



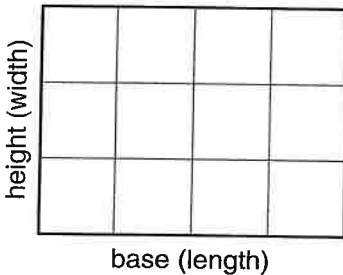
Perimeter and Area

In previous grades, your child studied the *perimeter* (distance around) and the *area* (amount of surface) of various geometric figures. This next unit will extend your child's understanding of geometry by developing and applying formulas for the areas of figures such as rectangles, parallelograms, and triangles.

Area of a Rectangle

Area = base * height (or length * width)

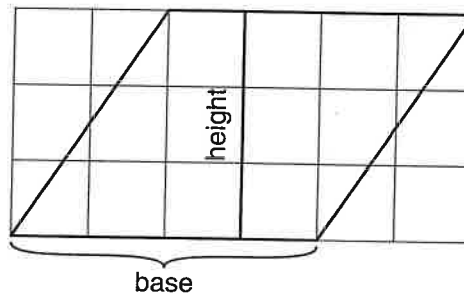
$$A = b * h \text{ (or } l * w \text{)}$$



Area of a Parallelogram

Area = base * height

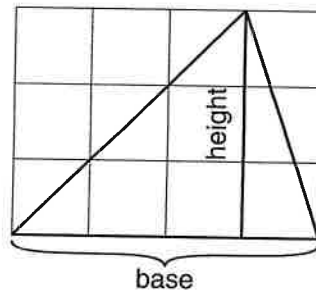
$$A = b * h$$



Area of a Triangle

Area = $\frac{1}{2}$ of (base * height)

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



Students will learn how to make scale drawings and apply their knowledge of perimeter, area, and scale drawing by analyzing the arrangement of the appliances in their kitchens and the furniture in their bedrooms.

Students will also calculate the area of the skin that covers their entire body. A rule of thumb is that the area of a person's skin is about 100 times the area of one side of that person's hand. Ask your child to show you how to calculate the area of your own skin.

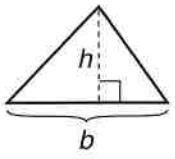
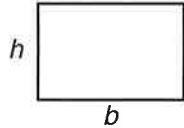
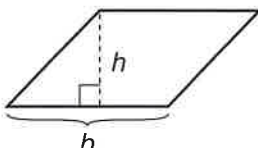
The World Tour will continue. Students will examine how geographical areas are measured and the difficulties in making accurate measurements. They will compare areas for South American countries by using division to calculate the ratio of areas.

Please keep this Family Letter for reference as your child works through Unit 8.

Vocabulary

Important terms in Unit 8:

area The amount of surface inside a closed 2-dimensional (flat) boundary. Area is measured in *square units*, such as square inches or square centimeters.

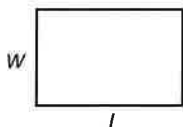
<p>Area of a triangle</p>  <p>$A = \frac{1}{2} * b * h$</p>	<p>Area of a rectangle</p>  <p>$A = b * h$</p>
<p>Area of a parallelogram</p>  <p>$A = b * h$</p>	

formula A general rule for finding the value of something. A formula is often written using letter *variables*, which stand for the quantities involved.

length The distance between two points on a 1-dimensional figure. Length is measured in units such as inches, meters, and miles.

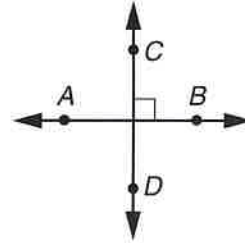
perimeter The distance around a 2-dimensional shape along the boundary of the shape. The perimeter of a circle is called its circumference. The perimeter of a polygon is the sum of the lengths of its sides.

Perimeter of a rectangle



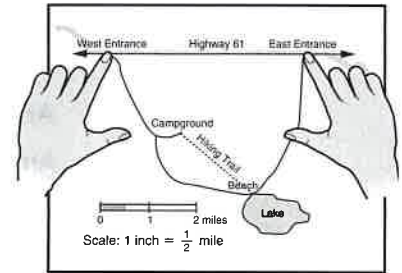
$P = l + w + l + w$
 $= 2 * (l + w)$

perpendicular Crossing or meeting at right angles. Lines, rays, line segments, and planes that cross or meet at right angles are perpendicular. The symbol \perp means "is perpendicular to," as in "line $CD \perp$ line AB ." The symbol \lrcorner indicates a right angle.



Perpendicular lines

scale The ratio of the distance on a map, globe, drawing, or model to an actual distance.



scale drawing A drawing of an object or a region in which all parts are drawn to the same scale as the object. Architects and builders often use scale drawings.

square unit A unit used to measure area. For example, a square that measures one inch on each side has an area of one square inch.

variable A letter or other symbol that represents a number. A variable can represent one specific number, or it can stand for many different numbers.

width The length of one side of a rectangle or rectangular object, typically the shorter side.

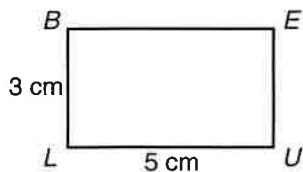
As You Help Your Child with Homework

As your child brings assignments home, you may want to go over the instructions together, clarifying them as necessary. The answers listed below will guide you through some of the Study Links in this unit.

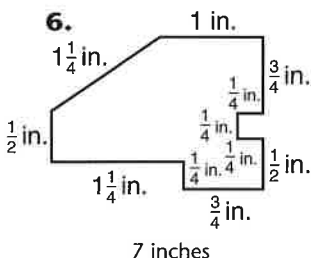
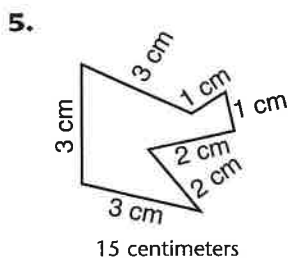
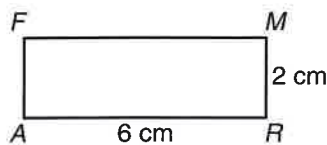
Study Link 8•1

1. 17 feet 2. 54 inches

3. Sample answer:



4. Sample answer:



Study Link 8•2

1. a. 52 miles b. 117 miles
c. $32\frac{1}{2}$ miles d. $175\frac{1}{2}$ miles

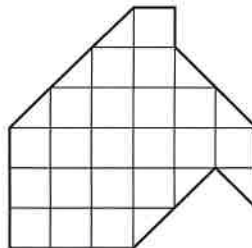
3.

Rectangle	Height in Drawing	Actual Height
A	$\frac{1}{2}$ in.	12 ft
B	$1\frac{1}{4}$ in.	30 ft
C	2 in.	48 ft
D	$1\frac{3}{4}$ in.	42 ft
E	1 in.	24 ft

Study Link 8•3

1. 24 square centimeters
2. 24 square centimeters

2., continued Sample answer:



3. 2,072 4. 11,740 5. 3,593 6. 2,848

Study Link 8•4

1. 87,500; 35 grid squares
2. 17,500; 7 grid squares
3. 88.71 4. 58.08 5. 386.174 6. 18.098

Study Link 8•5

1. 48 square feet 2. 21 square inches
3. 864 square centimeters
4. 300 square meters
5. 9 inches 6. 10 centimeters
7. 9, 15, 18, 21 8. 28, 35, 49, 56
9. 36, 54, 60, 66 10. 24, 48, 72, 84

Study Link 8•6

1. $9 * 4 = 36$ 2. $3 * 8 = 24$
3. $4 * 6 = 24$ 4. $65 * 72 = 4,680$
5. 13 inches 6. 85 meters

Study Link 8•7

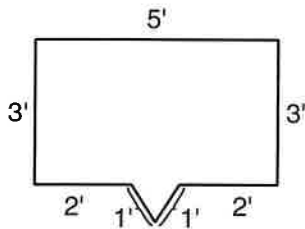
1. $\frac{1}{2} * (8 * 4) = 16$ 2. $\frac{1}{2} * (12 * 5) = 30$
3. $\frac{1}{2} * (10 * 2) = 10$
4. $\frac{1}{2} * (34 * 75) = 1,275$
5. 3 inches 6. 6 meters
7. 27, 36, 54, 72 8. 8, 24, 40, 48

STUDY LINK
8•1

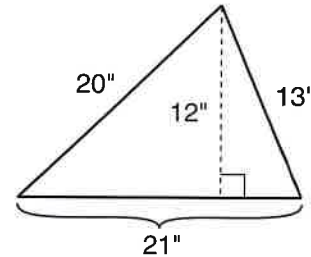
Perimeter



1. Perimeter = _____ feet



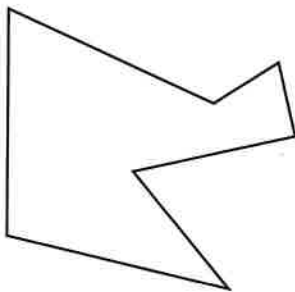
2. Perimeter = _____ inches



3. Draw a rectangle *BLUE* whose perimeter is 16 centimeters. Label the length of the sides.

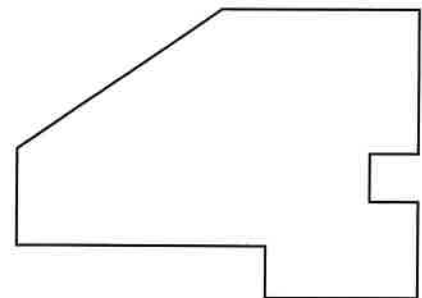
4. Draw a different rectangle *FARM* whose perimeter is also 16 centimeters. Label the length of its sides.

5. Measure the sides of the figure to the nearest centimeter. Label the length of its sides. Find its perimeter.



Perimeter = _____ centimeters

6. Measure the sides of the figure to the nearest $\frac{1}{4}$ inch. Label the length of its sides. Find its perimeter.



Perimeter = _____ inches

Practice

7. $\frac{1}{4}$ of 24 = _____

8. _____ = $\frac{2}{3}$ of 24

9. _____ = $\frac{5}{8}$ of 40

STUDY LINK
8•2

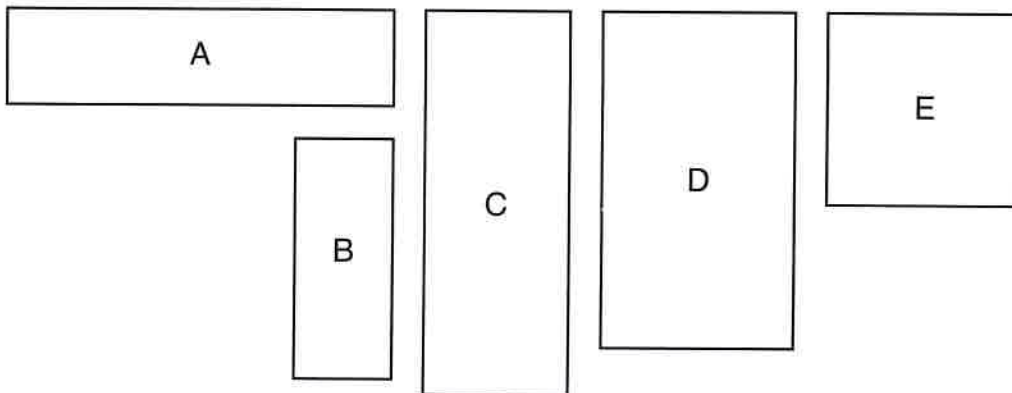
Scale



- If 1 inch on a map represents 13 miles, then
 - 4 inches represent _____ miles.
 - 9 inches represent _____ miles.
 - $2\frac{1}{2}$ inches represent _____ miles.
 - $13\frac{1}{2}$ inches represent _____ miles.
- The scale for a drawing is 1 centimeter:5 meters. Make a scale drawing of a rectangle that measures 20 meters by 15 meters.

Try This

- Scale: $\frac{1}{4}$ inch represents 6 feet. Measure the height of each rectangle to the nearest $\frac{1}{4}$ inch. Complete the table.



Rectangle	Height in Drawing	Actual Height
A		
B		
C		
D		
E		

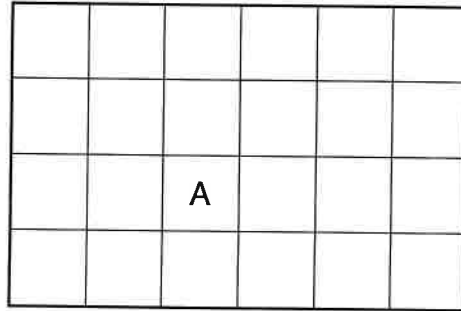
STUDY LINK
8•3

Exploring Area



1. Rectangle A at the right is drawn on a 1-centimeter grid. Find its area.

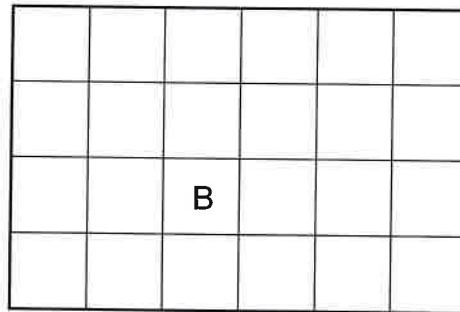
Area = _____ cm^2



2. Rectangle B has the same area as Rectangle A. Cut out Rectangle B. Then cut it into 5 pieces any way you want.

Rearrange the pieces into a new shape that is not a rectangle. Then tape the pieces together in the space below. What is the area of the new shape?

Area of new shape = _____ cm^2


Practice

3. $1,778 + 294 =$ _____

4. _____ = $6,096 + 5,644$

5. $4,007 - 414 =$ _____

6. _____ = $8,030 - 5,182$

STUDY LINK
8•4

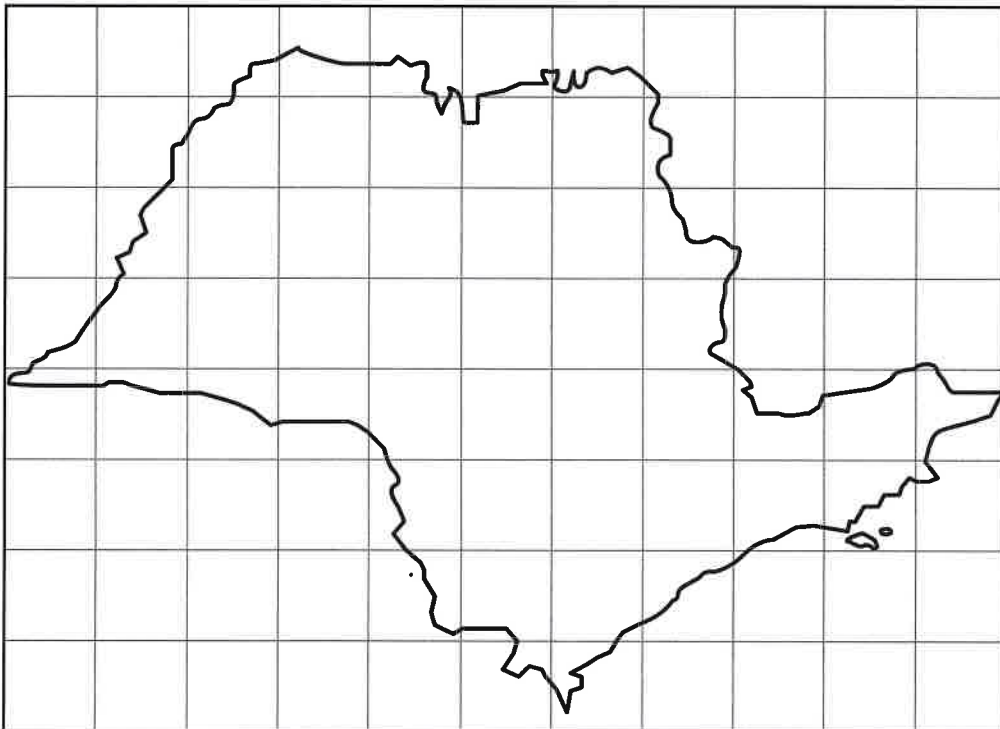
Areas of Irregular Figures



1. Below is a map of São Paulo State in Brazil. Each grid square represents 2,500 square miles. Estimate the area of São Paulo State.

I counted about _____ grid squares.

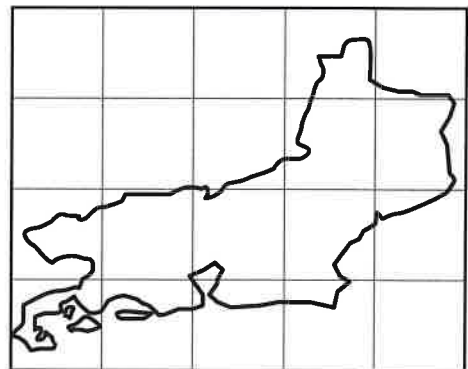
The area is about _____ square miles.



2. To the right is a map of Rio de Janeiro State in Brazil. Each grid square represents 2,500 square miles. Estimate the area of Rio de Janeiro State.

I counted about _____ grid squares.

The area is about _____ square miles.


Practice

3. _____ = $73.04 + 15.67$

4. $86.05 - 27.97 =$ _____

5. _____ = $312.11 + 74.064$

6. $57.1 - 39.002 =$ _____

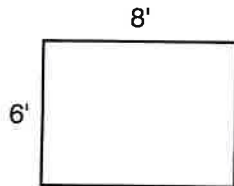
STUDY LINK
8•5

Areas of Rectangles



Find the area of each rectangle.

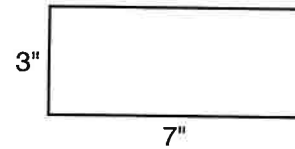
1.



Number model: _____

Area = _____ square feet

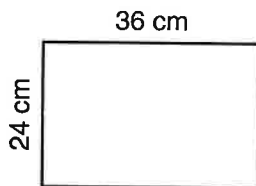
2.



Number model: _____

Area = _____ square inches

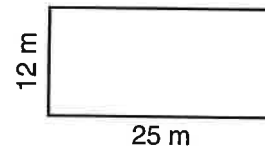
3.



Number model: _____

Area = _____ square centimeters

4.



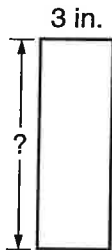
Number model: _____

Area = _____ square meters

Try This

The area of each rectangle is given. Find the missing length.

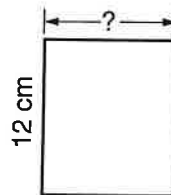
5.



Area = 27 in^2

height = _____ in.

6.



Area = 120 cm^2

base = _____ cm

Practice

7. 3, 6, _____, 12, _____, _____, _____

8. 14, 21, _____, _____, 42, _____, _____

9. 30, _____, 42, 48, _____, _____, _____

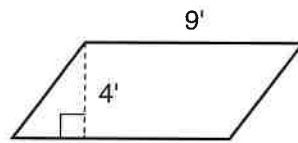
10. 12, _____, 36, _____, 60, _____, _____

Areas of Parallelograms



Find the area of each parallelogram.

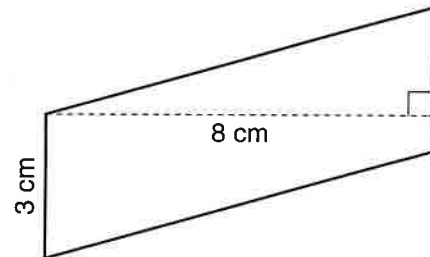
1.



Number model: _____

Area = _____ square feet

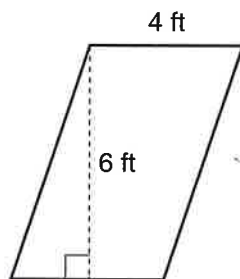
2.



Number model: _____

Area = _____ square centimeters

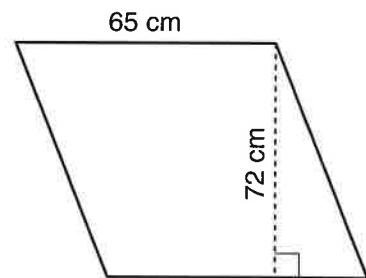
3.



Number model: _____

Area = _____ square feet

4.



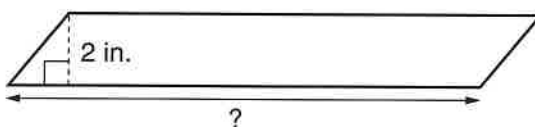
Number model: _____

Area = _____ square centimeters

Try This

The area of each parallelogram is given. Find the length of the base.

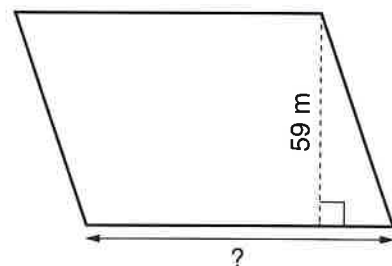
5.



Area = 26 square inches

base = _____ inches

6.



Area = 5,015 square meters

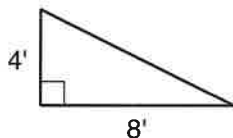
base = _____ meters

Areas of Triangles



Find the area of each triangle.

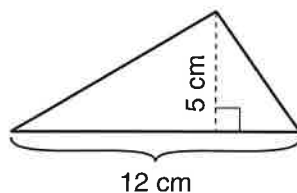
1.



Number model: _____

Area = _____ square feet

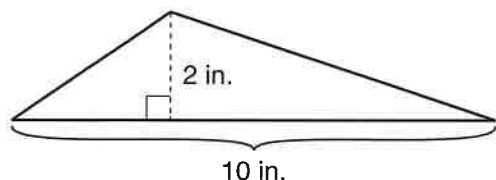
2.



Number model: _____

Area = _____ square cm

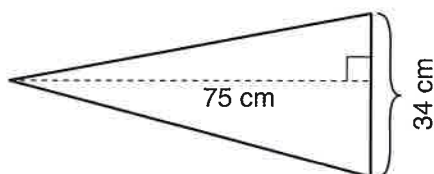
3.



Number model: _____

Area = _____ square in.

4.



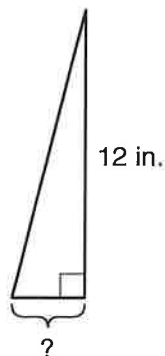
Number model: _____

Area = _____ square cm

Try This

The area of each triangle is given. Find the length of the base.

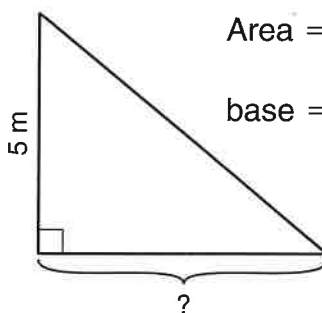
5.



Area = 18 in^2

base = _____ in.

6.



Area = 15 m^2

base = _____ m

Practice

7. 18, _____, _____, 45, _____, 63, _____

8. _____, 16, _____, 32, _____, _____, 56

STUDY LINK
8•8

Turtle Weights



Turtle	Weight (pounds)
Pacific leatherback	1,552
Atlantic leatherback	1,018
Green sea	783
Loggerhead	568
Alligator snapping	220
Flatback sea	171
Hawksbill sea	138
Kemps Ridley	133
Olive Ridley	110
Common snapping	85

Source: *The Top 10 of Everything 2004*

- The Atlantic leatherback is about 10 times heavier than the _____ turtle.
- The loggerhead is about _____ times the weight of the common snapping turtle.
- Which turtle weighs about 3 times as much as the loggerhead? _____
- The flatback sea turtle and the alligator snapping turtle together weigh about half as much as the _____ turtle.
- About how many common snapping turtles would equal the weight of two alligator snapping turtles? _____
- The Atlantic leatherback is about $\frac{\square}{\square}$ the weight of the Pacific leatherback.

Practice

Name the factors.

- 50 _____
- 63 _____
- 90 _____