Name Date Time

STUDY LINK 9•1

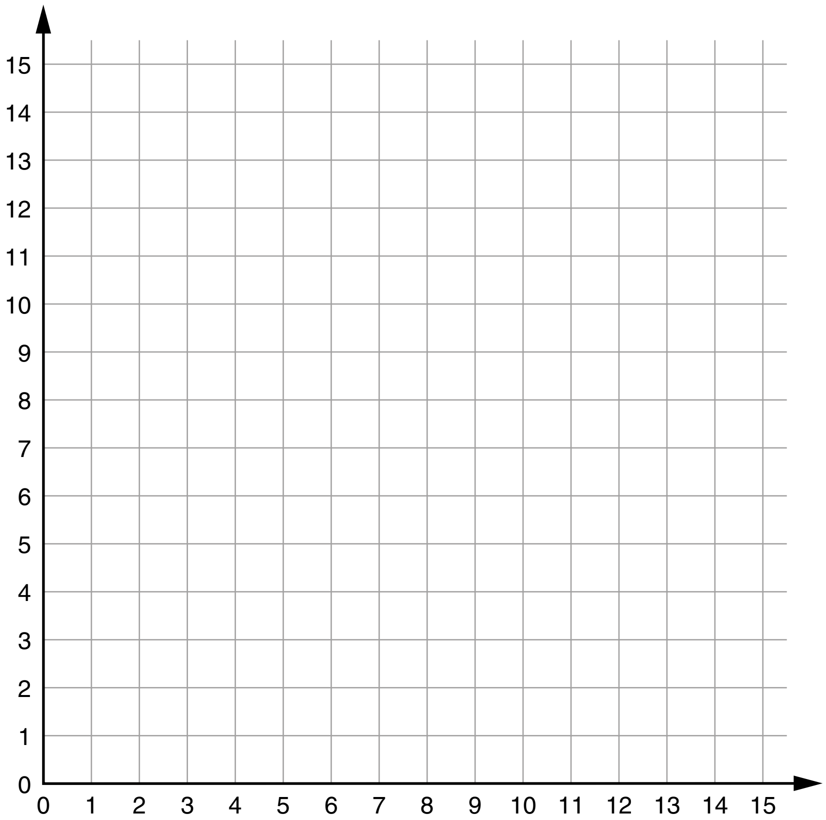
Plotting Points

1. Plot the following points on the grid below. After you plot each point, draw a line segment to connect it to the last point you plotted.
Reminder: Use your straightedge!

SRB 149 208

(3,6); (11,11); (15,11); (15,7); (7,2); (3,2); (3,6); (7,6)

Draw a line segment connecting (7,6) and (7,2).
Draw a line segment connecting (7,6) and (15,11).



2. What 3-dimensional shape could this drawing represent? ____________

3. **a.** What ordered pair would name the missing vertex to represent a prism? ____________

b. Draw the missing vertex, and then add dashed lines for the missing edges.

Practice

4. 3,745 + 8,761 + 791 = ____________

5. 3.745 + 87.61 + 781 = ____________

6. $4\frac{3}{8} + 5\frac{7}{8} =$ ____________

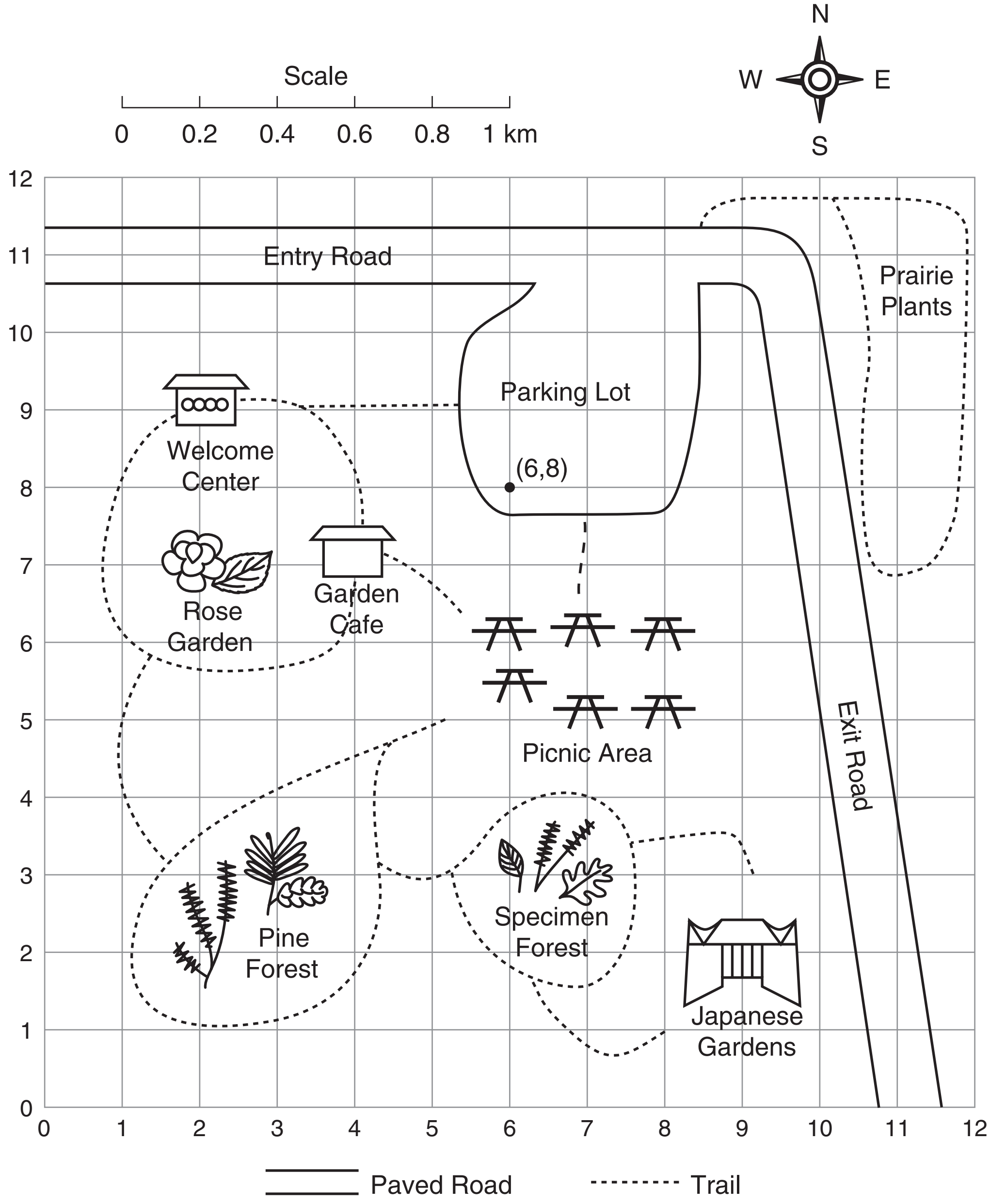
7. $\frac{1}{5} + \frac{3}{4} =$ ____________

Name Date Time

LESSON 9•1

A Botanical Garden Map

A fifth-grade class is visiting a botanical garden. They plan to see every attraction and have lunch in the picnic area. Each student has a copy of the map below. They want to use ordered pairs of numbers to label each attraction and the picnic area.



Find and plot the ordered pairs of numbers for each location.

School Bus (6,8)

Prairie Plants ______________

Pine Forest ______________

Specimen Forest ______________

Welcome Center ______________

Rose Garden ______________

Picnic Area ______________

Japanese Gardens ______________

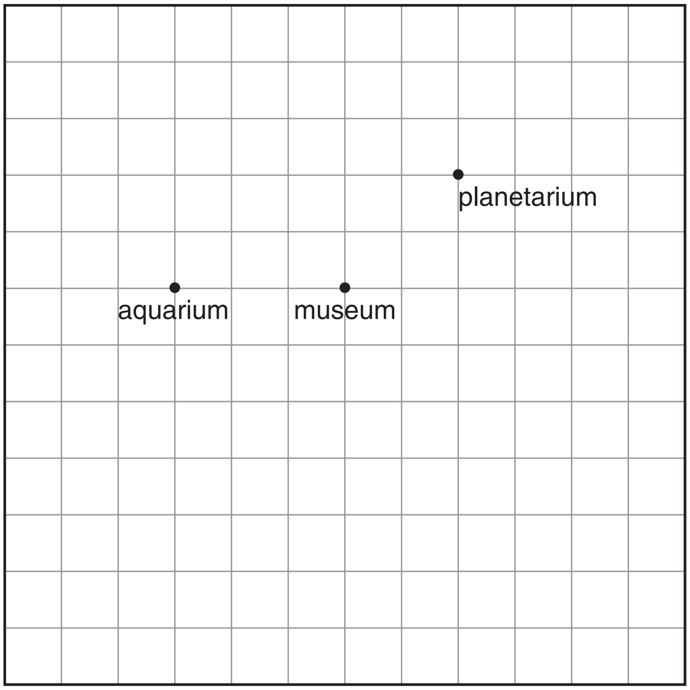
Name Date Time

LESSON 9•1

Traveling the Grid by Bus

Mrs. Thrasher's fifth-grade class is taking a fieldtrip to two different locations: the aquarium, museum, or planetarium, depending on which two places are closest to each other.

1. Choose where the class should go and connect the points.



Scale: 0.75 cm represents 1 block

2. Think of the grid lines as streets. The class must take the bus, and the bus can travel along the grid lines only. Which location is closer to the museum now?

   ____

   Is it the same as your first choice?

   ____

   Why or why not?

   ____

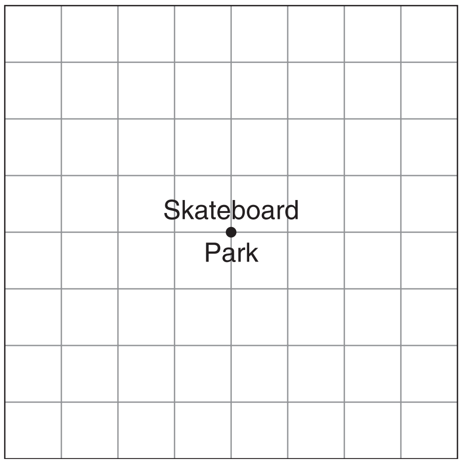
   ____

At the museum, the class learned about plans for the new Skateboard Park. Everyone thought that it should be located an equal distance from the aquarium, museum, and planetarium by bus.

3. Draw and label a point on the grid that shows where the new Skateboard Park should be located.

Maggie said the city should have built Skateboard Park first. You could just draw a circle using Skateboard Park as the center. Then there would be many locations that were the same distance away.

4. Use the grid to the right to check Maggie's idea. Remember that the bus can go along the gridlines only. Mark every point that is the same distance from Skateboard Park.



5. Do you agree or disagree with Maggie? ______________

   Explain your answer on the back of this page.

Name Date Time

STUDY LINK 9·2

Plotting Figures on a Coordinate Grid

SRB 144–146 208

1. Plot three points, and make a triangle on the grid below. Label the points as *A, B,* and *C.* List the coordinates of the points you've drawn.

   A: (_____,_____) *B:* (_____,_____) *C:* (_____,_____)

2. Circle the name of the kind of triangle you drew.

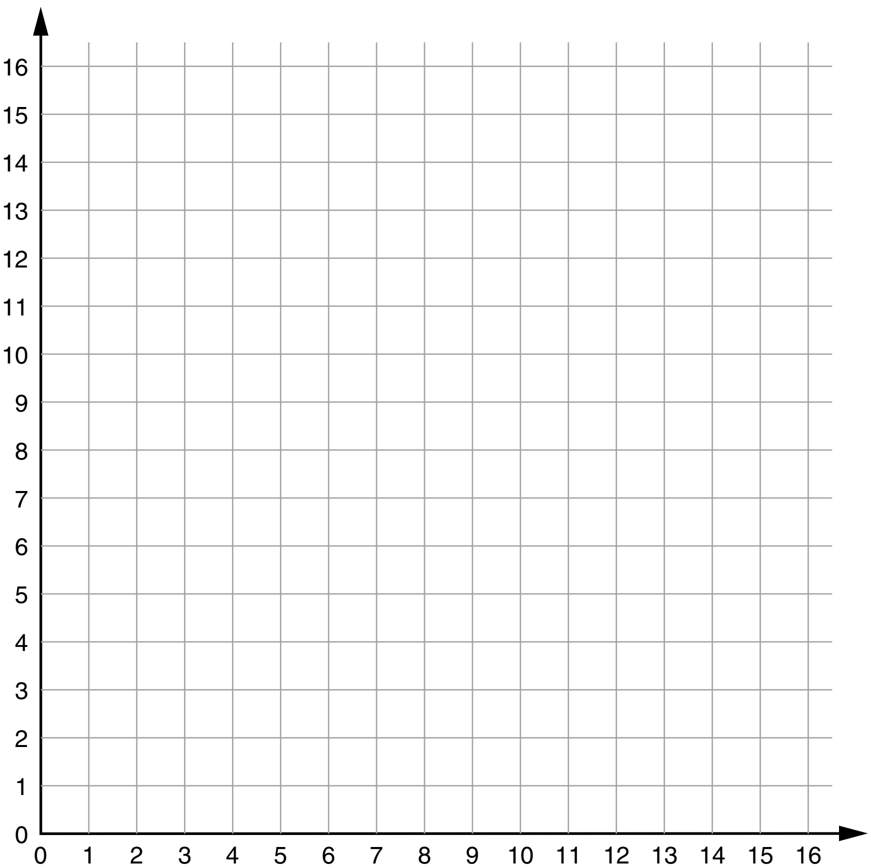
   scalene equilateral isosceles

3. Plot four points, and make a parallelogram on the grid below. Label the points as *M, N, O,* and *P.* List the coordinates of the points you've drawn.

   M: (_____,_____) *N:* (_____,_____) *O:* (_____,_____) *P:* (_____,_____)

4. Circle another name for the parallelogram you've drawn.

   quadrangle rhombus rectangle square



Name Date Time

LESSON 9•2

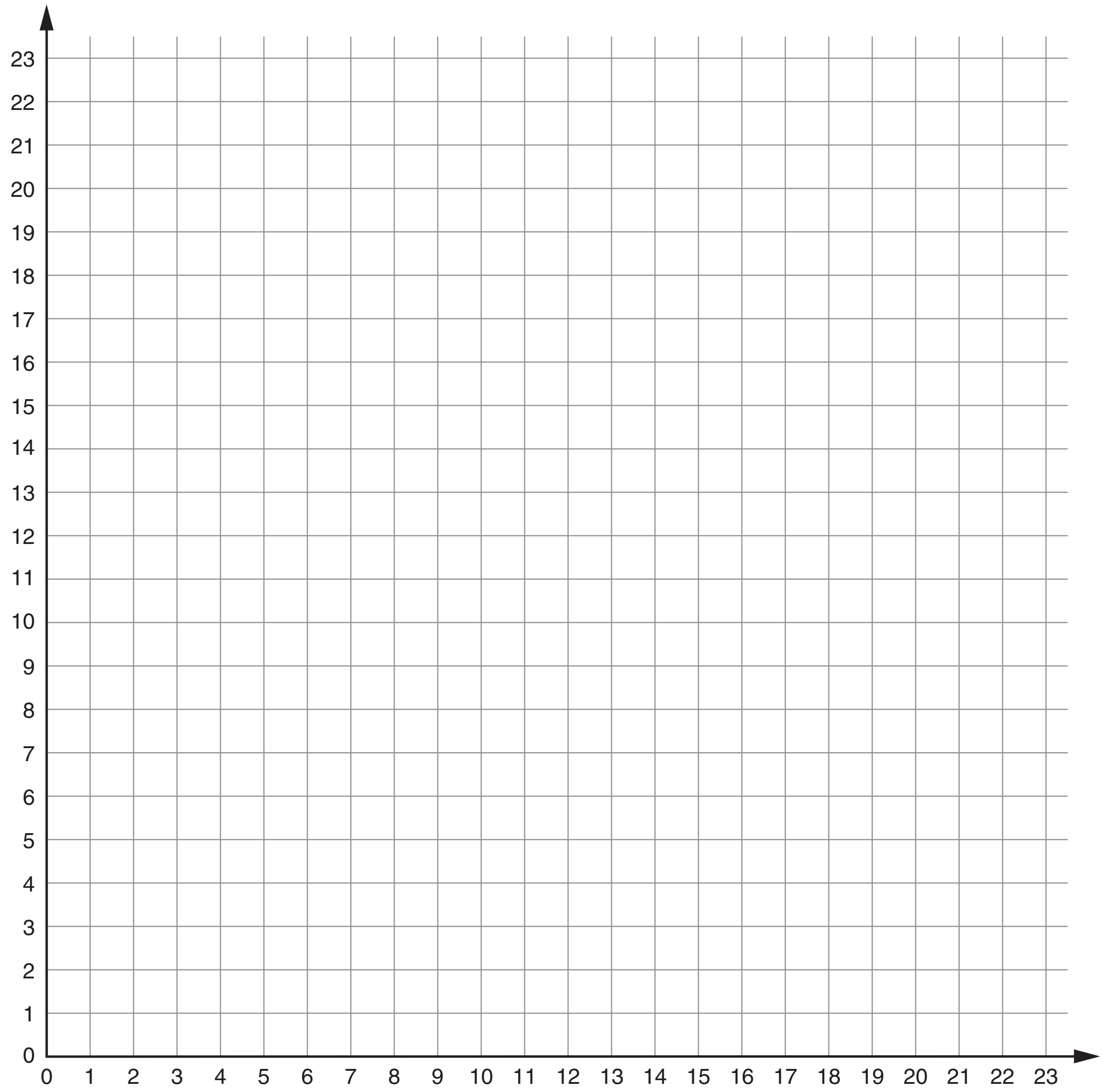
Plotting a Picture

1. Draw a simple picture on the grid by connecting points with straight lines. (Use at least 8 points, but no more than 14 points.)

2. Record the ordered pairs you have plotted on a separate sheet of paper. Be sure you record your points in the order in which they need to be connected.

3. Give your list of coordinates and a blank grid to your partner, and have your partner reproduce your drawing by plotting and connecting the points.

4. Compare your original picture with your partner's copy.



Name Date Time

LESSON 9•2

Scaling Graphs

Scaling a figure on a coordinate grid makes the figure larger or smaller along the coordinate directions. Using a notation to write the scale is another way to represent the rule used to transform a figure.

For example, using (M2,M2) doubles the width and the height of a figure.

This is “double scale” notation that shows how the ordered number pairs change. The M stands for multiplication. The *x*-axis coordinate is multiplied by 2, and the *y*-axis coordinate is multiplied by 2.

- ◆ (M1,M0.5) compresses the figure on the *y*-axis to half the original dimensions.
- ◆ (M2,M1) expands the figure on the *x*-axis to twice the original dimensions.

1. How would you describe a new figure that was scaled (M1,M1) from the original?

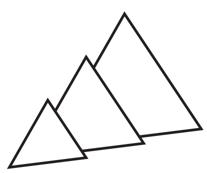
____

____

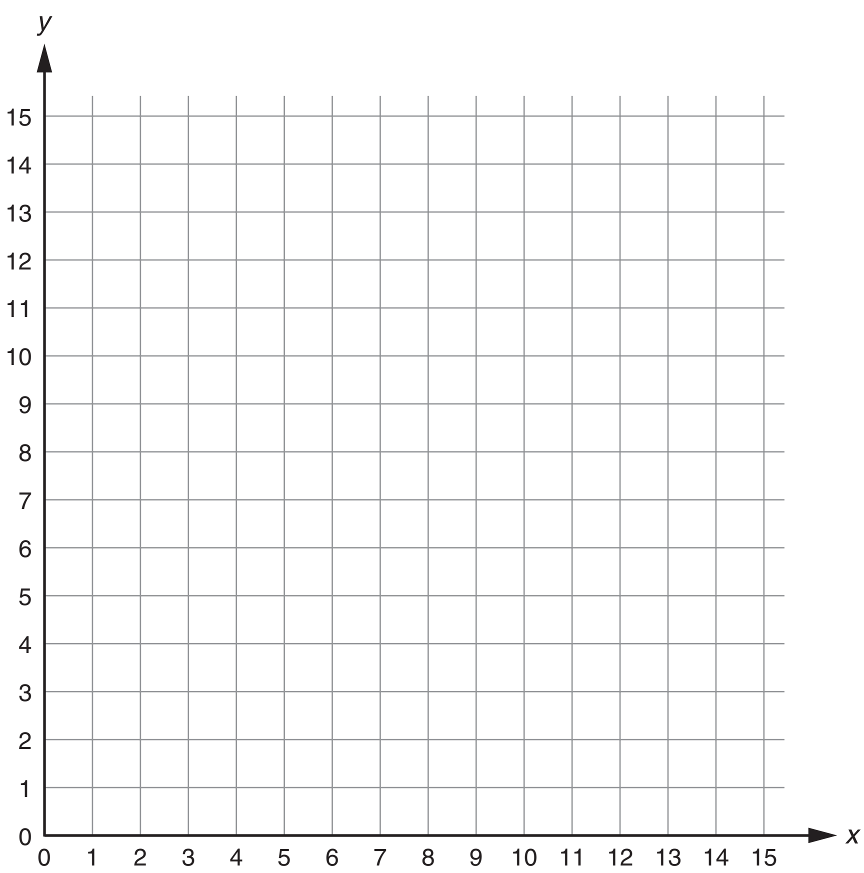
2. Plot and connect the following coordinates on the grid below:
(4,0.5); (2.5,0.5); (2.5,3.5); (0.5,1); (2.5,0.5); (0,0.5); (1,0); (3.5,0); (4,0.5)

3. Scale the Problem 2 figure to graph two new figures.

Each figure should be a different size. Locate the coordinates, and connect the points so the scaled figures are one behind the other on the grid. *For example:*



4. Write your rules and the corresponding double scales for each of the new figures on the back of this page.



Name Date Time

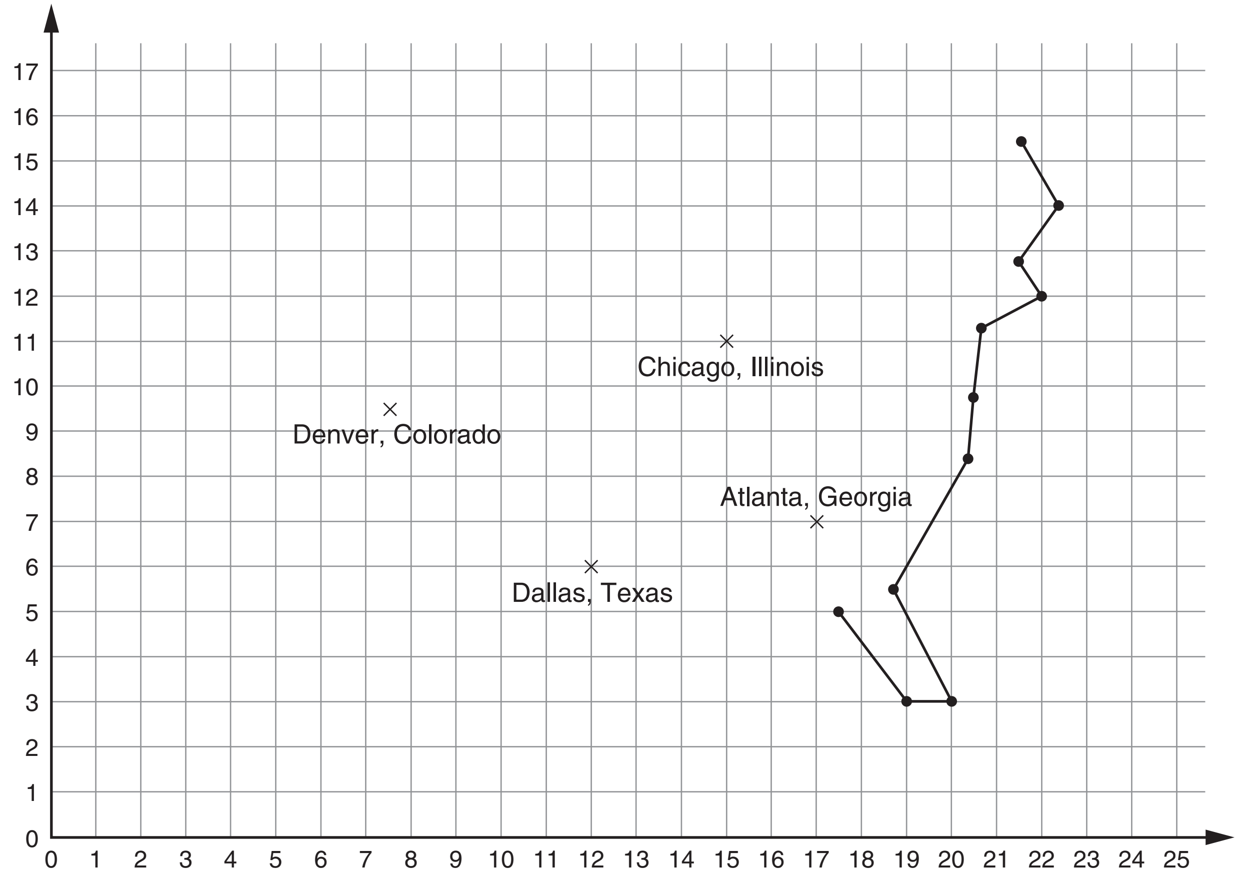
LESSON 9•2

Plotting a Map

1. a. Plot the following ordered number pairs on the grid:

(21,14); (17,11); (17,13); (15,14); (2,16); (1,11);
(2,8); (3,6); (7.5,5.5); (11,2.5); (12.5,4)

b. Connect all the points in the same order in which they were plotted. Then connect (12.5,4) to (17.5,5) and (21.5,15.5) to (21,14). When you have finished, you should see an outline map of the continental United States.



2. Write the coordinates of each city.

a. Chicago, Illinois (______,______) **b.** Atlanta, Georgia (______,______)

c. Dallas, Texas (______,______) **d.** Denver, Colorado (______,______)

3. Plot each city on the grid and write in the city name.

a. Billings, Montana (7.5,13) **b.** Salt Lake City, Utah (5.5,10.5)

4. The U.S.–Mexican border is shown by line segments from (3,6) to (7.5,5.5) and from (7.5,5.5) to (11,2.5). Write the border name on the grid.

Name Date Time

STUDY LINK 9·3

Reflections on a Coordinate Grid

SRB 157 208

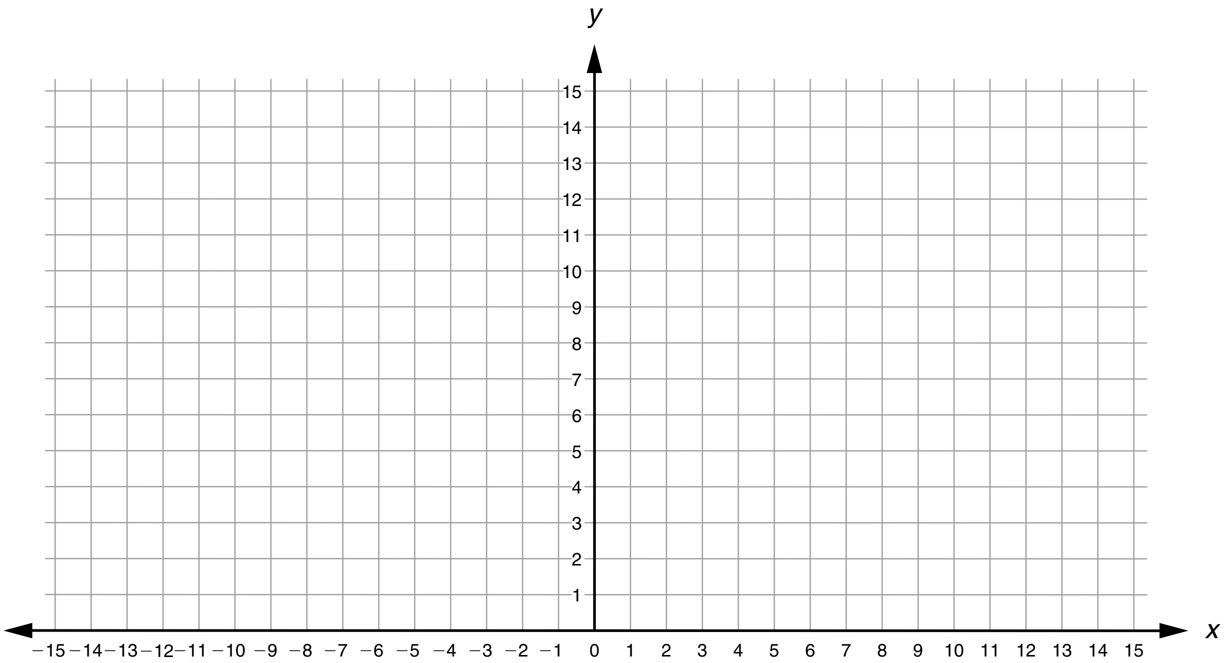
1. Plot the points listed below. Use a straightedge to connect the points in the same order that you plot them.

(6,0); (6,2); (5,3); (3,3); (3,6); (6,7); (7,10); (9,11); (11,11); (13,10); (13,3); (11,2); (11,0)

2. Which number (the first number or the second number) in the pair do you need to change to the opposite in order to draw the reflection of this design on the other side of the *y*-axis?

____

3. Draw the reflection described above. Plot the points and connect them.



Practice

Multiply.

4. $752 * 35 =$ ________________

5. $75.2 * 0.35 =$ ________________

6. $\frac{7}{8} * \frac{2}{3} =$ ________________

7. $2\frac{1}{2} * \frac{3}{4} =$ ________________

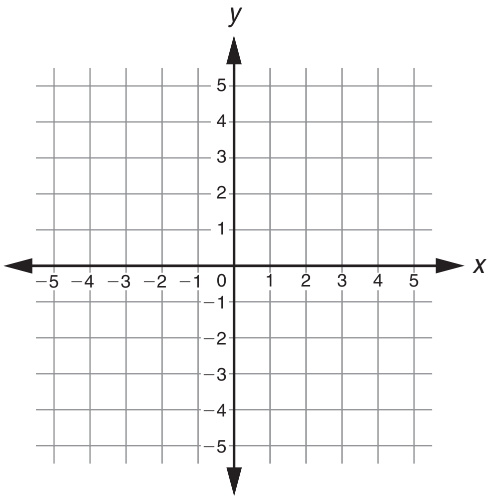
Name Date Time

LESSON 9•3

Building a Coordinate Grid

A **rectangular coordinate grid** is used to name points in the plane. A plane is a flat surface that extends forever. Every point on a coordinate grid can be named by an ordered number pair.

Write four true statements about rectangular coordinate grids.



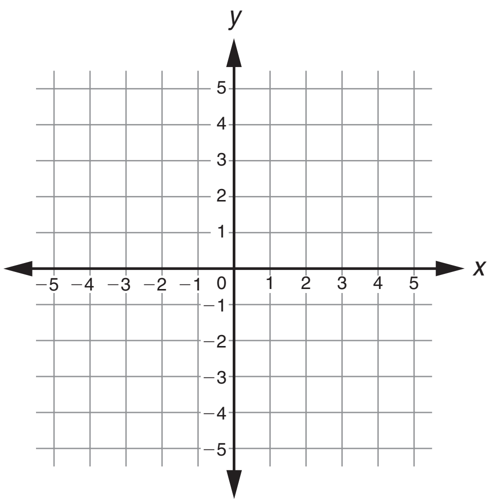
Name Date Time

LESSON 9•3

Building a Coordinate Grid

A **rectangular coordinate grid** is used to name points in the plane. A plane is a flat surface that extends forever. Every point on a coordinate grid can be named by an ordered number pair.

Write four true statements about rectangular coordinate grids.



Copyright © Wright Group/McGraw-Hill

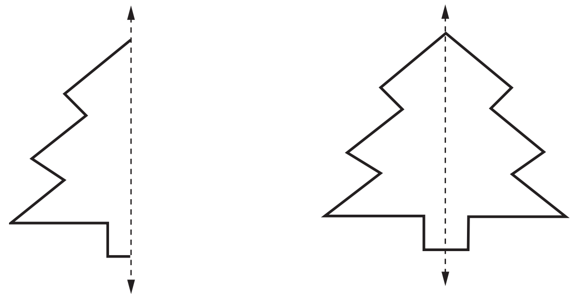
Name Date Time

LESSON 9•3

Exploring the Line of Reflection

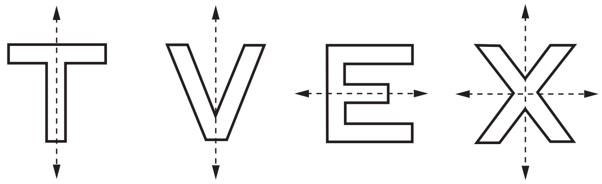
In geometry, when a line divides a figure into two parts that look exactly alike, but are facing opposite directions, the figure is said to be symmetric. The line is called a *line of symmetry* for the figure. Think of the line of symmetry as a line of reflection. The left side and its reflection together form the figure.

The line of reflection may also be used to produce a new figure that has the same size and shape. The original figure is called the preimage and the new figure is called the image. The preimage and the image are reversed, and each point and its matching point are the same distance from the line of reflection.



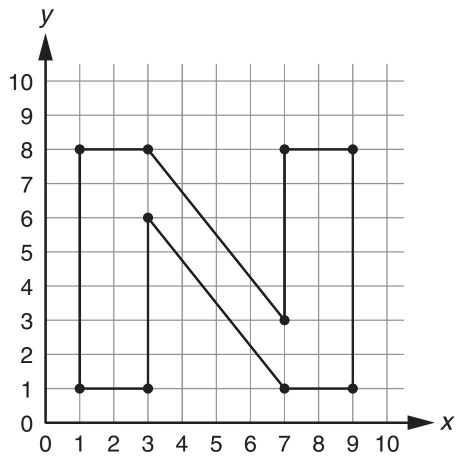
Reflect the left side to get the figure shown on the right.

line of symmetry

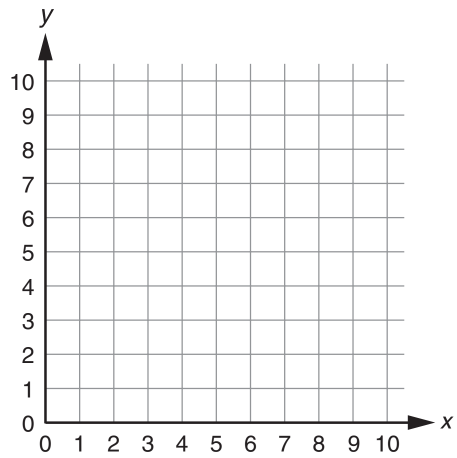


1. Graph the initial of your first name on the coordinate grid below. Record the coordinates.

Example:



Preimage Coordinates
(3,1)
(1,1)
(1,8)
(3,8)
(7,3)
(7,8)
(9,8)
(9,1)
(7,1)
(3,6)



Preimage Coordinates

2. Follow the instructions on *Math Masters,* page 264 to graph reflections of your initial.

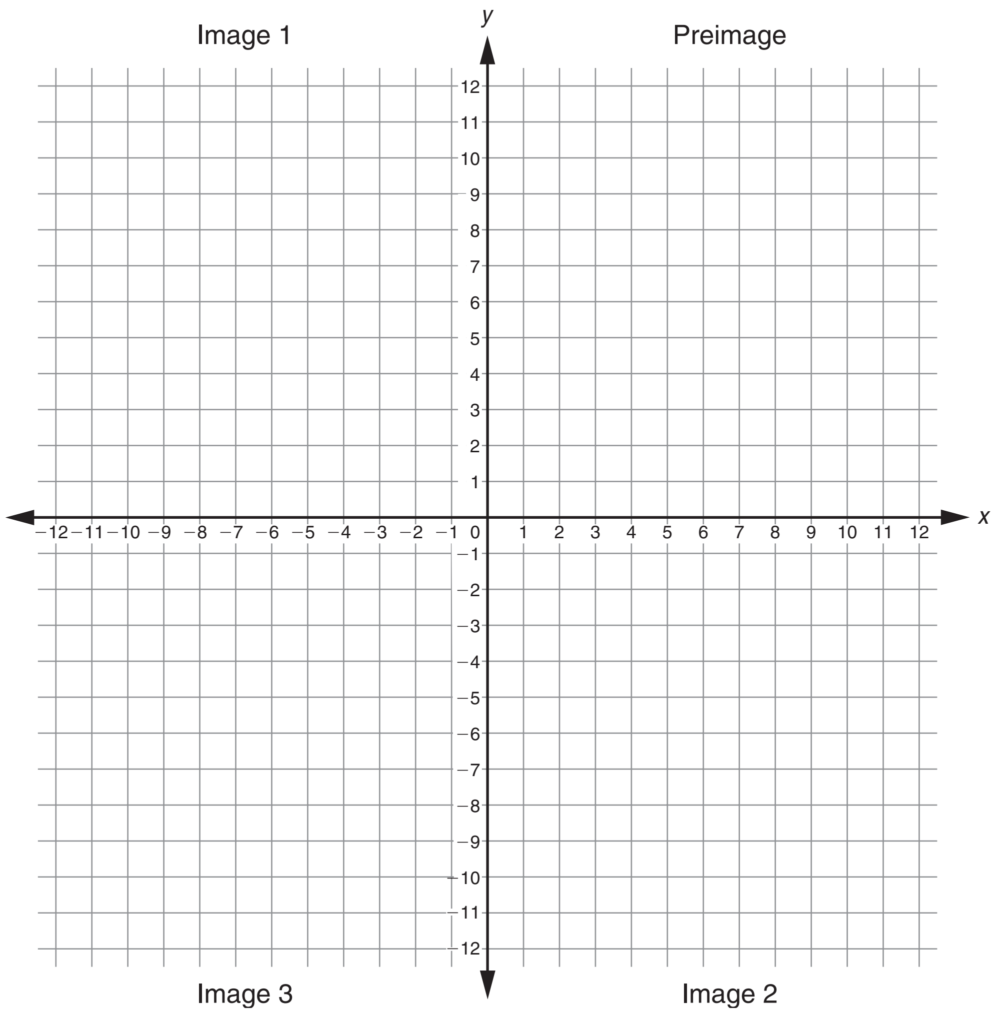
Name Date Time

LESSON 9•3

Graphing Initials

1. Plot the points of your initial on the coordinate grid below.

   Find and record the rule for each of the following images and plot them on the coordinate grid.



2. Use the *y*-axis as a line of reflection between the Preimage and Image 1.
   Rule: ______________________________

3. Use the *x*-axis as a line of reflection between the Preimage and Image 2.
   Rule: ______________________________

4. Use the *y*-axis as a line of reflection between Image 2 and Image 3.
   Rule: ______________________________

   ____

5. Draw a letter that has more than one line of symmetry. ______________

Name ______ Date ______ Time ______

STUDY LINK 9•4

More Area Problems

SRB 104 105 189

1. Rashid can paint 2 square feet of fence in 10 minutes. Fill in the missing parts to tell how long it will take him to paint a fence that is 6 feet high by 25 feet long. Rashid will be able to paint

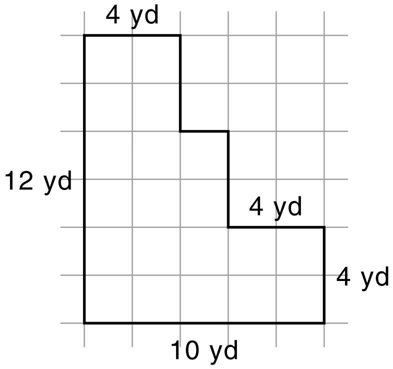
______ of fence in ______.
(area) (hours/minutes)

2. Regina wants to cover one wall of her room with wallpaper. The wall is 9 feet high and 15 feet wide. There is a doorway in the wall that is 3 feet wide and 7 feet tall. How many square feet of wallpaper will she need to buy?

______

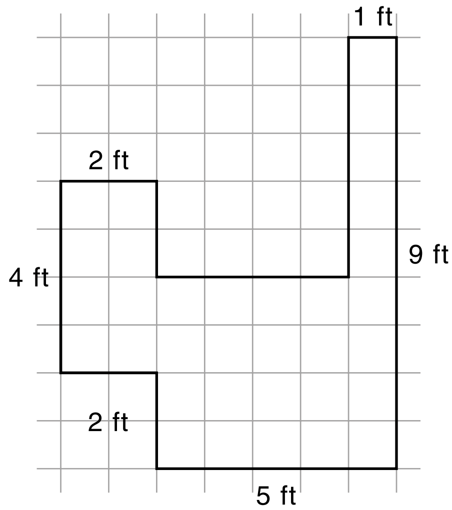
Calculate the areas for the figures below.

3.



Area = ______ yd^2

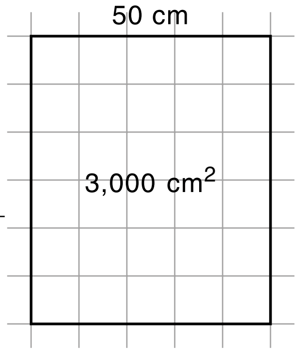
4.



Area = ______ ft^2

Fill in the missing lengths for the figures below.

5.

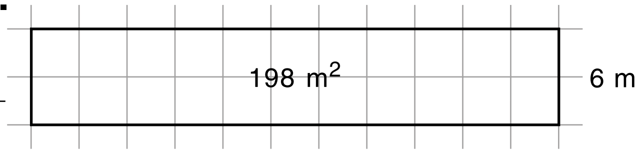


______ ______

______

6.

______



______

______

Name Date Time

LESSON 9•4

Comparing Perimeter and Area

- Roll 2 six-sided dice. The numbers on top are the lengths of 2 sides of a rectangle.
- Draw the rectangle in the grid below.
- Record the perimeter and the area of the rectangle in the table.
- Use centimeter cubes to find other rectangles that have the same area, but different perimeters. Draw the rectangles and record their perimeters and areas in the table.
- Repeat until you have filled the table. You might need to roll the dice several times.

Rectangle	Perimeter	Area
A		
B		
C		
D		
E		
F		

Name Date Time

LESSON 9•4

Perimeter and Area of Irregular Figures

- Cut 6 rectangles that are 6 columns by 7 rows from the centimeter grid paper.
- Record the area and the perimeter of one of these rectangles in Problem 1.
- Divide each rectangle by using 3 different colored pencils to shade three connected parts with the same number of boxes. The parts must follow the grid, and the squares must be connected by sides.
- Divide each rectangle in a different way.

1. For a rectangle that is 6 cm by 7 cm:

Area = ______________ Perimeter = ______________

2. Record the perimeters for the divisions of the 6 rectangles in the table.

Rectangle	**Perimeters**		
	Part 1	**Part 2**	**Part 3**
1			
2			
3			
4			
5			
6			

3. What is the area for each of the parts? ______________________________

4. What is the range of the perimeters for each of the parts? ______________________

5. **a.** Describe one relationship between perimeter and area.

____

____

b. Is the relationship the same for rectangles and irregular figures? Explain.

____

____

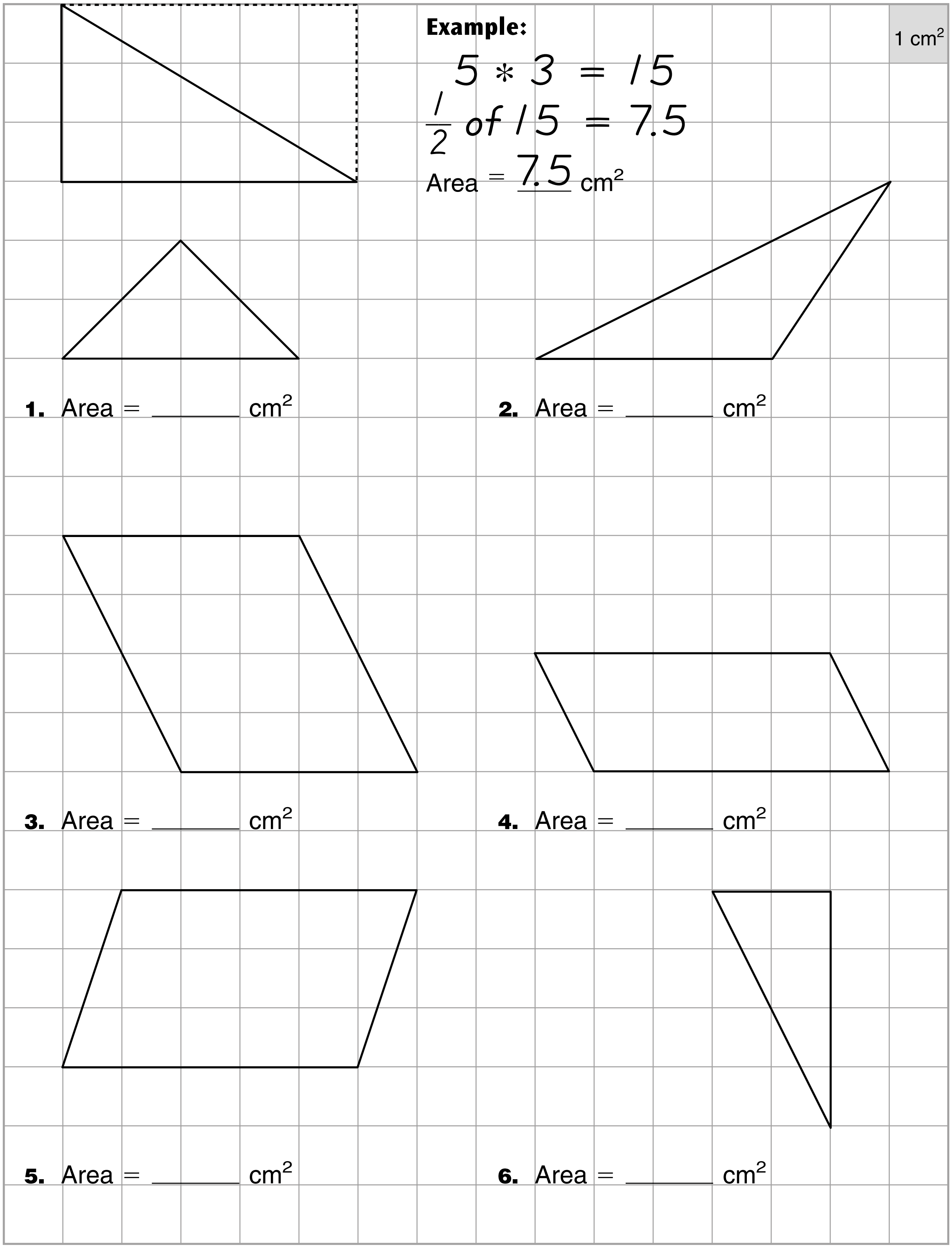
Name Date Time

STUDY LINK 9•5

The Rectangle Method

Use the rectangle method to find the area of each figure below.

SRB 190 191



Example:

$5 * 3 = 15$

$\frac{1}{2}$ of $15 = 7.5$

Area = 7.5 cm²

1. Area = ______ cm²

2. Area = ______ cm²

3. Area = ______ cm²

4. Area = ______ cm²

5. Area = ______ cm²

6. Area = ______ cm²

Name Date Time

STUDY LINK 9·6

Area Formulas

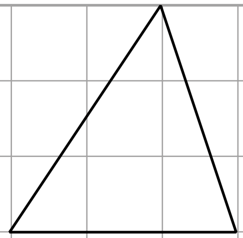
SRB 192 193

For each figure below, label the base and the height, find the area, and record the number model you use to find the area.

Area of a parallelogram: $A = b * h$

Area of a triangle: $A = \frac{1}{2} * b * h$

1 cm^2

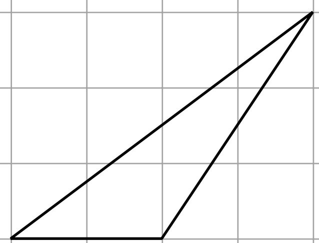


1. Area: ______________ (unit)

Number model: ______________

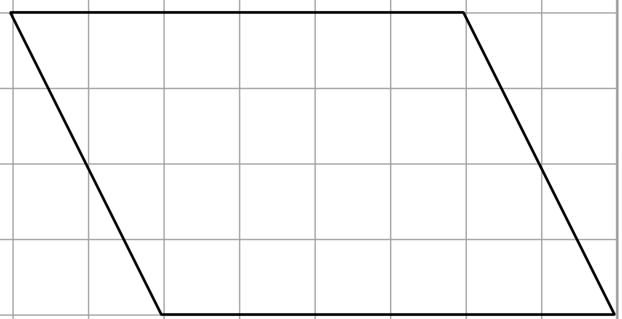
2. Area: ______________ (unit)

Number model: ______________



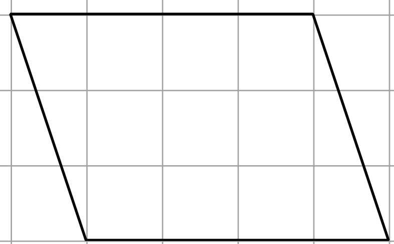
3. Area: ______________ (unit)

Number model: ______________



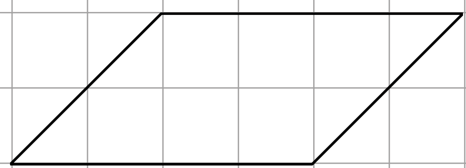
4. Area: ______________ (unit)

Number model: ______________



5. Area: ______________ (unit)

Number model: ______________



6. Area: ______________ (unit)

Number model: ______________

Name Date Time

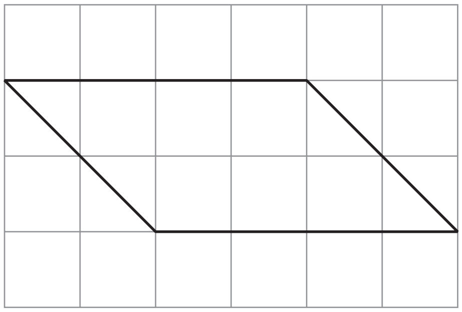
LESSON 9•6

Areas of Parallelograms

1. Cut out Parallelogram A on *Math Masters,* page 272 and form a rectangle. Do *not* cut out the shapes on this page. Tape the parallelogram to form a rectangle.

Parallelogram A

Tape your rectangle in the space below.



Base = ________ cm

Height = ________ cm

Area of parallelogram = ________ cm^2

Length = ________ cm

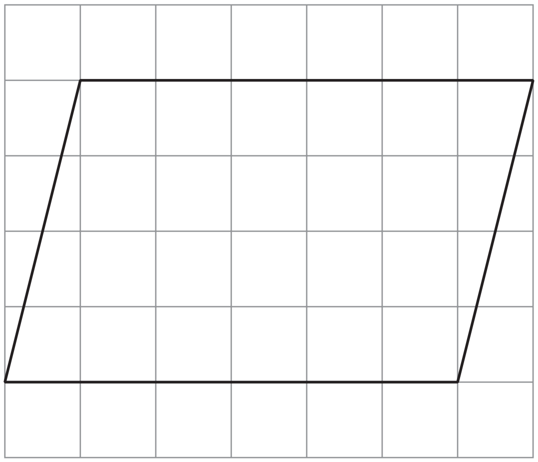
Width = ________ cm

Area of rectangle = ________ cm^2

2. Do the same with Parallelogram B on *Math Masters,* page 272.

Parallelogram B

Tape your rectangle in the space below.



Base = ________ cm

Height = ________ cm

Area of parallelogram = ________ cm^2

Length = ________ cm

Width = ________ cm

Area of rectangle = ________ cm^2

3. Write a formula for finding the area of a parallelogram.

____

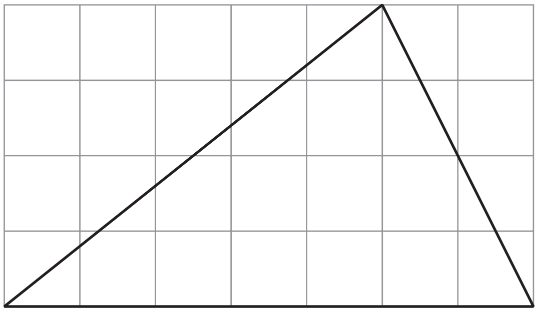
Name Date Time

LESSON 9·6

Areas of Triangles and Parallelograms

1. Cut out Triangles C and D from *Math Masters,* page 272 and form a parallelogram. Do *not* cut out the shapes below. Tape the two triangles together to form a parallelogram.

Triangle C



Tape your parallelogram in this space.

Base = ________ cm

Height = ________ cm

Area of triangle = ________ cm^2

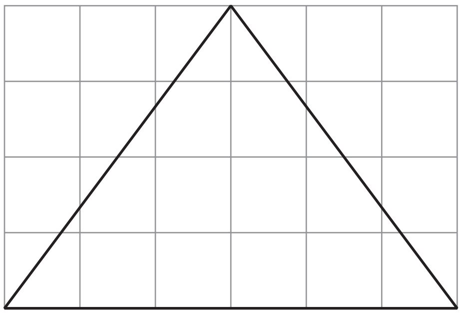
Length = ________ cm

Height = ________ cm

Area of parallelogram = ________ cm^2

2. Do the same with Triangles E and F on *Math Masters,* page 272.

Triangle E



Tape your parallelogram in this space.

Base = ________ cm

Height = ________ cm

Area of triangle = ________ cm^2

Base = ________ cm

Height = ________ cm

Area of parallelogram = ________ cm^2

3. Write a formula for finding the area of a triangle.

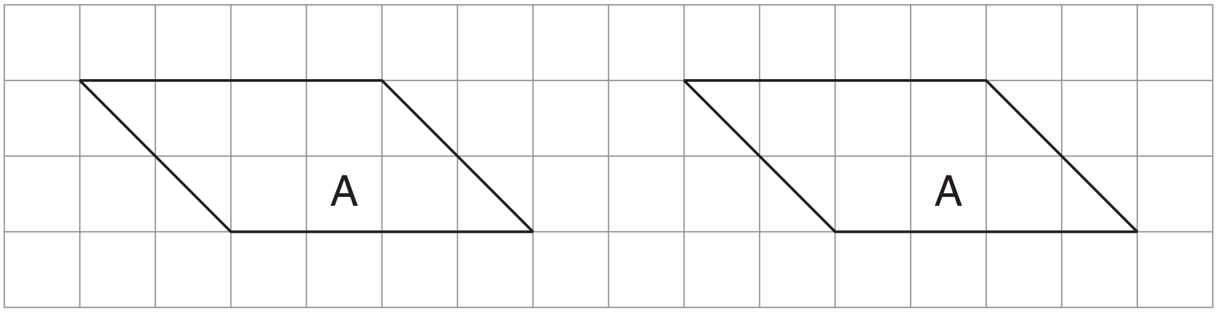
____

Name Date Time

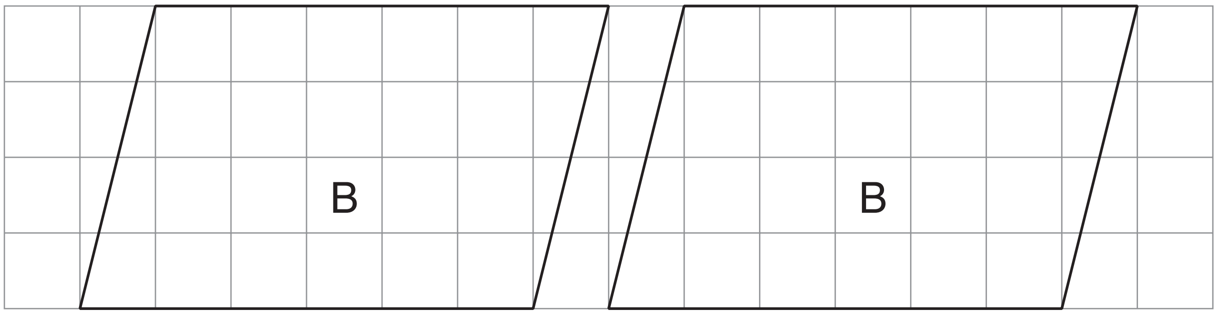
LESSON 9·6

Areas of Parallelograms and Triangles

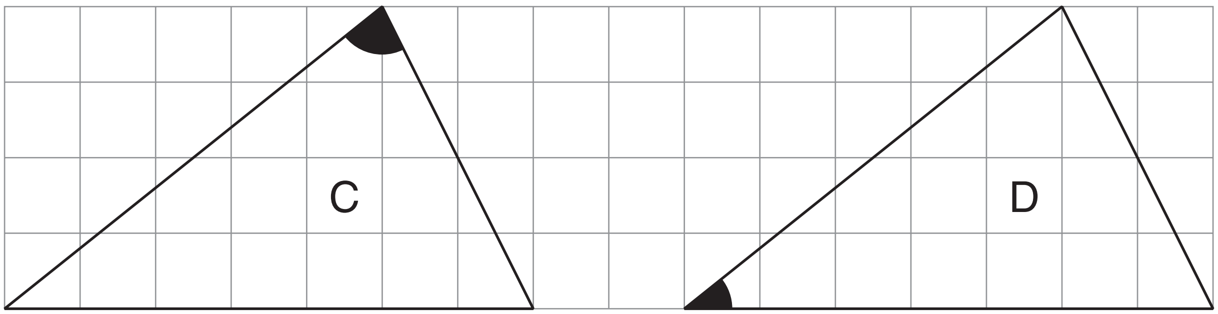
Cut out Parallelogram A. (Use the second Parallelogram A if you make a mistake.) Cut it into 2 pieces so that it can be made into a rectangle. Tape the rectangle on *Math Masters,* page 270.



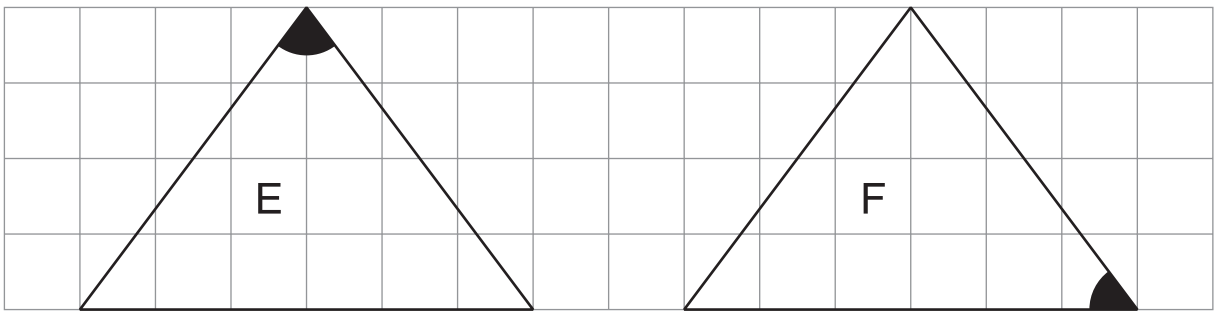
Do the same with Parallelogram B.



Cut out Triangles C and D. Tape them together at the shaded corners to form a parallelogram. Tape the parallelogram in the space next to Triangle C on *Math Masters,* page 271.



Do the same with Triangles E and F.

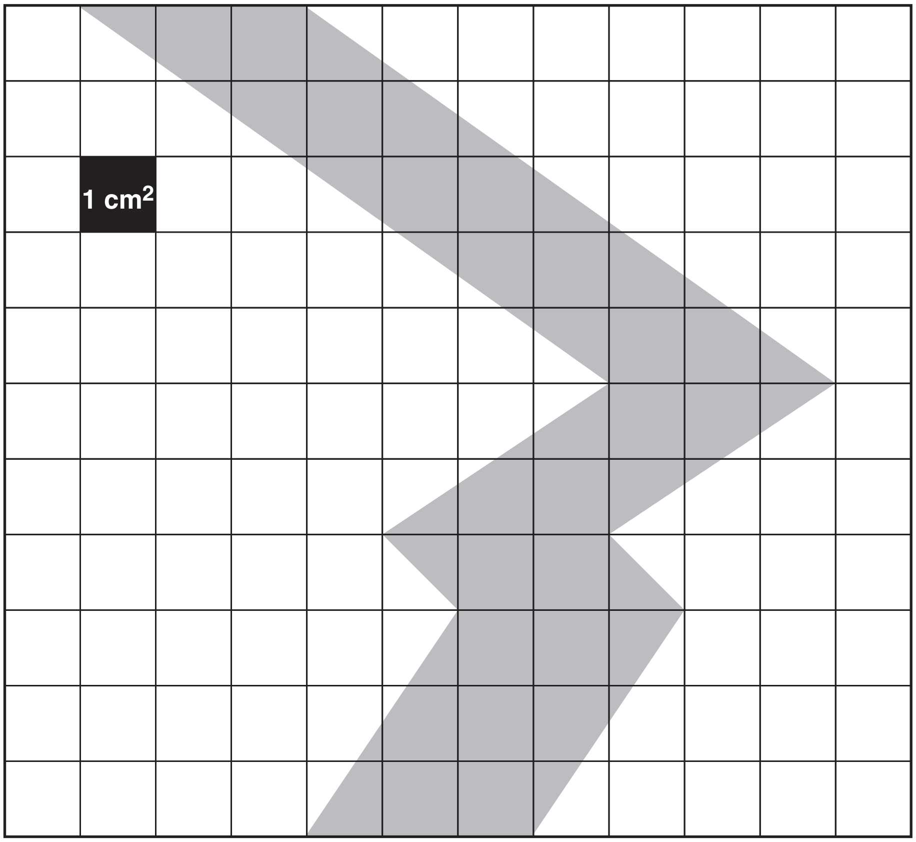


Name Date Time

LESSON 9•6

Calculating Area

1. Determine the area of the shaded path on the grid below.



The area of the path is about ________ cm^2.

2. Describe the strategy that you used to calculate the area of the path.

Name Date Time

LESSON 9·7

Latitudes

North

0° Latitude (Equator)	10°N	20°N	30°N	40°N
50°N	60°N	70°N		

South

0° Latitude (Equator)	10°S	20°S	30°S	40°S
50°S	60°S	70°S		

In squares for latitude, note that poles (90°N and 90°S) and latitudes 80°N and 80°S are not used.

Name Date Time

LESSON 9•7

Longitudes

0° Longitude (prime meridian)	10°W	20°W	30°W	40°W	50°W
60°W	70°W	80°W	90°W	100°W	110°W
120°W	130°W	140°W	150°W	160°W	170°W
180° Longitude	10°E	20°E	30°E	40°E	50°E
60°E	70°E	80°E	90°E	100°E	110°E
120°E	130°E	140°E	150°E	160°E	170°E

Name Date Time

STUDY LINK 9•7

An Area Review

Circle the most appropriate unit to use for measuring the area of each object.

SRB 188 192 193

1. The area of a football field

cm^2	ft^2	yd^2	in^2

2. The area of your hand

cm^2	ft^2	yd^2	in^2

3. The area of a postage stamp

cm^2	ft^2	yd^2	in^2

4. Area of a triangular kite

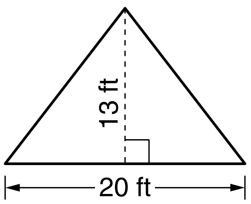
cm^2	ft^2	yd^2	in^2

5. Area of a parallelogram-shaped sign on the highway

cm^2	ft^2	yd^2	in^2

Use a formula to find the area of each figure. Write the appropriate number sentence and the area.

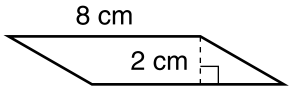
6.



Number sentence: ______________________

Area: ______________________ (unit)

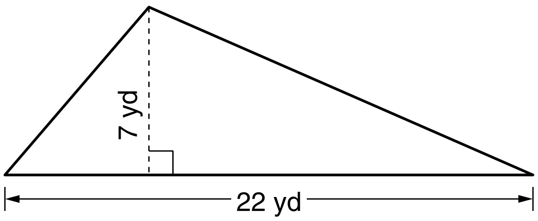
7.



Number sentence: ______________________

Area: ______________________ (unit)

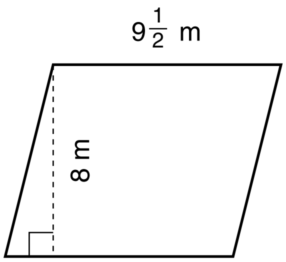
8.



Number sentence: ______________________

Area: ______________________ (unit)

9.



Number sentence: ______________________

Area: ______________________ (unit)

Name Date Time

LESSON 9•7

Estimation Challenge: Area

What is the ground area of your school? In other words, what area of land is taken up by the ground floor?

Work alone or with a partner to come up with an estimation plan. How can you estimate the ground area of your school without measuring it with a tape measure? Discuss your ideas with your classmates.

My estimation plan:

My best estimate:

How accurate is your estimate? In what range of areas might the actual area fall?

Name Date Time

LESSON 9•7

Practice with Area Formulas

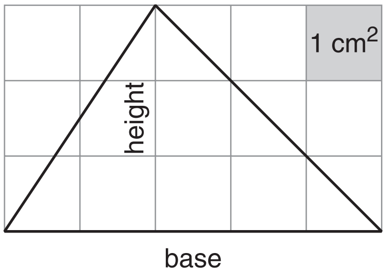
Write the following formulas.

Area of a triangle: ____________________

Area of a parallelogram: ____________________

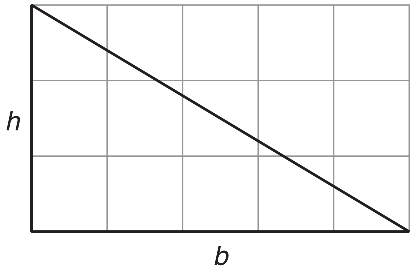
Use a formula to find the area of each figure.

1.



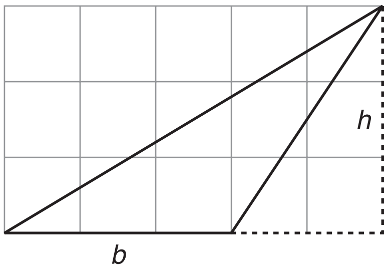
Area: ______________________________

2.



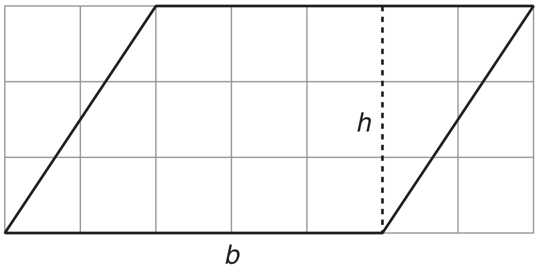
Area: ______________________________

3.



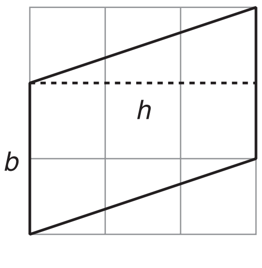
Area: ______________________________

4.



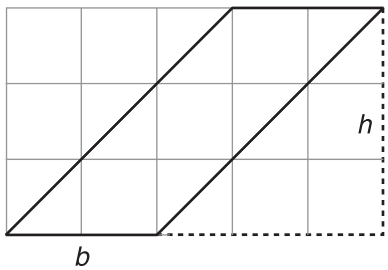
Area: ______________________________

5.



Area: ______________________________

6.



Area: ______________________________

Name Date Time

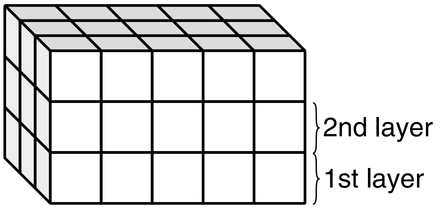
STUDY LINK 9•8

Volumes of Cube Structures

SRB 195–197

The structures below are made up of centimeter cubes.

1.

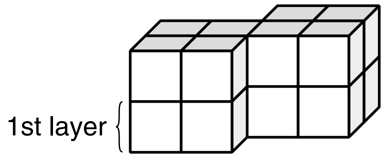


Area of base = ___________ cm^2

Volume of first layer = ___________ cm^3

Volume of entire cube structure = ___________ cm^3

2.

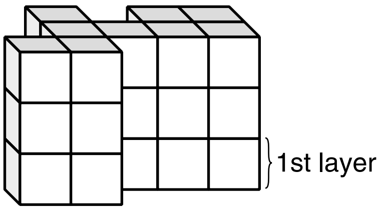


Area of base = ___________ cm^2

Volume of first layer = ___________ cm^3

Volume of entire cube structure = ___________ cm^3

3.

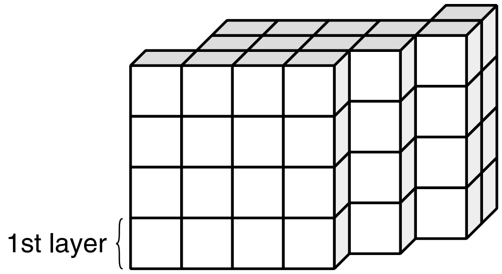


Area of base = ___________ cm^2

Volume of first layer = ___________ cm^3

Volume of entire cube structure = ___________ cm^3

4.



Area of base = ___________ cm^2

Volume of first layer = ___________ cm^3

Volume of entire cube structure = ___________ cm^3

Practice

5. $\frac{3}{5} * \frac{1}{8} =$ ___________

6. 3,840 / 4 = ___________

7. 960 ∗ 4 = ___________

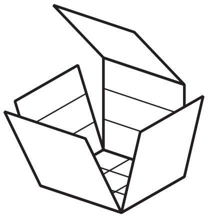
8. $\frac{4}{5} * \frac{5}{6} =$ ___________

Name Date Time

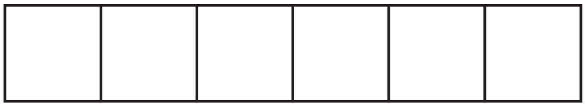
LESSON 9•8

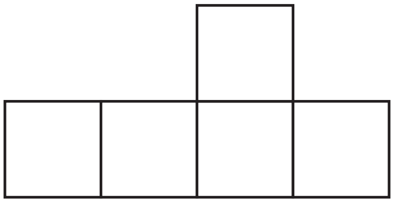
Unfolding Prisms

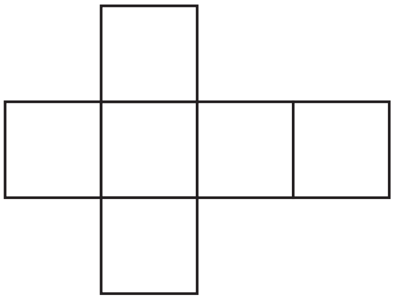
If you could unfold a prism so that its faces are laid out as a set attached at their edges, you would have a flat diagram for the shape. Imagine unfolding a cube. There are many different ways that you could make diagrams, depending on how you unfold the cube.

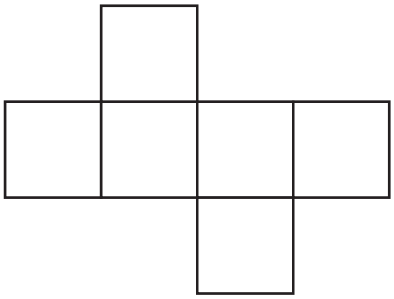


Which of the following are diagrams that could be folded to make a cube? Write *yes* or *no* in the blank next to each diagram.

1.  ______________

2.  ______________

3.  ______________

4.  ______________

Name Date Time

LESSON 9•8

Comparing Volume

What is the volume of one stick-on note? In other words, how much space is taken up by a single stick-on note? How does the volume of a stick-on note compare to the volume of a centimeter cube?

1. An unused pad of stick-on notes is an example of what shape?

______

2. Estimate the volume of one stick-on note.

______

3. Calculate the volume of one stick-on note. Volume = ______

Record your strategy.

______

______

______

______

______

______

4. Use a formula to calculate the volume of one centimeter cube. Volume = ______

Write the number sentence for this calculation.

______

5. Explain how the volume of one stick-on note compares with the volume of one centimeter cube.

______

______

______

______

______

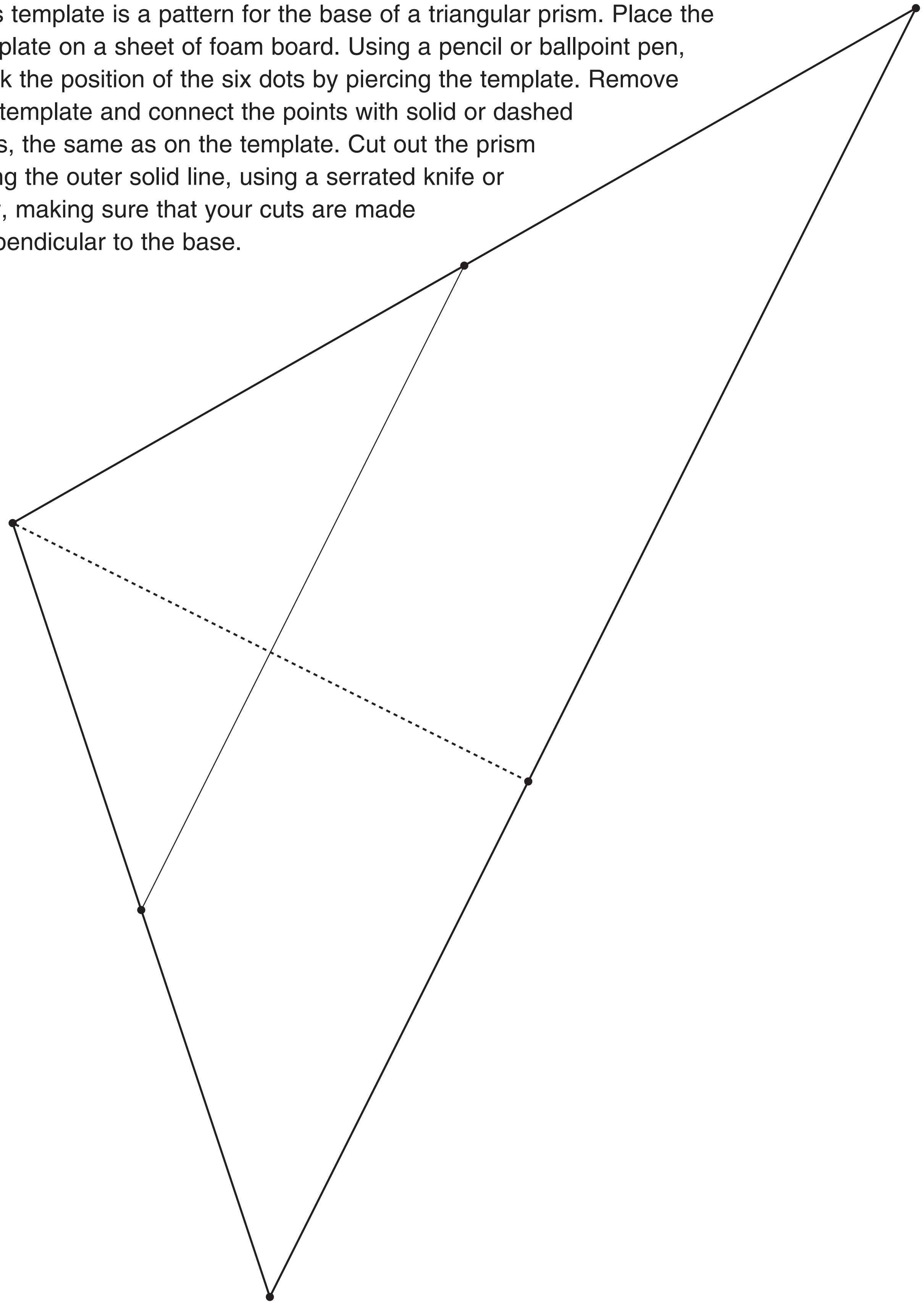
______

Name Date Time

LESSON 9•9

Triangular Prism Base Template

This template is a pattern for the base of a triangular prism. Place the template on a sheet of foam board. Using a pencil or ballpoint pen, mark the position of the six dots by piercing the template. Remove the template and connect the points with solid or dashed lines, the same as on the template. Cut out the prism along the outer solid line, using a serrated knife or saw, making sure that your cuts are made perpendicular to the base.

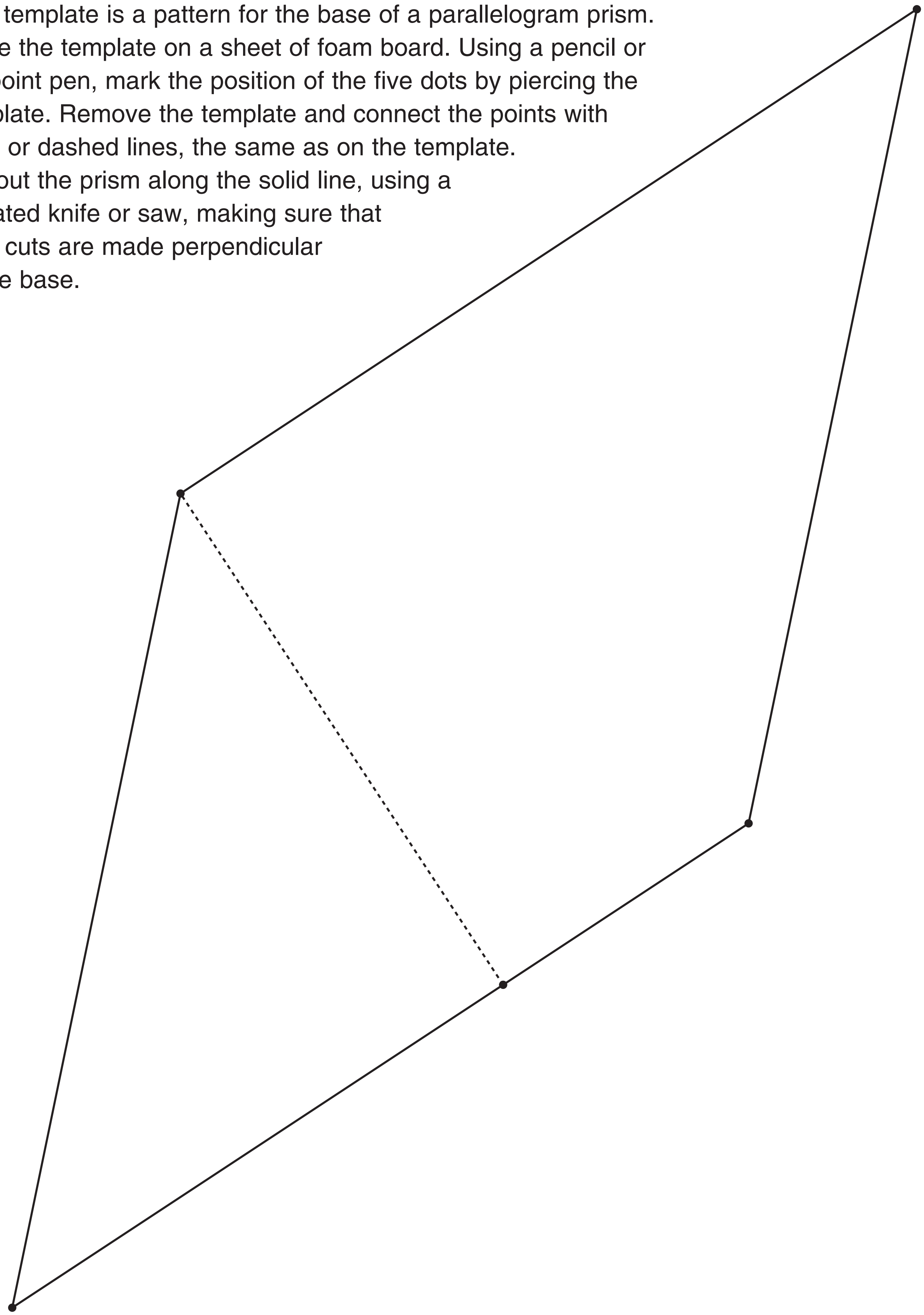


Name Date Time

LESSON 9•9

Parallelogram Prism Base Template

This template is a pattern for the base of a parallelogram prism. Place the template on a sheet of foam board. Using a pencil or ballpoint pen, mark the position of the five dots by piercing the template. Remove the template and connect the points with solid or dashed lines, the same as on the template. Cut out the prism along the solid line, using a serrated knife or saw, making sure that your cuts are made perpendicular to the base.



Name Date Time

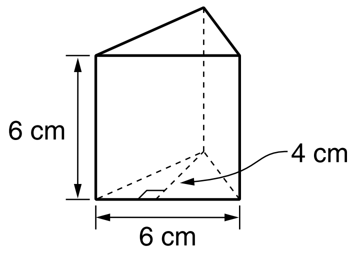
STUDY LINK 9•9

Volumes of Prisms

SRB 197

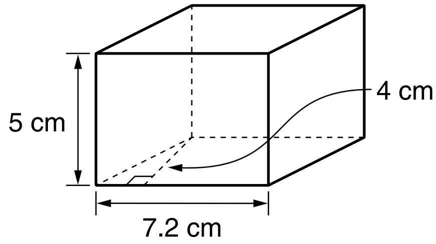
The volume V of any prism can be found with the formula $V = B * h$, where B is the area of the base of the prism, and h is the height of the prism from that base.

1.



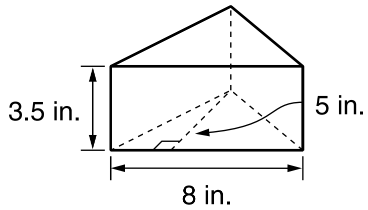
Volume = __________ cm^3

2.



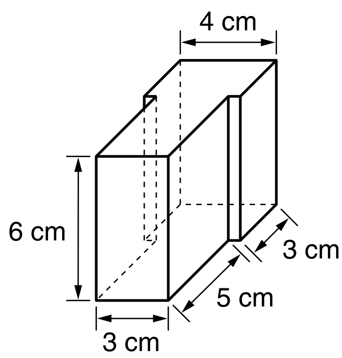
Volume = __________ cm^3

3.



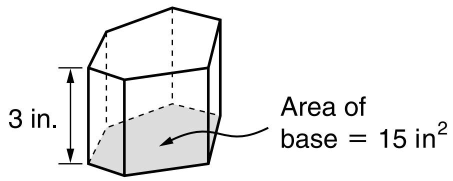
Volume = __________ in^3

4.



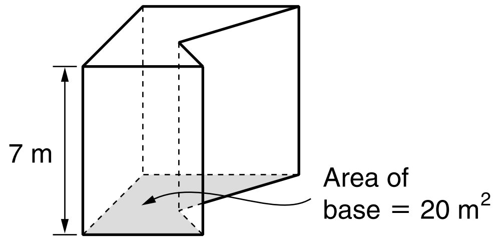
Volume = __________ cm^3

5.



Volume = __________ in^3

6.



Volume = __________ m^3

Practice

Solve each equation.

7. $36 * r = 144$ __________

8. $3{,}577 - t = 3{,}822$ __________

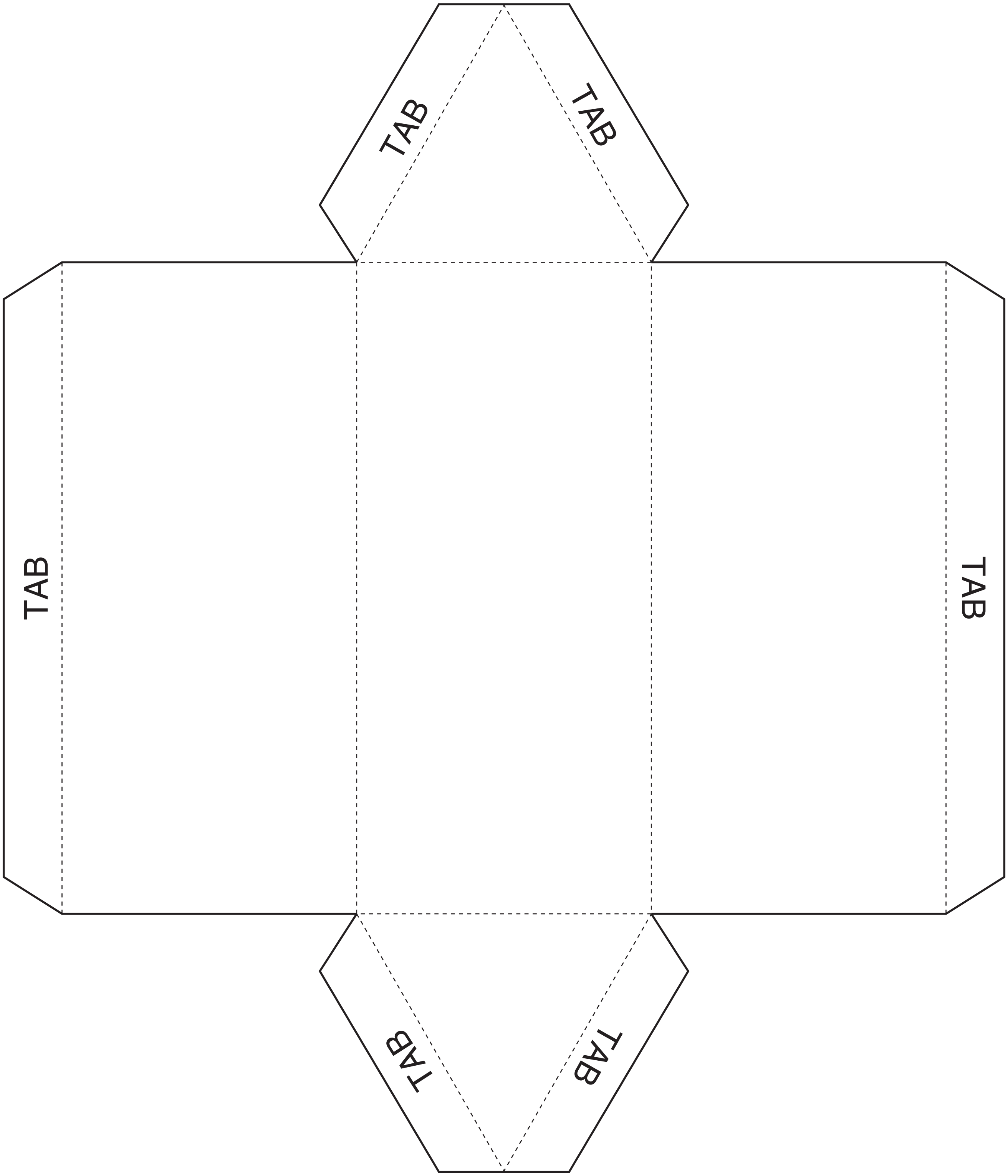
9. $3{,}577 - m = 3{,}417$ __________

10. $d * 68 = 340$ __________

Name Date Time

LESSON 9•9

Triangular Prism Template

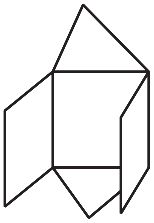


Name Date Time

LESSON 9•9

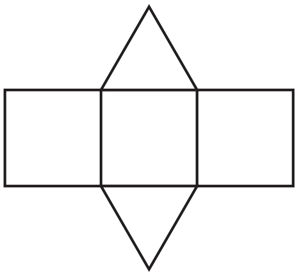
Unfolding Geometric Solids

If you could unfold a prism so that its faces are laid out as a set attached at their edges, you would have a flat diagram for the shape. Imagine unfolding a triangular prism. There are different ways that you could make diagrams, depending on how you unfold the triangular prism.



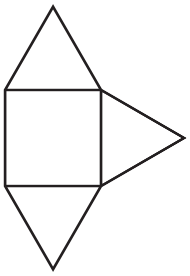
Which of the following are diagrams that could be folded to make a triangular prism? Write *yes* or *no* in the blank under each diagram.

1.



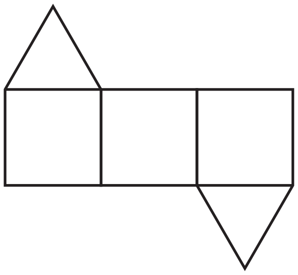
____

2.



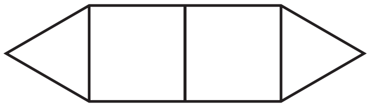
____

3.



____

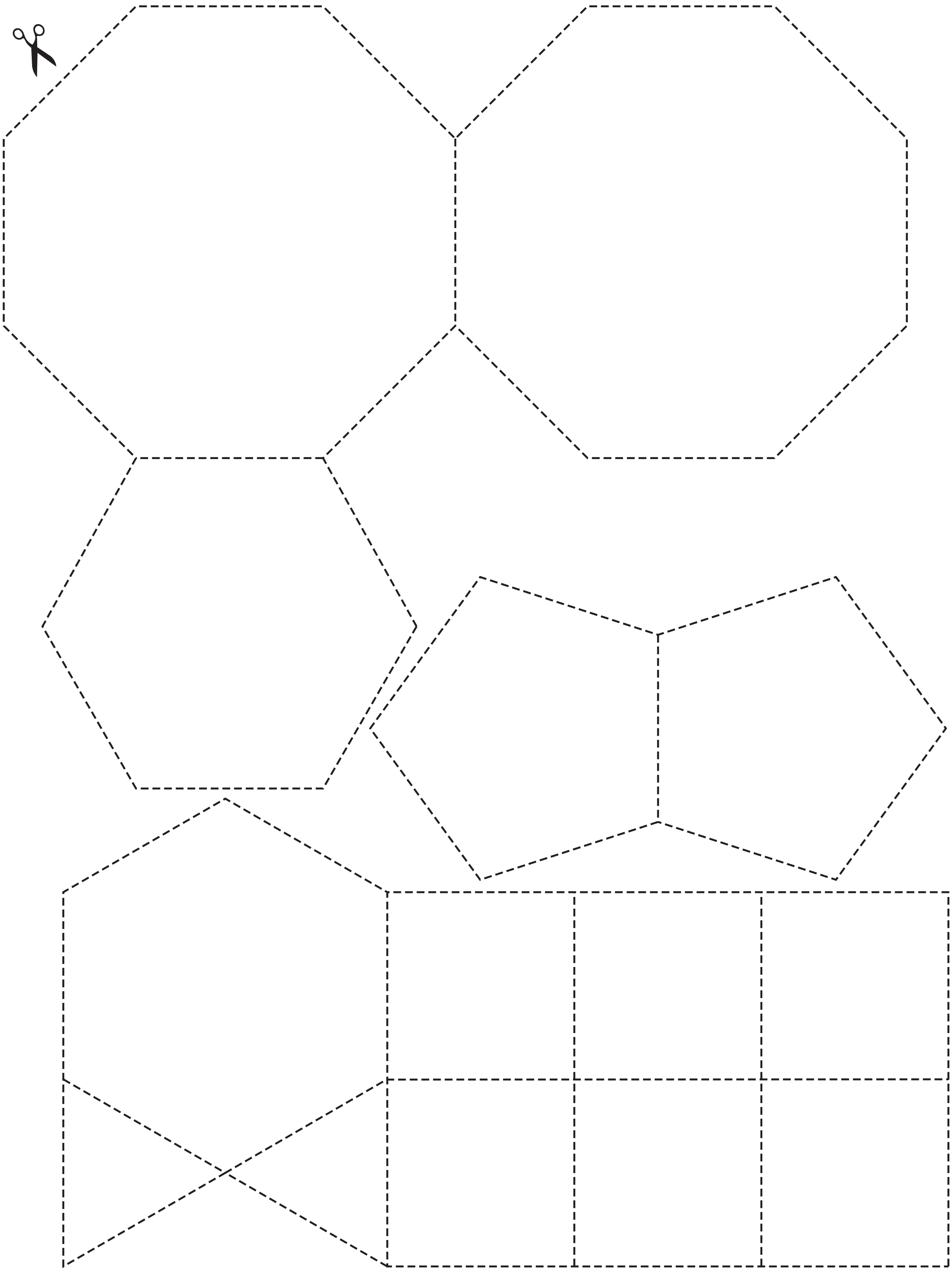
4.



____

LESSON 9•9

Faces and Bases



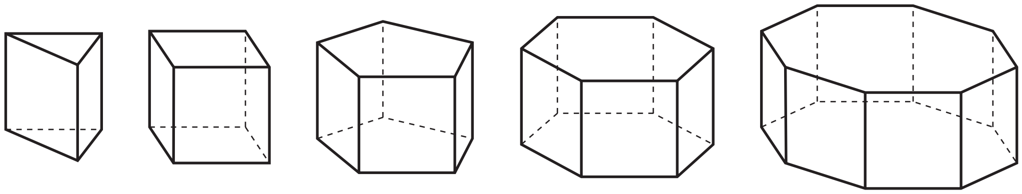
Name Date Time

LESSON 9•9

Using Faces and Bases

The flat diagram formed from unfolding a prism so that its faces are laid out flat and attached at their edges is called a **geometric net.** For a given prism, there are different nets, depending on how you think about unfolding the prism.

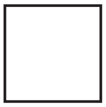
1. Cut out the figures on *Math Masters,* page 287. You and your partner will use the figures to build nets for the prisms below.



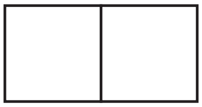
2. Take turns to select, draw, and place figures to form a net for a prism.
3. The partner who places the figure that completes the net states the number of faces and the number of bases. For example, if the net for a cube were completed, the partner would say, “4 faces, 2 bases.” This ends the round.
4. A partner can also block the completion of a net. In this case, the partner would put down a figure that would prevent completing the net in the following placement and say “block.” The blocked partner then has the opportunity to complete the net by placing two figures and stating the number of faces and bases. Again, this would end the round.

Example:

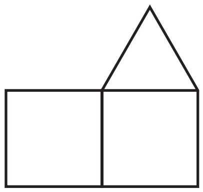
Student 1
Draw 1:



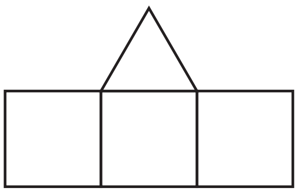
Student 2
Draw 2:



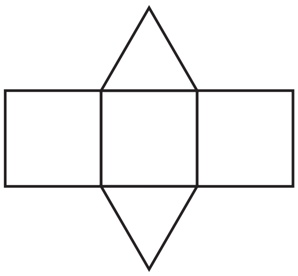
Student 1
Draw 3:



Student 2
Draw 4:



Student 1
Draw 5:



Student 1 states,
“3 faces, 2 bases.”

This ends the round.

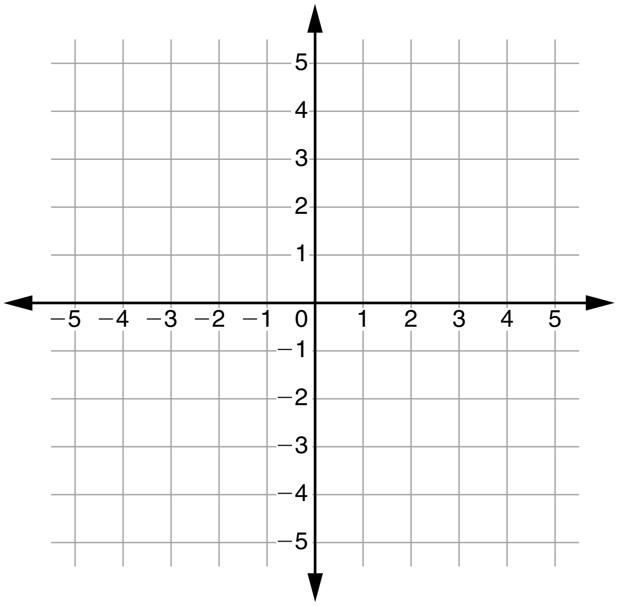
Name Date Time

STUDY LINK 9•10

Unit 9 Review

SRB 192 193 208

1. Plot 6 points on the grid below and connect them to form a hexagon. List the coordinates of the points you plotted.



(_____ , _____)

(_____ , _____)

(_____ , _____)

(_____ , _____)

(_____ , _____)

(_____ , _____)

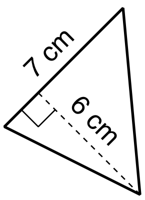
Find the area of the figures shown below. Write the number model you used to find the area.

Area of a rectangle: $A = b * h$

Area of a parallelogram: $A = b * h$

Area of a triangle: $A = \frac{1}{2} * b * h$

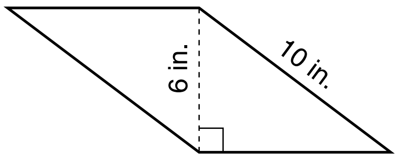
2.



Number model: ____________________

Area: ______________ (unit)

3.



Perimeter = 36 in.

Number model: ____________________

Area: ______________ (unit)

4. On the back of this page, explain how you solved Problem 3.

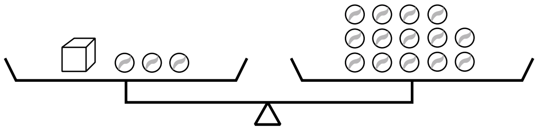
Name Date Time

STUDY LINK 9•11

Unit 10: Family Letter

Algebra Concepts and Skills

In this unit, your child will be introduced to solving simple equations with a pan balance, thus developing basic skills of algebra. For example, a problem might ask how many marbles in the illustration below weigh as much as a cube. You can solve this problem by removing 3 marbles from the left pan and 3 marbles from the right pan. Then the pans will still balance. Therefore, you know that one cube weighs the same as 11 marbles.



You can think of this pan-balance problem as a model for the equation $c + 3 = 14$, in which the value of c is 11.

A "What's My Rule?" table has been a routine since the early grades of *Everyday Mathematics.* In this unit, your child will follow rules to complete tables, such as the one below and will then graph the data. Your child will also determine rules from information provided in tables and graphs. Students will begin to express such rules using algebraic expressions containing variables.

Rule
+ 6

in	out
−1	5
2	8
5	
	12
12	
	15

As the American Tour continues, your child will work with variables and formulas to predict eruption times of the famous geyser, Old Faithful, in Yellowstone National Park.

In previous grades, your child studied the perimeter (distance around) and the area (amount of surface) of geometric figures. In Unit 9, students developed and applied formulas for the area of rectangles, parallelograms, and triangles. In this unit, your child will explore and apply formulas for the circumference (distance around) and area of circles.

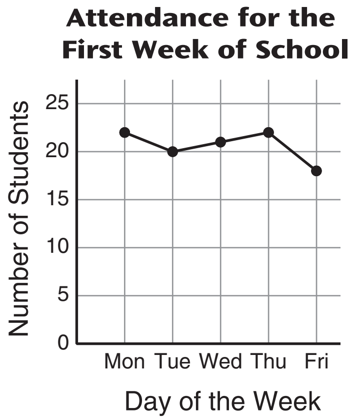
Please keep this Family Letter for reference as your child works through Unit 10.

Vocabulary

Important terms in Unit 10:

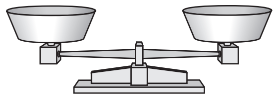
algebraic expression An expression that contains a variable. For example, if Maria is 2 inches taller than Joe, and if the variable M represents Maria's height, then the algebraic expression $M - 2$ represents Joe's height.

line graph A graph in which data points are connected by line segments.



Line graph

pan balance A tool used to weigh objects or compare weights.


Pan balance

predict In mathematics, to say what will happen in the future based on experimental data or theoretical calculation.

rate A comparison by division of two quantities with unlike units. For example, a speed such as 55 miles per hour is a rate that compares distance with time.

Do-Anytime Activities

To work with your child on concepts taught in this unit and in previous units, try these interesting and rewarding activities:

1. Have your child list different timed distances for a mile. For example, the fastest mile run by a human and by a race car; your child's own fastest mile completed by running, biking, or walking; the fastest mile run for a handicapped athlete; the fastest mile completed by a swimmer, and so on.

2. Have your child keep a running tally of when the school bus arrives. Or have your child time himself or herself to see how long it takes to walk to school in the morning compared to walking home in the afternoon. After a week, have your child describe landmarks for their data and interpret these landmarks.

Building Skills through Games

In this unit, your child will practice using algebraic expressions containing variables by playing the following game. For more detailed instructions, see the *Student Reference Book.*

First to 100 See *Student Reference Book,* page 308.
This is a game for two to four players and requires 32 Problem Cards and a pair of six-sided dice. Players answer questions after substituting numbers for the variable on the Problem Cards. The questions offer practice on a variety of mathematical topics.

As You Help Your Child with Homework

As your child brings assignments home, you might 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 10•1

1. 3 **2.** 3 **3.** 36 **4.** 4 **5.** 3

Study Link 10•2

3. 5, 10 **4.** 2, 2 **5.** 4, 6 **6.** 26
7. 2 **8.** 50 **9.** 0

Study Link 10•3

1. $2 * (L + M)$, or $2(L + M)$
2. $\frac{1}{4} * (M - (1 + s))$, or $\frac{1}{4}(M - (1 + s))$
3. a. Multiply N by 3 and add 5.
b. $Q = 3N + 5$
4. a. Multiply E by 6 and add 15.
b. $R = (E * 6) + 15$

Study Link 10•4

1. a.

Weight (lb) (w)	Cost ($) ($2.50 * w$)
1	2.50
3	7.50
6	15.00
10	25.00

2. a.

Gasoline (gal) (g)	Distance (mi) ($24 * g$)
1	24
4	96
7	168
13	312

Study Link 10•5

2. 60°F **4.** 72°F **5. a.** 70°F **b.** 67°F

Study Link 10•6

Time (sec)	Distance (yd)	
	Natasha	Derek
Start	0	10
1	6	15
2	12	20
3	18	25
4	24	30
9	54	55
10	60	60
11	66	65
12	72	70
13	80	75

Study Link 10•7

Answers vary.

Study Link 10•8

1. a. 22.0 **b.** 40.2
2. a. 85 **b.** 85
3. 21

Study Link 10•9

1. circumference **2.** area **3.** area
4. circumference **5.** 50 cm^2
6. 6 in. **7.** 5 m
8. Sample answer: The circumference is 31.4 meters, and this equals $\pi * d$, or about $3.14 * d$. Since $3.14 * 10 = 31.4$, the diameter is about 10 meters. The radius is half the diameter, or about 5 meters.