Vocabulary

Choose the best term from the box.

- divisor
- quotient
- hundredths
- tenths

1. The number 2.45 has a four in the _?_ place and a five in the _?_ place.

2. In 36 ÷ 9 = 4, the 4 is called the _?_, and the 9 is called the _?_.

Division Facts

3. 24 ÷ 6	**4.** 81 ÷ 9	**5.** 49 ÷ 7
6. 36 ÷ 6	**7.** 40 ÷ 8	**8.** 63 ÷ 9
9. 42 ÷ 7	**10.** 64 ÷ 8	**11.** 48 ÷ 8
12. 25 ÷ 5	**13.** 36 ÷ 9	**14.** 35 ÷ 7
15. 48 ÷ 6	**16.** 56 ÷ 8	**17.** 54 ÷ 9

Multiplication Facts

18. 8 × 8	**19.** 9 × 4	**20.** 7 × 4
21. 10 × 10	**22.** 11 × 11	**23.** 12 × 12
24. 8 × 4	**25.** 7 × 8	**26.** 10 × 8
27. 7 × 6	**28.** 8 × 5	**29.** 9 × 6
30. 9 × 9	**31.** 8 × 6	**32.** 7 × 9

Properties of Multiplication

Writing to Explain Write an answer to the question.

33. How can the Associative Property of Multiplication be used to compute 14 × 2 × 50 mentally?

3

The East Room is the largest room in the White House. What is its area? You will find out in Lesson 13-4.

4

Cowboys on cattle drives were called to dinner by the ringing of a triangular bell. What is the area of a triangular dinner bell? You will find out in Lesson 13-6.

MG 1.4 Differentiate between, and use appropriate units of measures for, two- and three-dimensional objects (i.e., find the perimeter, area, volume). Also **NS 1.9 (Grade 4)**
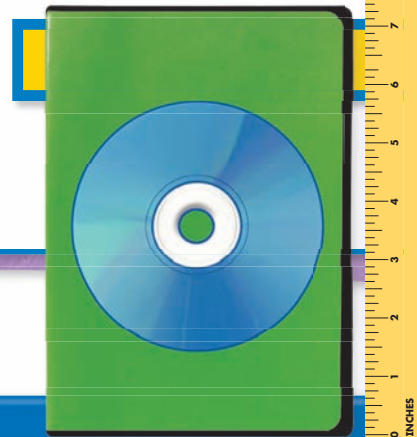
Using Customary Units of Length

How can you use fractions to measure more precisely?

Since an inch is divided into equal parts, you can use fractions to measure lengths. You can estimate the length of this DVD case first. What is the length of the DVD case to the nearest $\frac{1}{8}$ inch?

Hands-On
inch ruler

Guided Practice*

Do you know HOW?

For **1** and **2**, measure each segment to the nearest inch, $\frac{1}{2}$ inch, $\frac{1}{4}$ inch, and $\frac{1}{8}$ inch.

1.

2.

Do you UNDERSTAND?

3. In the example above, why isn't the length of the DVD case 8 inches to the nearest inch?

4. **Writing to Explain** Would it be reasonable to measure pieces of lumber needed to build a house only to the nearest inch?

Independent Practice

In **5** through **7**, use a ruler to measure each object to the nearest inch, $\frac{1}{2}$ inch, $\frac{1}{4}$ inch, and $\frac{1}{8}$ inch.
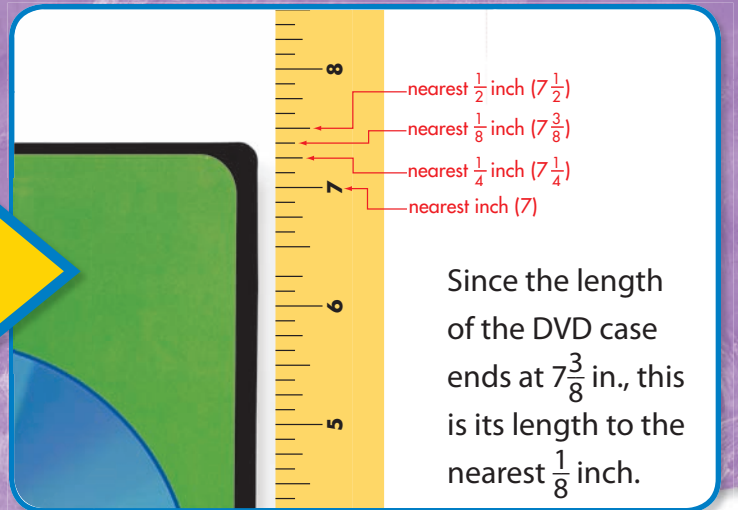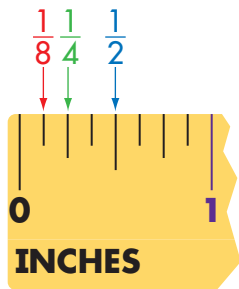
5.

6.

7.

In **8** through **13**, estimate each measure first. Then use a ruler to measure each to the nearest $\frac{1}{4}$ inch and $\frac{1}{8}$ inch.

8. The length of a pencil

9. The width of your foot

10. The length of a piece of chalk

11. The length of your index finger

12. The length of your math book

13. The width of your hand

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For another example, see Set A on page 314.

Your estimate for the length of the DVD case should be about 7 inches. You can use a ruler to find the length to the nearest 1 in., $\frac{1}{2}$ in., $\frac{1}{4}$ in., and $\frac{1}{8}$ in.

$\frac{1}{8}$ $\frac{1}{4}$ $\frac{1}{2}$

0 **1**

INCHES

nearest $\frac{1}{2}$ inch $(7\frac{1}{2})$
nearest $\frac{1}{8}$ inch $(7\frac{3}{8})$
nearest $\frac{1}{4}$ inch $(7\frac{1}{4})$
nearest inch (7)

Since the length of the DVD case ends at $7\frac{3}{8}$ in., this is its length to the nearest $\frac{1}{8}$ inch.

Problem Solving

14. Which line segment measures about $2\frac{1}{2}$ inches long?

A

B

C

D

15. **Think About the Process** Mae spent $12 on a new purse, $6 on lunch, and $14 for a book. She had $12 when she got home. Which expression shows much money Mae started with?

A $12 - 12 + 6 + 14$

B $(2 \times 12) + 14 + 6$

C $12 - 6 - (14 + 12)$

D $2 \times (12 + 12) - 14$

16. **Writing to Explain** When you measure the length of an object, will your measure ever be exact? Explain.

17. Jan has $49 to spend on poster board. If each poster board costs $3, how many poster boards can she buy?

18. **Estimation** Sheri played 4 computer games in 48 minutes. She scored about 825 points per game. About how many points did she score per minute?

19. **Number Sense** To find $8.3 \times 1,000$, how many places will you move the decimal point to the right? How many zeros will you need to annex? What is the product?

20. The measure of the length of a paper clip to the nearest inch, $\frac{1}{2}$ inch, and $\frac{1}{4}$ inch is 2 inches. How is this possible?

21. **Writing to Explain** Fifteen pounds of meat cost $26.85. Is it reasonable to say that the price per pound is $11? Explain.

Using Metric Units of Length

Hands-On
centimeter ruler

What units are used to measure length in the metric system?

Measurements in the metric system are based on the meter. The chart at the right lists other commonly used metric units and their equivalents.
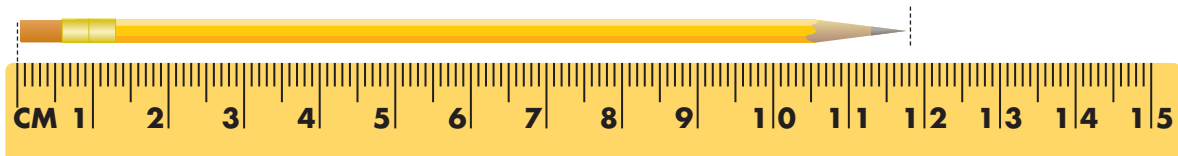
Metric Equivalents

1 centimeter =	10 millimeters (mm)
1 meter =	100 centimeters (cm)
1 meter =	1,000 millimeters (mm)
1,000 meters =	1 kilometer (km)

Another Example How do you measure length using metric units?

To the nearest centimeter: 12 cm   To the nearest millimeter: 118 mm

---

Guided Practice*

Do you know HOW?

1. Which unit would be most appropriate to measure the length of a kitchen?

2. Measure this segment to the nearest centimeter and nearest millimeter.

Do you UNDERSTAND?

3. What two units can be used to measure the thickness of a stack of 10 dimes?

4. **Writing to Explain** Why is the millimeter not an appropriate unit to measure the distance across a town?
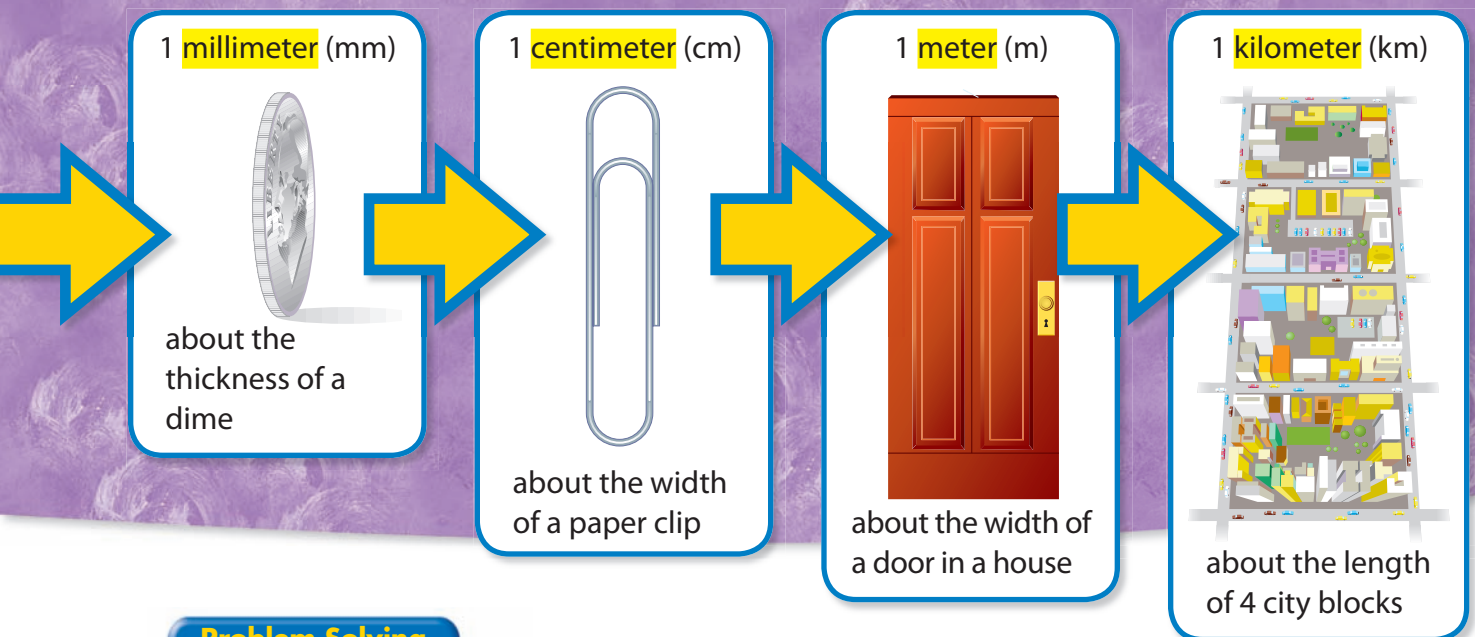

Independent Practice

For **5** through **7**, write mm, cm, m, or km as the most appropriate unit.

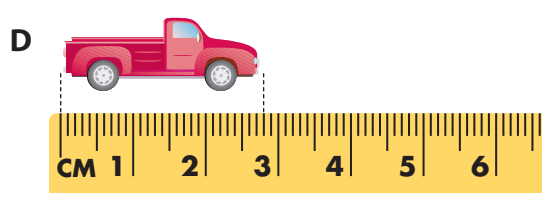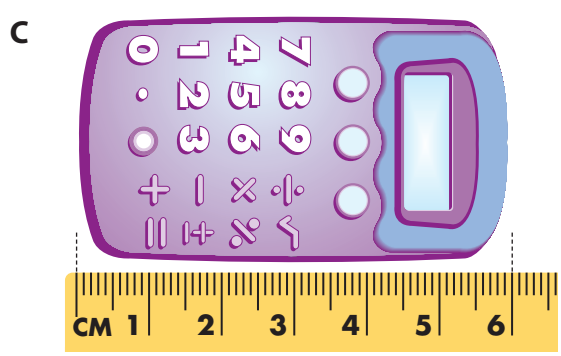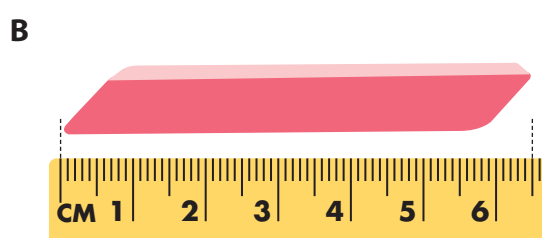**5.** Thickness of a fingernail   **6.** Length of a picnic table   **7.** Length of a road

In **8** through **13**, measure each segment to the nearest centimeter and to the nearest millimeter.

8.

9.

10.

11.

12.

13.

*For another example, see Set B on page 314.

1 **millimeter** (mm)	1 **centimeter** (cm)	1 **meter** (m)	1 **kilometer** (km)
about the thickness of a dime	about the width of a paper clip	about the width of a door in a house	about the length of 4 city blocks

Problem Solving

14. Which object is 65 millimeters wide?

A

CM 1 2 3 4 5 6

B

CM 1 2 3 4 5 6

C

CM 1 2 3 4 5 6

D

CM 1 2 3 4 5 6

15. **Writing to Explain** Darcy is estimating how much fabric she will need to make a new jacket. Is estimating reasonable in this situation? Why or why not?

16. Dana ordered 1 medium cheese pizza with 8 slices. She ate 2 pieces. Write 2 equivalent fractions to show the part of the pizza Dana did NOT eat.

17. Choose from the measures listed below to determine the most appropriate lengths.

$$40 \text{ mm} \qquad 2 \text{ m}$$
$$18 \text{ cm} \qquad 200 \text{ km}$$

a The distance between two cities

b The length of a bicycle

c The length of a drinking straw

d The length of a caterpillar

18. **Reasoning** If a measuring cup has $\frac{1}{4}$ cup milk in it, what fraction represents the amount of milk needed to finish filling the cup?
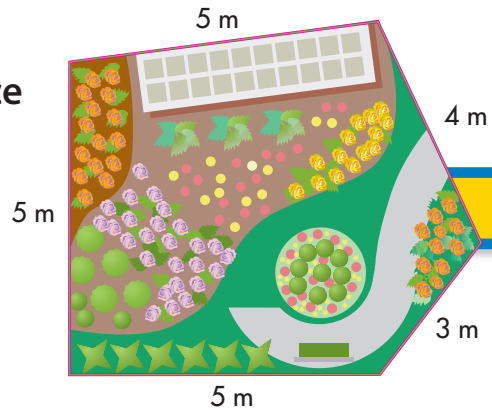
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Perimeter

How can you find the distance around a polygon?

The city wants to build a new fence around the rose garden in the town square. <mark>Perimeter</mark> is the distance around the outside of any polygon.

5 m

4 m

5 m

3 m

5 m

Another Example How can you use a formula to find the perimeter of a square and a rectangle?
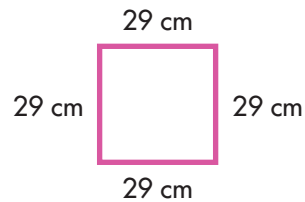
A <mark>formula</mark> is a rule that uses symbols.

Use a formula to find the perimeter of the square.

Perimeter = 4 × side
$P = 4 \times s$
$P = 4 \times 29 = 116$ cm

Tip s = side

29 cm

29 cm   29 cm

29 cm

Use either of these formulas to find the perimeter of the rectangle.

8 m

5 m

One Way

Perimeter = (2 × length) + (2 × width)
$P = (2 \times \ell) + (2 \times w)$
$P = (2 \times 8) + (2 \times 5)$
$P = 16 + 10 = 26$ m

Tip ℓ = length
w = width
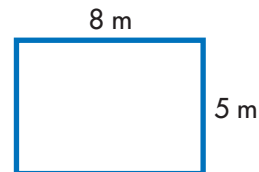
Another Way

Perimeter = 2 × (length + width)
$P = 2 \times (\ell + w)$
$P = 2 \times (8 + 5)$
$P = 2 \times 13 = 26$ m

Explain It

1. Will the formula for finding the perimeter of a square work for finding the perimeter of a rectangle?

Find the perimeter of the rose garden to find the total length of the new fence needed.

Perimeter is equal to the sum of the side lengths of a polygon.

One Way

Add the lengths of the sides.

$P = 5 + 5 + 4 + 3 + 5$
$P = 22$ m

The perimeter of the rose garden is 22 m.

Another Way

Since the longest side lengths are the same, multiplication can be used in the equation.
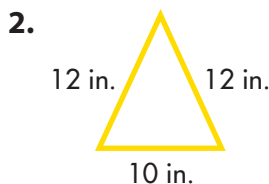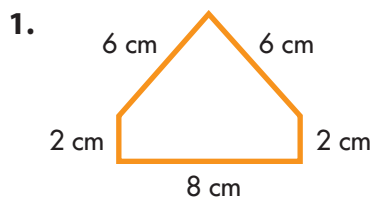
$P = 5 + 5 + 4 + 3 + 5$
$P = (3 \times 5) + 4 + 3$
$P = \quad 15 \quad + \quad 7$
$P = 22$ m

The perimeter of the rose garden is 22 m.

Guided Practice*

Do you know HOW?
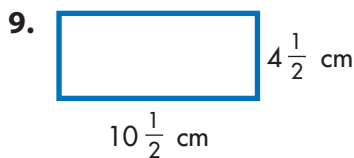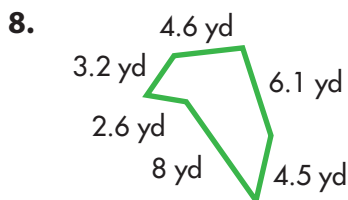
In **1** and **2**, find the perimeter of each figure.

1.

6 cm   6 cm
2 cm   2 cm
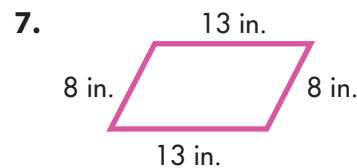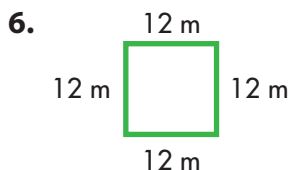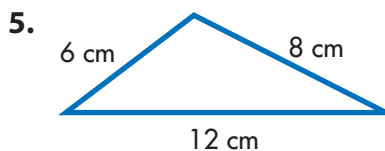8 cm

2.

12 in.   12 in.
10 in.

Do you UNDERSTAND?

3. Look at the dimensions of the garden above. If the longest sides of the garden were 9 m, how long would the fence need to be?

4. **Writing to Explain** In the above example, why can you add the lengths of the sides of the garden in any order to find its perimeter?

Independent Practice

For **5** through **10**, find the perimeter of each figure.
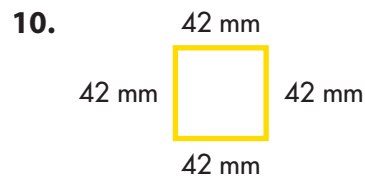
5.

6 cm   8 cm
12 cm

6.

12 m
12 m   12 m
12 m

7.

13 in.
8 in.   8 in.
13 in.

8.

4.6 yd
3.2 yd   6.1 yd
2.6 yd
8 yd   4.5 yd

9.

$4\frac{1}{2}$ cm
$10\frac{1}{2}$ cm
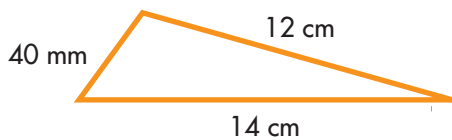
10.

42 mm
42 mm   42 mm
42 mm

11. **Number Sense** The perimeter of an equilateral triangle is 51 feet. What is the length of each of its sides?

A 13 ft   **C** 17 ft

B 15 ft   **D** 21 ft

12. Find the perimeter of a parallelogram with sides measuring $3\frac{3}{10}$ m, $8\frac{5}{10}$ m, $3\frac{3}{10}$ m, and $8\frac{5}{10}$ m.

A $23\frac{8}{10}$ m   **C** $24\frac{6}{10}$ m

B $23\frac{3}{5}$ m   **D** 24 m

13. What is the perimeter of the Pentagon near Washington, D.C.?

921 ft   921 ft

921 ft   921 ft

921 ft

14. What is the perimeter of the California State flag?

72 in.

40 in.

8 in.

CALIFORNIA REPUBLIC
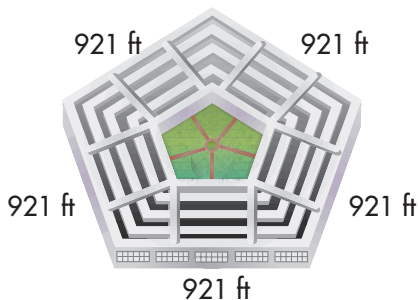
15. **Writing to Explain** Alfonso said that the perimeter of this triangle is 66 cm. What was his error? What should the perimeter be? Explain.

40 mm   12 cm   14 cm

16. Which unit (mm, cm, m, or km) would be the most appropriate for each measurement?

  a Distance across Lake Michigan

  b Length of a spoon

  c Thickness of an envelope

  d Height of a building

17. Which is the least common denominator of $\frac{1}{12}$ and $\frac{4}{5}$?

A 5   **C** 30

B 12   **D** 60

18. **Reasoning** Maria says her pencil is 1.7 meters long. Is this measurement reasonable? Explain.
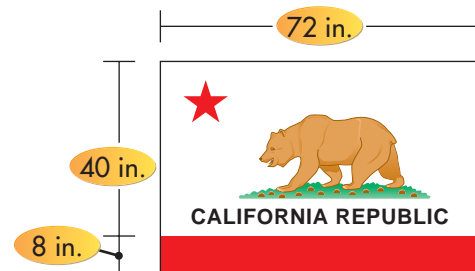
19. It takes Neptune about 165 Earth years to complete one orbit around the Sun. How many Earth months does it take Neptune to orbit the Sun once?

20. The planet Neptune was discovered in 1846. Neptune's average distance from the Sun is four billion, four hundred ninety-eight million, two hundred fifty-two thousand, nine hundred kilometers. Write this number in standard form.

21. Stan has $2\frac{3}{4}$ pounds of oranges, $1\frac{1}{4}$ pounds of lemons, and $1\frac{3}{4}$ pounds of limes. How many pounds of fruit does Stan have altogether?

Find each quotient. Simplify if possible.

1. $5 \div \frac{9}{10}$ **2.** $10 \div \frac{1}{2}$ **3.** $4 \div \frac{3}{8}$ **4.** $6 \div \frac{3}{4}$

5. $8 \div \frac{7}{8}$ **6.** $2 \div \frac{3}{4}$ **7.** $12 \div \frac{1}{12}$ **8.** $3 \div \frac{1}{4}$

Find each quotient. Simplify if possible.

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

14. $\frac{3}{10} \div \frac{2}{5}$ **15.** $\frac{2}{3} \div \frac{1}{6}$ **16.** $\frac{2}{9} \div \frac{2}{3}$ **17.** $\frac{3}{5} \div \frac{3}{5}$ **18.** $\frac{7}{8} \div \frac{5}{8}$

Find each product. Simplify if possible.

19. $2\frac{1}{2} \times 3\frac{1}{4}$ **20.** $1\frac{3}{8} \times 4\frac{2}{3}$ **21.** $3\frac{1}{2} \times 3\frac{1}{2}$ **22.** $1\frac{2}{5} \times 1\frac{3}{5}$

Error Search Find each product or quotient that is not correct. Write it correctly and explain the error.

23. $6 \div \frac{1}{6} = \frac{1}{36}$ **24.** $\frac{5}{6} \div \frac{1}{2} = 1\frac{2}{3}$ **25.** $2\frac{1}{2} \times 3\frac{1}{2} = 6\frac{1}{4}$

Number Sense

Estimating and Reasoning Write whether each statement is true or false. Explain your reasoning.

26. The expression $(21 \div 3) + (5 - 4) \times 2$ equals 9.

27. The product of 9 and 6.65 is closer to 54 than 63.

28. The sum of $\frac{2}{3}$ and $\frac{7}{10}$ is less than 1.

29. The quotient of $5\frac{4}{5}$ divided by 1 is 1.

30. The product of 385 and 286 is less than 120,000.

**31.** The difference of $4\frac{4}{5}$ and $4\frac{1}{3}$ is less than 1.

MG 1.1 ⚷ Derive and use the formula for the area of a triangle and of a parallelogram by comparing each with the formula for the area of a rectangle (i.e., two of the same triangles make a parallelogram with twice the area; a parallelogram is compared with a rectangle of the same area by pasting and cutting a right triangle on the parallelogram).
Also **MG 1.0.**

Area of Squares and Rectangles

How can a formula be used to find area?

The <mark>area</mark> of a figure is the amount of surface it covers. What are the areas of the baseball infield and the tennis court?

90 ft   90 ft
90 ft   90 ft

36 ft
78 ft
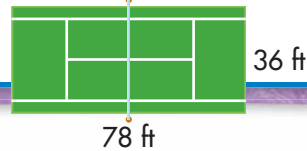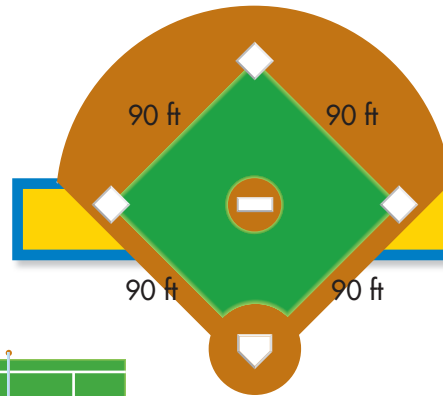
Guided Practice*

Do you know HOW?

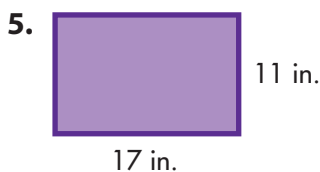In **1** and **2**, find the area of each figure.

1. Find the area of a square with a side that measures 34 cm.

2. Find the area of a rectangle with length 21 m and width 9 m.

Do you UNDERSTAND?

3. Which two dimensions are multiplied when finding the area of a rectangle?

4. **Writing to Explain** In the example above, how can you decide which figure has the greater area, without using the formula?

Independent Practice

For **5** through **10**, find the area of each figure.

5.
11 in.
17 in.

6.
14 ft
14 ft

7.
23 m
45 m

8.
39 cm
39 cm
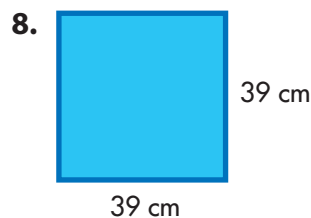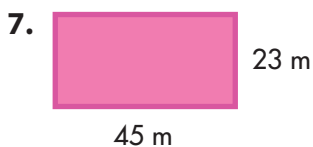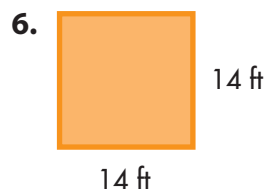
9. A rectangle with length 245 in. and width 167 in.

10. A square with a side that measures 31 yd

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For another example, see Set D on page 315.

The infield is a square, so all of its sides are equal.

Use the formula below to find the area of a square. Area is measured in square units.
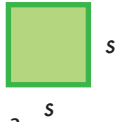
Area = side × side
$A = s \times s = s^2$
$A = 90 \text{ feet} \times 90 \text{ feet}$
$A = 8{,}100$ square feet (ft²)

The area of the infield is 8,100 ft².

The tennis court is a rectangle, so its opposite sides are equal.

Use the formula below to find the area of a rectangle.

Area = length × width
$A = \ell \times w$
$A = 78 \text{ feet} \times 36 \text{ feet}$
$A = 2{,}808$ square feet (ft²)

The area of the tennis court is 2,808 ft².

Problem Solving

11. The East Room of the White House is 79 feet long by 36 feet wide. What is the area of the room?

36 ft

		Blue Room		State Dining Room
	Green Room		Red Room	

79 ft — East Room — Corridor
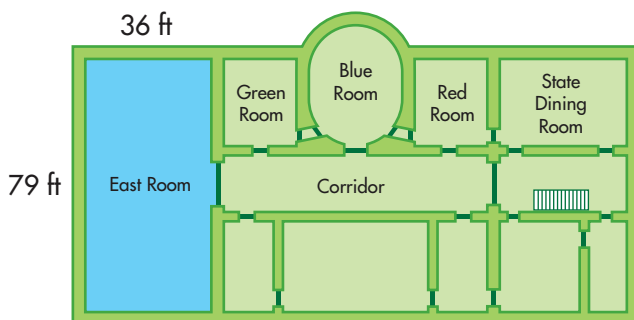
12. Ben's mom wants to buy new carpet for the family room that measures 12 feet by 11 feet. She can purchase the carpet on sale for $6 per square foot including installation. How much will Ben's mom spend to carpet the family room?

A $132

B $791

C $792

D $794

13. Number Sense A set of four postcards cost $1.00. Single postcards cost $0.50. What is the least amount of money you can spend to buy exactly 15 postcards?

14. Which has the greater area: a square with a side that measures 7 meters, or a 6-by-8-meter rectangle? What is the area?

For **15** through **17**, use the drawing at the right.

15. What is the perimeter of an Olympic-size swimming pool?

16. What is the area of the swimming pool?

17. What is the perimeter of each lane?

18. What is the perimeter and area of a square with a side that measures 15 m?
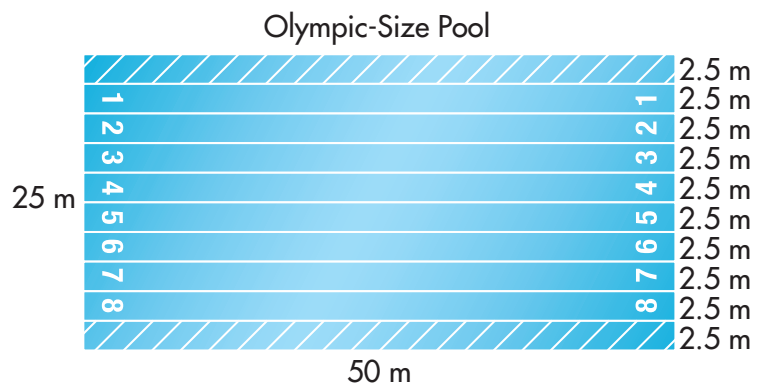
Olympic-Size Pool

25 m

Lanes: 1 2 3 4 5 6 7 8 / 8 7 6 5 4 3 2 1

2.5 m (×10)

50 m

Area of Parallelograms

How can finding the area of a rectangle help you find the area of a parallelogram?

Southwestern rugs often have parallelograms as part of the design. The <mark>base</mark> of this parallelogram is 8 cm. The <mark>height</mark> is 4 cm. What is its area?

MG 1.1 ⚷ Derive and use the formula for the area of a triangle and of a parallelogram by comparing each with the formula for the area of a rectangle (i.e., two of the same triangles make a parallelogram with twice the area; a parallelogram is compared with a rectangle of the same area by pasting and cutting a right triangle on the parallelogram).
Also **MG 1.0**.

4 cm

8 cm

Guided Practice*

Do you know HOW?

in **1** and **2**, find the area of each parallelogram.
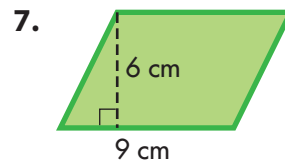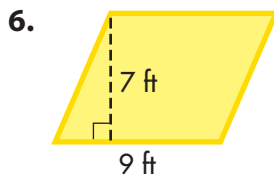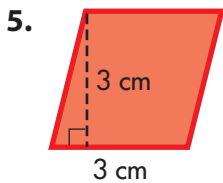
1.
3 in.
6 in.

2.
5 in.
8 in.
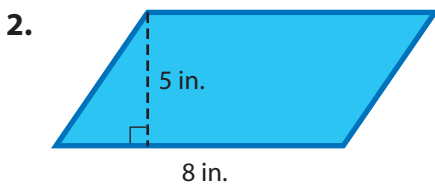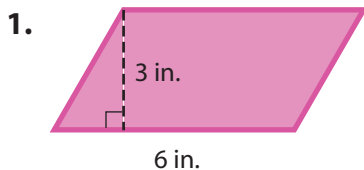
Do you UNDERSTAND?

3. In the example above, which dimensions of the parallelogram correspond to the dimensions of the rectangle?

4. Writing to Explain How can you adapt the formula for area of a rectangle to find the area of a parallelogram?
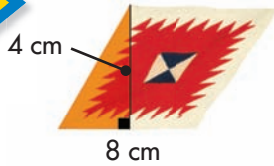

Independent Practice
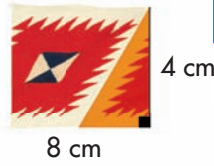
For **5** through **11**, find the area of each parallelogram.

5.
3 cm
3 cm

6.
7 ft
9 ft

7.
6 cm
9 cm

8.
4 in.
2 in.

9.
10 m
4.5 m

10.
27 m
7 m

11.
5 yd
13 yd

Animated Glossary
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For another example, see Set D on page 315.
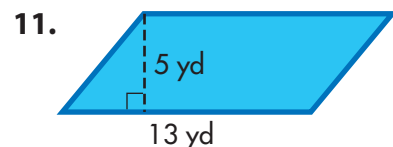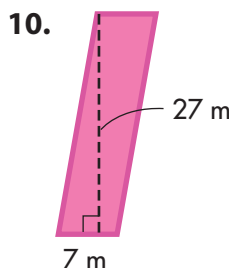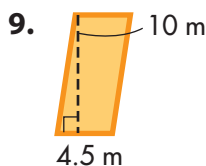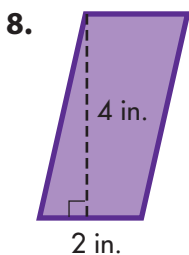
Step 1

The shaded triangle of the parallelogram can be cut off.

4 cm

8 cm

Step 2

The triangle can be placed along the other side to form a rectangle.

4 cm

8 cm

Think length = base (b)
width = height (h)

Use the formula to find the area of a parallelogram.

Area = base × height
$A = b \times h$
$A = 8 \text{ cm} \times 4 \text{ cm}$
$A = 32 \text{ cm}^2$

The area of the parallelogram is 32 cm².

Problem Solving

12. Parallelogram A has a base of 12 ft and a height of 11 ft. Parallelogram B has a base of 13 ft and a height of 10 ft. Which parallelogram has the greater area? How much greater is the area?

13. Each morning, Kathie rides the train 9 km to work. The train takes 10 minutes to travel $4\frac{1}{2}$ km. How much time does Kathie spend on the train each day going to and from work?

14. Which of these figures has the greatest area?

A
6 ft
11 ft

C
8 ft

B
3 ft
7 ft

D
12 ft
5 ft

15. A store display has 36 bottles of perfume on the bottom shelf, 30 bottles on the shelf above that, and 24 on the shelf above that. If this pattern continues, how many bottles will be on the next shelf above?

16. What is the area of the parallelogram lift shown below?

5 ft

13 ft

17. **Writing to Explain** Kurt bought two items that cost a total of $100. One item cost $10 more than the other. What was the cost of each item? Explain your reasoning.

18. **Algebra** Karl knows the area of a parallelogram is 54 in². The base of this parallelogram is 9 inches, and the height is h inches. What is the measure for the height of this parallelogram?

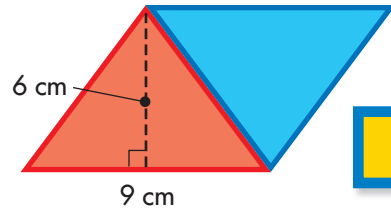# Area of Triangles
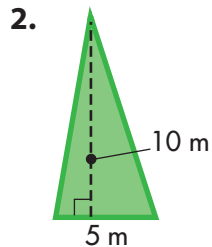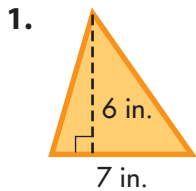
How can you use a parallelogram to find the area of a triangle?

This parallelogram is divided into two congruent triangles. The area of each triangle is equal to half the area of the parallelogram.

6 cm
9 cm

Guided Practice*

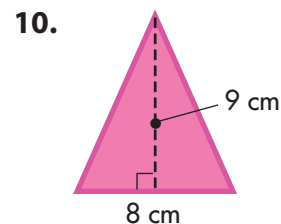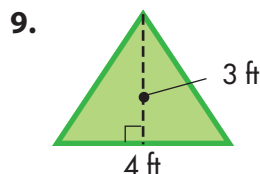### Do you know HOW?

In **1** and **2**, find the area of each triangle.
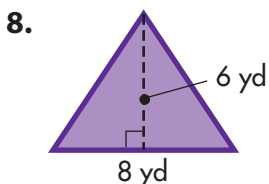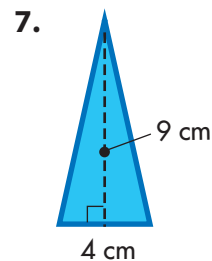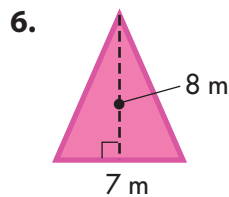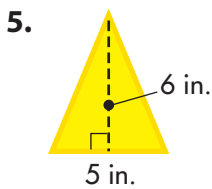
1.

6 in.
7 in.

2.

10 m
5 m

Do you UNDERSTAND?

3. Writing to Explain In the example above, how do you know the area of the triangle is equal to half the area of the parallelogram?

4. In the example above, find the area of the red triangle if the base measures 12 cm and the height remains the same.

Independent Practice

In **5** through **10**, find the area of each triangle.

5.

6 in.
5 in.

6.

8 m
7 m

7.

9 cm
4 cm

8.

6 yd
8 yd

9.

3 ft
4 ft

10.
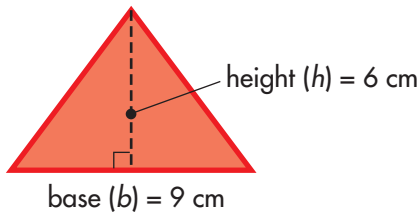
9 cm
8 cm

For another example, see Set D on page 315.

Step 1

Find the area of the red triangle.

Identify the measures of the base and height of the triangle.

base (b) = 9 cm
height (h) = 6 cm

height (h) = 6 cm

base (b) = 9 cm

Step 2

To find the area of a triangle, adapt the formula for the area of a parallelogram—just multiply by $\frac{1}{2}$.

Substitute the values into the formula.
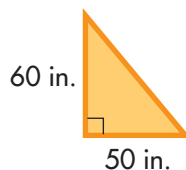
Area = $\frac{1}{2}$ × base × height

$A = \frac{1}{2} \times b \times h$

$A = \frac{1}{2} \times 9 \times 6$

$A = 27$ cm²

The area of the red triangle is 27 cm².

Problem Solving

11. Writing to Explain Jay says that this triangle has an area of 3,000 square inches. Is Jay correct? Explain.

60 in.

50 in.

12. Terry wants to buy one pair of moccasins. She can choose from some that cost $22.50, $27.00, $20.95, and $24.75. How much will Terry save if she buys the least expensive instead of the most expensive pair?

13. Reasoning The difference between the prices of two bikes is $18. The sum of the prices is $258. How much does each bike cost?

14. What is the area of a triangle with a base of 7 inches and a height of 8 inches?

A 15 in² **C** 56 in²

B 28 in² **D** 64 in²

15. Which of the following numbers is a composite number?

A 2 **C** 7

B 5 **D** 9

16. Natalie is going to wallpaper her room. Each wall in her bedroom measures 10 ft by 8 ft. How much wallpaper will Natalie need to cover 3 of the bedroom walls?

17. Algebra A lunar module has triangular-shaped windows. The base of each window is 60 cm. The height is h cm. The area of each window is 1,200 square centimeters. Find the height of each window.

18. What is the area of the dinner bell shown at the right?

19 in.

18 in.
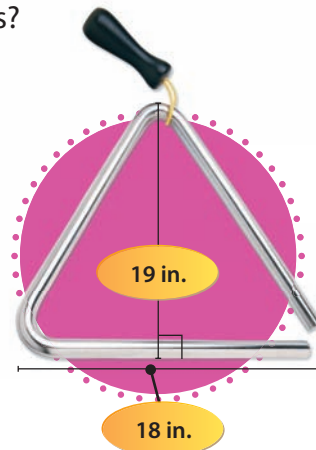
Lesson
13-7

MR 2.3 Use a variety of methods such as words, numbers, symbols, charts, graphs, tables, diagrams, and models, to explain mathematical reasoning. Also **MR 2.0, MG 1.4**.
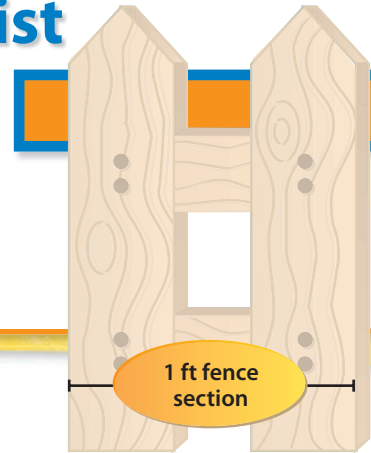
Problem Solving

Draw a Picture and Make an Organized List

Hands-On
grid paper

The Diaz family has 12 one-foot sections of fence to build a rectangular kennel for their dog. They want the kennel to have a perimeter of 12 ft, and have the greatest possible area. What should the dimensions of the kennel be?

1 ft fence section

Guided Practice*

Do you know HOW?

Draw a picture and make a list to solve.

1. Ali has 18 meters of fence to enclose her garden. She wants this garden to have the greatest possible area. What should the dimensions of Ali's garden be?

2. Eric painted a square picture that has an area of 400 sq cm. He wants to frame it, but needs to know the perimeter. What is the perimeter of Eric's picture?

Do you UNDERSTAND?

3. How does drawing a picture and making a list help you solve these problems?

4. **Write a Problem** Write a real-world problem that can be solved by drawing a picture and making a list.

Independent Practice

In **5** through **9**, draw a picture and make a list to solve.

5. Julie will be making a quilt. If she wants the quilt to have a perimeter of 30 ft, and cover the greatest area possible, what should its dimensions be?

6. A kitchen is 8 feet long and 6 feet wide. If the dimensions of the kitchen are doubled, how will the area change? How will the perimeter change?

Stuck? Try this....

• What do I know?
• What am I asked to find?
• What diagram can I use to help understand the problem?
• Can I use addition, subtraction, multiplication, or division?
• Is all of my work correct?
• Did I answer the right question?
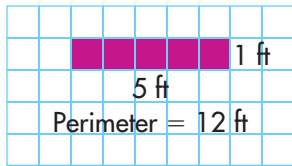• Is my answer reasonable?

For another example, see Set E on page 315.

The length of the kennel cannot be longer than 5 ft because the perimeter needs to be 12 ft.

I can draw a picture on grid paper to show this.

The area is $5 \times 1 = 5 \text{ ft}^2$

1 ft

1 ft

5 ft

Perimeter = 12 ft

I can draw more pictures and make a list of all possible dimensions and areas.

2 ft

3 ft

4 ft

3 ft

3 ft

Perimeters = 12 ft
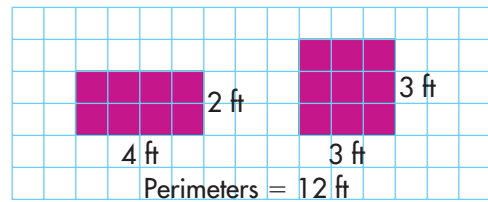
$$5 \times 1 = 5 \text{ ft}^2 \qquad 4 \times 2 = 8 \text{ ft}^2$$
$$3 \times 3 = 9 \text{ ft}^2$$

The dimensions of the kennel should be 3 ft wide by 3 ft long.

---

7. Mary is designing a geometric picture that will be put on a banner. The parallelogram in the picture has an area of 625 in². The square in the picture has the same area as the parallelogram. What are the dimensions of the square?

8. Beth's garden is 6 ft by 3 ft. She wants to plant 6 flowers per square foot.

   a How many flowers will she plant?

   b How can you check your answer?

9. The length of a rectangular sandbox is 8 ft. The area of the sandbox is 40 ft². If the length of the box is extended 2 more feet, how many feet does the width of the box need to be to have a final area of 60 ft²?

10. Rocio finished 21 pages in a scrapbook. On Monday, she finished half as many pages as on Tuesday. On Wednesday, Rocio finished twice as many pages as on Tuesday. How many pages did Rocio complete each day?

11. Robert has $107.56 in his savings account. He withdraws $30.60. Draw a picture and write an equation that can be solved to find Robert's new balance. Let b = Robert's new balance.

12. **Writing to Explain** Maria says that rectangles with the same perimeter can have different areas. Is Maria correct? Use a drawing to support your explanation.
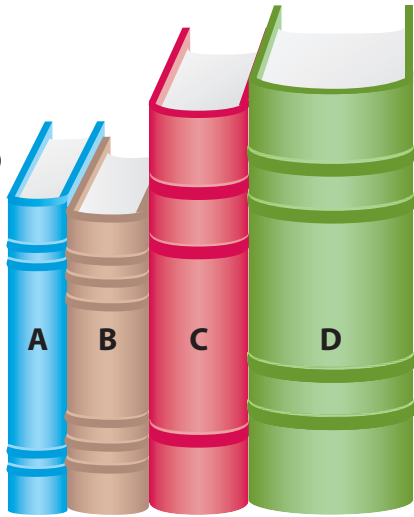
13. You want to buy 12 comic books. The store sells small and large comics and is having a special. You have $24. Do you have enough money to buy 12 small books? Twelve large books?

4 large for $12

3 small for $6

eTools
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1. Use a ruler to measure. Which book on the bookcase has a width of $\frac{7}{8}$ inch? (13-1)

A Book A

B Book B

C Book C

D Book D

| A | B | C | D |

2. Jenny made a scarf with the dimensions shown. What is the area of the scarf? (13-5)

27 in.

4 in.
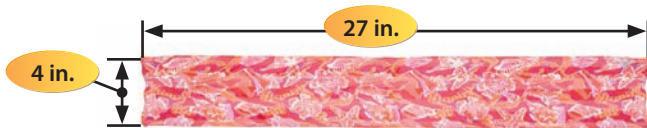
A 108 in²

B 78 in²

C 54 in²

D 39 in²

3. Yvonne glued sequins around the outside of each of her party invitations. If the invitations are 5 inches wide and 2.5 inches tall, what is the perimeter of the invitations? (13-3)

A 7.5 inches

B 7.5 in²

C 15 inches

D 15 in²

4. Mr. Santiago wants to build a horse corral with the greatest area possible, using exactly 40 yards of fencing. Which dimensions should he use? (13-7)

A 12 yards by 12 yards

B 15 yards by 5 yards

C 12 yards by 8 yards

D 10 yards by 10 yards

5. The area of rectangle *ABCD* is 24 square centimeters. What is the area of parallelogram *EFCD*? (13-5)

A   E   B   F

D   C
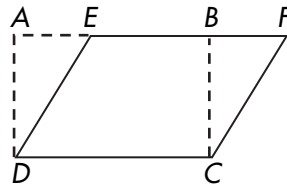
A 48 cm²

B 24 cm²

C 12 cm²

D 6 cm²

6. Use a ruler to measure. Which is closest to the height of the treble clef shown? (13-1)

A $\frac{1}{4}$ inch

B $\frac{3}{4}$ inch

C $\frac{5}{6}$ inch

D $\frac{7}{8}$ inch

**7.** Use a ruler to measure. Which is closest to the length of the drill bit shown? (13-2)

A 4 cm

B 5 cm

C 6 cm

D 7 cm

8. The area of the rectangle is 120 yd². What is the area of the shaded triangle? (13-6)

A 40 yd²

B 60 yd²

C 120 yd²

D 240 yd²

9. A rectangular window measures 36 inches wide and 48 inches tall. What is the area of the window? (13-4)

A 1,728 in²

B 1,728 inches

C 1,488 in²

D 1,488 inches

10. What is the area of the parking lot shown shaded in the diagram? (13-6)

30 yd
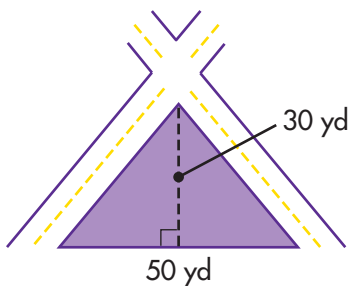
50 yd

A 110 yd²

B 375 yd²

C 750 yd²

D 1,500 yd²

11. Figure *MNPQ* is a square. Which of the following can be used to find the area of triangle *MNP*? (13-6)

M   *N*

16 m

Q   *P*
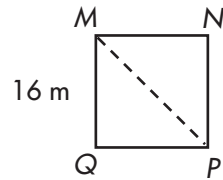
A $A = \frac{1}{2}(16 \times 16)$

B $A = \frac{1}{2}(4 \times 4)$

C $A = \frac{1}{2}(4 \times 16)$

D $A = 16 \times 16$

12. Chelsey is going to line the perimeter of the table shown with flowers for her wedding. What is the perimeter of the table top? (13-3)
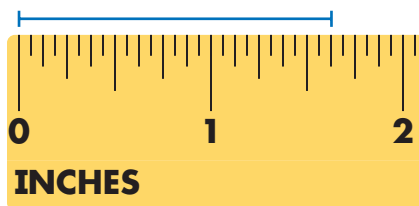
2 ft   4 ft
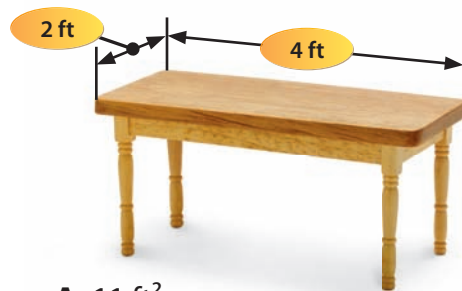
A 11 ft²

B 11 feet

C 12 ft²

D 12 feet

13. Which of the following can be used to find the area in square meters of a parallelogram whose base measures 20 m and height measures 12 m? (13-5)

A $A = (2 \times 20) + (2 \times 12)$

B $A = \frac{1}{2} \times 20 \times 2$

C $A = 20 \times 12$

D $A = 20 + 12$

Set A, pages 296–297

Find the length to the nearest inch, $\frac{1}{2}$ inch, $\frac{1}{4}$ inch, and $\frac{1}{8}$ inch.

INCHES

To the nearest:

inch: 2 in. $\frac{1}{2}$ inch: $1\frac{1}{2}$ in.

$\frac{1}{4}$ inch: $1\frac{3}{4}$ in. $\frac{1}{8}$ inch: $1\frac{5}{8}$ in.

Remember to write your measurements in fractions using simplest form. Use a ruler.

1. Find the length to the nearest $\frac{1}{4}$ inch and $\frac{1}{2}$ inch.

2. Find the length to the nearest inch and $\frac{1}{8}$ inch.

Set B, pages 298–299

Choose a reasonable metric unit for the length of a driveway.

The meter is the most reasonable unit.

The millimeter and centimeter are too small and the kilometer is too large.

Remember the shortest to longest measures are: millimeter (mm), centimeter (cm), meter (m), and kilometer (km).

1. length of a calculator

2. distance from Chicago to Denver

3. thickness of a thumbtack

Set C, pages 300–302

Find the perimeter.

7 m

12 m
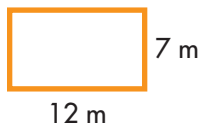
Tip P = perimeter
ℓ = length
w = width

Use a formula:

Perimeter = (2 × length) + (2 × width)

$P = (2 \times \ell) + (2 \times w)$

$P = (2 \times 12) + (2 \times 7)$
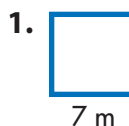
$P = 24 + 14 = 38$ m

Add the side lengths:

$P = 12 + 7 + 12 + 7 = 38$ m

Remember that perimeter is the distance around the outside of any polygon.

Find the perimeter.

1.

7 m

2. 23.2 in.   23.2 in.

42.5 in.

3.

6 m

11 m

Set D, pages 304–309

Find the area of the square.

7 ft
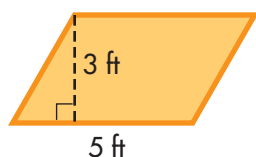
Tip $A = area$
$s = side$

Use the formula: $A = s \times s$.

$A = 7 \times 7 = 49$ ft²

Find the area of the parallelogram.

3 ft
5 ft

Tip $A = area$
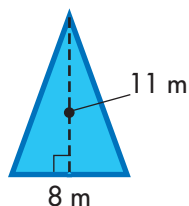$b = base$
$h = height$

Use the formula: $A = b \times h$.
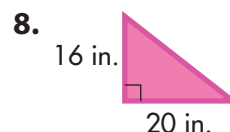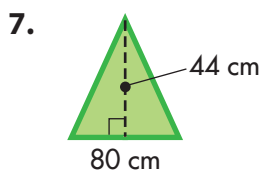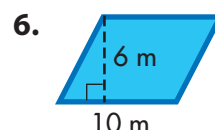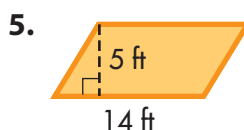
$A = 5 \times 3 = 15$ ft²

Find the area of the triangle.

11 m
8 m
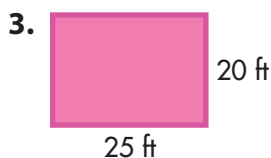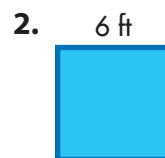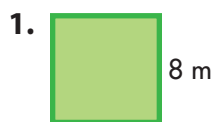
Tip $A = area$
$b = base$
$h = height$

Use the formula: $A = \frac{1}{2} \times b \times h$.

$A = \frac{1}{2} \times 11 \times 8 = 44$ m²

Remember to use the appropriate area formula for each polygon.

Find the area of each figure.

1. 8 m

2. 6 ft

3. 20 ft
25 ft

4. 12 in.
3 in.

5. 5 ft
14 ft

6. 6 m
10 m

7. 44 cm
80 cm

8. 16 in.
20 in.
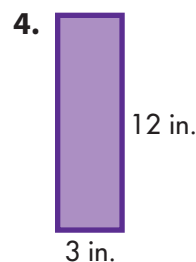
Set E, pages 310–311

When you are asked to draw a picture and make a list to solve a problem, follow these steps:

Step 1 Read and understand the problem.

Step 2 Make a plan by creating a list of different possible solutions.

Step 3 Test each of the items in your list to find a solution.

Step 4 Look back and check to see that your work is correct.

Remember that drawing a picture can help you make a list.

1. Cristina has 16 square feet of material to make a rectangular quilt. She wants the quilt to have the least possible (minimum) perimeter. If Cristina uses all 16 square feet, what dimensions should she use for the quilt?