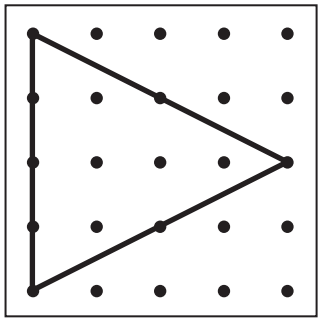
NAME _____ **DATE** _____

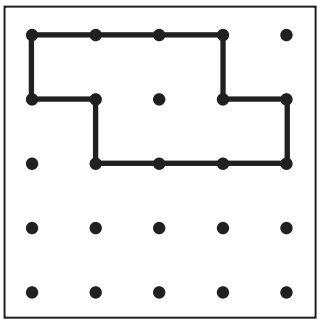
Home Connection 22 ★ Worksheet

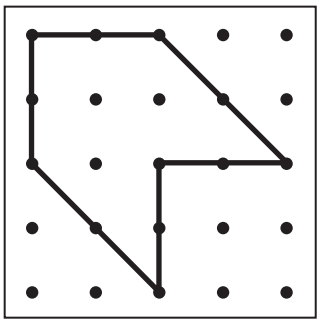
Shape Puzzles

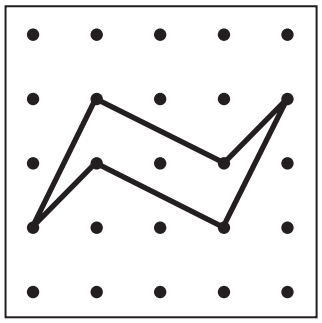
1 Use a ruler and a pencil to divide each polygon below into 2 congruent figures. Remember that *congruent* figures have to be exactly the same shape and the same size. You may not always be able to use a single line segment, and there is more than one way to do it for some of these shapes. One of the figures can't be divided into 2 congruent shapes. Can you find out which one it is?

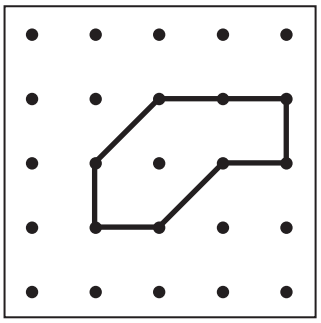


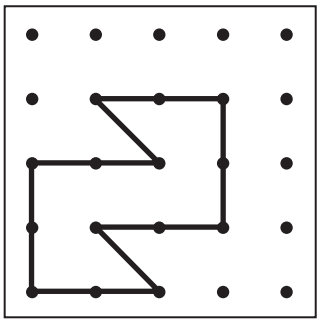
Triangle

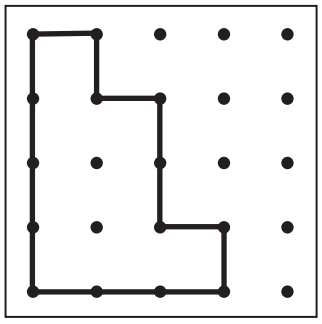


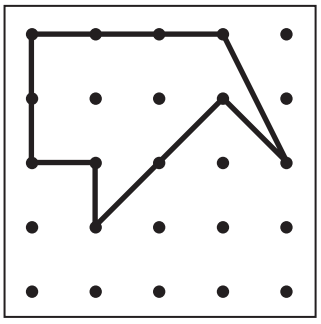


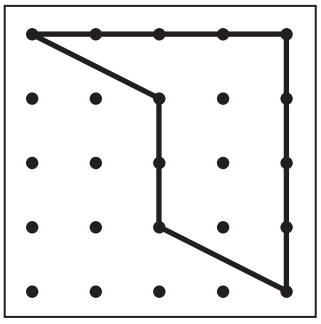












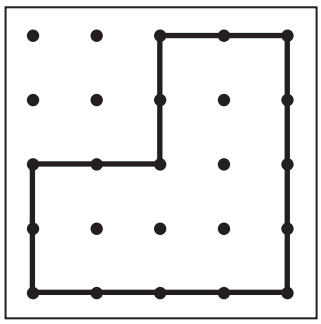
CHALLENGE

2 Label each polygon with its name. The first one is done as an example.

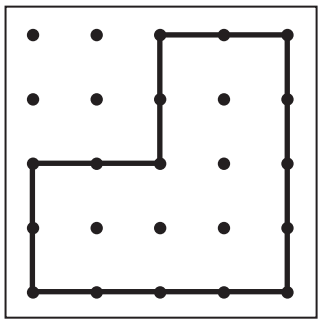
(Continued on back.)

Home Connection 22 Worksheet (cont.)

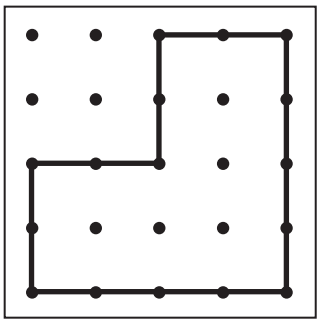
3 See how many different ways you can divide the hexagon on the geoboard below into 2, 3, 4, or more congruent shapes. (Remember that a *hexagon* is any closed figure that has 6 sides.) Record below all the different ways you can find to divide this shape into congruent parts. What is the greatest number of congruent parts you can break it into?



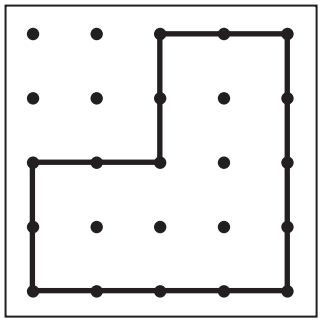
number of congruent parts _____



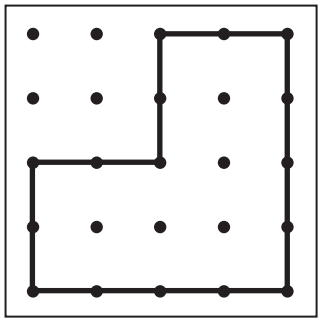
number of congruent parts _____



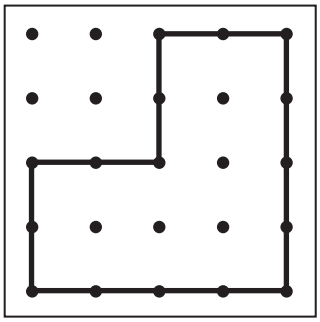
number of congruent parts _____



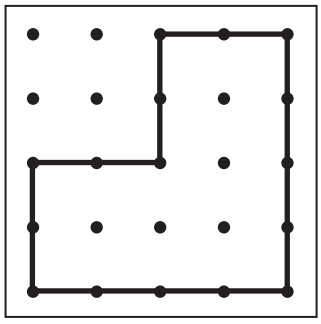
number of congruent parts _____



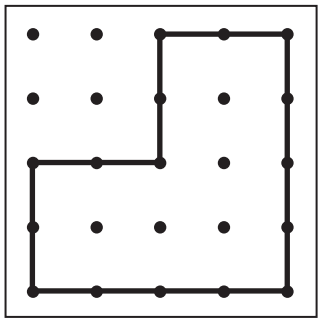
number of congruent parts _____



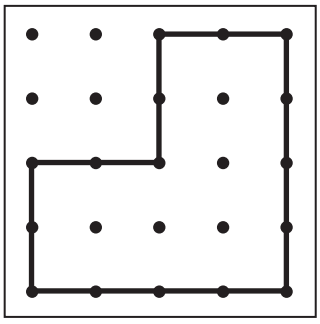
number of congruent parts _____



number of congruent parts _____



number of congruent parts _____



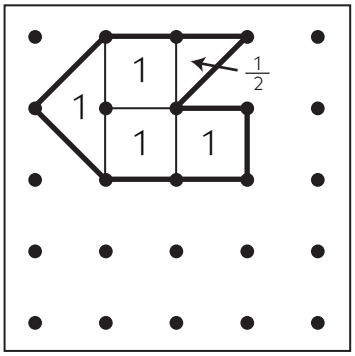
number of congruent parts _____

NAME _____ **DATE** _____

Home Connection 23 ★ Worksheet

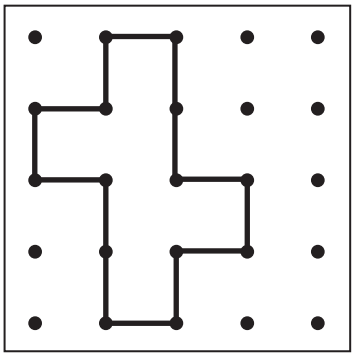
Areas of Geoboard Figures

1 Find and record the area of each figure on this page and the next. Be sure to show your work. Each small square on the geoboard is 1 square unit.

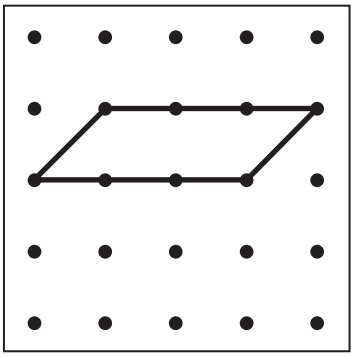


example

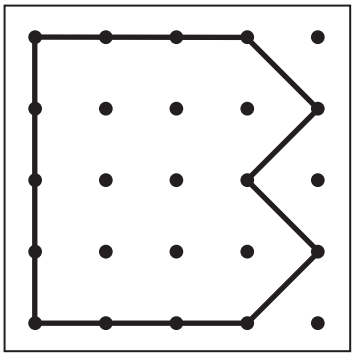
$4\frac{1}{2}$ square units



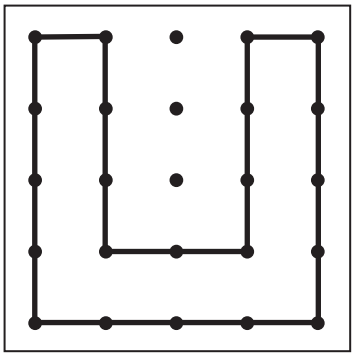
a _____ square units



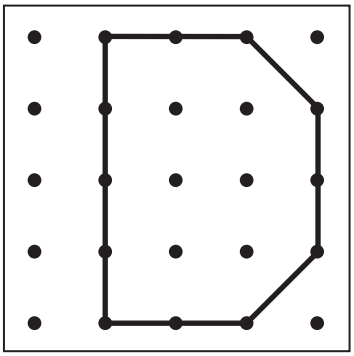
b _____ square units



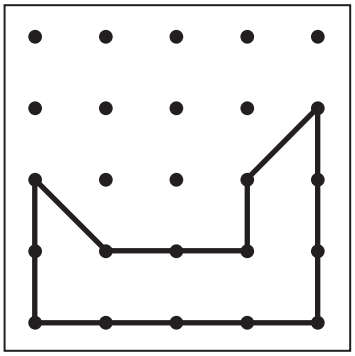
c _____ square units



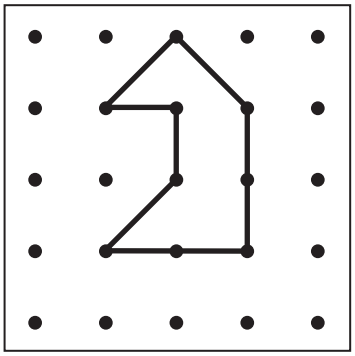
d _____ square units



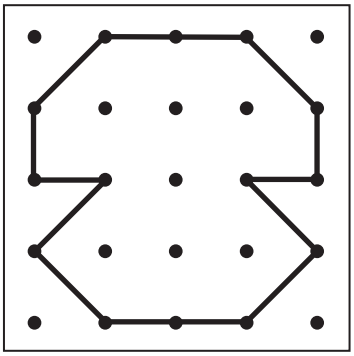
e _____ square units



f _____ square units



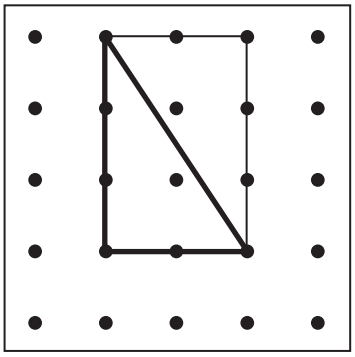
g _____ square units



h _____ square units

(Continued on back.)

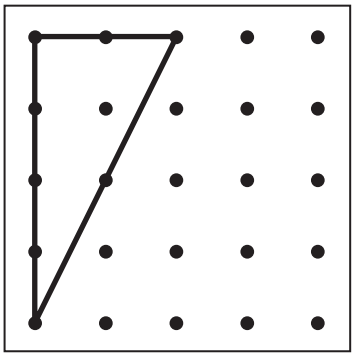
Home Connection 23 Worksheet (cont.)



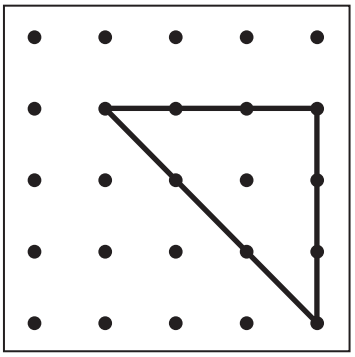
example

3 square units

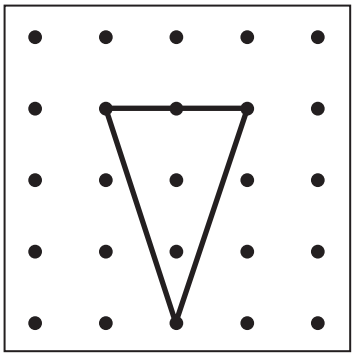
This triangle is half of a bigger rectangle. The area of the rectangle is 6, so the area of the triangle must be 3.



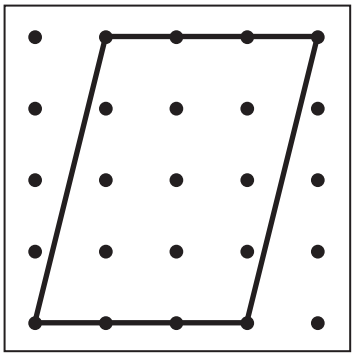
i _____ square units



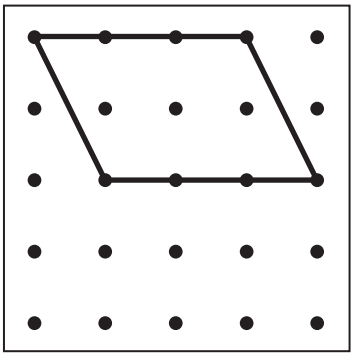
j _____ square units



k _____ square units



l _____ square units



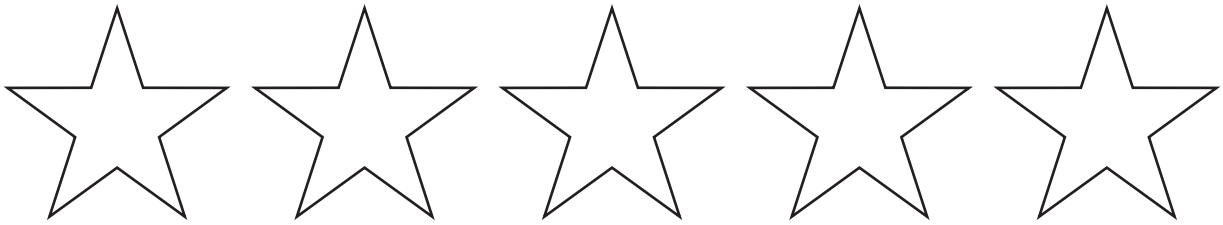
m _____ square units

(Continued on next page.)

NAME _____ DATE _____

Home Connection 23 Worksheet (cont.)

2 This star is an example of a decagon, a shape with 10 sides. In two stars, there are 20 sides altogether.



a In 5 stars, there are _____ sides altogether.

b Fill in the missing numbers on this chart about stars and sides.

Number of Stars	10	12	16		25	33		43	100	
Number of Sides	100			210			370			1,500

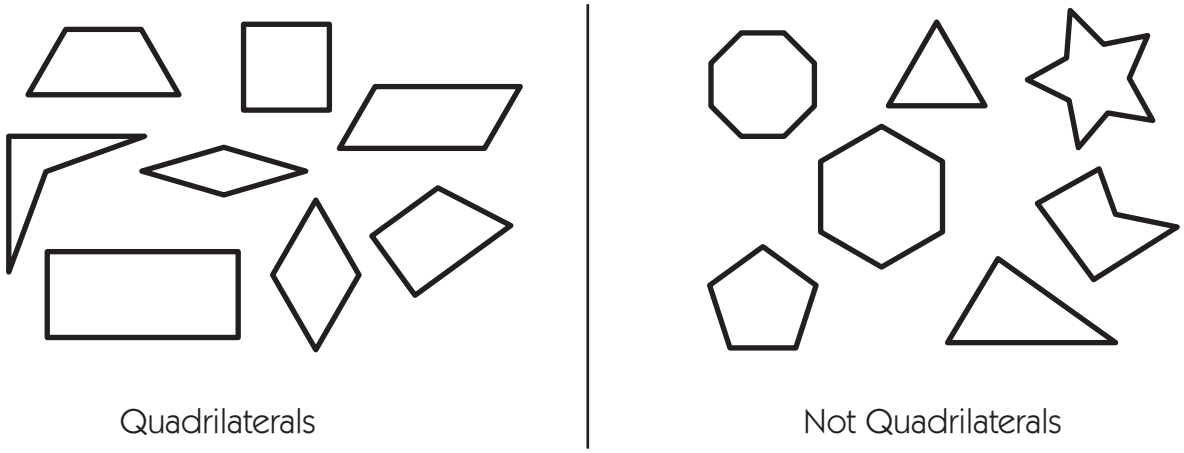
CHALLENGE

3 Draw a decagon (a 10-sided polygon) that is *not* a star.

NAME _____ **DATE** _____

Home Connection 24 ★ Worksheet

Thinking about Quadrilaterals



Quadrilaterals | Not Quadrilaterals

1a Study the diagram above and then circle the quadrilaterals in the row of shapes below:

b How do you know that the shapes you circled are quadrilaterals?

c Draw 2 examples of quadrilaterals.

d Draw 2 examples of shapes that are *not* quadrilaterals.

(Continued on back.)

Home Connection 24 Worksheet (cont.)

2 There are several different types of quadrilaterals. Study the descriptions below and draw a line from each to the picture that matches it best. There are picture definitions for the words in italics at the bottom of the page.

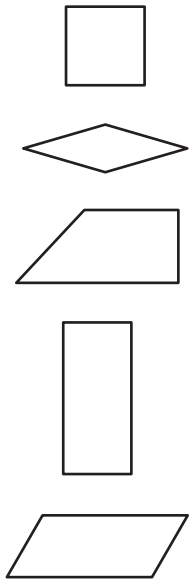
Trapezoid a quadrilateral with exactly 1 pair of *parallel* sides

Parallelogram a quadrilateral with 2 pairs of *parallel* sides

Rectangle a quadrilateral with 4 *right* angles

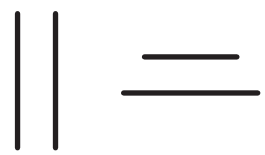
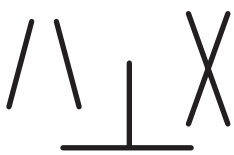
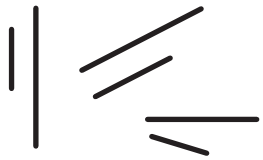
Rhombus a quadrilateral with 4 *congruent* sides

Square a quadrilateral with 4 *congruent* sides *and* 4 right angles



3 Roberto says that all quadrilaterals have at least 1 pair of *parallel* sides. Do you agree with him or not? Explain your answer.

4 Rebekkah says that a square can be called a rhombus, but a rhombus cannot be called a square. Do you agree with her or not? Explain your answer.

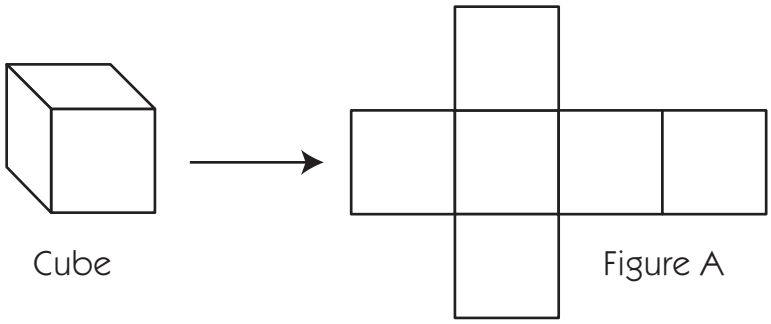
Parallel	Not Parallel	Congruent	Not Congruent
			

(Continued on next page.)

NAME _____ DATE _____

Home Connection 24 Worksheet (cont.)

5 If you cut this cube along some of its edges, you could unfold it into a flat shape that looks like Figure A. This would be one way to see that a cube has 6 faces, and all of them are square.



Cube Figure A

If you counted all the faces on 2 cubes, you'd get 12.

a If you counted all the faces on 5 cubes, you'd get _____.

b Fill in the missing numbers on this chart about cubes and faces. Do the gray box problems in your head or on a piece of scratch paper.

Number of Cubes	10	12	16		25	32		40	75	
Number of Faces	60			126			234			750

6 Choose one of the gray box problems and show how you figured it out.

CHALLENGE

7 Find one example of a quadrilateral at home that is not a square or a rectangle. Make a labeled sketch of it below or on the back of this page.

NAME _____ **DATE** _____

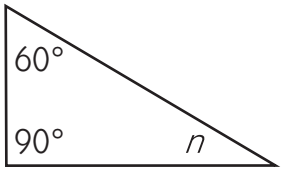
Home Connection 25 ★ Worksheet

Find the Angle Measure

1 The sum of the angle measures in a triangle is 180 degrees. Below are 4 triangles, each with a missing angle measure labeled n. For each one, choose the value of n.

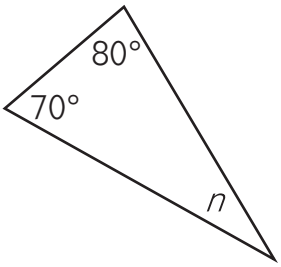
a

- ○ 20 degrees
- ○ 30 degrees
- ○ 50 degrees
- ○ 60 degrees



b

- ○ 10 degrees
- ○ 20 degrees
- ○ 30 degrees
- ○ 40 degrees

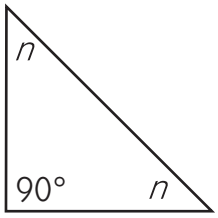


c

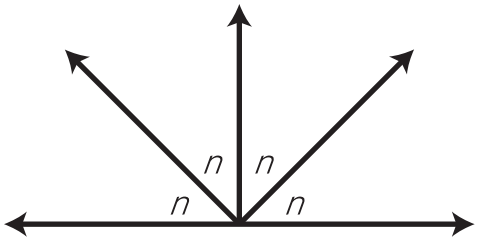
- ○ 130 degrees
- ○ 140 degrees
- ○ 150 degrees
- ○ 160 degrees

d

- ○ 30 degrees
- ○ 45 degrees
- ○ 50 degrees
- ○ 60 degrees



2a The 4 angles marked n below are congruent and have been put together to form a straight angle. Using sketches, numbers, and words, determine the value of each angle marked n. Show your work below.

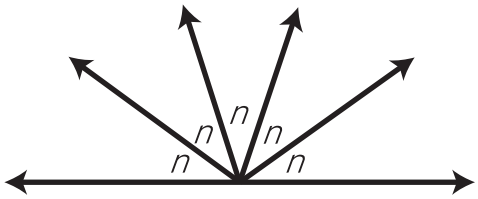


b The value of each angle marked n is _____ degrees.

(Continued on back.)

Home Connection 25 Worksheet (cont.)

3a The 5 angles marked n below are congruent and have been put together to form a straight angle. Using sketches, numbers, and words, determine the value of each angle marked n. Show your work below.

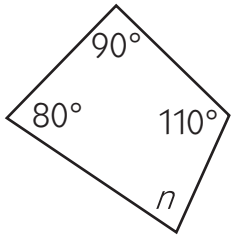


b The value of each angle marked n is _____ degrees.

4 The sum of the angle measures in a convex quadrilateral is 360 degrees. Below are 2 convex quadrilaterals, each with a missing angle measure labeled n. Determine the value (in degrees) of n for each convex quadrilateral.

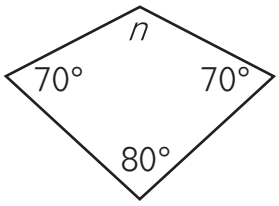
a

- ○ 80 degrees
- ○ 90 degrees
- ○ 100 degrees
- ○ 110 degrees



b

- ○ 80 degrees
- ○ 100 degrees
- ○ 120 degrees
- ○ 140 degrees



CHALLENGE

5 Can a triangle have 2 right angles? If so, draw it; if not, explain why not.

NAME _____ **DATE** _____

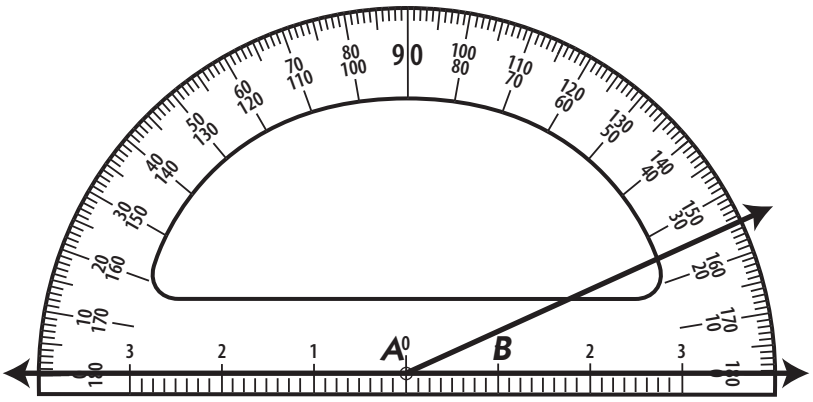
Home Connection 26 ★ Worksheet

Protractor Practice & Clock Angles

When you measure an angle you usually have to choose between two numbers because protractors are designed to measure angles that start on either the right or left side. There are two angles to measure in each of the problems on this sheet and the next. The angle on the left-hand side is angle A. The angle on the right-hand side is angle B. Find and record the measure of both angles in each problem.

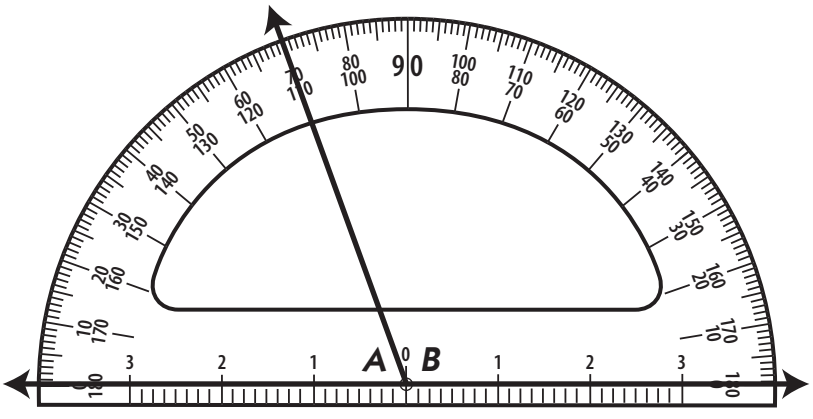
1 The measure of angle A is _____ degrees.

The measure of angle B is _____ degrees.



2 The measure of angle A is _____ degrees.

The measure of angle B is _____ degrees.

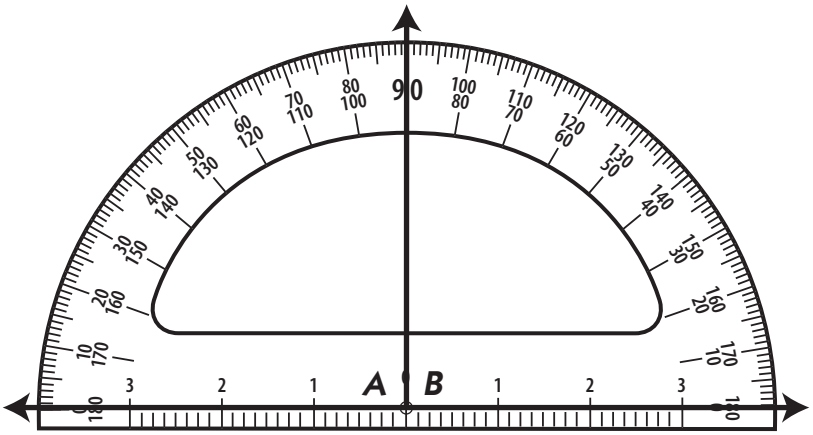


(Continued on back.)

Home Connection 26 Worksheet (cont.)

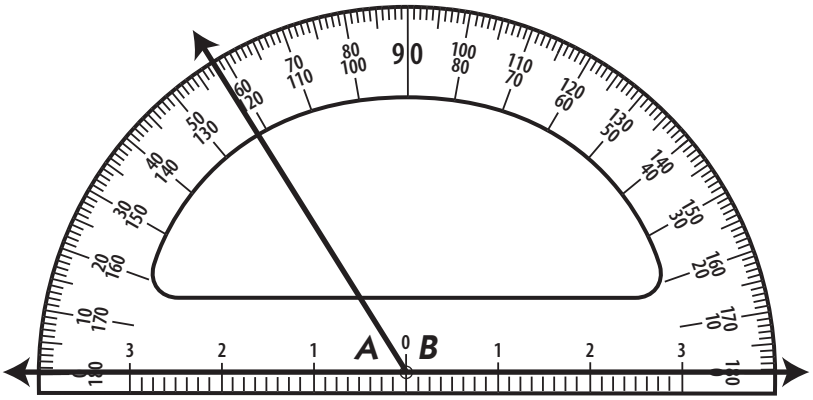
3 The measure of angle A is _____ degrees.

The measure of angle B is _____ degrees.



4 The measure of angle A is _____ degrees.

The measure of angle B is _____ degrees.



5 Go back and add each pair of angle measures in Problems 1 through 4. What do you notice? Why do you think it works this way?

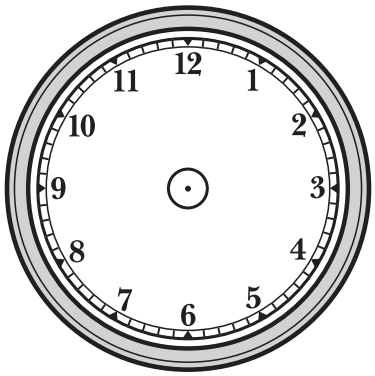
(Continued on next page.)

NAME _____ DATE _____

Home Connection 26 Worksheet (cont.)

6 Follow the directions below to construct an angle on each clock face. Use a ruler or a note-card so your lines are straight. For each one, give the measure of the angle and explain how you know it's that many degrees. (Hint: There are 360° in a circle.)

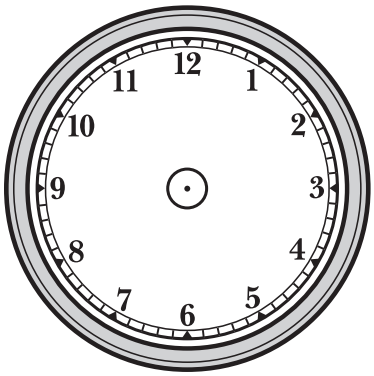
a Draw a line from the point above the 12 to the center of the clock and a line from the center to the point beside the 3.



Angle = _____°

Here's how I know:

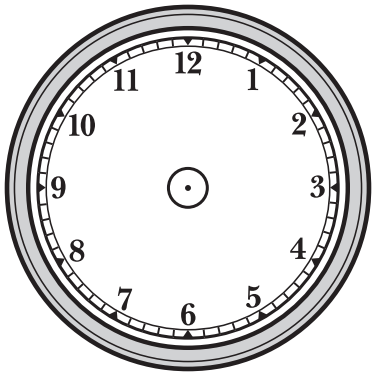
b Draw a line from the point above the 12 to the center of the clock and a line from the center to the point below the 6.



Angle = _____°

Here's how I know:

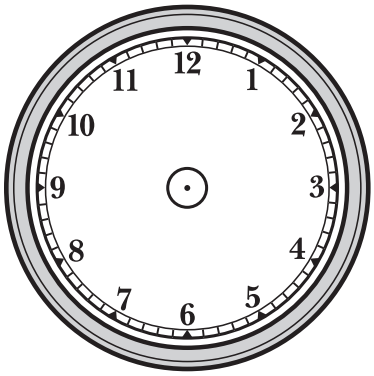
c Draw a line from the point above the 12 to the center of the clock and a line from the center to the point beside the 1.



Angle = _____°

Here's how I know:

d Draw a line from the point above the 12 to the center of the clock and a line from the center to the point beside the 4.



Angle = _____°

Here's how I know:

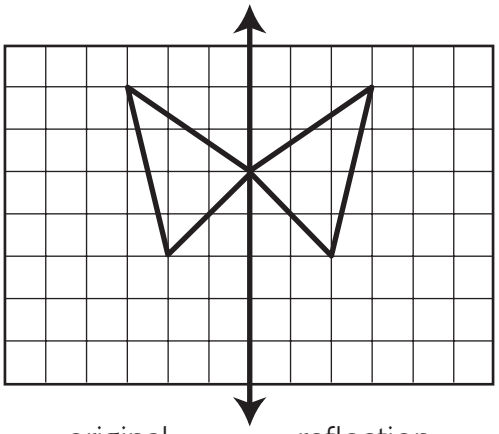
NAME _____ **DATE** _____

Home Connection 27 ★ Worksheet

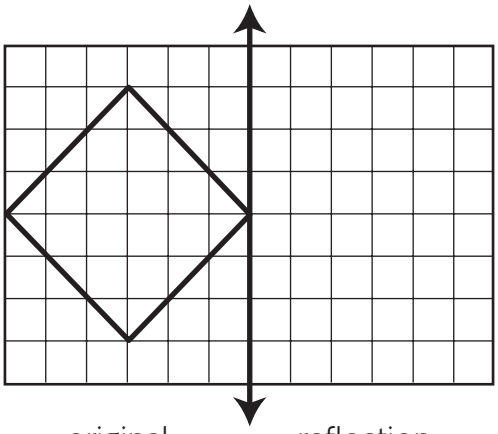
Reflections, Symmetry & Congruence

1 Reflect each of these shapes over the dark line in the center of the grid. Use a ruler or a straight edge to help make your lines straight.

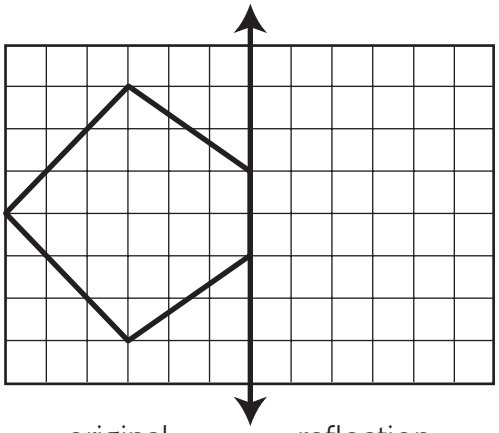
example



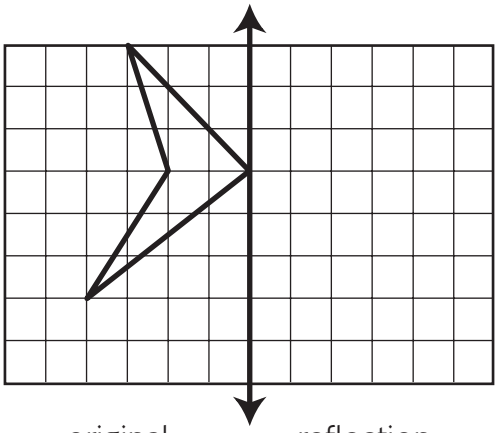
a



b



c



2 What did you do to make sure that the reflections you drew are accurate?

(Continued on back.)

Home Connection 27 Worksheet (cont.)

3 Preston says that when you reflect a figure over a line, the reflection is always congruent to the original. Do you agree or disagree with him? Explain your answer.

4 Tasha says that this shape has 4 lines of symmetry. Do you agree or disagree with her? Explain your answer and be sure to draw in any lines of symmetry you can find. (Hint: Trace the figure, cut it out, and fold it before you make your decision.)

5 Draw a design or picture that has exactly 2 lines of symmetry. Draw and label the lines of symmetry when you're finished. (If you prefer, you can use a picture from a newspaper or magazine instead of drawing one, but it has to have exactly 2 lines of symmetry.)

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NAME _____ **DATE** _____

Home Connection 28 ★ Activity

Area Bingo Practice

1 Cut out the 2 pages of Area Bingo Cards.

2 For each card listed below, graph the points on page 101 and connect them to form a polygon. Use a ruler so your lines are straight and label the polygon with its card letter.

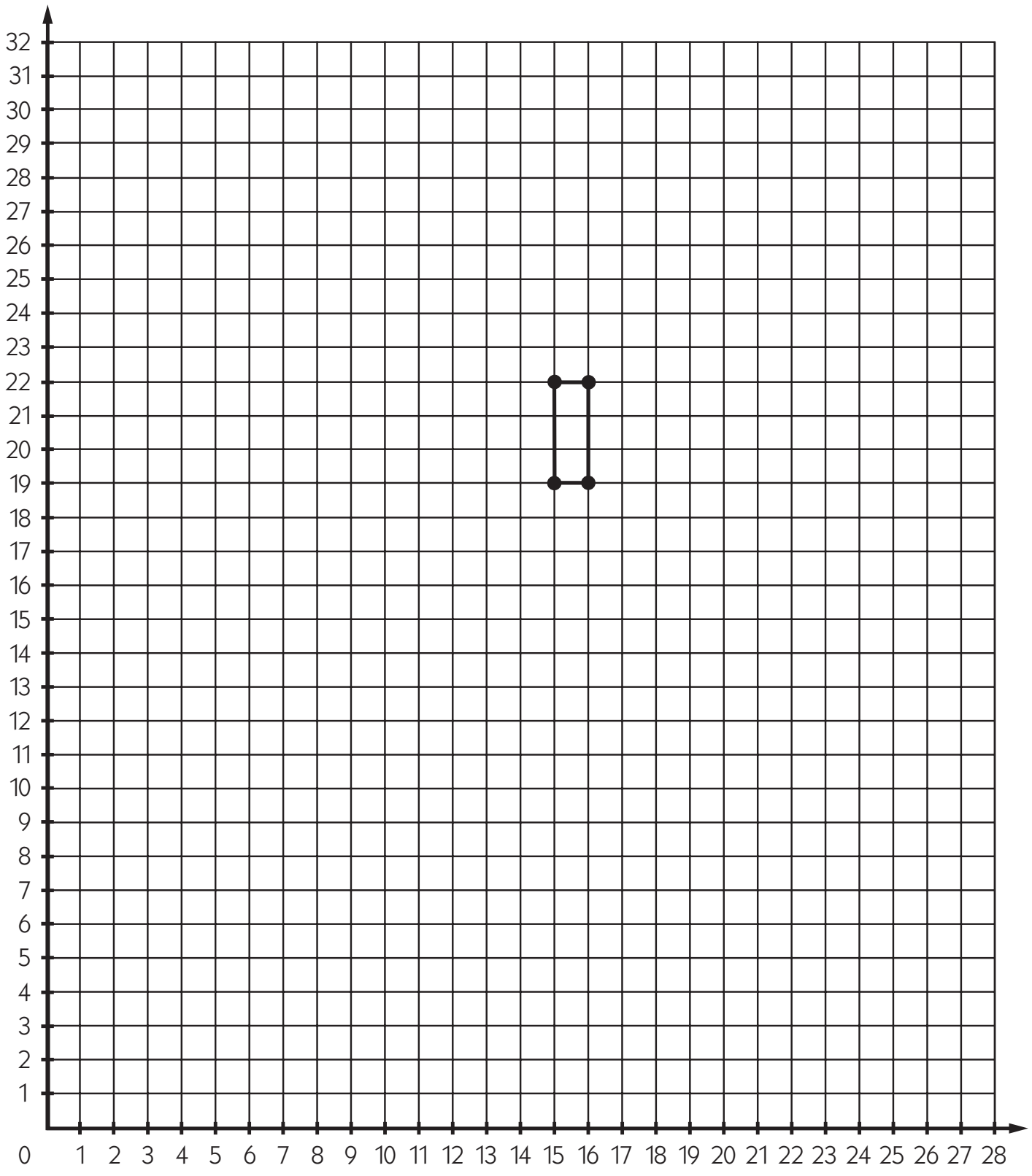
When you graph points, the first number tells you how far *over* and the second number tells you how far *up* to go. To find (3,9), for example, go *over* 3 on the *x*-axis and then *up* 9 on the *y*-axis.

3 Then write the name of the polygon along with its area on the chart below. The first one is done for you as an example.

Card	Polygon Name	Area
Card C	**example** Rectangle	3 square units
Card E		
Card G		
Card H		
Card I		
Card L		

(Continued on next page.)

Home Connection 28 Activity (cont.)



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NAME _____ DATE _____

Home Connection 28 Activity (cont.)

Cut out the cards on this page. Put them in a small envelope or plastic sandwich bag and bring them back to school when you return this assignment.

A	B	C	D
(2, 14) (3, 14) (4, 15) (3, 15) **HC 28** Area Bingo Card	(25, 18) (25, 20) (23, 20) **HC 28** Area Bingo Card	(15, 19) (15, 22) (16, 22) (16, 19) **HC 28** Area Bingo Card	(4, 13) (6, 13) (4, 15) (6, 15) **HC 28** Area Bingo Card
E	**F**	**G**	**H**
(2, 4) (2, 6) (7, 5) **HC 28** Area Bingo Card	(12, 20) (15, 20) (13, 22) (10, 22) **HC 28** Area Bingo Card	(10, 4) (17, 4) (17, 5) (10, 5) **HC 28** Area Bingo Card	(18, 14) (18, 16) (10, 16) **HC 28** Area Bingo Card

NAME _____ DATE _____

Home Connection 28 Activity (cont.)

Cut out the cards on this page. Put them in a small envelope or plastic sandwich bag and bring them back to school when you return this assignment.

I (22, 18) (22, 21) (25, 21) (25, 18) **HC 28** Area Bingo Card	**J** (21, 8) (25, 8) (25, 3) **HC 28** Area Bingo Card	**K** (7, 12) (6, 13) (17, 13) (18, 12) **HC 28** Area Bingo Card	**L** (20, 5) (23, 5) (20, 9) (17, 9) **HC 28** Area Bingo Card
M (5, 20) (8, 20) (8, 27) (5, 27) **HC 28** Area Bingo Card	**N** (14, 21) (25, 21) (14, 25) **HC 28** Area Bingo Card	**O** (10, 32) (13, 22) (16, 32) **HC 28** Area Bingo Card	**P** (7, 5) (15, 5) (10, 8) (2, 8) **HC 28** Area Bingo Card

NAME _____ DATE _____

Home Connection 28 Activity (cont.)

Cut out the cards on this page. Put them in a small envelope or plastic sandwich bag and bring them back to school when you return this assignment.

Q	R	S	T
(9, 19) (10, 19) (10, 32) (9, 32) **HC 28** Area Bingo Card	(17, 24) (17, 26) (24, 26) (24, 24) **HC 28** Area Bingo Card	(2, 9) (8, 9) (2, 5) **HC 28** Area Bingo Card	(0, 20) (4, 20) (0, 28) **HC 28** Area Bingo Card
U	**V**	**W**	**X**
(20, 0) (27, 0) (20, 8) **HC 28** Area Bingo Card	(17, 27) (19, 32) (25, 32) (23, 27) **HC 28** Area Bingo Card	(27, 1) (28, 1) (28, 32) (27, 32) **HC 28** Area Bingo Card	(0, 28) (8, 28) (8, 32) (0, 32) **HC 28** Area Bingo Card

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NAME _____ **DATE** _____

Home Connection 29 ★ Worksheet

Drawing Similar Figures

1 Graph the following points in order on the next page. Remember that the first number in each pair tells you how far to go over, and the second number tells you how far to go up. Then use a ruler or straight-edge to connect them in the same order: (1, 0), (1, 9), (3, 9), (5, 7), (7, 9), (9, 9), (9, 0), (7, 0), (7, 6), (5, 4), (3, 6), (3, 0) and back to (1, 0).

2 Describe the figure you got when you connected the points in order.

3a Multiply each pair of coordinates by 3. Write the answers in the table below.

Original coordinates	Coordinates multiplied by 3
(1, 0)	(3, 0)
(1, 9)	(3, 27)
(3, 9)	(9, 27)
(5, 7)	
(7, 9)	
(9, 9)	
(9, 0)	
(7, 0)	
(7, 6)	
(5, 4)	
(3, 6)	
(3, 0)	
(1, 0)	

b Now graph these points in order on the next page and use your ruler or straight-edge to connect them.

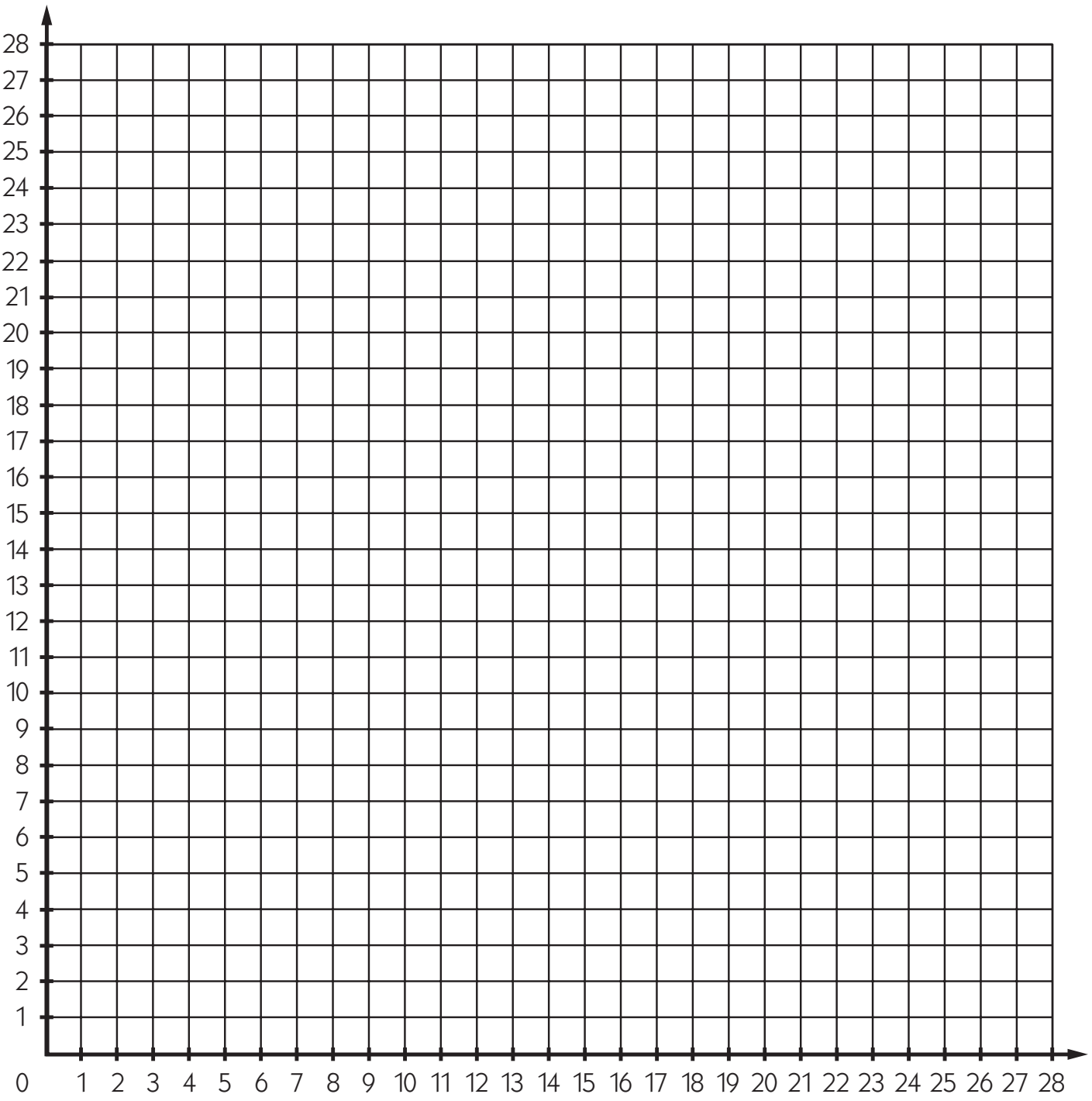
4a Divide each pair of coordinates by 2. Write the answers in the table below.

Original coordinates	Coordinates divided by 2
(1, 0)	$(\frac{1}{2}, 0)$
(1, 9)	$(\frac{1}{2}, 4\frac{1}{2})$
(3, 9)	$(1\frac{1}{2}, 4\frac{1}{2})$
(5, 7)	
(7, 9)	
(9, 9)	
(9, 0)	
(7, 0)	
(7, 6)	
(5, 4)	
(3, 6)	
(3, 0)	
(1, 0)	

b Now graph these points in order on the next page and use your ruler or straight-edge to connect them.

(Continued on next page.)

Home Connection 29 Activity (cont.)



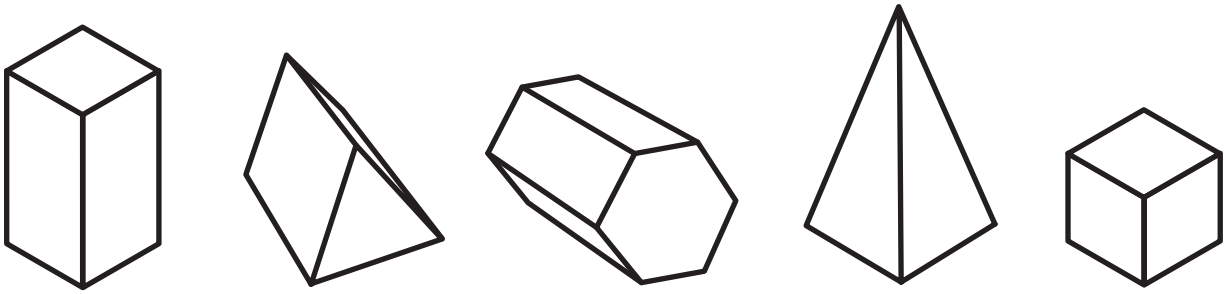
5 Write any observations you can make about the 3 figures. How are they alike? How are they different? How do they compare to one another in size and shape?

NAME _____ **DATE** _____

Home Connection 30 ★ Activity

Net Picks

A *net* is a 2-dimensional figure that can be cut and folded to form a 3-dimensional figure. On pages 115 and 117, you'll find five different nets. Each one will form one of the 3-dimensional figures shown below.

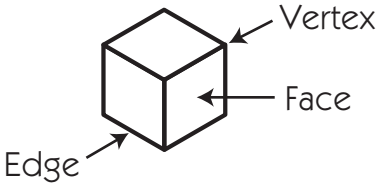


Rectangular Prism | Triangular Prism | Hexagonal Prism | Square-Based Pyramid | Cube

1 Predict which 3-dimensional shape each net represents and record your prediction on the chart below.

2 Cut out each net along the heavy outline and fold it on the thin lines to form a 3-dimensional shape.

3 Use the shapes you just folded to help fill in the rest of the chart. (Write in the figures you really get when you fold each net if they're different than your predictions.)



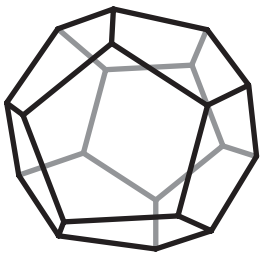
Net	Prediction/Actual Figure	Number of Faces	Number of Edges	Number of Vertices
a				
b				
c				
d				
e				

(Continued on back.)

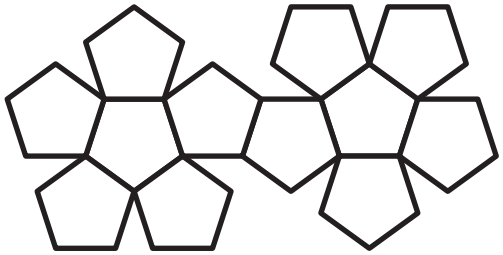
Home Connection 30 Worksheet (cont.)

CHALLENGE

4 In his famous book *The Phantom Tollbooth*, Norton Juster invented a character with 12 different faces. He based his idea on a 3-dimensional figure known as a dodecahedron. Here's a picture of a dodecahedron with its net.



Dodecahedron



Net for a Dodecahedron

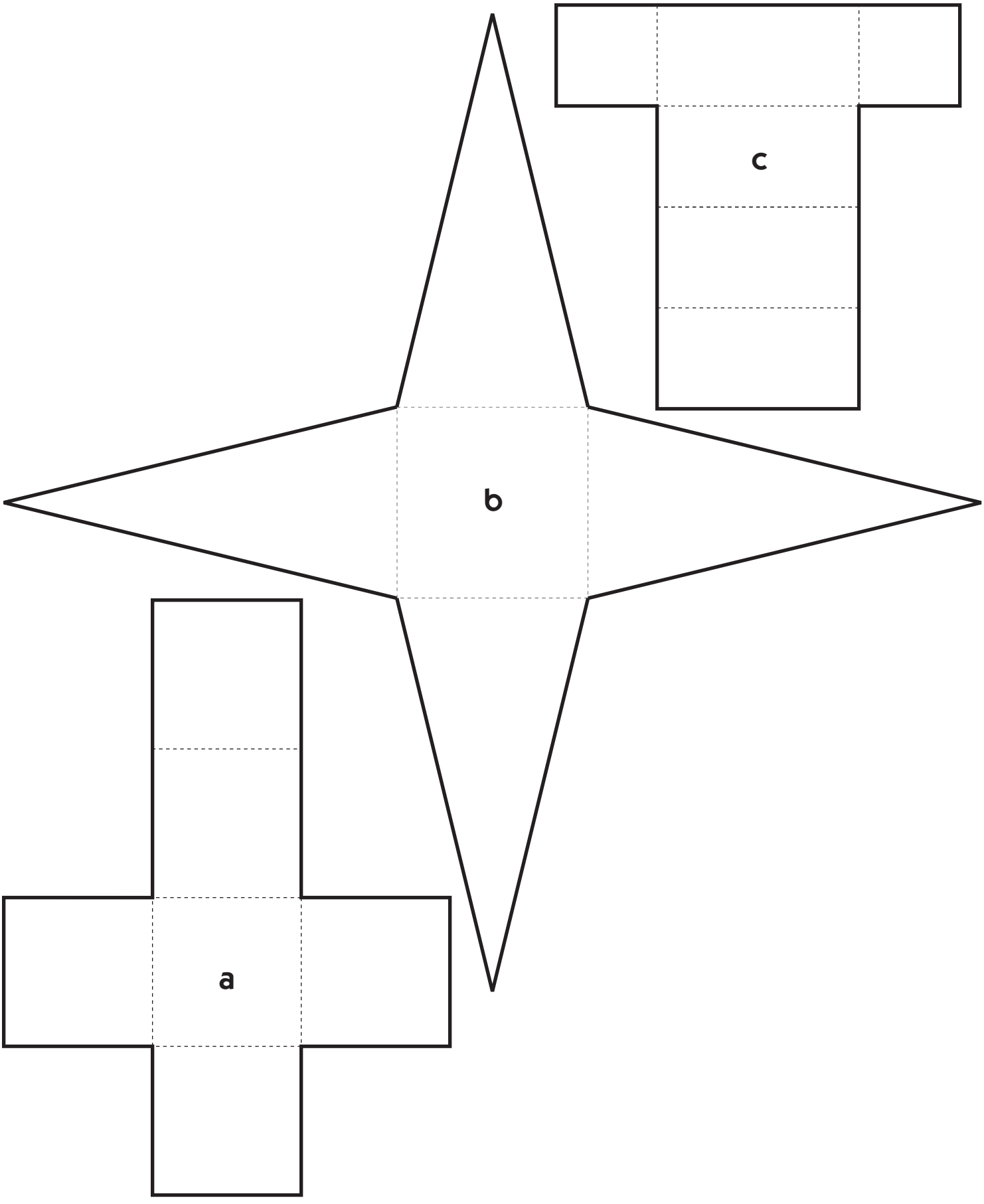
a Choose your favorite of the 5 figures you just cut out and folded. Unfold it and use crayons, colored pencils, or felt markers to turn it into some kind of character. Then fold it back up and use a little tape along the edges so it stays together.

b In the space below, write a descriptive paragraph about the character you just invented. Bring your character and your paragraph back to school to share with the class.

(Continued on next page.)

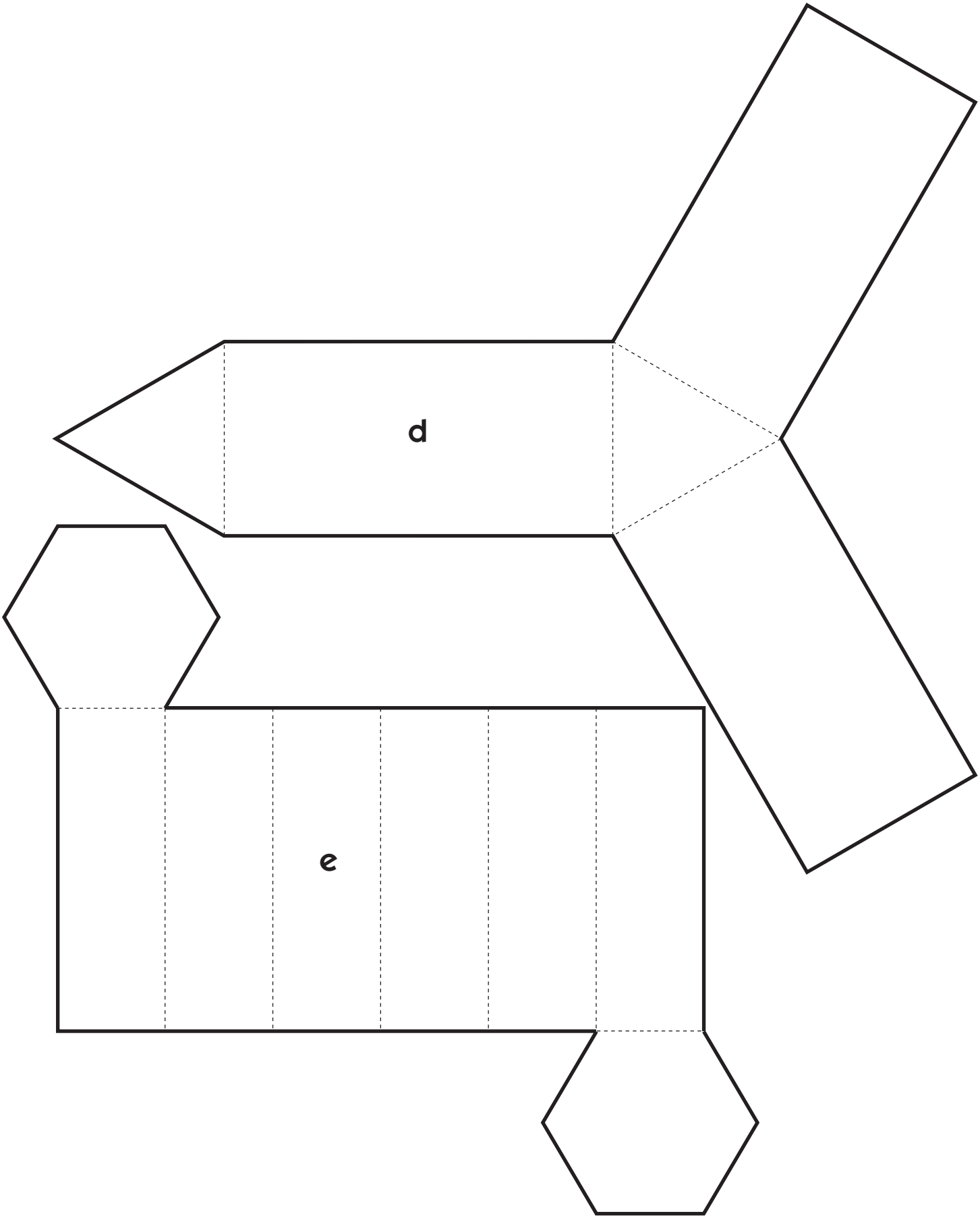
NAME _____ DATE _____

Home Connection 30 Activity (cont.)



NAME _____ DATE _____

Home Connection 30 Activity (cont.)



NAME _____ **DATE** _____

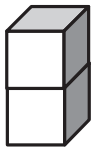
Home Connection 31 ★ Worksheet

Volume & Surface Area

The *volume* of a solid figure tells you how many cubes of a given size it takes to build that figure. Volume is measured in cubic units or cubes.

The *surface area* of a solid figure is what you get when you find the area of every surface, including the top and the bottom, and then add all the areas together. Surface area is measured in square units or squares.

This figure took 2 centimeter cubes to build, so its volume is 2 cubic cm (also written cm^3). There is 1 square on the top, 1 on the bottom, and 2 more squares on each of the 4 sides, so its surface area is 10 square cm (also written cm^2).

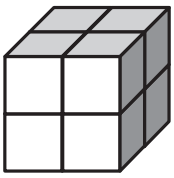


Volume = 2 cubic cm

Surface Area = 10 square cm

1 Find the volume and surface area of each cube building shown below and on the back of this page (building d is an optional challenge.) Use labeled sketches, numbers, and/or words to show how you got your answers for each building.

a

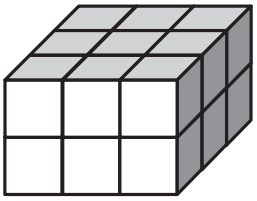


Volume = _____

Surface Area = _____

Explanation:

b



Volume = _____

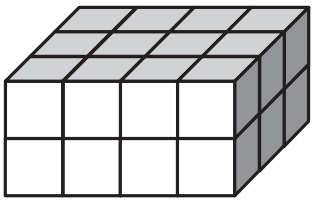
Surface Area = _____

Explanation:

(Continued on back.)

Home Connection 31 Activity (cont.)

1c



Volume = _____

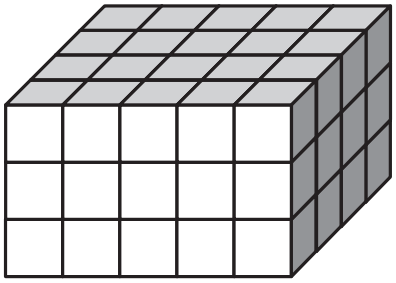
Surface Area = _____

Explanation:

2 Nguyen says it's easier to find the surface area of a cube than of other kinds of rectangular solids. Do you agree or disagree with him? Explain your answer.

CHALLENGE

d



Volume = _____

Surface Area = _____

Explanation: