 8 less than the product of k and 3

Practice 3-4

Using Number Sense to Solve One-Step Equations

Find the missing number that makes the equation true.

1. $7 + \square = 12$

2. $\square \times 5 = 30$

3. $13 - \square = 4$

Tell whether each equation is true or false.

4. $12 + 10 = 10 + 12$

5. $31 + 4 = 41 + 3$

6. $3.5 \times 1 = 1$

7. $(3 \times 5) \times 4 = 3 \times (5 \times 4)$

8. $(7 \times 2) + 6 = 7 \times (2 + 6)$

9. $0 \times a = a$

Solve each equation. Use either mental math or the strategy *Guess, Check, and Revise*.

10. $8b = 72$

11. $n + 14 = 45$

12. $h - 3.6 = 8$

13. $w \div 12 = 3$

14. $53 = z - 19$

15. $86 = 29 + y$

16. $153 = 9k$

17. $4 = m \div 24$

18. $c + 14.7 = 29.8$

19. The winners of a slam dunk basketball competition receive T-shirts. The coach spends \$50.40 on shirts for the entire team. Each T-shirt costs \$4.20. Solve the equation $(4.20)n = 50.40$ to find the number of team members.

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Practice 3-5

Solving Addition Equations

Solve each equation. Then check the solution. Remember, you can draw a diagram to help you solve an equation.

1. $38 + b = 42$

2. $n + 14 = 73$

3. $h + 3.6 = 8.6$

4. $12.4 = 9 + t$

5. $m + 7.3 = 9.1$

6. $5.62 + p = 5.99$

Write and solve an equation. Then check each solution.

7. The height of the male giraffe in one zoo is 17.3 feet. The male is 3.2 feet taller than the female giraffe. How tall is the female giraffe?

8. The top three best-selling record albums of all time are Michael Jackson's *Thriller* (24 million copies), Fleetwood Mac's *Rumours* (17 million copies), and Boston's *Boston* (b million copies). The three albums sold a combined total of 56 million copies. How many copies of *Boston* were sold?

Solve each equation. Then check the solution.

9. $a + 22 = 120$

10. $10 = e + 2.7$

11. $3.89 + x = 5.2$

Practice 3-6

Solving Subtraction Equations

Solve each equation. Then check the solution. Remember, you can draw a diagram to help you solve an equation.

1. $x - 10 = 89$

2. $14 = y - 15$

3. $a - 10 = 3.4$

4. $12.3 = b - 7$

5. $n - 2.7 = 8.3$

6. $3.12 = d - 6.88$

Write and solve an equation. Then check each solution.

7. The owner of a used music store bought a compact disc for \$4.70. When she sold it, her profit was \$4.75. What was the selling price?

8. Yesterday, Stephanie spent \$38.72 on new shoes and \$23.19 on computer software. When she was finished, she had \$31.18. How much money did she have before she went shopping?

Solve each equation. Then check the solution.

9. $x - 7 = 77$

10. $3.1 = r - 7.5$

11. $k - 5.13 = 2.9$

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Practice 3-7

Solving Multiplication and Division Equations

State whether the number given is a solution to the equation.

1. $8c = 80; c = 10$ 2. $b \div 7 = 8; b = 56$ 3. $9m = 108; m = 12$ 4. $y \div 9 = 17; y = 163$

5. $9r = 72; r = 7$ 6. $14b = 56; b = 4$ 7. $48 = y \div 4; y = 12$ 8. $32 = y \div 8; y = 256$

9. $17a = 41; a = 3$ 10. $w \div 21 = 17; w = 357$ 11. $21c = 189; c = 8$ 12. $52 = y \div 6; y = 302$

Solve each equation. Then check each solution.

13. $905 = 5a$ 14. $6v = 792$ 15. $12 = y \div 12$ 16. $b \div 18 = 21$

17. $80 = 16b$ 18. $19m = 266$ 19. $d \div 1,000 = 10$ 20. $g \div 52 = 18$

21. $672 = 21f$ 22. $z \div 27 = 63$ 23. $43h = 817$ 24. $58 = j \div 71$

Write and solve an equation for each situation.

Then check the solution.

25. Lea drove 420 miles and used 20 gallons of gas. How many miles per gallon did her car get?

26. Ty spent \$15 on folders that cost \$3 each. How many folders did he buy?

27. Julia wants to buy copies of a book to give as presents. How many books can she buy if they are on sale for \$12 each, and she has \$100 to spend?

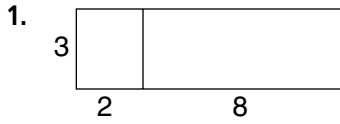
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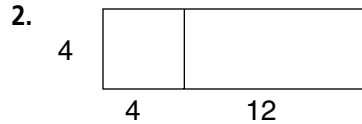
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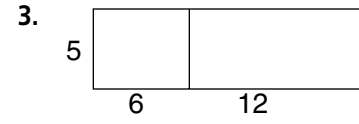
Practice 3-8

The Distributive Property

Write an expression to represent the total area of each figure. Then use your expression to find the total area. Show all your work.







Use the Distributive Property to find the missing numbers in the equations.

4. $8 \times (9 + 4) = (\square \times 9) + (8 \times \square)$

5. $(4 \times 7) + (4 \times 5) = 4 \times (\square + 5)$

6. $9 \times (7 - 1) = (9 \times \square) - (\square \times 1)$

7. $(5 \times 7) + (5 \times 6) = \square \times (7 + 6)$

8. $3 \times (7 + 9) = (\square \times 7) + (3 \times \square)$

9. $8 \times (9 - 6) = (8 \times \square) - (\square \times 6)$

Use the Distributive Property to multiply mentally.

10. 7×53

11. 8×97

12. 5×402

Use the Distributive Property to simplify each expression.

13. $9 \times (5 + 3) \times 4 - 6$

14. $(8 + 7) \times 3 \times 2$

15. $6 \times (8 - 3) + 9 \times 4$

16. The auditorium at the School for the Arts has 7 rows of seats, and each row has 102 seats in it. Use the Distributive Property to find the number of seats in the auditorium.

17. The largest television screen ever made was featured at the Tsukuba International Exposition near Tokyo, Japan, in 1985. The screen was called the Sony JUMBOtron and measured 40 meters by 25 meters. Use the Distributive Property to find the area of the screen.

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Practice 4-1

Divisibility and Mental Math

Is the first number divisible by the second? Use mental math.

- | | | |
|-----------------------|---------------------|---------------------|
| 1. 475 by 5 _____ | 2. 5,296 by 3 _____ | 3. 843 by 2 _____ |
| 4. 456,790 by 5 _____ | 5. 3,460 by 2 _____ | 6. 4,197 by 3 _____ |

Test each number for divisibility by 2, 3, 5, 9, or 10.

- | | | | |
|---------------------|---------------------|---------------------|---------------------|
| 7. 126
_____ | 8. 257
_____ | 9. 430
_____ | 10. 535
_____ |
| 11. 745
_____ | 12. 896
_____ | 13. 729
_____ | 14. 945
_____ |
| 15. 4,580
_____ | 16. 6,331
_____ | 17. 7,952
_____ | 18. 8,000
_____ |
| 19. 19,450
_____ | 20. 21,789
_____ | 21. 43,785
_____ | 22. 28,751
_____ |

Find the digit that makes each number divisible by 9.

- | | | |
|------------|------------|------------|
| 23. 54,78□ | 24. 42,□97 | 25. 83,2□4 |
|------------|------------|------------|

Name the numbers that are divisible by the numbers given.

26. numbers between 10 and 20, divisible by 2, 3, and 9

27. numbers between 590 and 610, divisible by 2, 3, 5, and 10

28. There are 159 students to be grouped into relay teams. Each team is to have the same number of students. Can each team have 3, 5, or 6 students?

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Practice 4-2

Write each expression using an exponent. Name the base and the exponent.

1. $3 \times 3 \times 3 \times 3$

2. $7 \times 7 \times 7 \times 7 \times 7 \times 7$

3. $9 \times 9 \times 9$

Write each number in expanded form using powers of 10.

4. 98,364

5. 20,351,401

6. 875,020

Simplify each expression.

7. 9^2

8. 6^4

9. 5^3

10. $156 + (256 \div 8^2)$

11. $32 + 64 + 2^3$

12. $53 + 64 \div 2^3$

13. $(3 \times 4)^2$

14. $60 \div (8 + 7) + 11$

15. $2^2 \times 5^2 + 106$

16. $4 + 7 \times 2^3$

17. $60 + (5 \times 4^3) + 2^2 \times 55$

18. $7^2 + 4$

19. $7^2 - 7 \times 2$

20. $48 \div 4 \times 5 - 2 \times 5$

21. $(4^2 - 4) \times 10$

22. $(4 + 3) \times (2 + 1)$

23. $2^4 \times 2^5$

24. $12 \times (30 + 37)$

25. $(3 + 2) \times (6^2 - 7)$

26. $5 \times (9 + 4) + 362 \div 2$

27. $3^4 + 405 \div 81$

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Practice 4-3

Prime Numbers and Prime Factorization

1. Make a list of all the prime numbers from 50 through 75. _____

Tell whether each number is prime or composite.

2. 53

3. 86

4. 95

5. 17

6. 24

7. 27

8. 31

9. 51

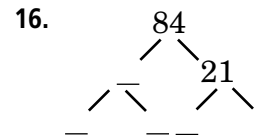
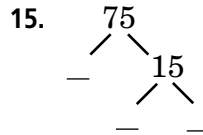
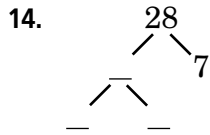
10. 103

11. 47

12. 93

13. 56

Complete each factor tree.



Find the prime factorization of each number.

17. 58

18. 72

19. 40

20. 30

21. 144

22. 310

Find the number with the given prime factorization.

23. $2 \times 2 \times 5 \times 7 \times 11$

24. $2 \times 3 \times 5 \times 7 \times 11$

25. $2 \times 2 \times 13 \times 17$

26. $7 \times 11 \times 13 \times 17$

27. There are 32 students in a class. How many ways can the class be divided into groups with equal numbers of students? What are they?

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Practice 4-4

Greatest Common Factor

List the factors to find the GCF of each set of numbers.

1. 8, 12

2. 18, 27

3. 15, 23

4. 17, 34

5. 24, 12

6. 18, 24

7. 5, 25

8. 20, 25

Use a division ladder to find the GCF of each set of numbers.

9. 10, 15

10. 25, 75

11. 14, 21

12. 18, 57

13. 32, 24, 40

14. 25, 60, 75

15. 12, 35, 15

16. 15, 35, 20

Use factor trees to find the GCF of each set of numbers.

17. 28, 24

18. 27, 36

19. 15, 305

20. 57, 27

21. 24, 48

22. 56, 35

23. 75, 200

24. 90, 160

25. 72, 108

Solve.

26. The GCF of two numbers is 850. Neither number is divisible by the other. What is the smallest that these two numbers could be?

27. The GCF of two numbers is 479. One number is even and the other number is odd. Neither number is divisible by the other. What is the smallest that these two numbers could be?

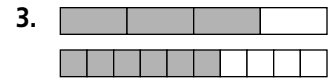
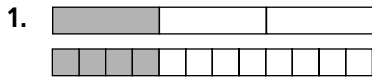
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Practice 4-5

Equivalent Fractions

Name the fractions modeled and determine if they are equivalent.



By what number can you multiply the numerator and denominator of the first fraction to get the second fraction?

4. $\frac{2}{3}, \frac{4}{6}$

5. $\frac{3}{8}, \frac{15}{40}$

6. $\frac{7}{10}, \frac{42}{60}$

7. $\frac{3}{4}, \frac{9}{12}$

By what number can you divide the numerator and denominator of the first fraction to get the second fraction?

8. $\frac{6}{8}, \frac{3}{4}$

9. $\frac{70}{80}, \frac{7}{8}$

10. $\frac{15}{60}, \frac{1}{4}$

11. $\frac{75}{100}, \frac{3}{4}$

Write two equivalent fractions for each fraction.

12. $\frac{3}{10}$ _____

13. $\frac{7}{8}$ _____

14. $\frac{5}{6}$ _____

15. $\frac{3}{4}$ _____

16. $\frac{15}{20}$ _____

17. $\frac{8}{12}$ _____

18. $\frac{15}{45}$ _____

19. $\frac{8}{32}$ _____

State whether each fraction is in simplest form. If it is not, write it in simplest form.

20. $\frac{15}{35}$ _____

21. $\frac{22}{55}$ _____

22. $\frac{25}{32}$ _____

23. $\frac{34}{36}$ _____

24. $\frac{19}{57}$ _____

25. $\frac{125}{200}$ _____

26. $\frac{27}{54}$ _____

27. $\frac{30}{41}$ _____

28. $\frac{85}{110}$ _____

29. A library has 10 camping guide books, 4 fishing guide books, and 6 hiking guide books. In simplest form, what fraction of the guide books are camping or hiking guide books?

30. An orchard has 48 apple trees, 30 peach trees, and 42 pear trees. In simplest form, what fraction of the trees are peach trees?

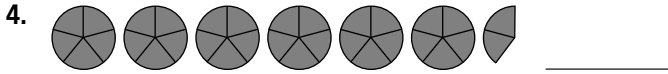
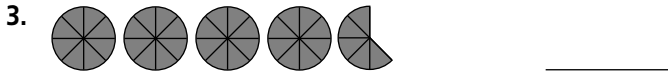
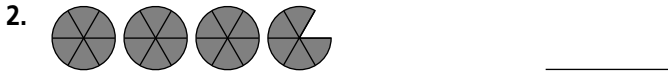
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Practice 4-6

Mixed Numbers and Improper Fractions

What mixed number represents the amount shaded?



Write each mixed number as an improper fraction.

5. $1\frac{7}{8}$ _____

6. $2\frac{3}{4}$ _____

7. $7\frac{1}{3}$ _____

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

9. $4\frac{1}{4}$ _____

10. $5\frac{5}{6}$ _____

11. $2\frac{3}{8}$ _____

12. $4\frac{7}{8}$ _____

13. $2\frac{3}{5}$ _____

14. $3\frac{11}{12}$ _____

15. $2\frac{7}{12}$ _____

16. $5\frac{4}{15}$ _____

Write each improper fraction as a mixed number in simplest form.

17. $\frac{15}{2}$ _____

18. $\frac{8}{3}$ _____

19. $\frac{5}{2}$ _____

20. $\frac{11}{10}$ _____

21. $\frac{7}{6}$ _____

22. $\frac{9}{8}$ _____

23. $\frac{27}{12}$ _____

24. $\frac{26}{18}$ _____

25. $\frac{35}{21}$ _____

26. $\frac{17}{5}$ _____

27. $\frac{17}{6}$ _____

28. $\frac{36}{15}$ _____

29. Find the improper fraction with a denominator of 6 that is equivalent to $5\frac{1}{2}$.

30. Find the improper fraction with a denominator of 12 that is equivalent to $10\frac{1}{4}$.

Practice 4-7

Least Common Multiple

List multiples to find the LCM of each set of numbers.

1. 5, 10

2. 2, 3

3. 6, 8

4. 8, 10

5. 5, 6

6. 12, 15

7. 9, 15

8. 6, 15

9. 6, 9

10. 3, 5

11. 4, 5

12. 9, 21

13. 4, 6, 8

14. 6, 8, 12

15. 4, 9, 12

16. 6, 12, 15

17. 8, 12, 15

18. 2, 4, 5

Use prime factorizations to find the LCM of each set of numbers.

19. 18, 21

20. 15, 21

21. 18, 24

22. 15, 30

23. 24, 30

24. 24, 72

25. 8, 42

26. 16, 42

27. 8, 56

28. 8, 30

29. 16, 30

30. 18, 30

31. 12, 24, 16

32. 8, 16, 20

33. 12, 16, 20

34. At a store, hot dogs come in packages of eight and hot dog buns come in packages of twelve. What is the least number of packages of each type that you can buy and have no hot dogs or buns left over?

Practice 4-8

Comparing and Ordering Fractions

Compare each pair of numbers using $<$, $=$, or $>$.

1. $2\frac{14}{17}$ $1\frac{16}{17}$

2. $\frac{15}{21}$ $\frac{5}{7}$

3. $2\frac{7}{8}$ $2\frac{5}{6}$

4. $3\frac{15}{16}$ $3\frac{21}{32}$

5. $4\frac{7}{8}$ $3\frac{9}{10}$

6. $5\frac{9}{10}$ $5\frac{18}{20}$

7. $1\frac{19}{20}$ $2\frac{1}{20}$

8. $4\frac{5}{6}$ $5\frac{19}{20}$

9. $7\frac{3}{10}$ $7\frac{9}{30}$

10. $4\frac{19}{24}$ $4\frac{7}{12}$

11. $5\frac{19}{20}$ $6\frac{21}{22}$

12. $4\frac{15}{20}$ $4\frac{21}{28}$

Order each set of numbers from least to greatest.

13. $\frac{9}{10}, \frac{5}{6}, \frac{14}{15}$

14. $1\frac{7}{8}, 1\frac{7}{12}, 1\frac{5}{6}$

15. $\frac{14}{15}, \frac{9}{10}, \frac{11}{12}$

16. $2\frac{1}{4}, 3\frac{7}{8}, 3\frac{5}{6}$

17. $\frac{2}{3}, \frac{4}{5}, \frac{7}{30}, \frac{11}{15}$

18. $2\frac{1}{6}, 1\frac{3}{4}, 3\frac{7}{8}, 2\frac{1}{10}$

19. $\frac{5}{12}, \frac{17}{30}, \frac{3}{5}$

20. $1\frac{5}{6}, 2\frac{1}{6}, 1\frac{11}{12}, 1\frac{11}{18}$

21. $\frac{17}{20}, 1\frac{18}{25}, 2\frac{31}{36}$

Use mental math to compare each pair of fractions using $<$, $=$, or $>$.

22. $\frac{1}{6}$ $\frac{1}{8}$

23. $\frac{8}{9}$ $\frac{8}{12}$

24. $\frac{1}{4}$ $\frac{1}{5}$

25. $\frac{3}{9}$ $\frac{3}{7}$

26. $\frac{5}{50}$ $\frac{1}{60}$

27. $\frac{9}{10}$ $\frac{10}{12}$

28. $\frac{1}{12}$ $\frac{1}{15}$

29. $\frac{5}{6}$ $\frac{3}{4}$

30. $\frac{1}{65}$ $\frac{3}{60}$

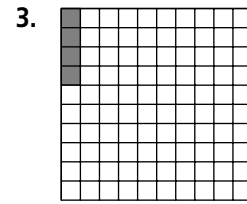
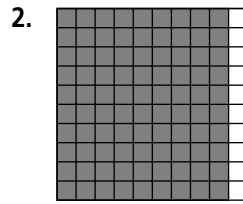
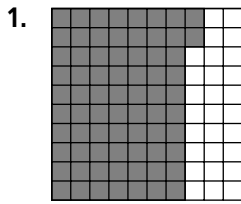
31. Four puppies measured $5\frac{1}{4}$ in., $5\frac{3}{8}$ in., $5\frac{5}{8}$ in., and $5\frac{5}{16}$ in. long at birth. Put the lengths in order from least to greatest.

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Practice 4-9

Write the decimal represented by each model as a fraction in simplest form.



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

4. 0.6 _____

5. 1.25 _____

6. 0.74 _____

7. 0.635 _____

8. 0.8 _____

9. 6.16 _____

10. 0.645 _____

11. 0.782 _____

12. 0.493 _____

Write each fraction or mixed number as a decimal.

13. $\frac{5}{4}$ _____

14. $\frac{7}{8}$ _____

15. $\frac{9}{16}$ _____

16. $\frac{1}{8}$ _____

17. $1\frac{4}{5}$ _____

18. $\frac{9}{100}$ _____

19. $\frac{7}{25}$ _____

20. $\frac{3}{50}$ _____

21. $\frac{1}{125}$ _____

22. You buy $2\frac{3}{4}$ pounds of apples. What number should appear on the digital scale when the apples are weighed?

Rewrite each set of numbers in order from least to greatest.

23. $\frac{2}{5}, 1.4, \frac{1}{3}, 0.5$

24. $2\frac{1}{5}, 2.25, \frac{8}{20}, 2.8$

25. $\frac{1}{3}, 0.4, \frac{4}{9}, 2.5$

26. $\frac{7}{8}, 0.75, \frac{3}{5}, 0.65$

Determine whether each statement of equality is true or false.

27. $\frac{2}{5} = 0.4$

28. $0.4 = \frac{6}{15}$

29. $0.5 = \frac{8}{15}$

30. $10.20 = 10\frac{2}{100}$

31. $4.3 = \frac{43}{10}$

32. $2\frac{4}{5} = 2.8$

Practice 5-1

Estimating Sums and Differences

Write the fraction shown by each model. Then choose a benchmark for each measurement. Use 0 , $\frac{1}{2}$, or 1 .



Estimate each sum or difference. Use the benchmarks 0 , $\frac{1}{2}$, and 1 .

3. $\frac{5}{16} + \frac{5}{8}$

4. $\frac{10}{12} + \frac{4}{5}$

5. $\frac{8}{10} - \frac{1}{2}$

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

7. $\frac{7}{10} - \frac{1}{6}$

8. $\frac{13}{15} - \frac{1}{12}$

Estimate each sum or difference.

9. $4\frac{1}{4} - 1\frac{7}{9}$

10. $8\frac{6}{8} - 2\frac{1}{3}$

11. $5\frac{7}{8} + 3\frac{3}{4}$

12. $8\frac{1}{12} - 3\frac{9}{10}$

13. $6\frac{5}{7} - 2\frac{2}{9}$

14. $3\frac{5}{8} + 2\frac{3}{10}$

15. Name three fractions whose benchmark is $\frac{1}{2}$.

16. Name three fractions whose benchmark is 1 .

17. The fabric for play costumes costs \$5.95 per yard. Patti needs $2\frac{7}{8}$ yards for one costume and $3\frac{5}{8}$ yards for another one. About how much will she spend on these costumes? Estimate the sum by first rounding to the nearest whole number.

18. One bag of oranges costs \$2.99 and weighs about $3\frac{7}{8}$ pounds. Individual oranges are sold at \$.89 per pound. Which is the better buy? Explain.

Practice 5-2

Fractions With Like Denominators

Write each sum or difference in simplest form.

1. $\frac{1}{4} + \frac{2}{4}$

2. $\frac{7}{10} - \frac{4}{10}$

3. $\frac{5}{8} - \frac{3}{8}$

4. $\frac{1}{8} + \frac{5}{8}$

5. $\frac{5}{8} + \frac{2}{8}$

6. $\frac{3}{10} + \frac{6}{10}$

7. $\frac{11}{12} - \frac{5}{12}$

8. $\frac{11}{16} - \frac{3}{16}$

9. $\frac{3}{6} + \frac{1}{6}$

10. What is the total amount of sugar in the recipe at the right?

11. Martha decides to double the recipe. How much brown sugar will she use?

Martha's Cookie Recipe
1 cup shortening
2 eggs
$\frac{1}{4}$ cup white sugar
$\frac{1}{4}$ cup brown sugar
$1\frac{1}{2}$ cup flour
1 teaspoon vanilla

Estimate each sum or difference.

12. $\frac{3}{8} + \frac{2}{8} - \frac{4}{8}$

13. $\frac{1}{10} + \frac{2}{10} + \frac{4}{10}$

14. $\frac{7}{15} - \frac{2}{15} - \frac{5}{15}$

15. $\frac{9}{20} - \left(\frac{2}{20} - \frac{4}{20}\right)$

16. $\frac{6}{9} + \frac{2}{9} - \frac{1}{9}$

17. $\frac{12}{50} + \frac{20}{50} + \frac{8}{50}$

Solve.

18. At the tea shop, $\frac{5}{15}$ of the customers purchased green tea, $\frac{2}{15}$ of the customers purchased jasmine tea, and $\frac{5}{15}$ of the customers purchased herbal tea. What portion of the customers purchased another type of tea?

19. A piece of fabric is $\frac{7}{9}$ yard long. A piece of ribbon is $\frac{2}{9}$ yard long. How many more yards of ribbon do you need to have equal lengths of fabric and ribbon?

Practice 5-3

Fractions With Unlike Denominators

Write each sum or difference in simplest form.

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

2. $\frac{2}{5} - \frac{1}{10}$

3. $\frac{1}{6} + \frac{1}{4}$

4. $\frac{5}{8} - \frac{1}{4}$

5. $\frac{7}{8} - \frac{1}{2}$

6. $\frac{3}{10} + \frac{4}{5}$

7. $\frac{5}{6} - \frac{2}{5}$

8. $\frac{5}{12} - \frac{1}{4}$

9. $\frac{7}{16} + \frac{1}{8}$

10. $\frac{11}{16} + \frac{5}{8}$

11. $\frac{2}{7} + \frac{1}{2}$

12. $\frac{4}{5} + \frac{3}{4}$

13. Jeanie has a $\frac{3}{4}$ -yard piece of ribbon. She needs one $\frac{3}{8}$ -yard piece and one $\frac{1}{2}$ -yard piece. Can she cut the piece of ribbon into the two smaller pieces? Explain.

Simplify by using mental math.

14. $\frac{7}{10} + \frac{2}{5} - \frac{1}{10}$ _____

15. $\frac{5}{100} + \frac{20}{100} + \frac{30}{100}$ _____

16. $\frac{2}{8} - \frac{2}{4} + \frac{5}{8}$ _____

17. $\frac{10}{12} - \left(\frac{1}{12} + \frac{4}{6}\right)$ _____

18. $\frac{6}{10} - \frac{2}{10} + \frac{1}{2}$ _____

19. $\frac{8}{16} - \frac{1}{4} + \frac{8}{16}$ _____

20. For the class photo, $\frac{1}{5}$ of the students wore jeans, $\frac{2}{10}$ of the students wore shorts, and $\frac{4}{10}$ of the students wore a skirt. What fraction of the students wore something else? _____

Practice 5-4

Adding Mixed Numbers

Complete to rename each mixed number.

1. $3\frac{9}{8} = 4\frac{?}{8}$ _____

2. $5\frac{7}{4} = 6\frac{?}{4}$ _____

3. $2\frac{17}{12} = 3\frac{?}{12}$ _____

Write each sum in simplest form.

4. $4\frac{3}{10} + 5\frac{2}{5}$

5. $3\frac{7}{8} + 2\frac{1}{2}$

6. $5\frac{2}{3} + 3\frac{1}{4}$

7. $6\frac{3}{4} + 2\frac{1}{2}$

8. $1\frac{1}{12} + 3\frac{1}{6}$

9. $9\frac{2}{5} + 10\frac{3}{10}$

10. $7\frac{1}{3} + 5\frac{11}{12}$

11. $11\frac{7}{10} + 4$

12. $2\frac{2}{3} + 4\frac{3}{4}$

13. $7\frac{3}{4} + 2\frac{7}{8}$

14. $4\frac{1}{2} + 3\frac{5}{6}$

15. $7\frac{2}{3} + 1\frac{5}{6}$

16. $2\frac{1}{4} + 4\frac{3}{5}$

17. $5\frac{3}{8} + 7\frac{1}{4}$

18. $14\frac{5}{16} + 8\frac{3}{8}$

19. $\frac{11}{12} + 4\frac{5}{12}$

20. $27\frac{2}{5} + 3\frac{4}{5}$

21. $7\frac{1}{6} + 9\frac{7}{12}$

22. Estimate the length of rope needed to go around a triangle with sides $6\frac{1}{2}$ feet, $7\frac{3}{4}$ feet, and $10\frac{1}{4}$ feet.

23. Sam grew three pumpkins for the pumpkin growing contest. The pumpkins weighed $24\frac{1}{8}$ pounds, $18\frac{2}{4}$ pounds, and $32\frac{5}{16}$ pounds. Find the combined total weight of Sam's pumpkins.

Compare using $<$, $=$, or $>$. Use benchmarks to help.

24. $50\frac{7}{10} + 49\frac{1}{5}$ 101

25. $5\frac{3}{4} + 5\frac{1}{8}$ $11\frac{1}{2}$

26. $20\frac{1}{5} + 4\frac{9}{10}$ 25

27. $22\frac{1}{9} + 8\frac{3}{4}$ $31\frac{11}{12}$

28. $16\frac{6}{12} + 18\frac{4}{9}$ 34.5

29. $1\frac{1}{3} + 2\frac{1}{8}$ 3.5

Practice 5-5

Subtracting Mixed Numbers

Write each difference in simplest form.

1. $10\frac{11}{16} - 3\frac{7}{8}$ _____

2. $8\frac{1}{3} - 2\frac{3}{8}$ _____

3. $9 - 3\frac{2}{5}$ _____

4. $5\frac{3}{16} - 2\frac{3}{8}$ _____

5. $8\frac{1}{6} - 3\frac{2}{5}$ _____

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

7. $2\frac{3}{4} - 1\frac{1}{8}$ _____

8. $4\frac{1}{8} - 2\frac{1}{16}$ _____

9. $9\frac{2}{3} - 3\frac{5}{6}$ _____

10. $2\frac{1}{10} - 1\frac{2}{5}$ _____

11. $15\frac{7}{12} - 8\frac{1}{2}$ _____

12. $6\frac{7}{16} - 2\frac{7}{8}$ _____

13. $27\frac{1}{4} - 13\frac{11}{12}$ _____

14. $5\frac{2}{5} - 1\frac{1}{4}$ _____

15. $10\frac{2}{3} - 7\frac{3}{4}$ _____

16. $5\frac{3}{4} - 2\frac{1}{2}$ _____

17. $16\frac{5}{12} - 10\frac{1}{3}$ _____

18. $23\frac{7}{8} - 9\frac{1}{16}$ _____

Solve.

19. Robbie needs to buy fencing for his square vegetable garden that measures $16\frac{3}{4}$ feet on a side. One side borders the back of the garage. The fencing costs \$4 per feet. Estimate how much the fencing will cost.

20. Paula has 2 yards of elastic. One project needs a piece $\frac{3}{4}$ yard. Does she have enough for another project that needs $1\frac{1}{3}$ yards? Explain.

21. Use a ruler or measuring tape to find the perimeter of your desk. Measure to the nearest half inch.

width: _____ length: _____ perimeter: _____

Now find the perimeter of your teacher's desk.

width: _____ length: _____ perimeter: _____

Subtract to find the difference in the perimeters. _____

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Practice 5-6**Equations With Fractions****Solve each equation using mental math. Write your solution in simplest form.**

1. $\frac{5}{17} + x = \frac{8}{17}$

2. $\frac{2}{7} + x = \frac{5}{7}$

3. $x - \frac{1}{2} = 10\frac{1}{10}$

4. $5\frac{7}{8} - x = \frac{13}{16}$

Solve each equation. Remember you can use a model.

5. $\frac{4}{7} - x = \frac{6}{35}$

6. $x - \frac{1}{5} = \frac{3}{10}$

7. $x + \frac{7}{22} = \frac{13}{22}$

8. $\frac{7}{9} - x = \frac{1}{36}$

9. $x - \frac{1}{6} = \frac{1}{6}$

10. $x + 9\frac{1}{4} = 12\frac{7}{16}$

11. $2\frac{5}{6} + x = 7\frac{17}{18}$

12. $8\frac{3}{8} - x = 3\frac{1}{24}$

Write and solve an equation for each situation.

13. Lori and Fraz ate
- $\frac{7}{12}$
- of a vegetable pizza. If Lori ate
- $\frac{1}{3}$
- of the pizza, how much of it did Fraz eat?

14. Irene's gas tank was
- $\frac{9}{10}$
- full when she left her house, and it was
- $\frac{7}{15}$
- full when she arrived for her vacation. What fraction of a tank of gas did she use driving there?

15. Last year, Wyatt weighed
- $74\frac{1}{8}$
- pounds at football camp. When he weighed in this year, he was
- $4\frac{5}{12}$
- pounds heavier. How much does Wyatt currently weigh?

Practice 5-7

Measuring Elapsed Time

Clark is trying to plan his Saturday. He estimates each activity will take the following times.

Make a schedule for Clark's day if he wakes up at 7:00 A.M. Assume all his activities are done in the given order.

Activity	Amount of Time	Time of Day
1. Get up, eat breakfast	30 min	_____
2. Mow lawn	1 h	_____
3. Rake yard	2 h	_____
4. Wash, wax car	45 min	_____
5. Walk dog	15 min	_____
6. Clean room	45 min	_____
7. Eat lunch	30 min	_____
8. Shop for school clothes	1 h 30 min	_____
9. Read book	45 min	_____
10. Do homework	1 h 15 min	_____
11. Baby-sit brother	2 h	_____
12. Eat supper	45 min	_____
13. Get ready for party	30 min	_____
14. Ride to party	20 min	_____
15. Party	2 h	_____
16. Ride home	20 min	_____

Find the elapsed time.

17. from 2:12 P.M. to 10:18 P.M.

18. from 9:35 A.M. to 8:48 P.M.

19. from 6:45 P.M. to 11:24 A.M.

20. from 2:55 A.M. to 8:13 A.M.

21. The movie begins at 7:45 P.M. and lets out at 10:20 P.M. How long is the movie?

22. A plane left at 10:45 A.M. and landed at 4:37 P.M. How long was the flight?

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Practice 6-1

Multiplying Fractions

Draw a model to find each product.

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

2. $\frac{2}{5} \times \frac{1}{2}$

Find each product.

3. $\frac{3}{5}$ of 10

4. $\frac{1}{4}$ of 12

5. $\frac{2}{3}$ of 6

6. $\frac{5}{6}$ of $\frac{3}{8}$

7. $\frac{3}{5}$ of $\frac{1}{2}$

8. $\frac{3}{4}$ of 12

9. $\frac{3}{16}$ of 8

10. $\frac{1}{2} \times \frac{5}{6}$

11. $\frac{3}{4} \times \frac{7}{8}$

12. $\frac{3}{5}$ of $\frac{3}{4}$

13. $\frac{1}{2} \cdot \frac{1}{3}$

14. $\frac{1}{8} \times \frac{3}{4}$

15. $\frac{2}{5} \times \frac{7}{11}$

16. $\frac{2}{3}$ of $\frac{1}{4}$

17. $\frac{2}{5} \cdot \frac{1}{2}$

18. $\frac{1}{4}$ of $\frac{4}{5}$

19. $\frac{5}{6} \cdot \frac{2}{5}$

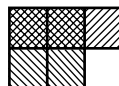
20. $\frac{2}{7}$ of $\frac{3}{5}$

21. $\frac{1}{3}$ of $\frac{9}{10}$

22. $\frac{1}{12} \times \frac{3}{4}$

23. $\frac{3}{10} \cdot \frac{3}{5}$

24. What product does the model represent?



Solve.

25. A kitten eats $\frac{1}{4}$ cup of cat food. Another cat in the same household eats 6 times as much. How much food does the cat eat?

26. You brought home $\frac{1}{2}$ of a can of paint. You then used $\frac{2}{3}$ of the paint to cover a table top. What fraction of a full can of paint did you use?

Practice 6-2

Multiplying Mixed Numbers

Estimate each product.

1. $2\frac{5}{6} \times 1\frac{3}{4}$ _____

2. $3\frac{3}{8} \times 7\frac{1}{4}$ _____

3. $5\frac{3}{8} \times 2\frac{7}{8}$ _____

4. $2\frac{3}{8} \times 4\frac{4}{5}$ _____

5. $6\frac{7}{12} \times 5\frac{9}{10}$ _____

6. $7\frac{1}{3} \times 10\frac{11}{12}$ _____

7. $12\frac{1}{4} \times 3\frac{3}{4}$ _____

8. $8\frac{1}{6} \times 2\frac{1}{4}$ _____

9. $15\frac{2}{3} \times 5\frac{5}{7}$ _____

Find each product.

10. $2\frac{5}{6} \cdot 1\frac{3}{4}$ _____

11. $3\frac{3}{8} \cdot 7\frac{1}{4}$ _____

12. $5\frac{3}{8} \times 2\frac{7}{8}$ _____

13. $2\frac{3}{8} \cdot 4\frac{4}{5}$ _____

14. $6\frac{7}{12} \times 5\frac{9}{10}$ _____

15. $7\frac{1}{3} \times 10\frac{11}{12}$ _____

16. $12\frac{1}{4} \times 3\frac{3}{4}$ _____

17. $8\frac{1}{6} \cdot 2\frac{1}{4}$ _____

18. $15\frac{2}{3} \cdot 5\frac{5}{7}$ _____

19. $\frac{1}{4} \times 5\frac{2}{5}$ _____

20. $2\frac{3}{8} \cdot \frac{4}{5}$ _____

21. $1\frac{1}{2} \cdot 5\frac{1}{3}$ _____

22. $3\frac{3}{8} \times 6$ _____

23. $\frac{3}{4} \times 1\frac{3}{5}$ _____

24. $9\frac{3}{5} \cdot \frac{1}{3}$ _____

25. $1\frac{1}{4} \times 2\frac{2}{3}$ _____

26. $1\frac{3}{5} \cdot \frac{1}{4}$ _____

27. $6\frac{1}{4} \times 1\frac{2}{5}$ _____

Solve.

28. Ken used a piece of lumber to build a bookshelf. If he made three shelves that are each $2\frac{1}{2}$ ft long, how long was the piece of lumber? _____

29. Deanna's cake recipe needs to be doubled for a party. How much of each ingredient should Deanna use?

Cake Recipe		
<i>ingredient</i>	<i>amount</i>	<i>doubled amount</i>
flour	$2\frac{1}{4}$ cups	_____
sugar	$1\frac{3}{4}$ cups	_____
butter	$1\frac{1}{2}$ cups	_____
milk	$\frac{3}{4}$ cup	_____

Practice 6-3**Dividing Fractions****Write the reciprocal of each number.**

1. $\frac{7}{10}$ _____ 2. 4 _____ 3. $\frac{1}{3}$ _____ 4. $\frac{1}{12}$ _____
5. Draw a diagram to show how many $\frac{3}{4}$ -ft pieces of string can be cut from a piece of string $4\frac{1}{2}$ ft long.

Find each quotient.

6. $\frac{3}{10} \div \frac{4}{5}$ _____ 7. $\frac{3}{8} \div 3$ _____ 8. $\frac{1}{3} \div \frac{2}{7}$ _____
9. $\frac{1}{4} \div \frac{1}{4}$ _____ 10. $\frac{7}{8} \div \frac{2}{7}$ _____ 11. $\frac{1}{4} \div \frac{1}{8}$ _____
12. $\frac{1}{2} \div \frac{2}{5}$ _____ 13. $\frac{8}{9} \div \frac{1}{2}$ _____ 14. $3 \div \frac{3}{8}$ _____

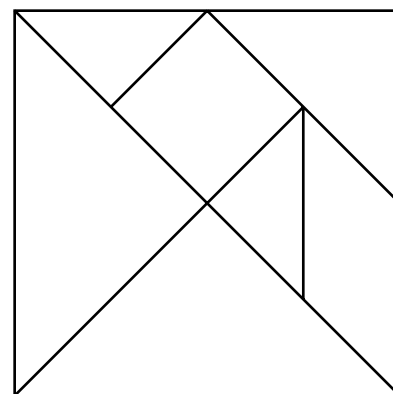
Solve.

15. How many $\frac{3}{4}$ -cup servings are there in a 6-cup package of rice?

16. George cut 5 oranges into quarters. How many pieces of orange did he have?

17. Maureen, Frank, Tashia, Zane, Eric, and Wesley are addressing envelopes for volunteer work at a local charity. They were given $\frac{3}{4}$ of an entire mailing to address to be evenly divided among six of them. What fraction of the entire mailing does each person address?

18. Study the tangram pieces at the right. If the entire square is 1, find the fractional value of each piece. You can copy the tangram and cut the pieces to compare them.



Practice 6-4

Dividing Mixed Numbers

Estimate each quotient.

1. $\frac{4}{5} \div \frac{7}{8}$

2. $2\frac{3}{7} \div \frac{5}{6}$

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

4. $\frac{1}{8} \div \frac{11}{12}$

5. $17\frac{11}{13} \div 2\frac{7}{9}$

6. $51\frac{1}{5} \div 4\frac{9}{10}$

7. $4 \div 1\frac{8}{11}$

8. $21\frac{2}{3} \div \frac{15}{17}$

9. $32\frac{5}{8} \div 2\frac{6}{11}$

Find each quotient.

10. $1\frac{4}{5} \div \frac{1}{3}$

11. $1\frac{2}{3} \div \frac{1}{8}$

12. $3\frac{4}{7} \div 3\frac{1}{2}$

13. $\frac{2}{5} \div 4\frac{3}{5}$

14. $4\frac{1}{8} \div \frac{3}{7}$

15. $2\frac{4}{5} \div 4\frac{3}{4}$

16. $1\frac{5}{7} \div 1\frac{2}{3}$

17. $\frac{1}{3} \div 2\frac{1}{6}$

18. $1\frac{4}{9} \div \frac{6}{7}$

19. $\frac{1}{2} \div 3\frac{1}{4}$

20. $4\frac{2}{7} \div 1\frac{1}{6}$

21. $\frac{4}{5} \div 3\frac{2}{5}$

22. $\frac{1}{4} \div 1\frac{5}{9}$

23. $1\frac{3}{4} \div \frac{1}{5}$

24. $4\frac{2}{7} \div 1\frac{1}{2}$

325 $1\frac{1}{2} \div 1\frac{2}{3}$

26. $1\frac{5}{8} \div \frac{5}{9}$

27. $1\frac{3}{5} \div \frac{1}{3}$

Anna bought a strip of fabric 10 yd long. She needs a $1\frac{1}{3}$ -yd piece to make a pillow.

28. How many pillows can Anna make? _____

29. Anna decides to make smaller pillows using $\frac{2}{3}$ -yd pieces. How many small pillows can she make? _____

30. A bulletin board is 56 in. wide and 36 in. high. How many $3\frac{1}{2}$ -in. columns can be created? _____

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Practice 6-5

Solving Fraction Equations by Multiplying

Solve each equation. Check the solution.

1. $\frac{n}{4} = \frac{1}{2}$

$n =$ _____

2. $\frac{x}{7} = 6$

$x =$ _____

3. $\frac{y}{19} = 3$

$y =$ _____

4. $\frac{m}{18} = 2$

$m =$ _____

5. $\frac{n}{8} = 1$

$n =$ _____

6. $\frac{n}{30} = \frac{3}{5}$

$n =$ _____

7. $\frac{3}{7}q = \frac{3}{8}$

$q =$ _____

8. $\frac{5}{14}c = \frac{1}{2}$

$c =$ _____

9. $\frac{3}{2}b = \frac{6}{7}$

$b =$ _____

10. $\frac{1}{4}n = 2$

$n =$ _____

11. $\frac{7}{8}t = 3$

$t =$ _____

12. $\frac{5}{12}h = \frac{3}{5}$

$h =$ _____

13. $\frac{4}{9}v = \frac{1}{4}$

$v =$ _____

14. $\frac{8}{25}h = 2$

$h =$ _____

15. $\frac{10}{7}h = \frac{1}{2}$

$h =$ _____

16. $\frac{2}{3}w = 3$

$w =$ _____

17. $\frac{8}{17}d = \frac{1}{3}$

$d =$ _____

18. $\frac{3}{2}v = \frac{1}{2}$

$v =$ _____

Solve.

19. The largest U.S. standard postage stamp ever issued has a width of about 1 inch, which was $\frac{3}{4}$ of the height of the stamp. Write and solve an equation to find the height of the stamp.

20. Candace said, "I'm thinking of a fraction. If I divide it by $\frac{1}{2}$, I get $\frac{3}{11}$." What fraction was Candace thinking of?

Practice 6-6

The Customary System

Customary Units of Measure

Use the table to choose an appropriate unit of measurement for each item. Explain.

	Name	Approximate Comparison
Length	inch	Length of a soda bottle cap
	foot	Length of an adult male's foot
	mile	Length of 14 football fields
Weight	ounce	Weight of a slice of bread
	pound	Weight of a loaf of bread
	ton	Weight of two grand pianos
Capacity	cup	Amount of water in a drinking glass
	quart	Amount in a bottle of fruit punch
	gallon	Amount in a large can of paint

1. height of a stop sign

2. length of a leaf

3. width of a door

5. weight of a small notebook

7. weight of a garbage truck

9. water in a swimming pool

11. a soup in a can

4. depth of the ocean

6. weight of a couch

8. weight of a box of books

10. water in a bathtub

12. milk in a carton

Compare using $<$, $=$, or $>$.

13. water you use to wash dishes 1 cup

14. the depth of the Grand Canyon 30 miles

15. the weight of a cereal bowl 6 ounces

Practice 6-7

Changing Units in the Customary System

Complete each statement.

1. $7\frac{1}{2}$ ft = _____ yd

2. 45 in. = _____ ft

3. $1\frac{1}{4}$ mi = _____ ft

4. $2\frac{1}{2}$ lb = _____ oz

5. 28 fl oz = _____ c

6. $2\frac{3}{4}$ T = _____ lb

7. 3 lb = _____ oz

8. 10 pt = _____ qt

Add or subtract.

9. $8\text{ ft } 3\text{ in.}$
 $- 3\text{ ft } 5\text{ in.}$

10. $12\text{ qt } 1\text{ pt}$
 $+ 11\text{ qt } 1\text{ pt}$

11. $9\text{ yd } 15\text{ in.}$
 $+ 7\text{ yd } 28\text{ in.}$

12. $105\text{ lb } 8\text{ oz}$
 $- 98\text{ lb } 12\text{ oz}$

13. $3\text{ c } 7\text{ fl oz}$
 $+ 4\text{ c } 6\text{ fl oz}$

14. $13\text{ yd } 2\text{ ft}$
 $- 6\text{ yd } 1\text{ ft}$

Solve.

15. The odometer of an automobile shows tenths of a mile.
How many feet are in $\frac{1}{10}$ mi?

16. How many inches are in one mile?

17. Jarel bought 3 containers of cottage cheese, each weighing 24 oz.
How many pounds did she buy?

18. Katie poured 12 oz of juice from a full 6-qt container. How many cups were left in the container?

Use $<$, $=$, or $>$ to complete each statement.

19. $4\frac{1}{3}$ ft 50 in.

20. 136 oz $8\frac{1}{2}$ lb

21. 26 fl oz 3 c

22. 5 qt $1\frac{1}{4}$ gal

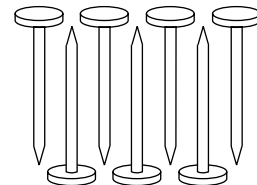
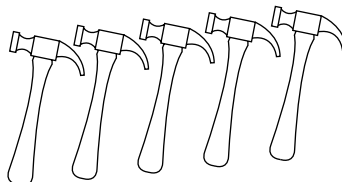
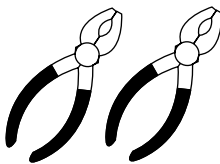
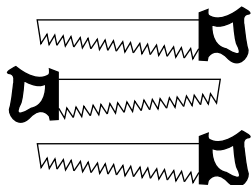
23. 8 yd 21 ft

24. 4,500 lb $3\frac{1}{2}$ T

Practice 7-1

Ratios

Write each ratio in three ways.



1. saws to pliers

2. hammers to nails

3. saws to nails

4. nails to saws

5. hammers to pliers

6. pliers to saws

7. pliers to nails

8. saws to hammers

9. nails to hammers

Write each ratio as a fraction in simplest form.



10. pencils : squares

11. flowers : pencils

12. pencils : flowers

13. squares : flowers

14. flowers : squares

15. squares : pencils

Find the value that makes the ratios equal.

16. 4 to 10, 2 to ?

17. 8 : 3, ? : 9

18. 51 to 18, ? to 6

19. $\frac{12}{12}$, $\frac{?}{20}$

20. 98 : 46, 49 : ?

21. $\frac{15}{7}$, $\frac{?}{21}$

22. 1 : 1, 8 : ?

23. $\frac{28}{56}$, $\frac{?}{14}$

24. 36 to 12, ? to 1

Practice 7-2

Unit Rates

Find the unit rate for each situation.

1. 44 breaths in 2 minutes

2. 72 players on 9 teams

3. 60 miles in 2 hours

4. 15 pages in 30 minutes

5. 48 questions in 4 quizzes

6. \$3 for 4 packages

Write the unit rate as a ratio. Then find an equal ratio.

7. There are 12 inches in a foot. Find the number of inches in 6 feet.

8. The cost is \$8.50 for 1 shirt. Find the cost of 4 shirts.

9. There are 365 days in a year. Find the number of days in 3 years.

10. There are 6 cans per box. Find the number of cans in 11 boxes.

11. There are 5 students in a group. Find the number of students in 5 groups.

12. There are 70 pages in a notebook. Find the number of pages in 8 notebooks.

Find each unit price.

13. \$5 for 10 pounds _____ 14. 40 ounces for \$12 _____

15. \$6 for 10 pens _____ 16. \$60 for 5 books _____

17. \$27 for 3 shirts _____ 18. \$35 for 25 tapes _____

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Practice 7-3

Understanding Proportions

Do the ratios in each pair form a proportion?

1. $\frac{8}{9}, \frac{4}{3}$

2. $\frac{20}{16}, \frac{18}{15}$

3. $\frac{18}{12}, \frac{21}{14}$

4. $\frac{21}{27}, \frac{35}{45}$

5. $\frac{18}{22}, \frac{45}{55}$

6. $\frac{38}{52}, \frac{57}{80}$

7. $\frac{10}{65}, \frac{18}{87}$

8. $\frac{51}{48}, \frac{68}{64}$

Find the value that completes each proportion.

9. $\frac{4}{5} = \frac{?}{15}$

10. $\frac{8}{?} = \frac{4}{15}$

11. $\frac{3}{2} = \frac{21}{?}$

12. $\frac{?}{5} = \frac{32}{20}$

13. $\frac{7}{8} = \frac{?}{32}$

14. $\frac{5}{4} = \frac{15}{?}$

15. 8 to 12 = ? to 6

16. 9 : 12 = 3 : ?

17. In 1910, there were about 220 families for every 1,000 people in the United States. If a certain town had a population of 56,000, about how many families would you expect to find in the town?

18. For every 100 families with TV sets, about 12 families like watching sports. In a town of 23,400 families who all have TV sets, how many families would you expect to like watching sports?

19. In 1800, there were only about 6 people per square mile of land in the U.S. What was the approximate population in 1800 if there were about 364,700 square miles in the U.S.?

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Practice 7-4

Using Cross Products

Does each pair of ratios form a proportion?

1. $\frac{14}{21}, \frac{8}{12}$ _____

2. $\frac{12}{18}, \frac{16}{24}$ _____

3. $\frac{24}{25}, \frac{12}{15}$ _____

4. $\frac{28}{42}, \frac{26}{39}$ _____

5. $\frac{16}{24}, \frac{19}{27}$ _____

6. $\frac{50}{8}, \frac{155}{25}$ _____

Solve each proportion.

7. $\frac{9}{7} = \frac{27}{x}$

8. $\frac{17}{12} = \frac{34}{y}$

9. $\frac{6}{a} = \frac{36}{54}$

10. $\frac{m}{25} = \frac{9}{75}$

11. $\frac{31}{c} = \frac{93}{15}$

12. $\frac{14}{35} = \frac{m}{5}$

13. $\frac{12}{27} = \frac{4}{w}$

14. $\frac{46}{52} = \frac{23}{y}$

Write and solve a proportion for each problem.

15. It costs \$15 to buy 5 packs of baseball cards. How much will it cost to buy 25 packs of baseball cards?

16. There are 35 children and 6 adults at a preschool. To keep the same child to adult ratio, how many adults are needed for 140 children?

17. Sam is making dinner for four people. The recipe calls for 15 ounces of steak. How much steak will he need if he makes dinner for 10 people?

18. Brenda is selling magazines. Two subscriptions sell for \$15.99. How much will 8 subscriptions cost?

19. A baseball player made 14 errors in 156 games this year. About how many errors would you expect the player to make in 350 games?

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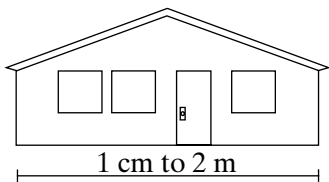
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Practice 7-5

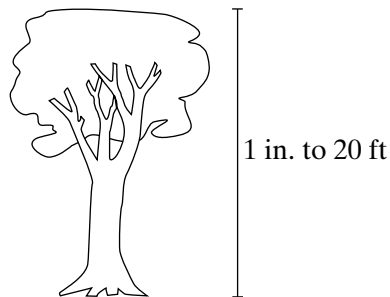
Scale Drawings

Use a ruler to measure the scale drawing. Then find the dimensions of the actual object with the given scale.

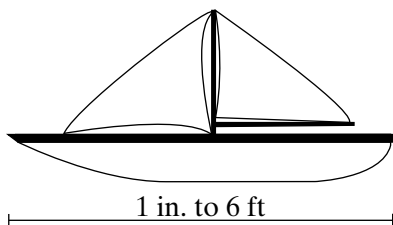
1.



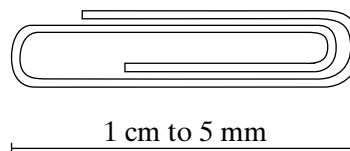
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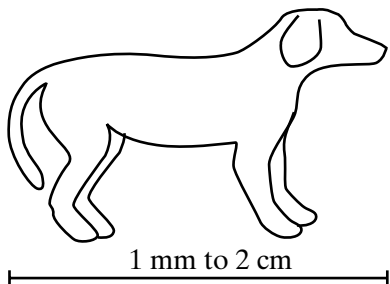
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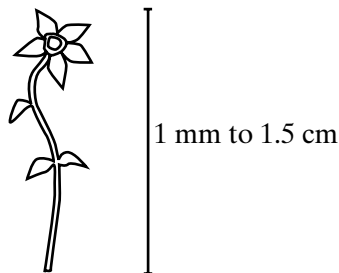
4.



5.



6.



7. Find the measure, in centimeters, of your thumb from the tip of your fingernail to where it meets your wrist. If you drew a $\frac{3}{4}$ -size picture of yourself, how long would your thumb be in the drawing?

8. The length of a wall in a floor plan is $6\frac{1}{2}$ inches. The actual wall is 78 feet long. Find the scale of the floor plan.

9. The height of a building is $3\frac{3}{8}$ inches on a scale drawing. Find the actual height of the building if the scale used is 1 inch : 4 feet.

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Practice 7-6

Percents, Fractions, and Decimals

Write each percent as a decimal and as a fraction in simplest form.

1. 46% _____ 2. 17% _____ 3. 90% _____ 4. 5% _____

Write each decimal as a percent and as a fraction in simplest form.

5. 0.02 _____ 6. 0.45 _____ 7. 0.4 _____ 8. 0.92 _____

Write each fraction as a decimal and as a percent.

9. $\frac{3}{5}$ _____ 10. $\frac{7}{10}$ _____ 11. $\frac{13}{25}$ _____ 12. $\frac{17}{20}$ _____

The table shows the fraction of students who participated in extracurricular activities from 1965 to 2000. Complete the table by writing each fraction as a percent.

Students' Extracurricular Choices

Year	1965	1970	1975	1980	1985	1990	1995	2000
Student participation (fraction)	$\frac{3}{4}$	$\frac{8}{10}$	$\frac{17}{20}$	$\frac{39}{50}$	$\frac{21}{25}$	$\frac{19}{25}$	$\frac{87}{100}$	$\frac{9}{10}$
Student participation (percent)	_____	_____	_____	_____	_____	_____	_____	_____

Write each fraction or decimal as a percent. Write the percent (without the percent sign) in the puzzle.

ACROSS

1. $\frac{3}{5}$
2. $\frac{1}{5}$
3. 0.55
5. 0.23
6. $\frac{7}{20}$
7. 0.17
9. 0.4
10. $\frac{9}{25}$

DOWN

1. $\frac{13}{20}$
2. 0.25
3. $\frac{1}{2}$
4. $\frac{3}{20}$
5. 0.24
6. $\frac{3}{10}$
7. 0.1
8. $\frac{4}{25}$

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Practice 7-7

Finding a Percent of a Number

Find each answer.

- | | | |
|-------------------------|-------------------------|-------------------------|
| 1. 15% of 20
_____ | 2. 40% of 80
_____ | 3. 20% of 45
_____ |
| 4. 90% of 120
_____ | 5. 65% of 700
_____ | 6. 25% of 84
_____ |
| 7. 60% of 50
_____ | 8. 45% of 90
_____ | 9. 12% of 94
_____ |
| 10. 37% of 80
_____ | 11. 25% of 16
_____ | 12. 63% of 800
_____ |
| 13. 55% of 250
_____ | 14. 18% of 420
_____ | 15. 33% of 140
_____ |

Solve each problem.

16. Teri used 60% of 20 gallons of paint. How much did she use? _____
17. The Badgers won 75% of their 32 games this year. How many games did they win? _____
18. Vivian earned \$540 last month. She saved 30% of this money. How much did she save? _____
19. A survey of the students at Lakeside School yielded the results shown below. There are 1,400 students enrolled at Lakeside School. Complete the table for the number of students in each activity.

How Lakeside Students Spend Their Time on Saturday

Activity	Percent of Students	Number of Students
Baby-sitting	22%	
Sports	26%	
Job	15%	
At home	10%	
Tutoring	10%	
Other	17%	

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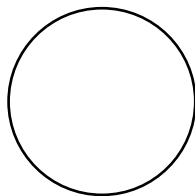
Practice 7-8

Circle Graphs

Sketch a circle graph for the given percents.

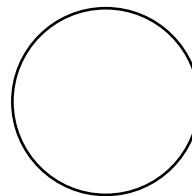
1. Favorite Foods

Pizza	Spaghetti	Hamburger
60%	30%	10%



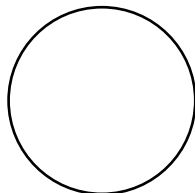
2. Favorite Type of Book

Animal	Sports	Adventure	Mystery
20%	25%	10%	45%



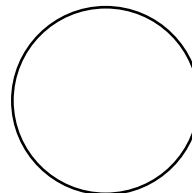
3. Favorite Color

Blue	Purple	Red
40%	35%	25%



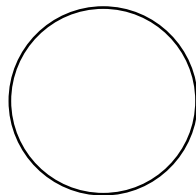
4. Favorite Sport

Swimming	Softball	Soccer	Hockey
20%	30%	5%	45%



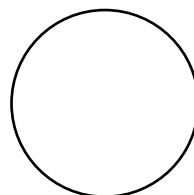
5. Number of TV Stations Received
by Homes

1-6	7-10	11-14	15-40	41-60
7%	34%	34%	19%	6%



6. Bowling Record

Games Won	Games Lost	Games Tied	Forfeits
50%	35%	5%	10%



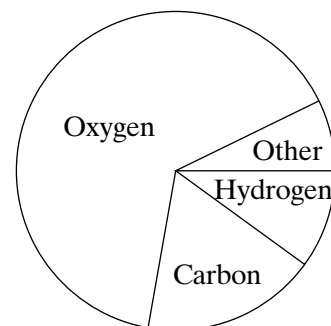
Use the circle graph for Exercises 7-9.

7. Which element is found in the greatest quantity in the body?

8. List the three elements, from least to greatest quantity.

9. Why might there be a portion labeled "other"?

Major Elements Found in the Body



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Practice 7-9

Estimating With Percents

Estimate each amount.

1. 81% of 60

2. 20% of 490

3. 48% of 97

4. 72% of 80

5. 18% of 90

6. 21% of 80

7. 39% of 200

8. 81% of 150

9. 68% of 250

10. 73% of 99

Solve each problem.

11. Mr. Andropolis wants to leave the waitress a 12% tip. Estimate the tip he should leave if the family's bill is \$32.46.

12. Michael receives a 9.8% raise. He currently earns \$1,789.46 per month. Estimate the amount by which his monthly earnings will increase.

13. Estimate the sales tax and final cost of a book that costs \$12.95 with a sales tax of 6%.

14. A real estate agent receives a 9% commission for every house sold. Suppose she sold a house for \$112,000. Estimate her commission.

15. A jacket costs \$94.95. It is on sale for 30% off. Estimate the sale price.

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Practice 8-1

Points, Lines, Segments, and Rays

Use the diagram at the right. Name each of the following.

1. three segments

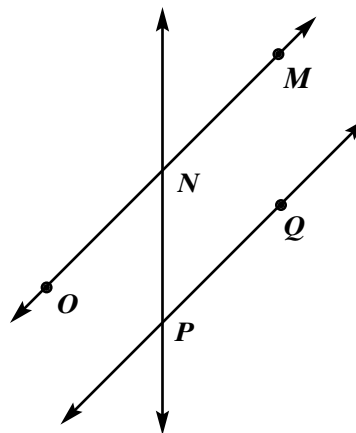
2. three rays

3. two lines that appear to be parallel

4. two pairs of intersecting lines

5. Draw a line segment.

6. Draw a ray.



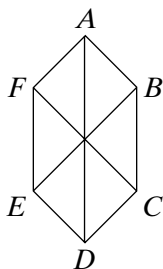
Use *sometimes*, *always*, or *never* to complete each sentence.

7. A ray _____ has one endpoint.

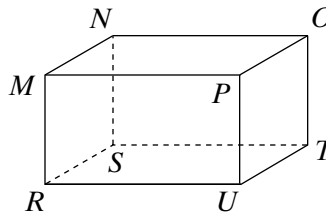
8. A line _____ has an endpoint.

Name the segments that appear to be parallel.

- 9.



- 10.



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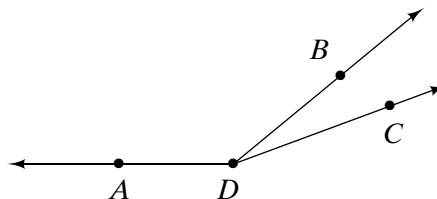
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Practice 8-2

Use the diagram at the right.

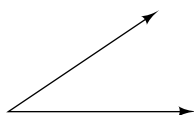
1. Name three rays.

2. Name three angles. Classify each angle as acute, right, obtuse, or straight.

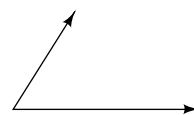


Measure each angle with a protractor.

3. _____



4. _____



5. _____



6. _____



Use a protractor to draw angles with the following measures.

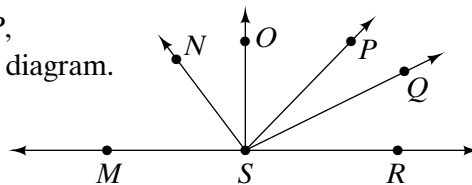
7. 88°

8. 66°

Use the diagram at the right.

9. Use a protractor to measure $\angle MSN$, $\angle NSO$, $\angle OSP$, $\angle PSQ$, and $\angle QSR$. Mark the measurements on the diagram.

10. List all the obtuse angles shown.

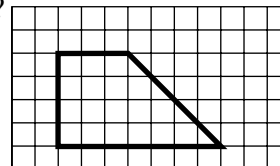


11. List all the right angles shown.

12. List all the straight angles shown.

13. List all the acute angles shown.

14. What are the angle measures in the figure shown at the right?



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Practice 8-3

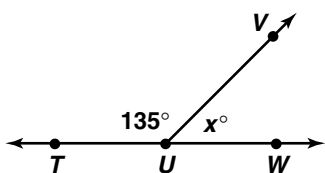
Special Pairs of Angles

Complete each sentence with *sometimes, always, or never*.

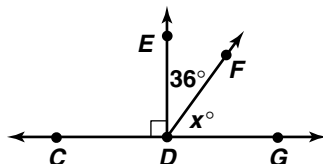
1. Two right angles are _____ complementary.
2. Two acute angles are _____ supplementary.
3. One obtuse angle and one acute angle are _____ supplementary.
4. One obtuse angle and one right angle are _____ supplementary.

Find the value of x in each figure.

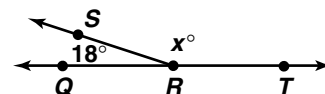
5.



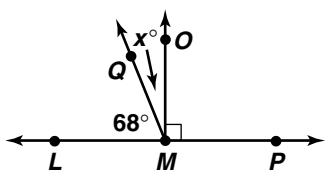
6.



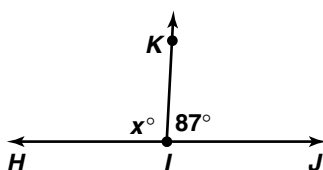
7.



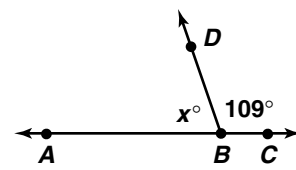
8.



9.



10.



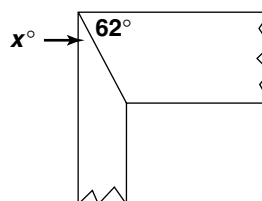
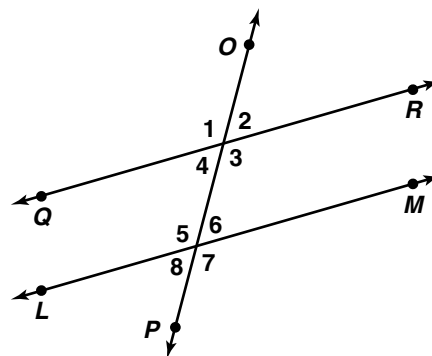
Use the diagram at the right to identify each of the following.

11. two pairs of supplementary angles

12. a pair of acute vertical angles

13. a pair of obtuse vertical angles

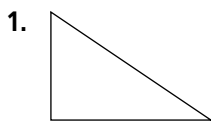
14. Find the measure of the angle marked x° at the corner of the picture frame.

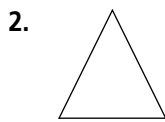


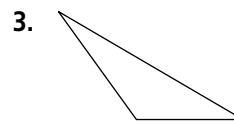
Practice 8-4

Classifying Triangles

Measure the sides and angles of each triangle. Then name each triangle by its angles and its sides.







Classify each triangle with the following side lengths.

4. 8, 9, 8 _____

5. 3, 4, 5 _____

6. 15, 15, 15 _____

7. 4, 7, 9 _____

Classify each triangle with the following angles.

8. $60^\circ, 60^\circ, 60^\circ$

9. $25^\circ, 14^\circ, 141^\circ$

10. $90^\circ, 63^\circ, 27^\circ$

11. $90^\circ, 89^\circ, 1^\circ$

Sketch each triangle. If you cannot sketch a triangle, explain why.

12. a right obtuse triangle

13. an acute equilateral triangle

14. an isosceles scalene triangle

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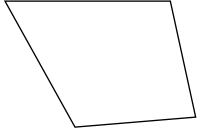
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Practice 8-5

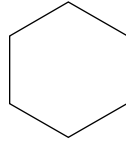
Exploring and Classifying Polygons

Identify each polygon according to the number of sides.

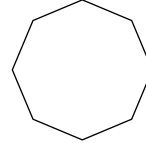
1. _____



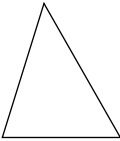
2. _____



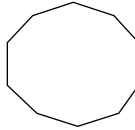
3. _____



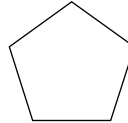
4. _____



5. _____

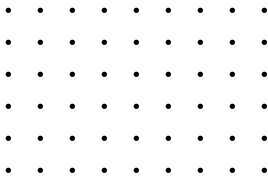


6. _____

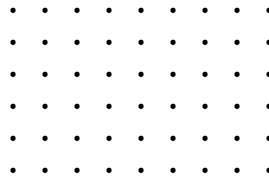


Use the dot paper below to draw an example of each polygon.

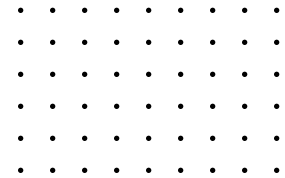
7. a quadrilateral with one right angle



8. a pentagon with no right angle

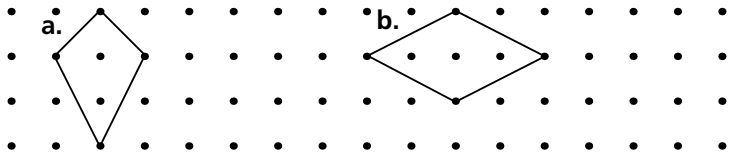


9. a hexagon with two right angles



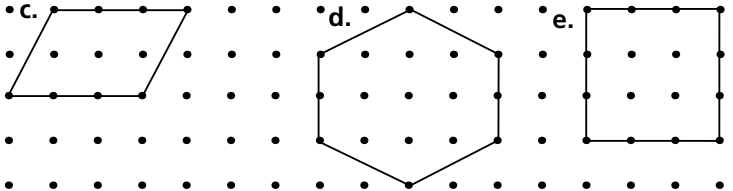
Use the diagram to identify all the polygons for each name.

10. quadrilateral



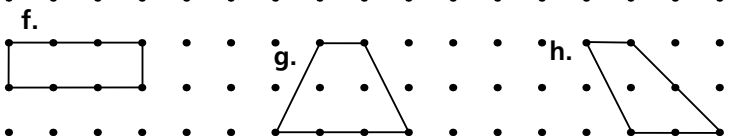
11. parallelogram

12. rhombus



13. rectangle

14. square



15. trapezoid

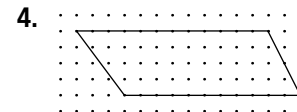
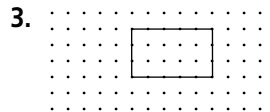
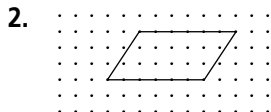
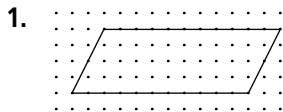
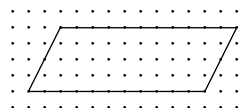
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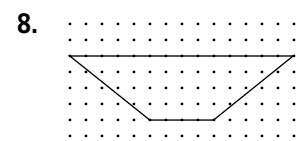
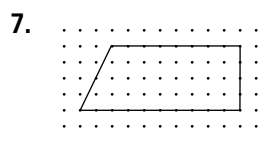
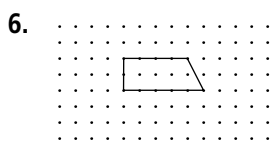
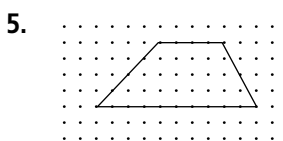
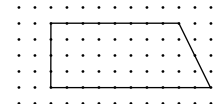
Practice 8-6

Congruent and Similar Figures

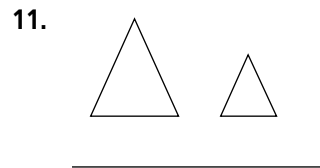
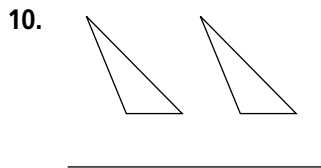
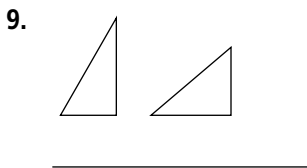
For each figure tell whether it is congruent to the parallelogram at the right.



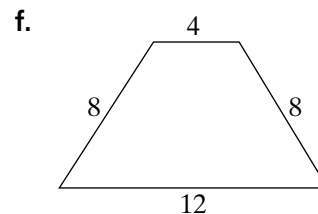
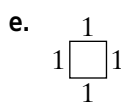
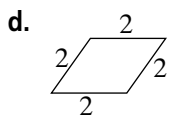
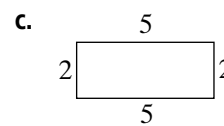
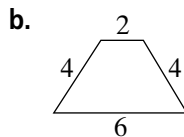
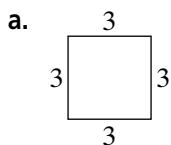
Which trapezoids appear to be similar to the trapezoid at the right?



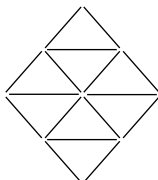
Tell whether the triangles appear to be *congruent*, *similar*, or *neither*.



12. List the pairs of figures that are similar. If necessary, use a protractor to measure the angles.



13. The figure below contains eight congruent triangles. Redraw the figure with four fewer segments, so that only four congruent triangles remain.

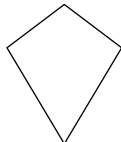


Practice 8-7

Line Symmetry

Tell whether each figure has line symmetry. If it does, draw the line(s) of symmetry. If not, write *none*.

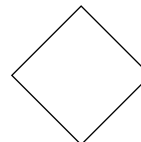
1.



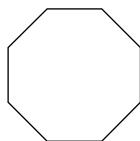
2.



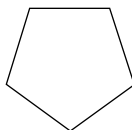
3.



4.



5.



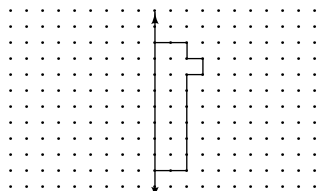
6.



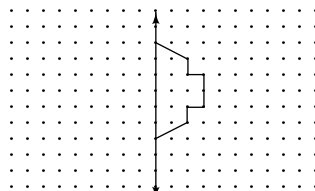
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Complete each figure so that the line is a line of symmetry.

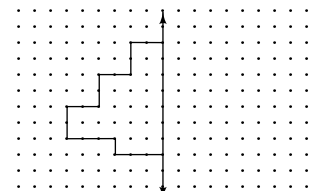
7.



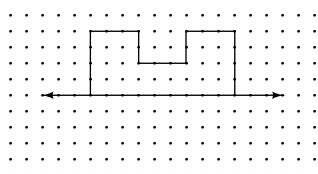
8.



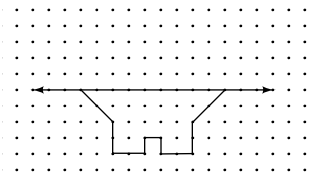
9.



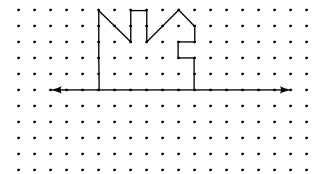
10.



11.



12.



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Is there a line of symmetry for each word? If so, draw it.

13.

BOX

14.

TOOT

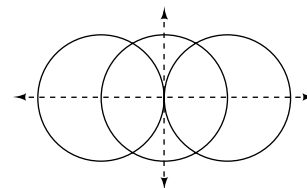
15.

CHICO

16.

MOM

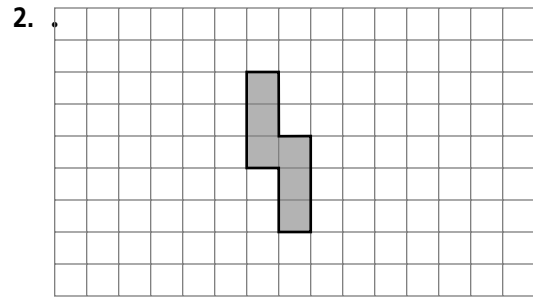
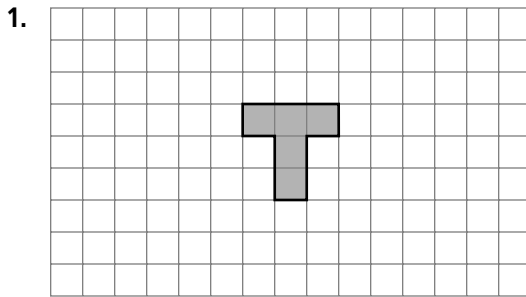
17. Many logos such as the one at the right have both horizontal line symmetry and vertical line symmetry. Design three other logos, one with horizontal line symmetry only, one with vertical line symmetry only, and one with both horizontal and vertical line symmetry.



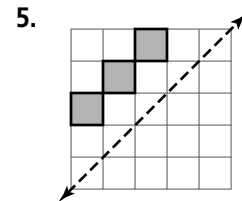
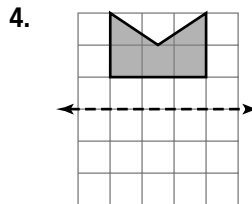
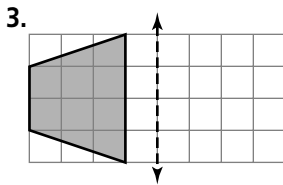
Practice 8-8

Transformations

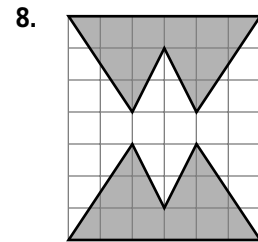
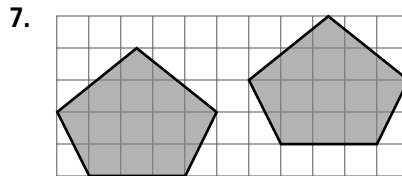
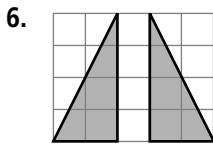
Draw two translations of each figure.



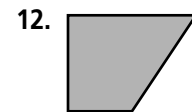
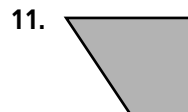
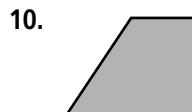
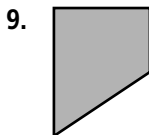
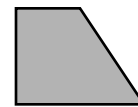
Draw the reflection of each figure. Use the dashed line as the line of reflection.



Tell whether each pair of figures shows a translation or a reflection.



Tell whether each figure is a rotation of the shape at the right. Write *yes* or *no*. If so, state the number of degrees.



Practice 9-1

Metric Units of Length, Mass, and Capacity

Choose an appropriate metric unit of length.

- | | |
|--|---|
| 1. the height of an office building
_____ | 2. the width of a page of a text
_____ |
| 3. the length of an ant
_____ | 4. the depth of a lake
_____ |

Choose an appropriate metric unit of mass.

- | | | |
|-----------------------------|--------------------------------|------------------------|
| 5. a grain of rice
_____ | 6. a bag of groceries
_____ | 7. a feather
_____ |
| 8. a cat
_____ | 9. a leaf
_____ | 10. an eraser
_____ |

Choose an appropriate metric unit of capacity.

- | | | |
|---------------------------------|------------------------------|-----------------------------|
| 11. a gasoline tank
_____ | 12. a coffee mug
_____ | 13. 6 raindrops
_____ |
| 14. a pitcher of juice
_____ | 15. a swimming pool
_____ | 16. a can of paint
_____ |

Is each measurement reasonable? Write *True* or *False*.

- | | |
|---|--|
| 17. The mass of the horse is about 500 kg.
_____ | 18. Jean drank 5.8 L of juice at breakfast.
_____ |
| 19. A mug holds 250 mL of hot chocolate.
_____ | 20. A penny is about 3 kg.
_____ |
| 21. The mass of a nail is about 500 g.
_____ | 22. A soccer field is about 5 m long.
_____ |

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Practice 9-2

Converting Units in the Metric System

Convert each measurement to meters.

- | | | | |
|--------------------|-------------------|--------------------|--------------------|
| 1. 800 mm
_____ | 2. 50 cm
_____ | 3. 2.6 km
_____ | 4. 7 km
_____ |
| 5. 35 km
_____ | 6. 40 mm
_____ | 7. 300 cm
_____ | 8. 1.8 km
_____ |

Convert each measurement to liters.

- | | | | |
|--------------------|----------------------|-----------------------|-----------------------|
| 9. 160 mL
_____ | 10. 0.36 kL
_____ | 11. 0.002 kL
_____ | 12. 240.9 mL
_____ |
| 13. 8 kL
_____ | 14. 80 mL
_____ | 15. 17.3 mL
_____ | 16. 0.09 kL
_____ |

Convert each measurement to grams.

- | | | | |
|-----------------------|--------------------|------------------------|----------------------|
| 17. 4,000 mg
_____ | 18. 7 kg
_____ | 19. 56,000 mg
_____ | 20. 0.19 kg
_____ |
| 21. 600 mg
_____ | 22. 90 kg
_____ | 23. 2,800 mg
_____ | 24. 0.4 kg
_____ |

Convert each measurement.

- | | | |
|---------------------------------------|--|-------------------------------------|
| 25. <u> ?</u> km = 3,400 m
_____ | 26. 420 mL = <u> ?</u> cL
_____ | 27. 37 cm = <u> ?</u> m
_____ |
| 28. 5,100 mg = <u> ?</u> cg
_____ | 29. 77.8 mm = <u> ?</u> cm
_____ | 30. 9.5 kL = <u> ?</u> L
_____ |
| 31. 2.564 kg = <u> ?</u> g
_____ | 32. <u> ?</u> m = 400,000 cm
_____ | 33. 948 mm = <u> ?</u> cm
_____ |

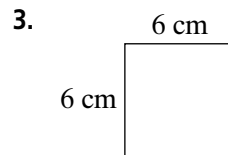
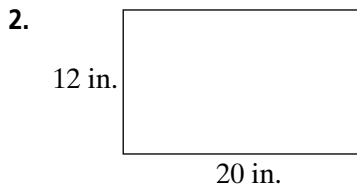
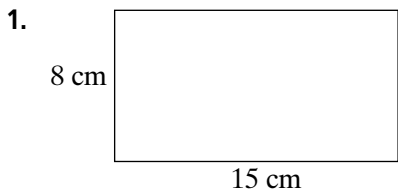
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Practice 9-3

Perimeters and Areas of Rectangles

Find the perimeter and area of each rectangle.



4. $\ell = 5 \text{ in.}, w = 13 \text{ in.}$

5. $\ell = 18 \text{ m}, w = 12 \text{ m}$

6. $\ell = 3 \text{ ft}, w = 8 \text{ ft}$

Find the area of each square given the side s or the perimeter P .

7. $s = 3.5 \text{ yd}$

8. $s = 9 \text{ cm}$

9. $P = 24 \text{ m}$

10. $P = 38 \text{ in.}$

Choose a calculator, paper and pencil, or mental math to solve.

11. The length of a rectangle is 8 centimeters. The width is 6 centimeters.

a. What is the area? _____

b. What is the perimeter? _____

12. The area of a rectangle is 45 square inches.

One dimension is 5 inches. What is the perimeter? _____

13. The perimeter of a square is 36 centimeters.

What is the area of the square? _____

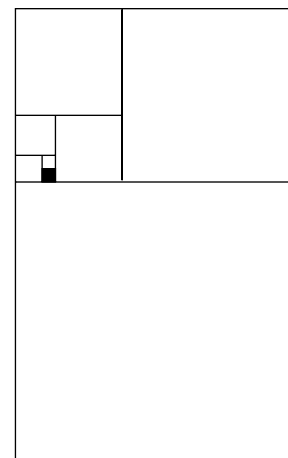
14. The perimeter of a rectangle is 38 centimeters.

The length is 7.5 centimeters. What is the width? _____

15. The figure at the right contains only squares.

Each side of the shaded square is 1 unit.

What is the length, width, and area of the figure?



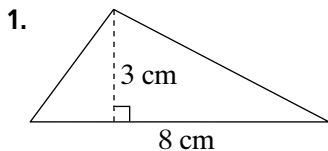
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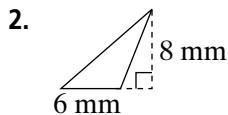
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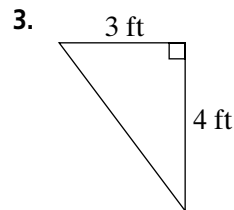
Practice 9-4

Areas of Parallelograms and Triangles

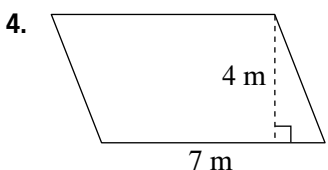
Find the area of each triangle.

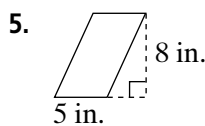


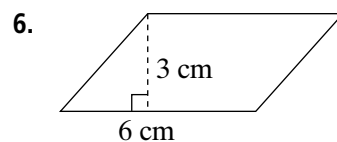




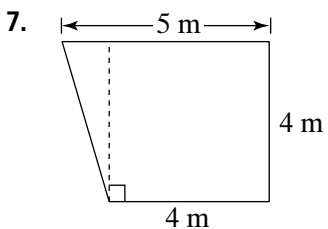
Find the area of each parallelogram.

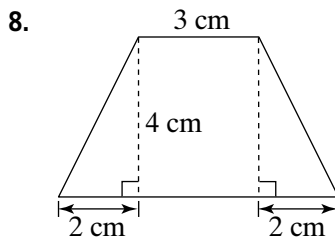


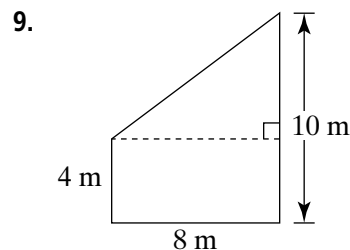




Find the area of each complex figure.







10. Draw and label a triangle and a parallelogram that each have an area of 20 square units.

Tell whether each statement is *true* or *false*.

11. A parallelogram and triangle can have the same base and area. _____

12. Two triangles that have the same base always have the same area. _____

13. Any obtuse triangle has a greater area than any acute triangle. _____

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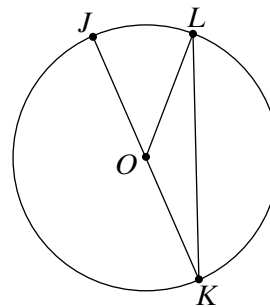
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Practice 9-5

Circles and Circumference

List each of the following for circle O .

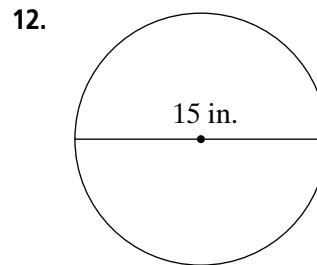
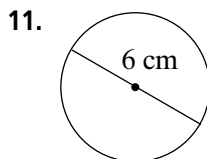
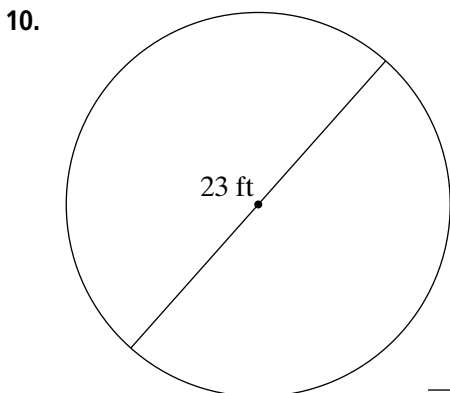
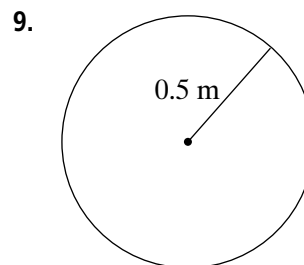
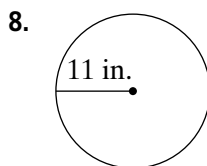
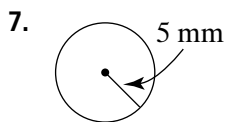
1. three radii _____
2. one diameter _____
3. two chords _____



Find the unknown length for a circle with the given dimension.

4. $r = 4$ in.; $d = ?$ _____
5. $d = 15$ cm; $r = ?$ _____
6. $d = 9$ mm; $r = ?$ _____

Find the circumference of each circle. Round to the nearest unit.



Estimate the circumference of each circle with the given radius or diameter. Use 3 for π .

13. $d = 4$ in. _____
14. $d = 8$ cm _____
15. $r = 6$ m _____
16. $r = 10$ ft _____
17. $r = 3$ in. _____
18. $d = 20$ cm _____

Find the diameter of a circle with the given circumference. Round to the nearest unit.

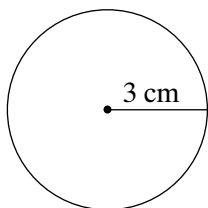
19. $C = 128$ ft _____
20. $C = 36$ cm _____
21. $C = 200$ m _____
22. $C = 85$ in. _____
23. $C = 57$ cm _____
24. $C = 132$ in. _____

Practice 9-6

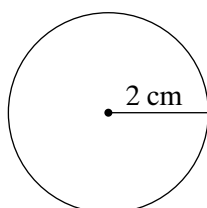
Area of a Circle

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

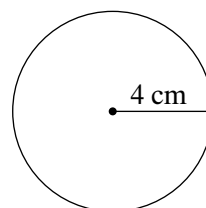
1.



2.

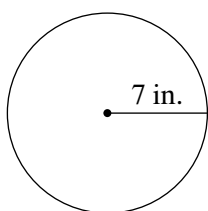


3.

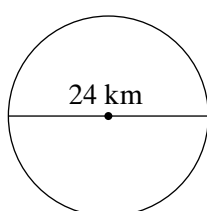


Find the area of each circle. Round to the nearest unit. Use $\frac{22}{7}$ for π .

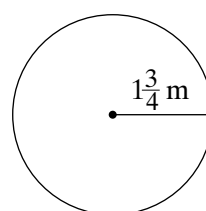
4.



5.



6.



Find the area of a circle with the given radius or diameter. Round to the nearest tenth.

7. $r = 12$ cm _____

8. $d = 15$ m _____

9. $d = 9$ cm _____

10. $d = 14$ cm _____

11. $r = 22$ m _____

12. $r = 28$ m _____

Solve each problem. Round to the nearest square inch.

13. Find the area of an 8-inch diameter pizza.

14. Find the area of a 12-inch diameter pizza.

15. The cost of the 8-inch pizza is \$7.00. The cost of the 12-inch pizza is \$12.50. Which size pizza is the better buy? Explain.

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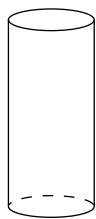
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Practice 9-7

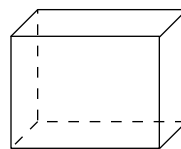
Three-Dimensional Figures and Spatial Reasoning

Name each three-dimensional figure.

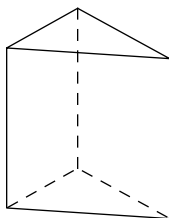
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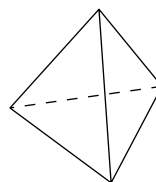
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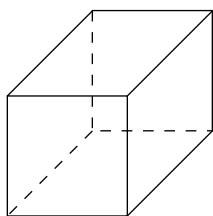
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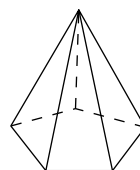
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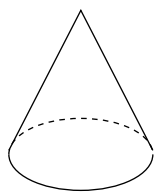
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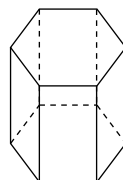
6.



7.



8.



9. In a square pyramid, what shape are the faces?

10. How many faces does a rectangular prism have? How many edges? How many vertices?

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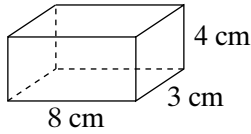
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Practice 9-8

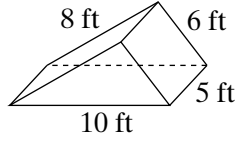
Surface Areas of Prisms

Draw a net for each prism.

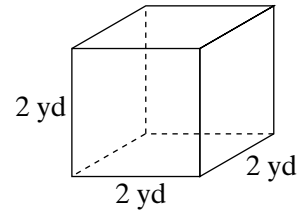
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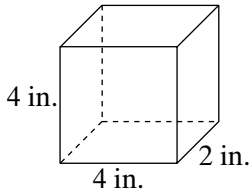


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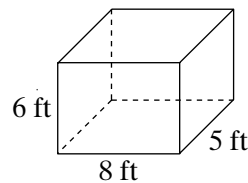


Find the surface area of each figure to the nearest whole number.

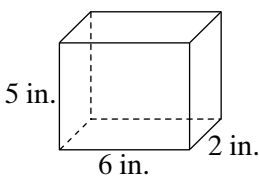
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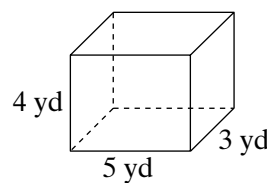
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6.

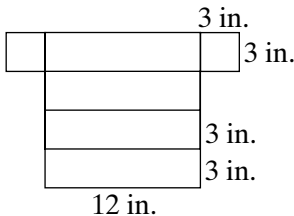


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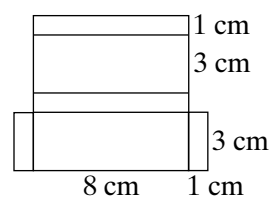


Find the surface area of the rectangular prism with the given net.

8.



9.



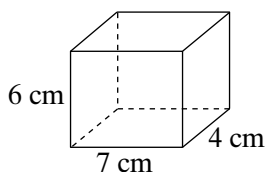
10. Jan is making a pencil holder out of plastic canvas. The pencil holder will be 4 inches high. It will not have a top. The perimeter of the square base is 17.64 inches. How much plastic canvas does Jan need?

Practice 9-9

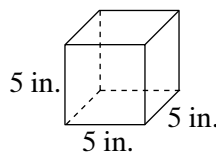
Volumes of Rectangular Prisms

Find the volume of each rectangular prism.

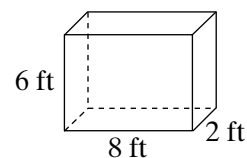
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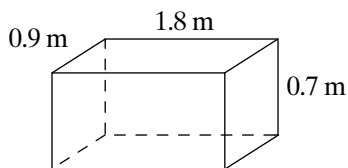
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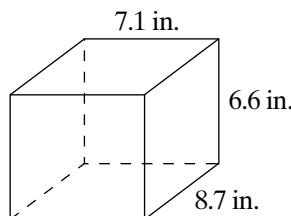
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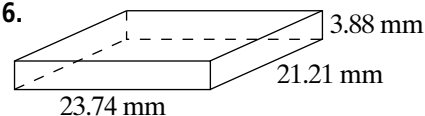
4.



5.



6.



7. $\ell = 6 \text{ cm}, w = 5 \text{ cm}, h = 12 \text{ cm}$

8. $\ell = 13 \text{ in.}, w = 7 \text{ in.}, h = 9 \text{ in.}$

9. $\ell = 14 \text{ m}, w = 13 \text{ m}, h = 19 \text{ m}$

10. $\ell = 44 \text{ cm}, w = 27 \text{ cm}, h = 89 \text{ cm}$

11. $\ell = 2.5 \text{ ft}, w = 1.9 \text{ ft}, h = 11.6 \text{ ft}$

12. $\ell = 48.1 \text{ m}, w = 51.62 \text{ m}, h = 3.42 \text{ m}$

13. A packing box is 1.2 m long, 0.8 m wide, and 1.4 m high. What is the volume of the box?

14. A fish aquarium measures 3 feet long, 2 feet wide, and 2 feet high. What is the volume of the aquarium?

15. A swimming pool is 25 feet wide, 60 feet long, and 7 feet deep. What is the volume of the pool?

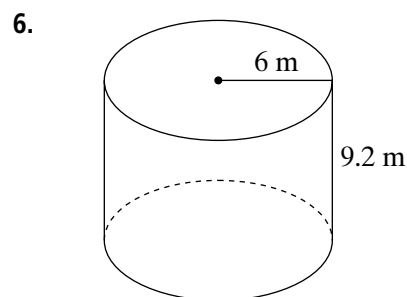
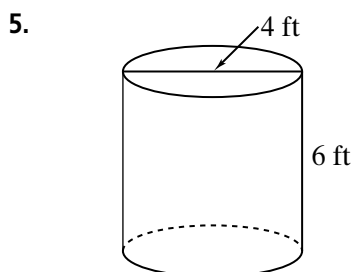
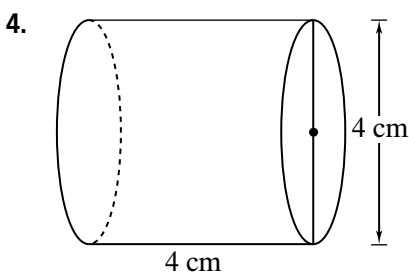
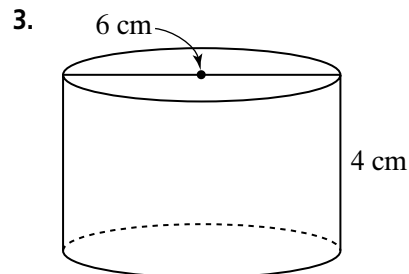
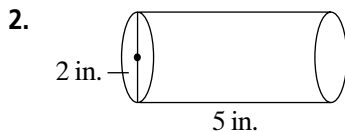
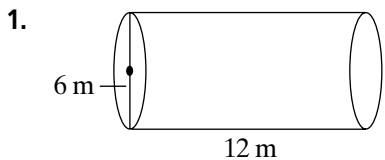
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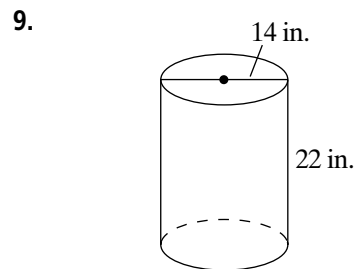
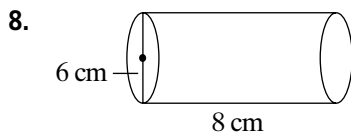
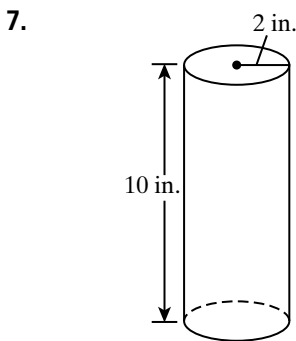
Practice 9-10

Surface Areas and Volumes of Cylinders

Find the surface area of each figure to the nearest whole number.



Find the volume of each cylinder. Round to the nearest whole number.



Find the surface area and volume of each cylinder with the measurements listed below. Round to the nearest whole number.

10. $d = 12$ in.; $h = 14$ in.

Surface area: _____

Volume: _____

11. $d = 8.4$ m; $h = 9.3$ m

Surface area: _____

Volume: _____

12. $d = 19.66$ mm; $h = 25.44$ mm

Surface area: _____

Volume: _____

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Practice 10-1

Tree Diagrams and the Counting Principle

The rectangle shape in a set of blocks comes in two sizes (small and large), three colors (yellow, red, and blue), and two thicknesses (thick and thin).

1. Draw a tree diagram to find the total number of outcomes. _____

2. How many outcomes are possible?

3. How many outcomes will be red?

4. How many outcomes will be blue and thin?

5. How many outcomes will be large?

6. Show how you could use the counting principle to find the number of outcomes.

7. Suppose a medium size is also available. How many outcomes are possible now?

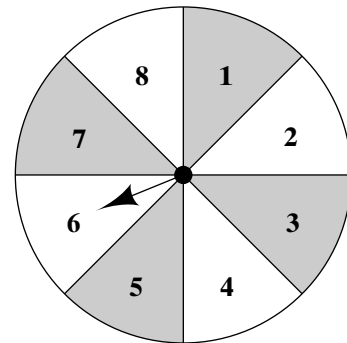
Use the counting principle to find the total number of outcomes.

8. You toss a coin 8 times.

9. A restaurant offers 12 types of entrees, 6 types of appetizers, and 4 types of rice. How many meals of appetizer, entree, and rice are there?

Construct a sample space using a tree diagram.
How many possible outcomes are there?

10. You spin the spinner at the right, then toss a coin.



11. You toss a coin twice, then roll a number cube.

Practice 10-2

Probability

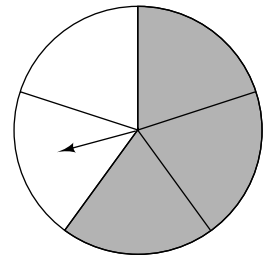
A number cube is rolled once. Find each probability. Write your answer as a fraction, a decimal, and a percent.

- | | |
|-----------------------------------|------------------------------------|
| 1. $P(3)$ _____ | 2. $P(\text{even})$ _____ |
| 3. $P(1, 3, \text{ or } 5)$ _____ | 4. $P(0)$ _____ |
| 5. $P(1 \text{ or } 6)$ _____ | 6. $P(1 \text{ through } 6)$ _____ |

A spinner is divided into 5 equal sections. You spin the spinner once.

7. Find the probability that the spinner lands on a white section.

8. Find the probability that the spinner lands on a shaded section.



Use the words *impossible*, *equally likely*, and *certain* to help you describe each event. Then find the probability.

9. rolling a blue on a cube painted with 3 blue faces and 3 yellow faces

10. drawing a nickel at random from a bag containing 7 dimes

11. choosing a name that starts with *H* from a phone book page that begins with *Hardy* and ends with *Hoffman*

A stack of cards is placed face down. Each card has one letter of the word *EXCELLENT*. Find each probability. Write as fraction, decimal, and percent.

- | | |
|-----------------------------------|------------------------------------|
| 12. $P(E)$
_____ | 13. $P(N)$
_____ |
| 14. $P(T \text{ or } X)$
_____ | 15. $P(\text{consonant})$
_____ |

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Practice 10-3

Experimental Probability

Mirga and José played a game and completed the table.

Mirga wins						
José wins						
Times played						

1. Find the experimental probability that Mirga wins.

2. Find the experimental probability that José wins.

3. Do you think the game is fair? Explain.

The table below shows the results of spinning a spinner 15 times.

Find each experimental probability.

Trial	1	2	3	4	5	6	7	8
Outcome	blue	yellow	red	blue	green	red	yellow	blue

Trial	9	10	11	12	13	14	15
Outcome	blue	green	red	blue	blue	green	red

4. $P(\text{red})$ _____ 5. $P(\text{yellow})$ _____ 6. $P(\text{green})$ _____ 7. $P(\text{blue})$ _____

One day, 40 members who came to an athletic club were asked to complete a survey. Use the results below to find each probability.

Question	Result
Are you male or female?	28 male, 12 female
Are you under 26 years old?	24 yes, 16 no

8. $P(\text{male})$ _____ 9. $P(\text{26 or older})$ _____

For Exercises 10 and 11, refer to the table, which shows the results of tossing a number cube 20 times. Is each game fair? Explain.

Outcome	1	2	3	4	5	6
Number of Times Rolled	1	2	4	6	2	5

10. Player A wins if the number is even. Player B wins if the number is odd.

11. Player A wins if the number is 2. Player B wins if the number is 5.

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Practice 10-4

Making Predictions from Data

Answer each question with a complete sentence in your own words.

1. What is a *population*?

2. What is a *sample*?

3. How can you predict the number of times an event will occur?

The probability of an event is 20%. How many times should you expect the event to occur in the given number of trials?

4. 15 trials 5. 40 trials 6. 75 trials 7. 120 trials

Write and solve a proportion to make each prediction.

8. In a sample of 400 customers at a fast-food restaurant, it was determined that 156 customers ordered a salad. The restaurant typically has 1,200 customers in a day. Predict how many of these customers will order a salad.

9. Before a company delivers 600 strings of lights, it tests a sample. A quality inspector examines 75 strings of lights and finds that 3 are defective. Predict how many strings of lights in the delivery are defective.

10. A company manufactures egg timers. An inspector finds that there are 22 defective timers in a sample of 500. Predict how many egg timers are defective in a shipment of 4,250 egg timers.

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Practice 10-5

Independent Events

Decide whether or not the events are independent. Explain your answers.

1. You draw a red marble out of a bag. Then you draw a green marble.

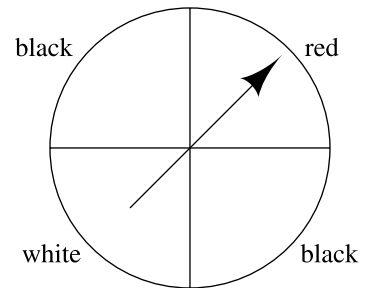
2. You draw a red marble out of a bag and put it back. Then you draw a green marble.

3. You roll a number cube 3 times.

You spin the spinner at the right twice. Find each probability.

4. both red 5. white, then black 6. both black

7. white, then red 8. both white 9. black, then red



10. Are the spins independent events? Explain.

A number cube is rolled three times. Find the probability of each sequence of rolls.

11. 2, 3, 6 12. odd, even, odd 13. all greater than 1

Suppose each letter of your name is printed on a separate card.

14. One card is drawn from a container holding first-name letters. Find P (first letter of your first name).

15. One card is drawn from a container holding last-name letters. Find P (first letter of your last name).

16. One card is drawn from each container. Find P (your initials).

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Practice 11-1

Use an integer to represent each situation.

1. spent \$23 _____ 2. lost 12 yards _____ 3. deposit of \$58 _____

Write the opposite of each integer.

4. 16 _____ 5. -12 _____ 6. 100 _____ 7. 75 _____

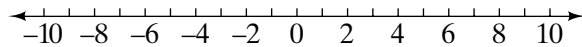
Find each absolute value.

8. $|-5|$ _____ 9. $|13|$ _____ 10. $|25|$ _____ 11. $|-7|$ _____

12. The temperature in Fargo, North Dakota, was 6°F at noon. By 4 P.M. the temperature dropped to -10°F . What integer represents the change in temperature?

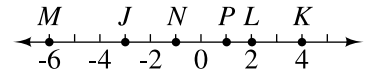
13. A snail climbs 3 inches up a wall. Then it slides 6 inches down the wall. What integer represents the distance the snail traveled from its original position?

14. Graph these integers on the number line: $-4, 9, 1, -2, 3$.



Write an integer for each point on the number line.

15. J _____ 16. K _____
17. L _____ 18. M _____



Write two numbers that have the given absolute value.

19. 4 _____ 20. 38 _____
21. 260 _____ 22. 4,092 _____

Think of the days of a week as integers. Let today be 0, and let days in the past be negative and days in the future be positive.

23. If today is Tuesday, what integer stands for last Sunday? _____
24. If today is Wednesday, what integer stands for next Saturday? _____
25. If today is Friday, what integer stands for last Saturday? _____
26. If today is Monday, what integer stands for next Monday? _____

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Practice 11-2

Comparing and Ordering Integers

Compare, using $<$ or $>$.

1. $2 \square -9$

2. $-5 \square -4$

3. $10 \square -10$

4. $-2 \square 5$

5. $-33 \square 2$

6. $-50 \square -60$

7. $-9 \square 0$

8. $-9 \square -4$

Order each set of integers from least to greatest.

9. $-7, -5, -12, -4$ _____

10. $0, -6, 6, 4, -4$ _____

11. $15, -36, 4, -50$ _____

12. $-3, -12, 9, -27$ _____

13. Order the temperatures from least to greatest. _____

- The temperature was 25°F below zero.
- The pool temperature was 78°F .
- Water freezes at 32°F .
- The low temperature in December was -3°F .
- The temperature in the refrigerator was 34°F .

Write an integer that is located on a number line between the given integers.

14. $-2, \text{ _____}, 9$

15. $3, \text{ _____}, -12$

16. $-7, \text{ _____}, -11$

17. $0, \text{ _____}, -5$

18. $2, \text{ _____}, -1$

19. $-25, \text{ _____}, -16$

Complete with an integer that makes the statement true.

20. $-9 > \text{ _____}$

21. $0 > \text{ _____}$

22. $-1 > \text{ _____}$

23. $3 < \text{ _____}$

24. $-5 < \text{ _____}$

25. $-50 < \text{ _____}$

26. During scuba lessons, Sue dove 30 feet, Harriet dove 120 feet, and Kathy dove 90 feet. What integers represent these depths? Order the integers from least to greatest.

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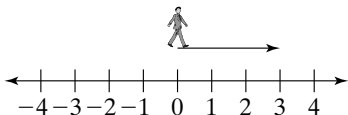
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Practice 11-3

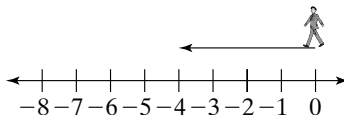
Adding Integers

Write a numerical expression for each model. Find each sum.

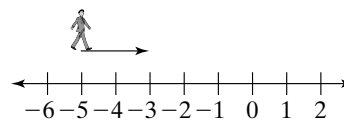
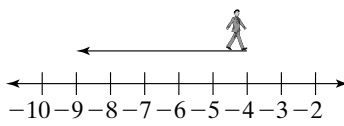
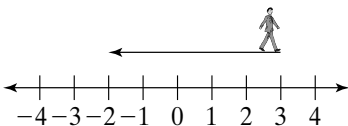
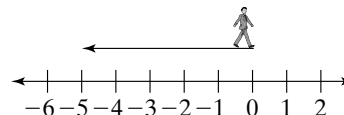
1. _____



2. _____



3. _____



Use a number line or mental math to find each sum.

4. $-2 + (-8)$ _____

5. $8 + (-4)$ _____

6. $-6 + 3$ _____

7. $-2 + (-6)$ _____

8. $6 + (-9)$ _____

9. $-5 + (-7)$ _____

Compare. Write $<$, $=$, or $>$.

10. $-5 + (-6)$ $6 + (-5)$

11. $-8 + 10$ $-3 + 6$

12. $-4 + (-9)$ $-8 + (-5)$

13. $20 + (-12)$ $-12 + (-4)$

Solve.

14. Bill has overdrawn his account by \$15. There is a \$10 service charge for an overdrawn account. If he deposits \$60, what is his new balance?

15. Jody deposited \$65 into her savings account. The next day, she withdrew \$24. How much of her deposit remains in the account?

16. The outside temperature at noon was 9°F . The temperature dropped 15 degrees during the afternoon. What was the new temperature?

17. The temperature was 10° below zero and dropped 24 degrees. What is the new temperature?

18. The high school football team lost 4 yards on one play and gained 9 yards on the next play. What is the total change in yards?

19. Philip earned \$5 for shoveling snow and received \$8 allowance. He spent \$6 at the movies. How much money does he have left?

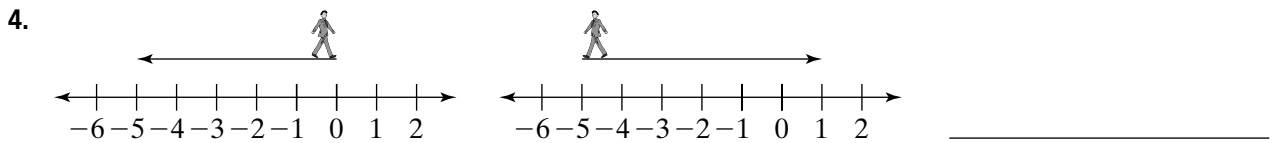
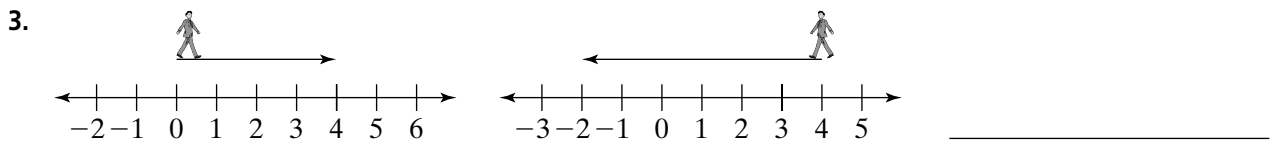
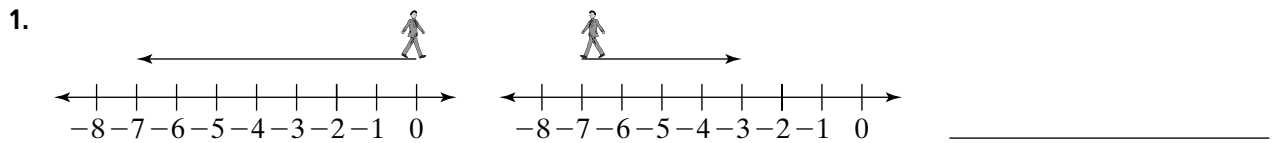
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Practice 11-4

Subtracting Integers

Write a numerical expression for each model. Find each difference.



Find each difference.

5. $2 - 5$ _____ 6. $-5 - 2$ _____ 7. $-6 - 3$ _____
 8. $10 - (-3)$ _____ 9. $-9 - (-2)$ _____ 10. $0 - (-5)$ _____

Compare using $<$, $=$, or $>$.

11. $5 - 12$ $5 - (-12)$ 12. $8 - (-5)$ $-8 - 5$
 13. $9 - (-4)$ $4 - (-9)$ 14. $-12 - 12$ $12 - (-12)$

Solve.

15. The temperature was 48°F and dropped 15° in two hours. What was the temperature after the change? _____
 16. The temperature at midnight is -5°C and is expected to drop 12° by sunrise. What is the expected temperature at sunrise? _____
 17. Catherine has \$400 in her checking account. She writes a check for \$600. What is the balance in her account? _____
 18. On the first play, the football team lost 6 yards. On the second play, the team lost 5 yards. What was their total change in yards? _____

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Practice 11-5

Multiplying Integers

Use a number line to find each product.

1. 5×2

2. -4×3

3. $6 \times (-2)$

4. $-3 \times (-2)$

Find each product.

5. 7×8

6. -5×7

7. $4 \times (-8)$

8. $-8 \times (-2)$

9. $11 \times (-6)$

10. -7×6

11. $-8 \times (-8)$

12. 10×4

Find each product.

13. $11 \times (-9) \times (-4)$ _____

14. $-6 \times (-5) \times (-1)$ _____

15. $5 \times 7 \times (-2) \times 3$ _____

16. $-3 \times 6 \times (-4) \times 5$ _____

Solve.

17. Your teacher purchases 24 pastries for a class celebration, at \$2 each. What integer expresses the amount he paid?

18. Temperatures have been falling steadily at 5°F each day. What integer expresses the change in temperature in degrees 7 days from today?

19. A submarine starts at the surface of the Pacific Ocean and descends 60 feet every hour. What integer expresses the submarine's depth in feet after 6 hours?

20. A skydiver falls at approximately 10 meters per second. Write a number sentence to express how many meters he will fall in 40 seconds.

Practice 11-6**Dividing Integers****Find each quotient.**

1. $14 \div 7$

2. $21 \div (-3)$

3. $-15 \div 5$

4. $-27 \div (-9)$

5. $45 \div (-9)$

6. $-42 \div 6$

7. $-105 \div (-15)$

8. $63 \div (-9)$

9. $108 \div 6$

10. $-204 \div 17$

11. $240 \div (-15)$

12. $-252 \div (-12)$

13. $-286 \div 13$

14. $320 \div 16$

15. $-378 \div (-14)$

16. $380 \div (-19)$

Represent each rate of change with an integer.

17. spends \$300 in 5 days

18. runs 800 feet in 4 minutes

19. descends 45 yards in 15 seconds

20. lose 26 ounces of baby fat in 13 months

21. Juan's baseball card collection was worth \$800. Over the last 5 years, the collection decreased \$300 in value. What integer represents the average decrease in value each year?

22. Florence purchased stock for \$20 per share. After 6 days, the stock is worth \$32 per share. What integer represents the average increase in stock value each day?

23. A freight train starts out at 0 miles per hour. After 15 miles the train is traveling 90 miles per hour. What integer represents the average increase in speed per mile?

Practice 11-7

Solving Equations with Integers

Solve each equation. Check the solution.

1. $r + 16 = 8$ _____ 2. $-6 + m = -14$ _____

3. $p + 18 = -12$ _____ 4. $t - 14 = -10$ _____

5. $c - (-6) = 20$ _____ 6. $y - 11 = -4$ _____

7. $h \div 8 = -8$ _____ 8. $4z = -96$ _____

9. $y \div (-5) = -12$ _____ 10. $-9w = -81$ _____

11. $-4u = 56$ _____ 12. $x \div (-7) = 8$ _____

Write and solve an equation for each situation.

13. You have 26 songs on your digital music player. After you add some, you have 39 songs. How many songs did you add?

14. You earned \$32 for baby-sitting for 4 hours. How much did you make per hour?

15. Joe won 24 points for the swim team during the first half of the meet. He won 47 points in all during the meet. How many points did he win during the second half of the meet?

16. Jan had 36 books checked out from the library. After returning some of them, she still had 17 books checked out. How many books did Jan return to the library?

17. Dan and four friends shared the cost of three pizzas and five drinks. If each boy's share was \$9, how much was the total bill?

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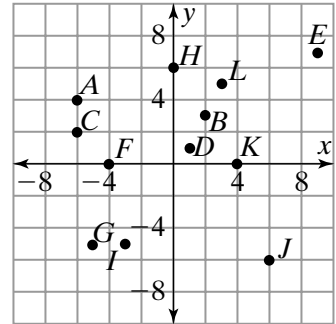
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Practice 11-8

Graphing in the Coordinate Plane

Name the point with the given coordinates in the coordinate plane at the right.

1. $(2, 3)$ _____ 2. $(-4, 0)$ _____
 3. $(-3, -5)$ _____ 4. $(0, 6)$ _____

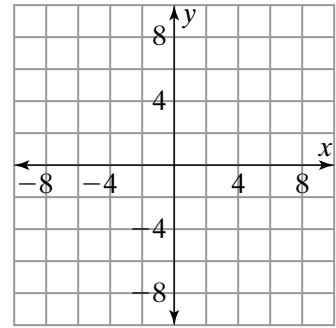


Find the coordinates of each point at the right.

5. J _____ 6. E _____
 7. D _____ 8. A _____
 9. G _____ 10. C _____

Graph each point on the coordinate plane at the right.

11. $A(8, -4)$ 12. $B(-4, 8)$
 13. $C(4, 8)$ 14. $D(-8, -4)$
 15. $E(8, 4)$ 16. $F(-4, -8)$
 17. A taxi begins at $(4, -3)$. It travels 3 blocks west and 5 blocks north to pick up a customer. What are the customer's coordinates?

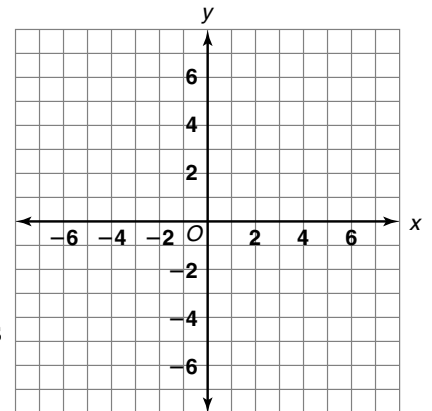


18. A moving truck fills up a shipment at an old address, at $(-2, 1)$. It travels 7 blocks south and 6 blocks east to the new address. What is the location of the new address?

Use the coordinate plane at the right.

19. Graph four points on the coordinate plane so that when the points are connected in order, the shape is a rectangle. List the coordinates of the points.

20. Graph four points on the coordinate plane so that when the points are connected in order, the shape is a parallelogram that is not a rectangle. List the coordinates of the points.



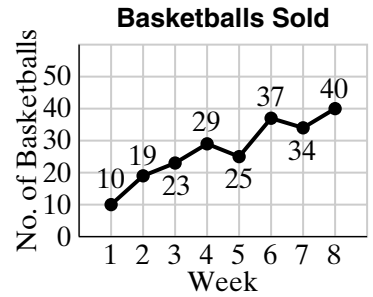
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Practice 11-9

Applications of Integers

Use the graph at the right for Exercises 1–4.



- How many basketballs were sold in the third week? _____
- How many basketballs were sold in the fifth week? _____
- How many more basketballs were sold in the fourth week than were sold in the third week? _____
- Which weeks showed a drop in the number of basketballs sold?

5. Find the closing balance for each day.

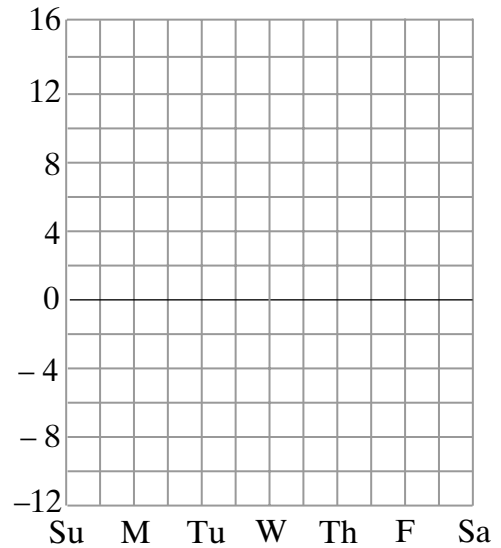
Day	Income	Expenses	Balance
Sunday	\$45	-\$32	
Monday	\$50	-\$40	
Tuesday	\$40	-\$26	
Wednesday	\$45	-\$50	
Thursday	\$30	-\$35	
Friday	\$60	-\$70	
Saturday	\$60	-\$53	

- Draw a line graph to show the balances in Exercise 5.
- On which day did the greatest balance occur?

- On which day did the least balance occur?

- On which two days was the balance the same?

- What was the total balance for the week? Was it a loss or profit?



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Practice 11-10

Graphing Functions

Complete the function table given the rule.

1. Rule: Output = Input \cdot 5

Input	1	2	3	4	5
Output	5	10	15		

2. Rule: Output = Input \cdot 2

Input	10	20	30	40	50
Output	20	40	60		

3. Rule: Output = Input + 3

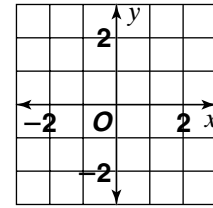
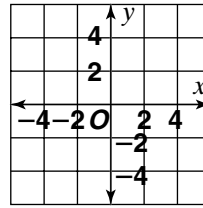
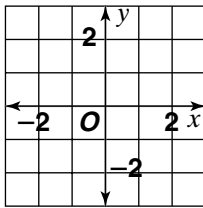
Input	3	4	5	6	7
Output	6	7	8		

Make a table and graph each function. Use x -values of $-2, -1, 0, 1,$ and 2 .

4. $y = x - 1$

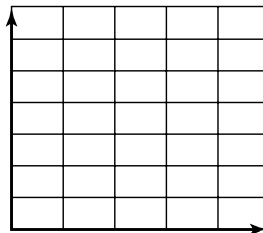
5. $y = 3x$

6. $y = \frac{x}{2} - 1$

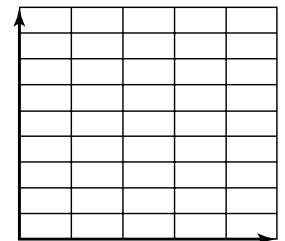


Graph each function.

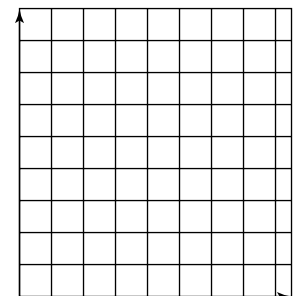
7. Hours	Wages (\$)
1	15
2	30
3	45
4	60



8. Gallons	Quarts
1	4
2	8
3	12
4	16



9. A parking garage charges \$3.50 per hour to park. The function rule: $c = 3.5h$ shows how the number of hours h , relates to the parking charge c . Graph the function.



Practice 12-1

Solving Two-Step Equations

Explain what was done to the first equation to get the second equation.

1. $\frac{x}{5} - 3 = 12 \rightarrow x = 75$

2. $6x + 7 = 31 \rightarrow x = 4$

3. $\frac{x}{3} + 2 = 4 \rightarrow x = 6$

Solve each equation. Check the solution.

4. $4r + 13 = 57$

$r =$ _____

5. $\frac{z}{4} + 16 = 21$

$z =$ _____

6. $7 = \frac{t}{6} - 3$

$t =$ _____

7. $6q - 18 = 30$

$q =$ _____

8. $\frac{w}{15} + 26 = 42$

$w =$ _____

9. $15u + 18 = 18$

$u =$ _____

10. $9 = 7b - 12$

$b =$ _____

11. $\frac{x}{11} + 21 = 35$

$x =$ _____

12. $\frac{s}{7} - 11 = 17$

$s =$ _____

13. Hideki baked 41 cookies. He gave the same number of cookies to each of 5 friends, saving 11 cookies for himself. How many cookies did each friend receive?

14. Estelle is buying dresses by mail. She pays \$65 for each dress, plus a shipping and handling charge of \$8 for the entire order. If her order costs \$268, how many dresses did she buy?

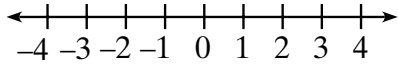
15. Ms. Juarez planted a 7-foot-tall tree. The height (h) of the tree, in feet, after n years is given by the equation $h = 4n + 7$. In how many years will the height be 39 feet?

Practice 12-2

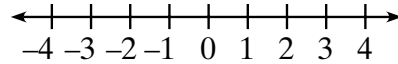
Inequalities

Graph each inequality on a number line.

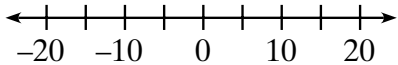
1. $x \leq 3$



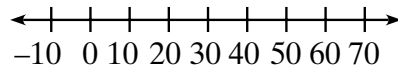
2. $t > 1$



3. $q \geq -10$



4. $m < 50$



For each inequality, tell whether the number in bold is a solution.

5. $x < 7$; **7** _____

6. $p > -3$; **3** _____

7. $k \geq 5$; **0** _____

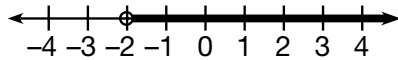
8. $z \leq 12$; **4** _____

9. $n > 3$; **6** _____

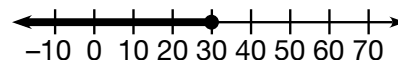
10. $g \geq 3$; **-1** _____

Write an inequality for each graph.

11. _____



12. _____



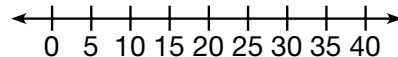
Write a real-world statement for each inequality.

13. $d \geq 60$

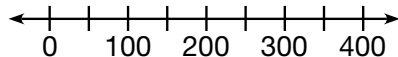
14. $p < 200$

Write and graph an inequality for each statement.

15. You can walk there in 20 minutes or less.



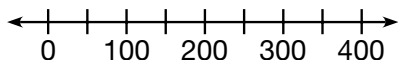
16. Each prize is worth over \$150.



17. A species of catfish, *Malapterurus electricus*, can generate up to 350 volts of electricity.

a. Write an inequality to represent the amount of electricity generated by the catfish.

b. Draw a graph of the inequality you wrote in part (a).



Practice 12-3

Solving One-Step Inequalities

Solve each inequality.

1. $x - 5 < 15$

2. $m + 7 \geq 12$

3. $k + 5 < -10$

4. $g - (-4) \geq 0$

5. $-6 > b - 24$

6. $f - 6 < 12$

7. $q + 9 < 60$

8. $h + (-1) > -1$

9. $42 + p \geq 7$

Write an inequality for each sentence. Then solve the inequality.

10. Five is greater than a number minus 2. _____

11. Twenty is less than or equal to a number plus 4. _____

12. A number minus 5 is greater than 25. _____

13. A number plus 18 is less than or equal to 20. _____

Write an inequality for each problem. Then solve the inequality.

14. You and the chess teacher have been playing chess for 18 minutes. To make the chess club, you must win the game in less than 45 minutes. How much time do you have to win the chess game?

15. Your phone card allows you to talk long distance for up to 120 minutes. You have been on a long-distance call for 72 minutes. How much longer do you have to talk before your phone card expires?

Solve each inequality mentally.

16. $x - 28 < 108$

17. $s - 18 \geq 12$

18. $t + 5 < -15$

19. $g + 12 > 20$

20. $k - 4 \geq 25$

21. $24 > b + 16$

Practice 12-4

Exploring Square Roots and Rational Numbers

Determine if each number is a perfect square.

- | | | |
|--------------|--------------|----------------|
| 1. 90 _____ | 2. 225 _____ | 3. 28 _____ |
| 4. 289 _____ | 5. 144 _____ | 6. 1,000 _____ |

Find each square root without using a calculator.

- | | | |
|------------------------|------------------------|------------------------|
| 7. $\sqrt{196}$ _____ | 8. $\sqrt{289}$ _____ | 9. $\sqrt{16}$ _____ |
| 10. $\sqrt{361}$ _____ | 11. $\sqrt{1}$ _____ | 12. $\sqrt{25}$ _____ |
| 13. $\sqrt{9}$ _____ | 14. $\sqrt{256}$ _____ | 15. $\sqrt{400}$ _____ |

Use a calculator to find each square root to the nearest hundredth.

- | | | |
|-----------------------|-----------------------|-----------------------|
| 16. $\sqrt{10}$ _____ | 17. $\sqrt{48}$ _____ | 18. $\sqrt{28}$ _____ |
| 19. $\sqrt{72}$ _____ | 20. $\sqrt{37}$ _____ | 21. $\sqrt{86}$ _____ |

Tell which consecutive whole numbers each square root is between.

- | | | |
|--------------------------|---------------------------|--------------------------|
| 22. $\sqrt{8}$
_____ | 23. $\sqrt{3}$
_____ | 24. $\sqrt{40}$
_____ |
| 25. $\sqrt{75}$
_____ | 26. $\sqrt{120}$
_____ | 27. $\sqrt{54}$
_____ |

Tell whether each number is rational.

- | | | | |
|-------------------------|--------------------------|------------------------|-----------------------|
| 28. $\frac{2}{9}$ _____ | 29. $\sqrt{16}$ _____ | 30. $\sqrt{32}$ _____ | 31. $7.\bar{4}$ _____ |
| 32. $\sqrt{48}$ _____ | 33. $\frac{12}{5}$ _____ | 34. $8.\bar{65}$ _____ | 35. $\sqrt{24}$ _____ |

36. The largest pyramid in Egypt, built almost 5,000 years ago, covers an area of about 63,300 square yards. Find the length of each side of the square base. Round to the nearest yard.

37. Square floor tiles frequently have an area of 929 square centimeters. To the nearest tenth of a centimeter, find the length of a side of one of these tiles.

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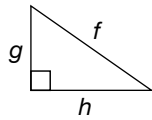
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Practice 12-5

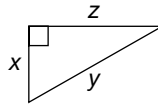
Introducing the Pythagorean Theorem

Use the Pythagorean Theorem to write an equation expressing the relationship between the legs and the hypotenuse for each triangle.

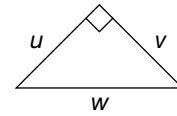
1. _____



2. _____



3. _____



Find the missing side length of each right triangle.

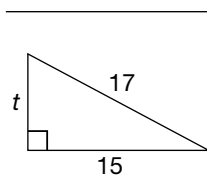
4. $a = 10, b = 24, c = ?$

5. $a = ?, b = 35, c = 37$

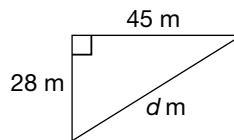
6. $a = 39, b = ?, c = 89$

Find the missing side length of each right triangle.

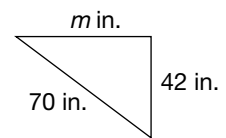
7. $t =$ _____



8. $d =$ _____



9. $m =$ _____



10. The state of Colorado is shaped like a rectangle, with a base measuring about 385 miles and a height of about 275 miles. About how far is it from the northwest corner to the southeast corner of Colorado?

11. A drawing tool is shaped like a right triangle. One leg measures about 14.48 centimeters, and the hypotenuse measures 20.48 centimeters. What is the length of the other leg? Round your answer to the nearest hundredth of a centimeter.

12. An 8-foot ladder is leaned against a wall from 4 feet away. How high up the wall does the ladder reach? Round your answer to the nearest tenth of a foot.

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