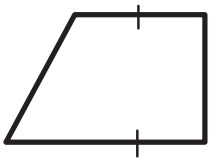
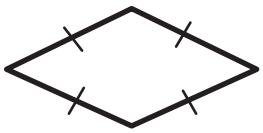
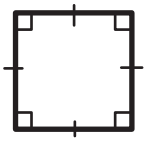
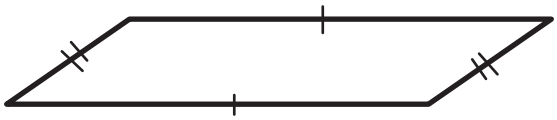
NAME _____ **DATE** _____

Classifying Quadrilaterals

A *quadrilateral* is any polygon that has 4 sides. There are many kinds of quadrilaterals, including:

Trapezoid: a quadrilateral with exactly 1 pair of parallel sides 	Rectangle: a quadrilateral with 2 pairs of parallel sides and 4 right angles 
Rhombus: a quadrilateral with 4 sides that are all the same length 	Square: a quadrilateral with 4 right angles and 4 sides that are all the same length 
Parallelogram: a quadrilateral with 2 pairs of parallel sides 	

1 Look carefully at the figures below. Decide how many right angles, pairs of congruent sides, and pairs of parallel sides each has. Then circle the word or words that say what kind of figure it is. You might circle more than one word for some figures.

Figure	Right Angles?	Pairs of Congruent Sides?	Pairs of Parallel Sides?	Circle the word(s) that describe(s) the figure.
a 				trapezoid rectangle rhombus square parallelogram
b 				trapezoid rectangle rhombus square parallelogram
c 				trapezoid rectangle rhombus square parallelogram

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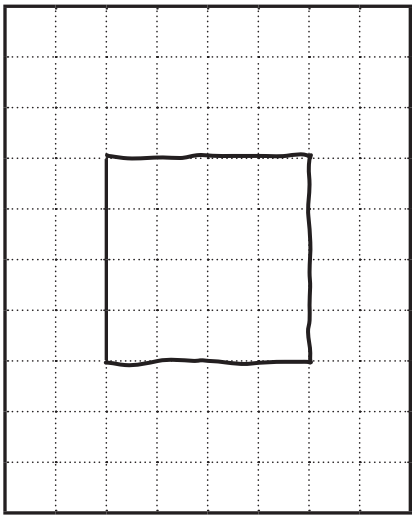
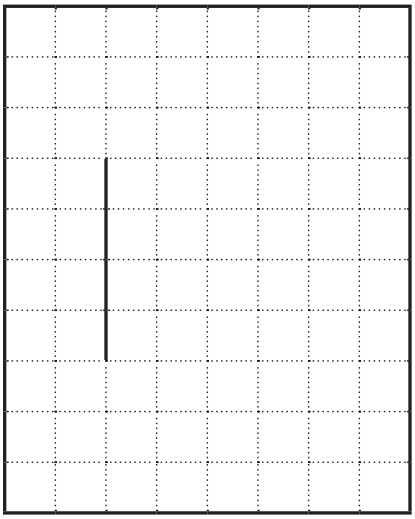
Drawing Quadrilaterals

1 Start with the same line each time to draw the different shapes named below.

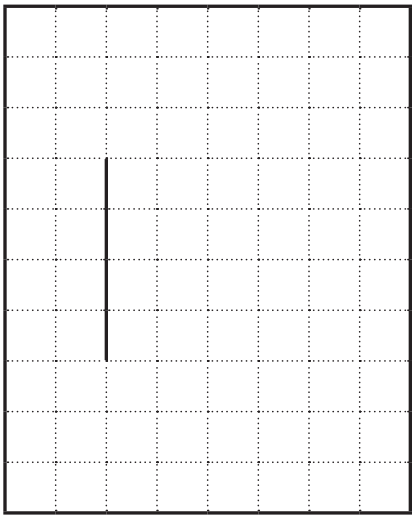
ex Square



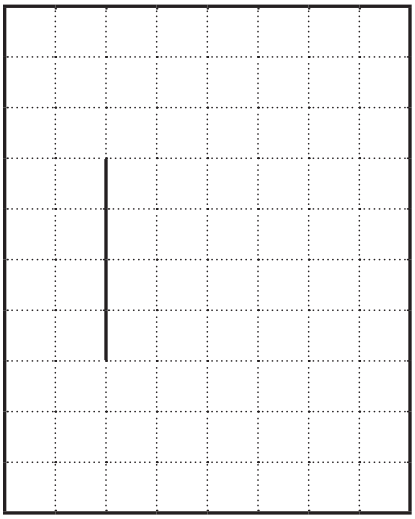
a Parallelogram that is not a rhombus or rectangle



b Trapezoid



c Rectangle that is not a square



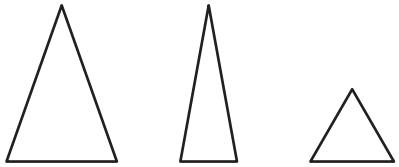
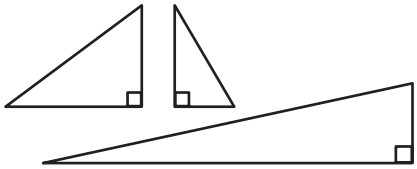
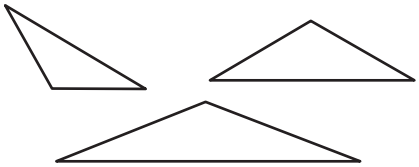
CHALLENGE

2 Which of your shapes above has the largest area? How can you tell?

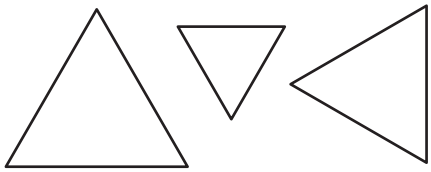
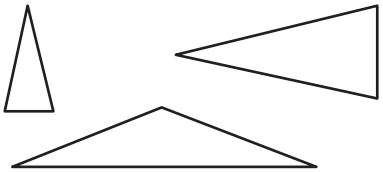
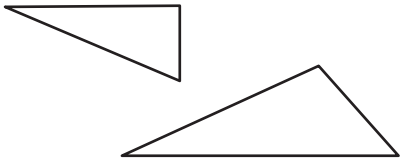
NAME _____ **DATE** _____

Classifying Triangles

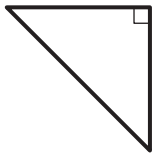
You can group triangles by the size of their angles.

Acute triangles All 3 angles are acute.	Right triangles 1 angle is a right angle.	Obtuse triangles 1 angle is an obtuse angle.
		

You can also group triangles by the lengths of their sides.

Equilateral triangles All 3 sides are the same length.	Isosceles triangles 2 sides are the same length.	Scalene triangles No sides are the same length.
		

1 Look carefully at the triangles below and fill in the chart.

Triangle	Acute Angles?	Right Angles?	Obtuse Angles?	Congruent Sides?	What Kind? (circle as many as apply)
a 					acute equilateral right isosceles obtuse scalene
b 					acute equilateral right isosceles obtuse scalene

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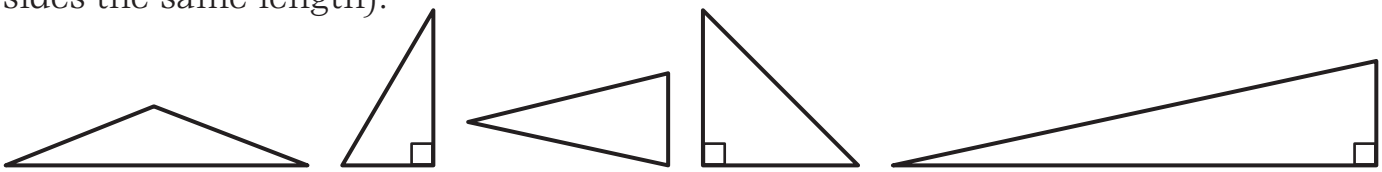
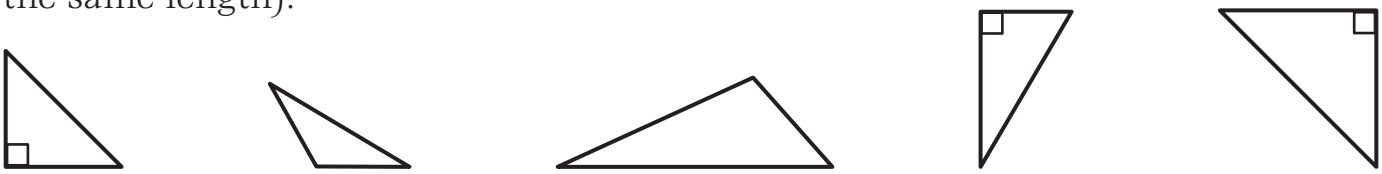
Identifying & Drawing Triangles

1 Circle the *right triangle* (one right angle) that is also an *isosceles triangle* (two sides the same length).

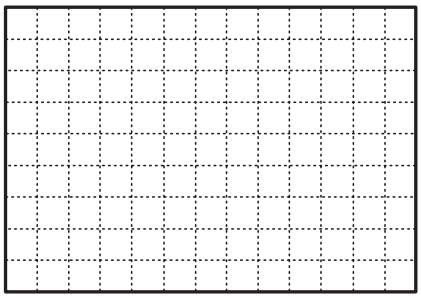


2 Circle the *right triangle* (one right angle) that is also a *scalene triangle* (no sides the same length).

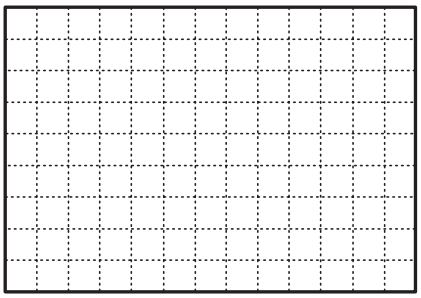


3 Draw the triangles described below.

a An obtuse isosceles triangle

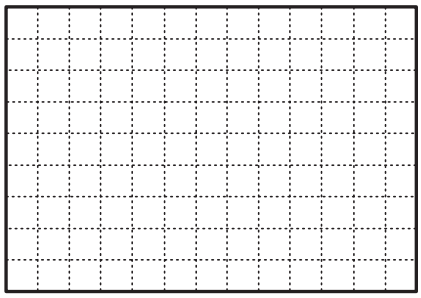


b An acute isosceles triangle



CHALLENGE

4 Lawrence said he drew a right obtuse triangle. Rosa said that was impossible. Explain why Rosa is correct.



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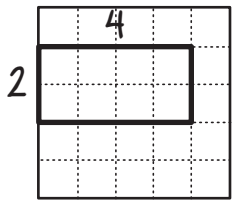
Finding the Areas of Rectangles, Triangles & Parallelograms

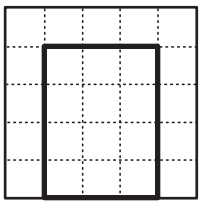
1 Find the area of each rectangle below. Each small square has an area of 1 square unit.

ex

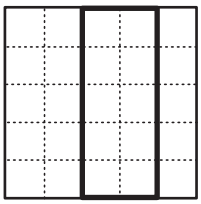


$2 \times 4 = 8$
8 square units

a

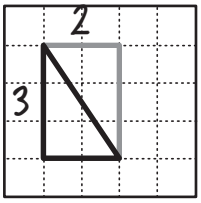


b



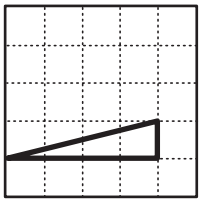
2 Find the area of each triangle below. Each small square has an area of 1 square unit.

ex

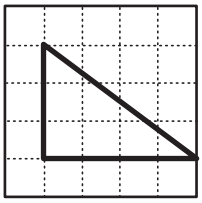


$(3 \times 2) \div 2 = 3$
3 square units

a

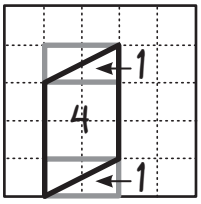


b



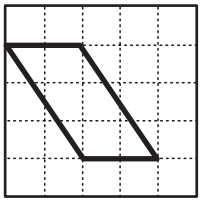
3 Find the area of each parallelogram below. Each small square has an area of 1 square unit.

ex

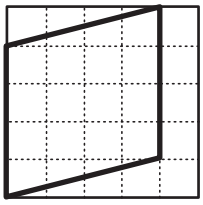


$2 \div 2 = 1$
$2 \times 2 = 4$
$1 + 1 + 4 = 6$
6 square units

a



b



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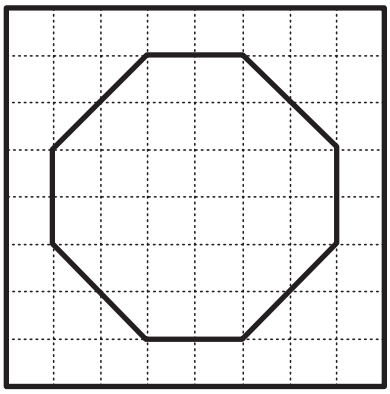
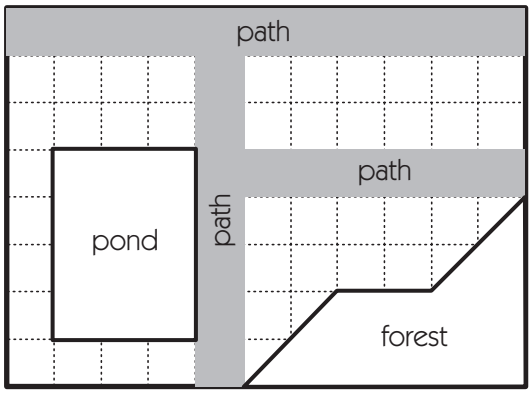
Area Story Problems

1 A spider spun a web shaped like this on our screen door. What area (in square units) did the web cover? Show all your work.



2 This is a map of the park near Sam's house. Any place that is not a path, the pond, or the forest is covered in grass. If each square represents 9 square yards, what area of the park is covered in grass? Show all your work.



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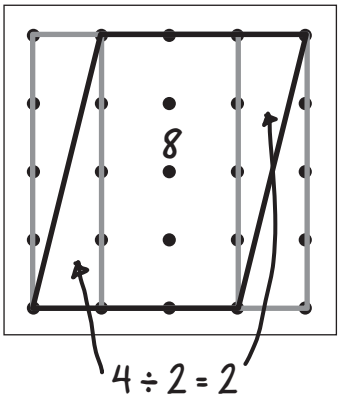
Finding the Areas of Quadrilaterals

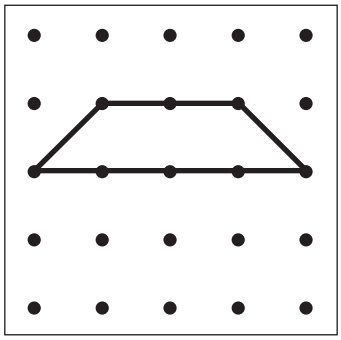
Find the area of each of these figures if the area of each small square on the geoboard is 1 square unit. Remember that you can divide the figures into pieces or draw shapes around them to help you find the area.

ex Area = 12 sq. units

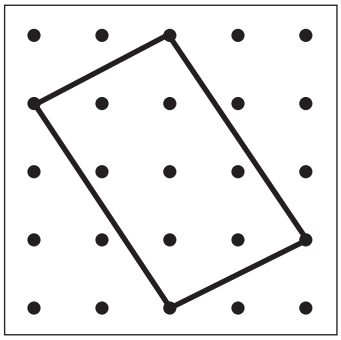


2 + 2 + 8 = 12 sq. units

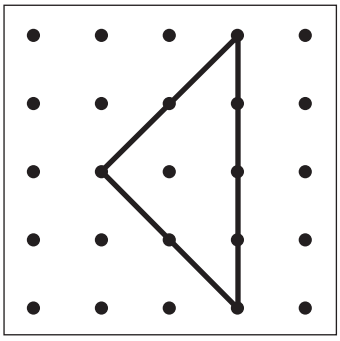
1 Area = _____



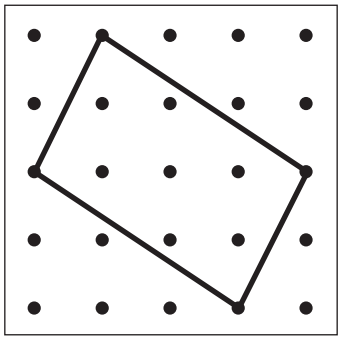
2 Area = _____



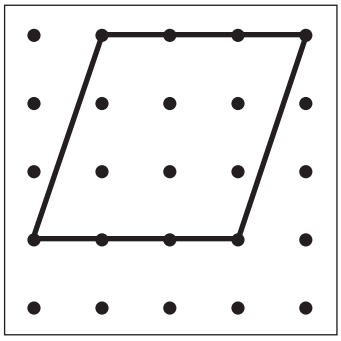
3 Area = _____



4 Area = _____



5 Area = _____



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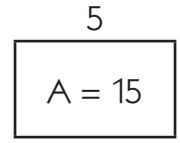
Length & Perimeter

1 Use a ruler marked in inches to measure each strip to the nearest eighth of an inch.

Strip	Measurement
ex 	$3\frac{1}{8}$ inches
a 	
b 	
c 	

2 The rectangle below has a perimeter of 16 and an area of 15. Sketch three other rectangles that have a perimeter of 16. Then find the area of each rectangle.



CHALLENGE

3 If you made a circle that was 16 inches around (had a circumference of 16 inches), do you think it would have an area that was greater or less than a square with a perimeter of 16 inches? Explain your answer.

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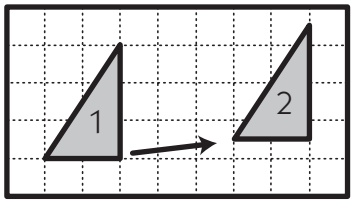
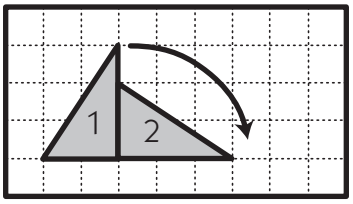
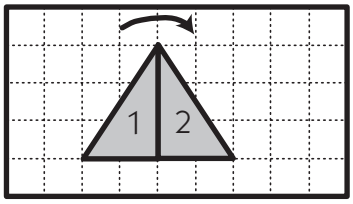
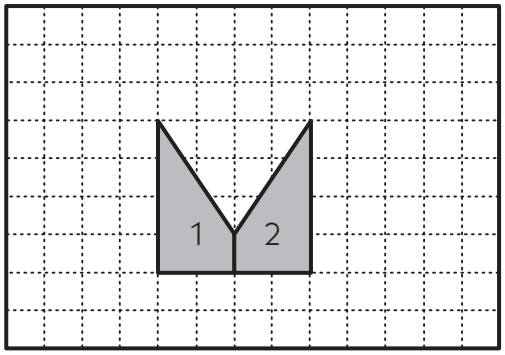
Naming Transformations

There are three different kinds of *transformations*.

Slide (translation)	Turn (rotation)	Flip (reflection)
		

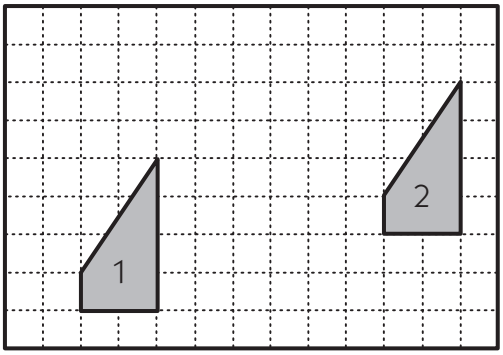
1 Fill in the circle to name the transformation on each grid.

a



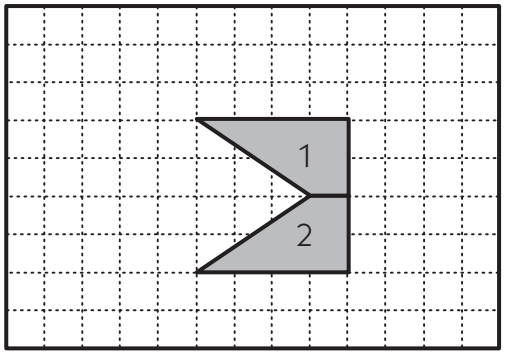
○ slide ○ turn ○ flip

b



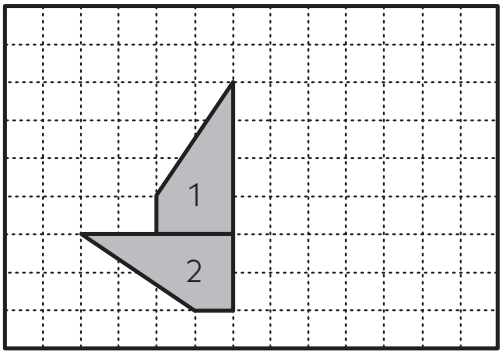
○ slide ○ turn ○ flip

c



○ slide ○ turn ○ flip

d



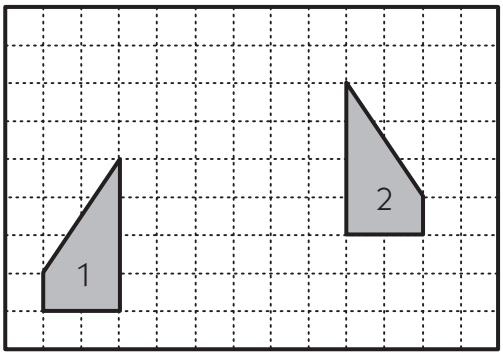
○ slide ○ turn ○ flip

NAME _____ **DATE** _____

Which Two Transformations?

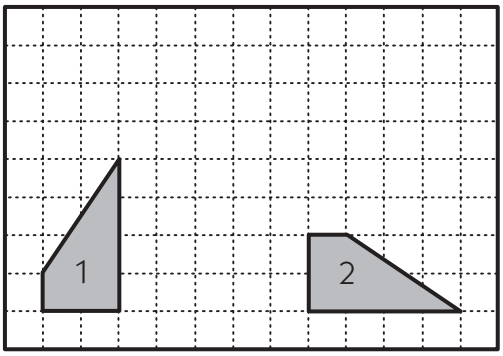
1 Fill in the circle to show which two transformations were performed on the figure.

ex



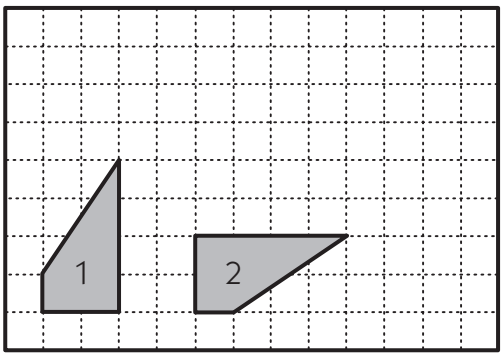
○ turn then flip ● flip then slide ○ turn then slide

a



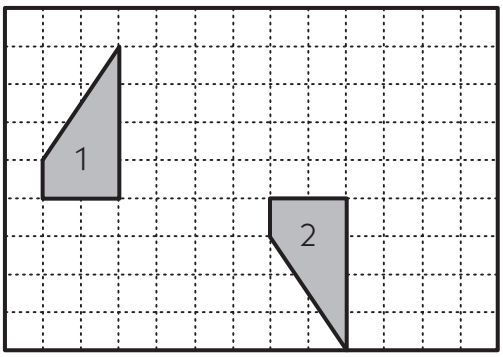
○ turn then flip ○ flip then slide ○ turn then slide

b



○ flip then turn ○ flip then slide ○ turn then slide

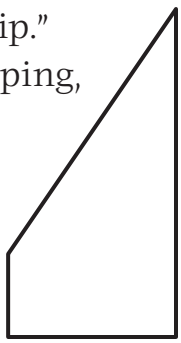
c



○ turn then flip ○ flip then slide ○ turn then slide

CHALLENGE

2 Paul said that the example in problem 1 above could be "slide then flip." Jenny said, "Maybe it never matters what order you do the turning, flipping, or sliding." Experiment with Jenny's idea using some grid paper and a cut-out shape that has no symmetry like the shape to the right. Then write what you discovered on a separate sheet of paper.



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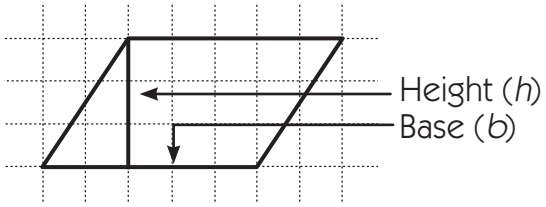
Finding the Areas of Parallelograms

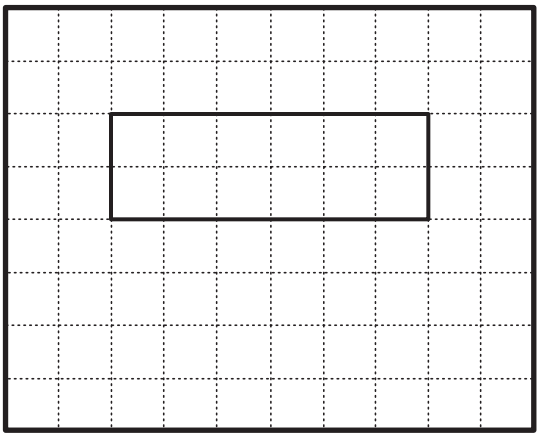
To find the area of any parallelogram, including squares and rectangles, multiply the base by the height.

Base × Height = Area
5 × 3 = 15 square units



1 Multiply the base by the height to find the area of these parallelograms.

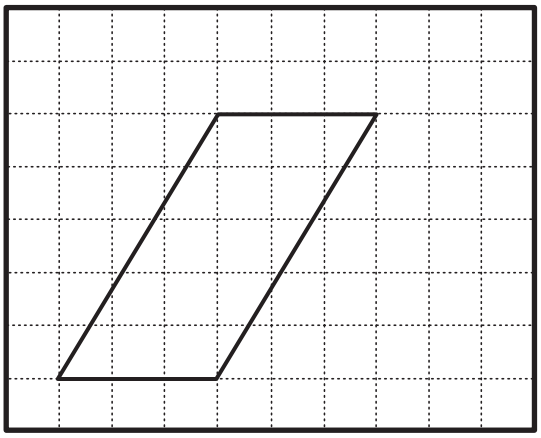
ex



Base 6 Height 2

Area 6 × 2 = 12 square units

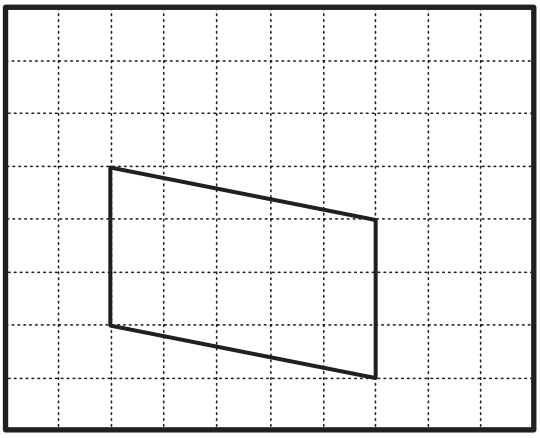
a



Base _____ Height _____

Area _____

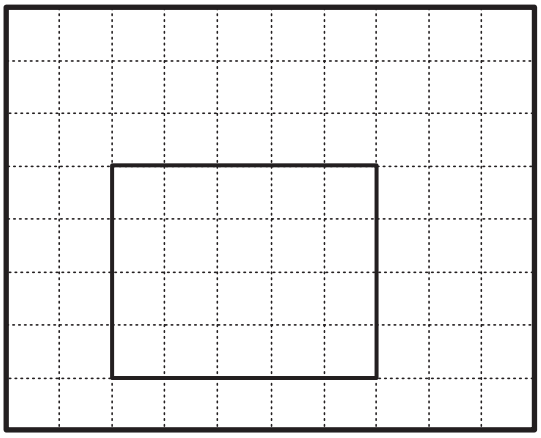
b



Base _____ Height _____

Area _____

c



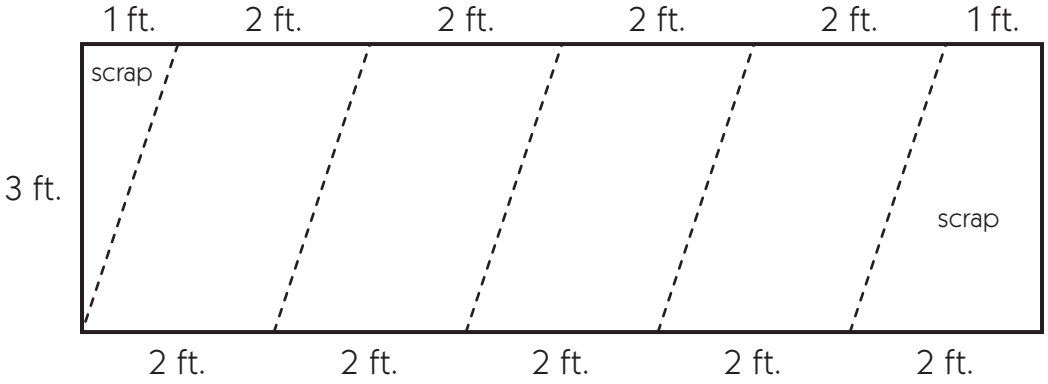
Base _____ Height _____

Area _____

NAME _____ **DATE** _____

The Bulletin Board Problem

1 Maya and Rachel are decorating their classroom bulletin board. They cut a 10-foot piece of chart paper that was 3 feet wide. Then they cut it along the dotted lines shown below to make thick stripes to put on the bulletin board. What was the area of each stripe? Show all your work.



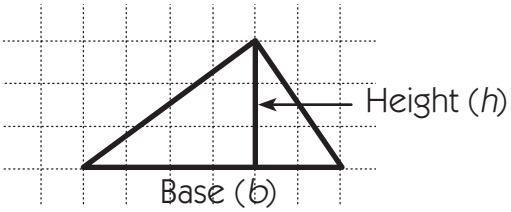
2 How much of the paper (in square feet) was left over as scraps? Show all your work.

NAME _____ **DATE** _____

Finding the Area of a Triangle

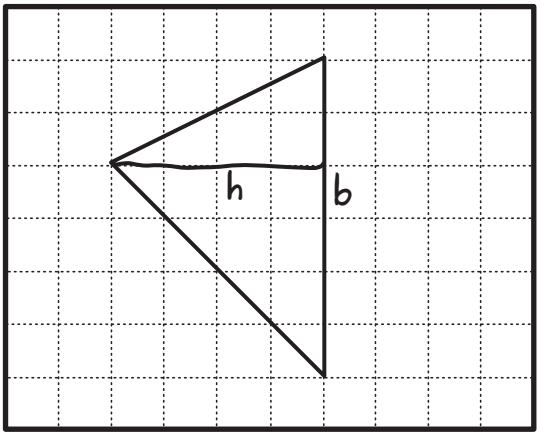
To find the area of any triangle, multiply the base by the height and then divide by 2.

(Base × Height) ÷ 2 = Area
(6 × 3) ÷ 2 = 9 Square Units



1 Label the base and height on each triangle. Then use the formula above to find the area of each one.

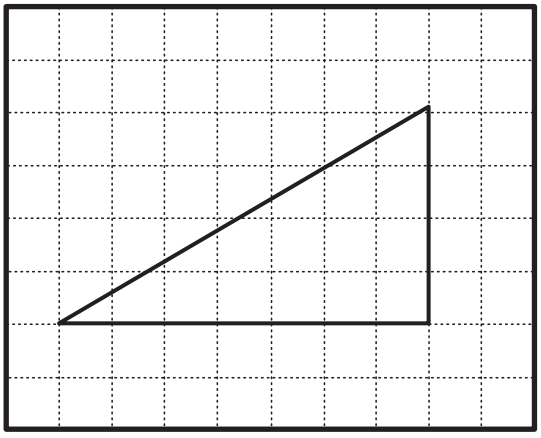
ex



Base 6 Height 4

Area (6 x 4) ÷ 2 = 12 square units

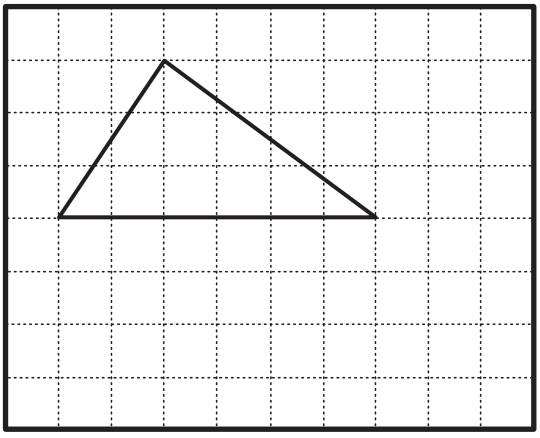
a



Base _____ Height _____

Area _____

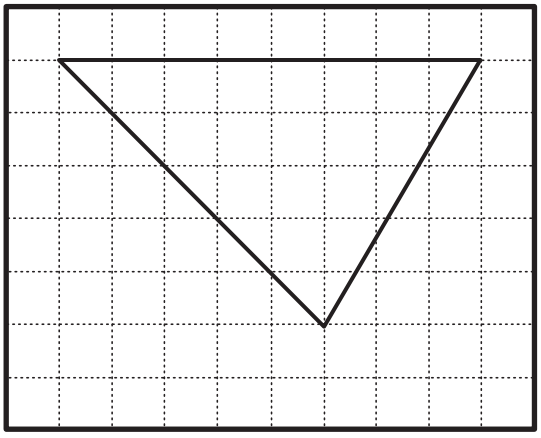
b



Base _____ Height _____

Area _____

c



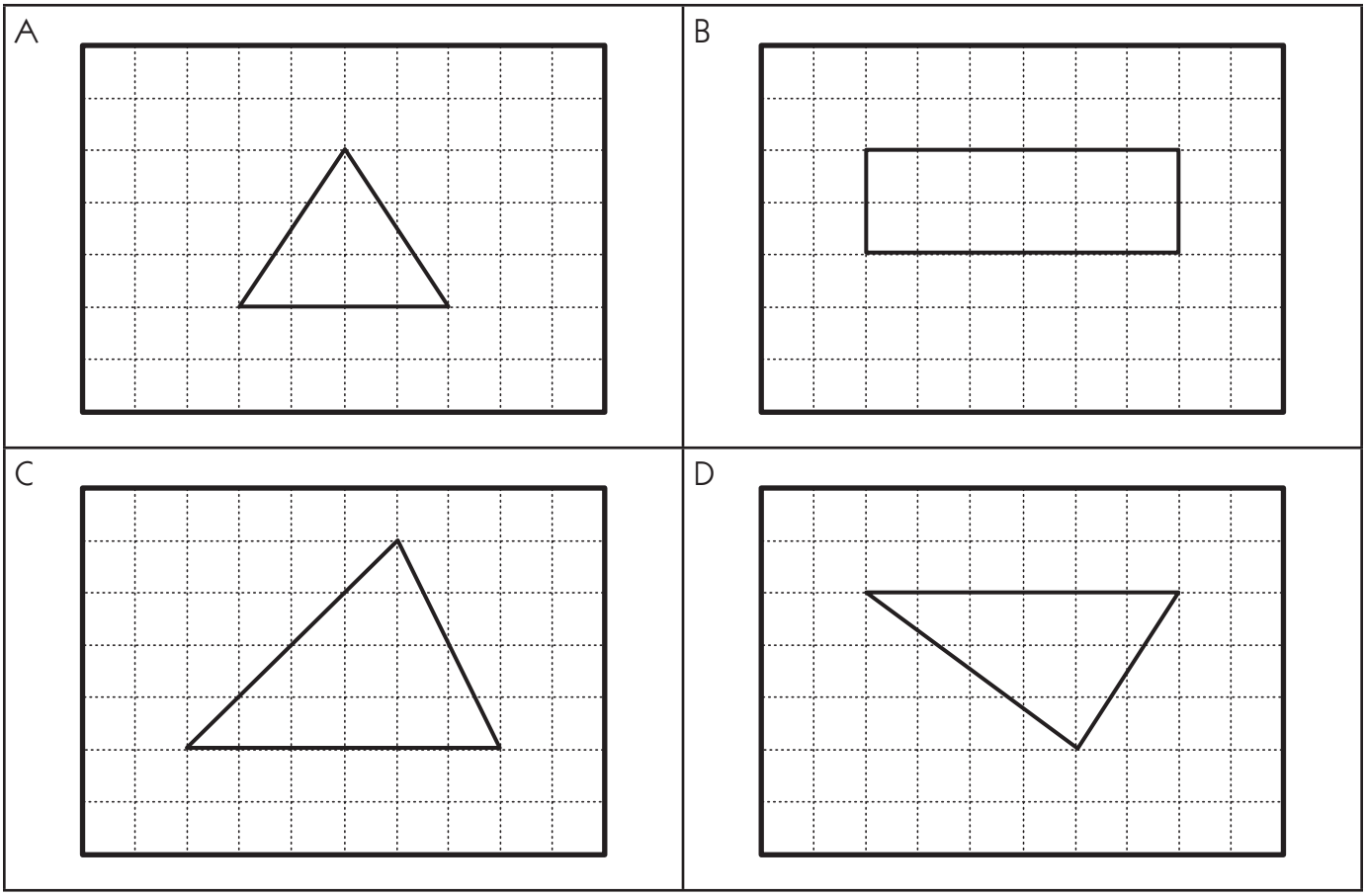
Base _____ Height _____

Area _____

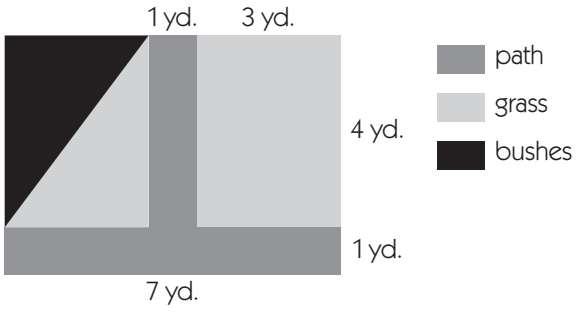
NAME _____ **DATE** _____

More Area Problems

1 Which two figures have exactly the same area? Show your work. _____ and _____



2a This is a map of Mrs. Jackson's backyard. If there are 18 square yards of grass, how many square yards of bushes are there in her backyard?



b Remember that there are 3 feet in a yard. How many *square feet* of bushes are there in Mrs. Jackson's backyard?

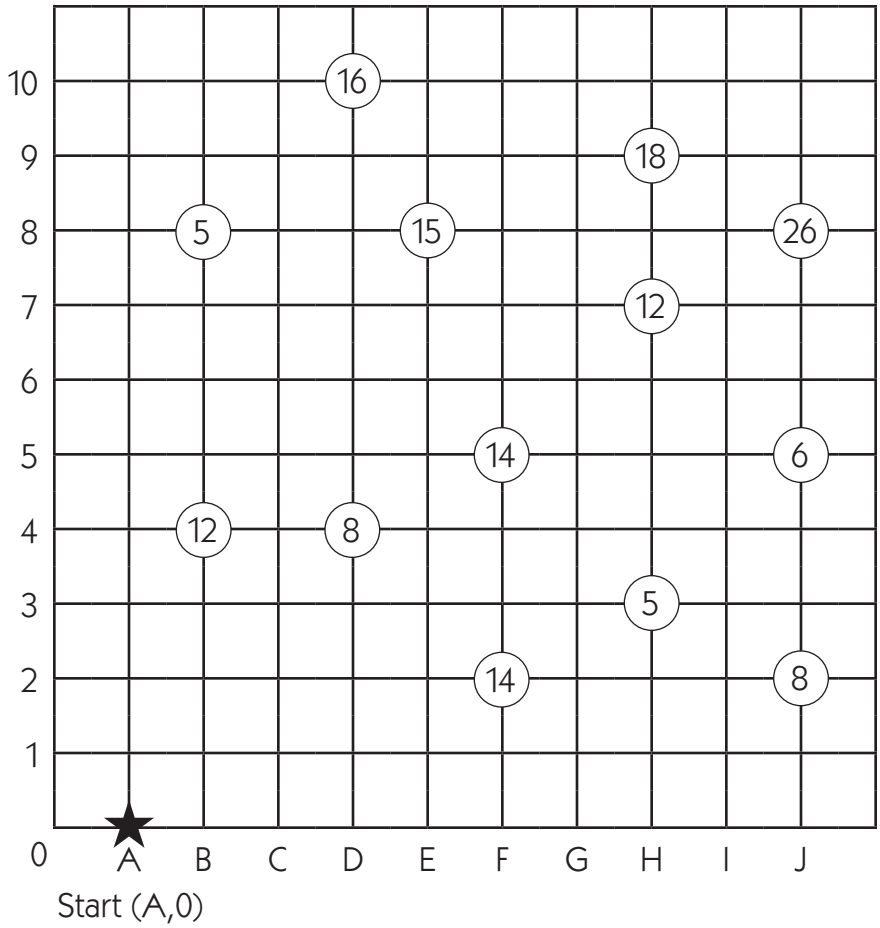
NAME _____ **DATE** _____

Rita's Robot

1 Pirate Rita built a robot to go out and collect treasure for her. She needs to program the robot so it knows where to go on the map.

The robot can only collect 90 gold coins before it has to come back, and it can only travel along the grid lines (not on the diagonals). It can travel only 30 spaces before it runs out of fuel.

Help Pirate Rita program the robot to collect as much treasure as it can carry and return to the starting point before it runs out of fuel. Draw on the map at right, and keep track of the robot's moves on the table below.



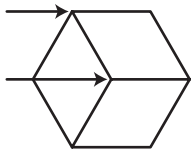
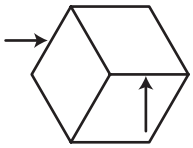
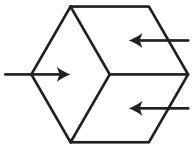
Destination Coordinates	Spaces Moved	Running Total of Spaces Moved	Coins Collected	Running Total of Coins Collected

NAME _____ **DATE** _____

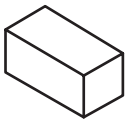
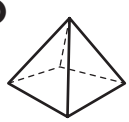
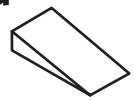
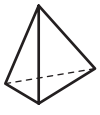
Faces, Edges & Vertices

1 Use each word one time to show what part of the cube the arrows are pointing to in each picture.

edges faces vertices

a _____ 	**b** _____ 	**c** _____ 

2 Fill in the table to describe and name each three-dimensional figure.

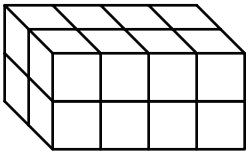
	Faces	Edges	Vertices	Shape Name
ex 	6	12	8	cube
a 				
b 				
c 				
d 				
e 				
f 				

NAME _____ **DATE** _____

Surface Area & Volume

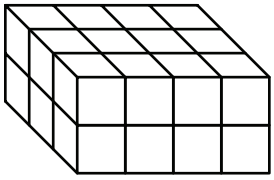
1 Each figure below is built out of centimeter cubes. Find the surface area and volume of each one.

ex



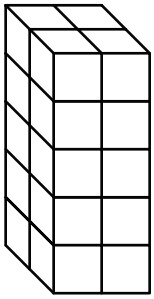
Surface Area	Volume
2 x 2 x 2 = 8 4 x 2 x 4 = 32 8 + 32 = 40 sq. cm.	2 x 2 x 4 = 16 cubic cm.

a



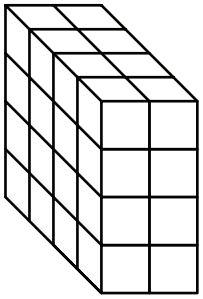
Surface Area	Volume

b



Surface Area	Volume

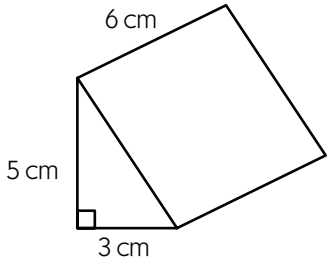
c



Surface Area	Volume

CHALLENGE

2 Find the volume of this triangular prism.

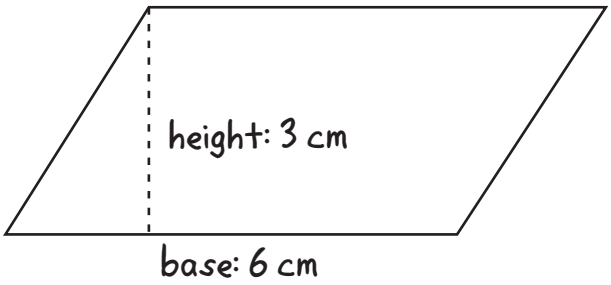


NAME _____ **DATE** _____

Measuring to Find the Area

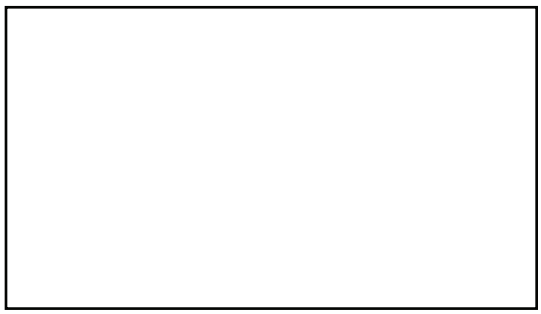
1 Use the centimeter side of a ruler to measure the height and base of each figure. Label them and then find the area.

ex



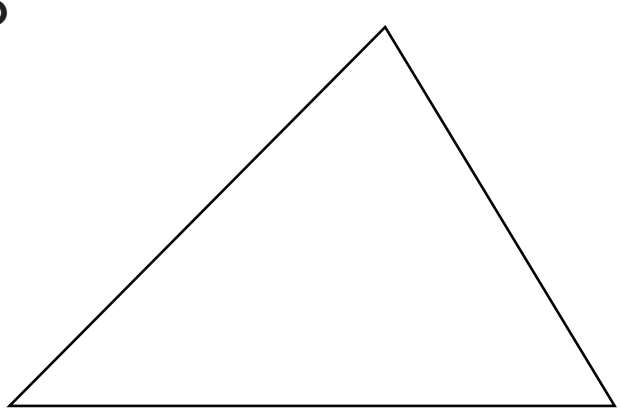
Area 3 cm x 6 cm = 18 sq. cm

a



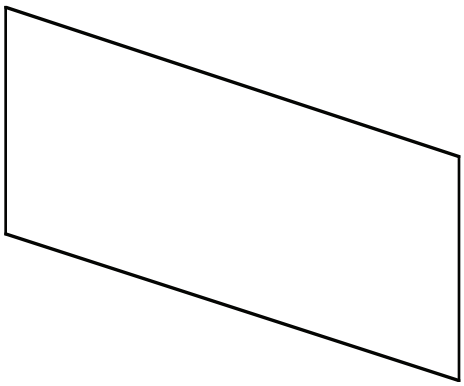
Area _____

b



Area _____

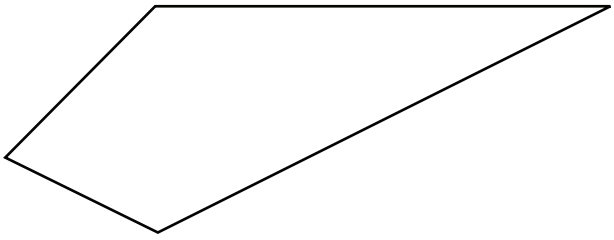
c



Area _____

CHALLENGE

2 Measure parts of this figure and then find the area. You might want to divide it into pieces.

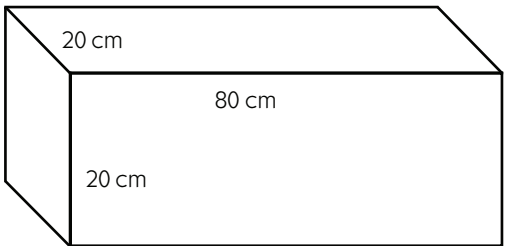


NAME _____ **DATE** _____

Volume & Surface Area of Rectangular & Triangular Prisms

Find the volume and surface area of each prism below.

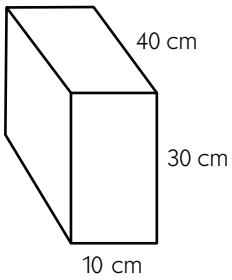
1



Volume: _____

Surface Area: _____

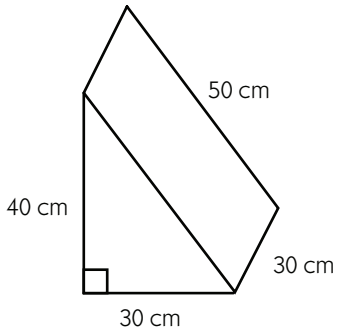
2



Volume: _____

Surface Area: _____

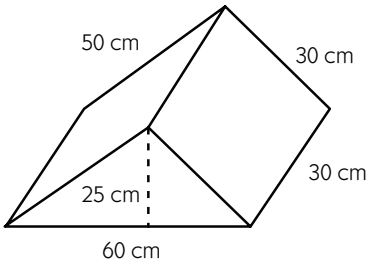
3



Volume: _____

Surface Area: _____

4



Volume: _____

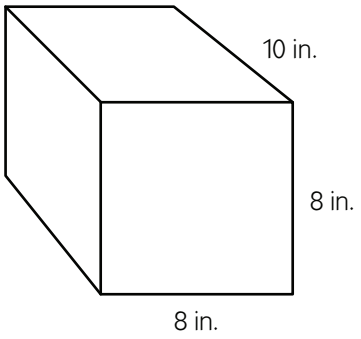
Surface Area: _____

NAME _____ **DATE** _____

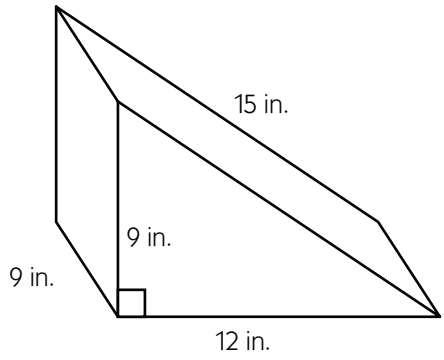
Surface Area & Volume Story Problems

1 Jerome is wrapping these two presents for his mom's birthday. Which one will it take more wrapping paper to cover? Show all your work.

Present A

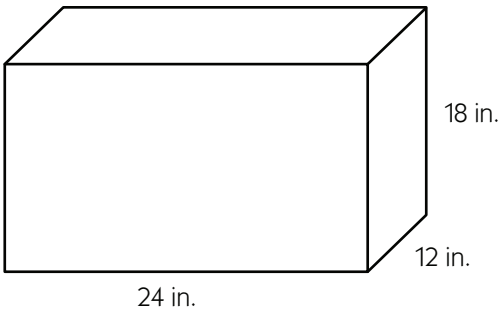


Present B

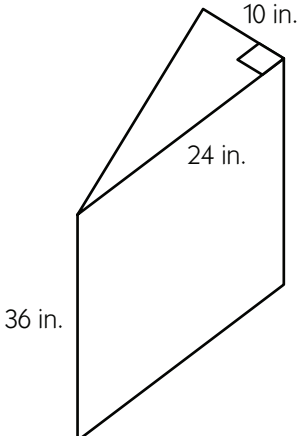


2 Lucy is thinking about buying a fish tank. She likes this traditional fish tank and one shaped like a triangular prism that fits in the corner. Which one holds more water? Show all your work.

Tank A



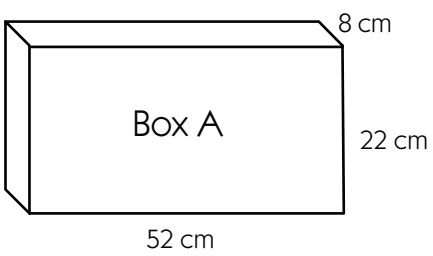
Tank B

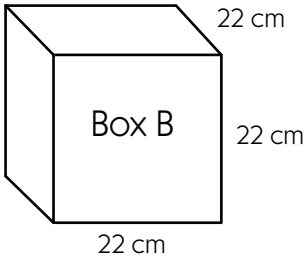


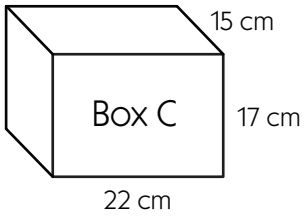
NAME _____ **DATE** _____

Which Box Holds the Most?

1 Ebony's cousin Jada is away at college this year. Ebony wants to send her a package with some candy in it. She has the three boxes shown below. Which box should she use if she wants to send Jada as much candy as possible?







a What do you need to know about the boxes in order to answer the question above?

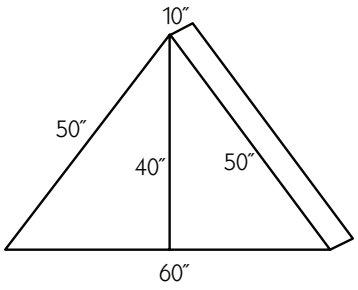
b Solve the problem. Show all your work.

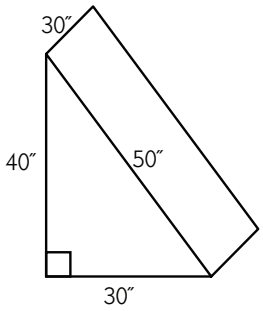
2 Ebony wants to wrap the box in paper before she sends it to Jada. What is the surface area of the box you chose above? Show all your work.

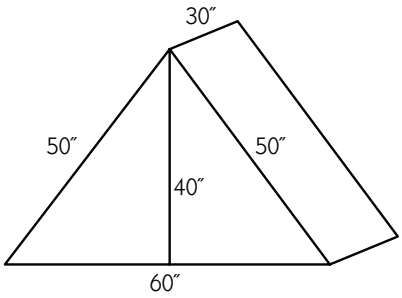
NAME _____ **DATE** _____

Francine's Piece of Wood

1 Francine has a piece of wood that is 18,000 cubic inches in volume. Circle the piece of wood below that could belong to Francine. Show all your work.







CHALLENGE

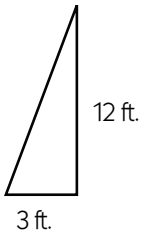
2 What is the surface area of the piece of wood you circled above? Show all your work. (Draw each of the five faces separately if you need to.)

NAME _____ **DATE** _____

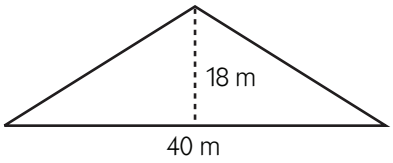
Triangles & Tents

1 Find the area of each triangle below. Show all of your work.

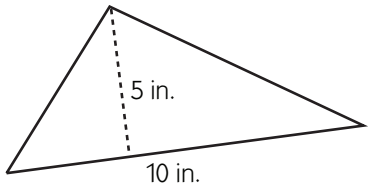
a



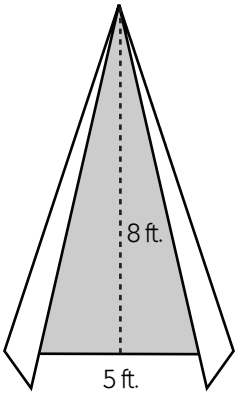
b



c



2 Frank and Samantha are making a tent for their backyard. The tent will have three sides that are all triangles with a base of 5 feet and a height of 8 feet. How many square feet of fabric will they need? Show all of your work.



NAME _____ **DATE** _____

Metric Length, Area & Volume

1a How many meters are in 1 kilometer?

b How many meters are in 3 kilometers?

2 Our school's swimming pool is 25 meters long. If our coach wants us to swim 3 kilometers, how many laps will we need to do? (A lap is two lengths of the pool.) Show all your work.

3 The distance around our school's playing field is 300 meters. If our coach wants us to run 3 kilometers, how many times will we need to run around the field?

CHALLENGE

4a How many centimeters are there in 1 meter?

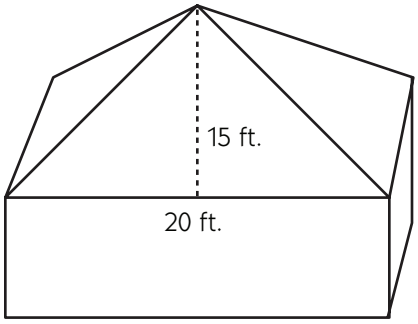
b How many square centimeters are in 1 square meter?

c How many cubic centimeters are in 1 cubic meter?

NAME _____ **DATE** _____

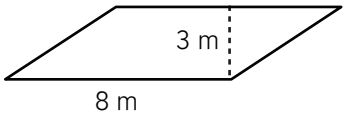
The Garage Roof & The Parking Lot

1 The roof of our garage is made up of 4 identical triangles that are 20 feet wide at the base and 15 feet tall. How many square feet is the roof altogether? Show all of your work.

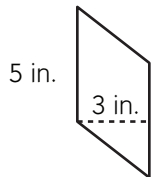


2 Find the area of each parallelogram below.

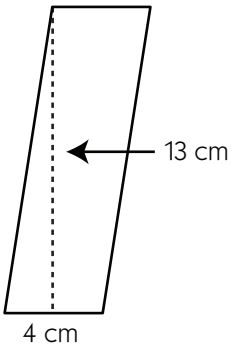
a



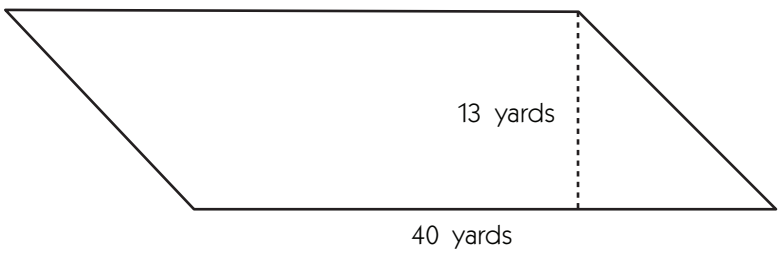
b



c



3 The parking lot at our school is shaped like a parallelogram. Its dimensions are shown below. How many square yards does the parking lot cover? Show all of your work.



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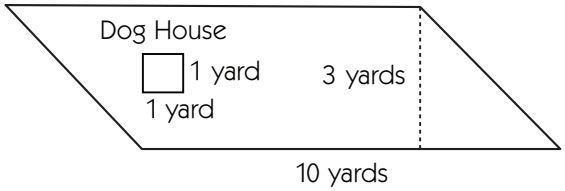
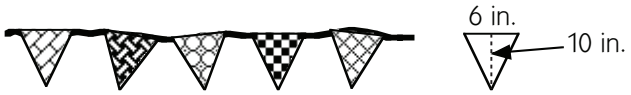
Square Inches, Square Feet & Square Yards

1a The grassy part of Jorge's lawn is a parallelogram with the dimensions shown below. Jorge has a doghouse on the lawn for his dog. How many square yards of grass are left for Jorge's family? Show all of your work.



2a Wanda and her brother George are making a banner of fabric triangles to decorate their house for a party. Each triangle is 10 inches long and 6 inches across at the base. If they use 30 triangles in their banner, how many square inches of fabric will they use? Show all of your work.



CHALLENGE

b How many square feet is that? Show all of your work.

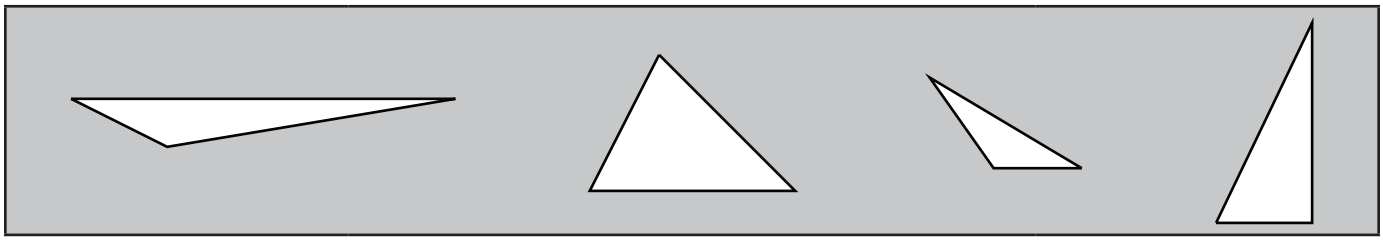
CHALLENGE

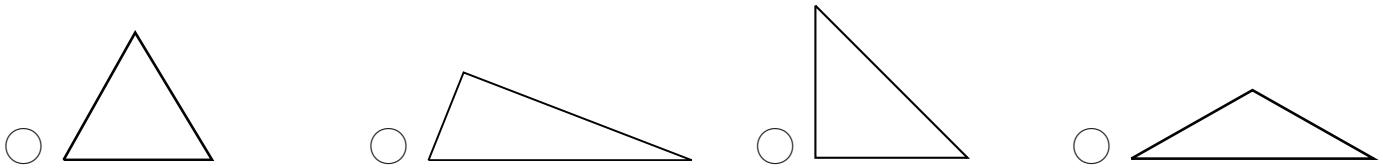
b How many square feet is that? Show all of your work.

NAME _____ **DATE** _____

Classifying Triangles & Quadrilaterals

1a All of the triangles in the box have something in common. Fill in the circle next to the triangle that belongs with them.

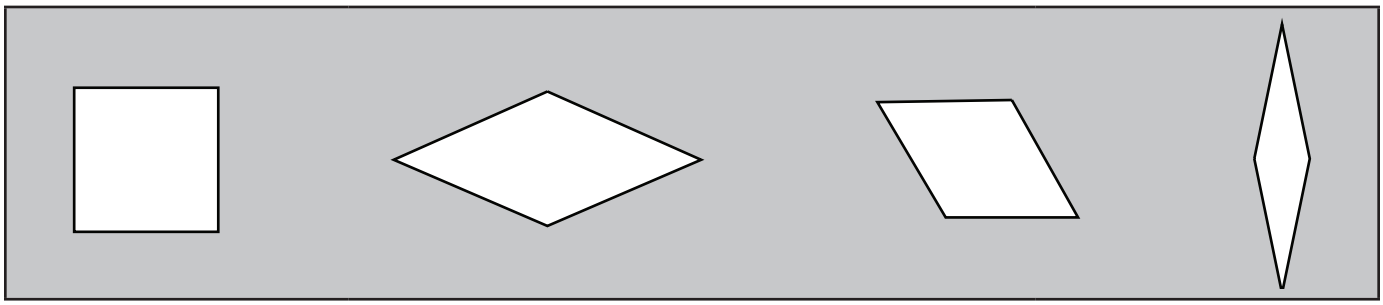


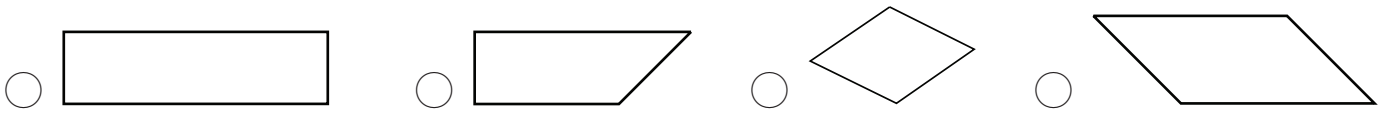


b How do you know the triangle you picked belongs in the group?

c What is the name for this kind of triangle?

2a All of the quadrilaterals in the box have something in common. Fill in the circle next to the quadrilateral that belongs with them.





b How do you know the quadrilateral you picked belongs in the group?

c What is the name for this kind of quadrilateral?

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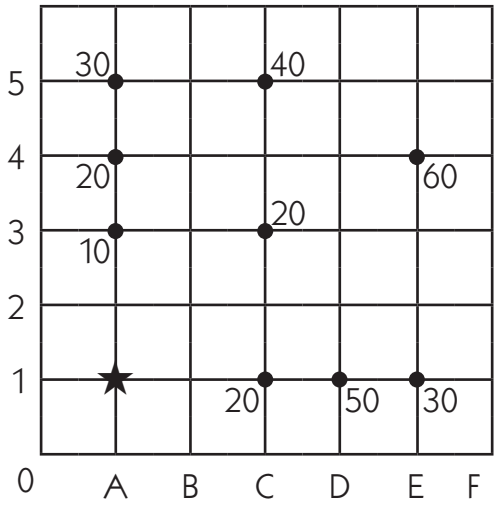
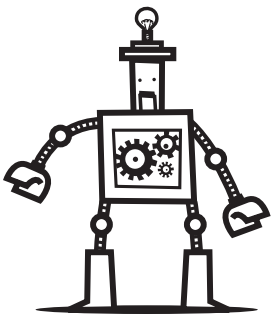
The Robot's Path

Pirate Christopher programmed a robot to collect gold pieces for him on the grid below. The numbers on the grid show how many gold pieces are at each location. The robot started at (A,1). It made just 3 turns and traveled 14 spaces before returning to its starting point with exactly 170 gold pieces. The robot *only* traveled on the horizontal and vertical grid lines.





1 If the robot makes only 3 turns and returns along the grid lines to its starting point, what shape must its path be?

2 If the robot traveled 14 spaces, what could be the dimensions of the shape you named above?

3 The robot turned at points _____, _____, and _____.

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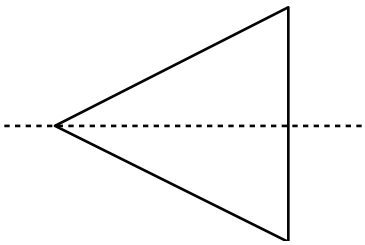
Drawing Lines of Symmetry

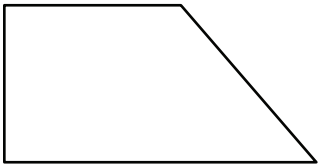
Draw all the lines of symmetry in each figure. There may be 1 line of symmetry, more than 1 line of symmetry, or no lines of symmetry.

ex



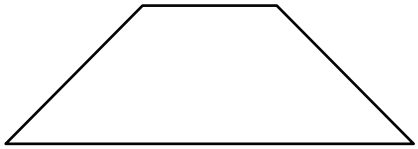
This figure has 1 line(s) of symmetry.

1



This figure has _____ line(s) of symmetry.

2

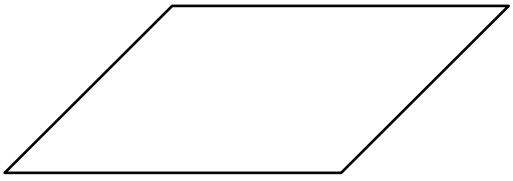


This figure has _____ line(s) of symmetry.

3

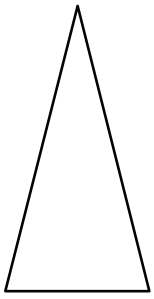
This figure has _____ line(s) of symmetry.

4



This figure has _____ line(s) of symmetry.

5



This figure has _____ line(s) of symmetry.

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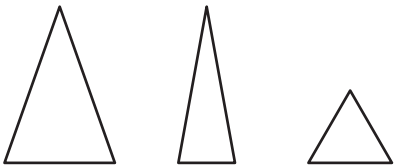
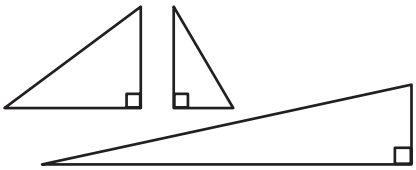
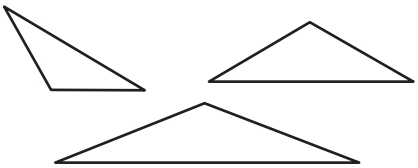
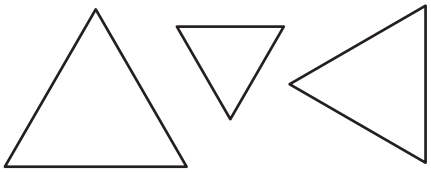
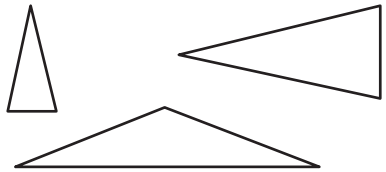
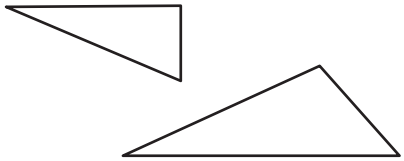
Classifying Triangles Review

Use the following information to solve the problems below.

- You can group triangles by the size of their angles

Acute triangles All 3 angles are acute.	Right triangles 1 angle is a right angle.	Obtuse triangles 1 angle is an obtuse angle.
		

- You can also group triangles by the lengths of their sides

Equilateral triangles All 3 sides are the same length.	Isosceles triangles 2 sides are the same length.	Scalene triangles No sides are the same length.
		

1 Think carefully about each kind of triangle and draw them if you like. What is the greatest possible number of lines of symmetry each kind of triangle below can have? Explain your answer with words and/or sketches.

a Acute triangles can have no more than _____ lines of symmetry.	Why?
b Right triangles can have no more than _____ lines of symmetry.	Why?
c Obtuse triangles can have no more than _____ lines of symmetry.	Why?