Name _____

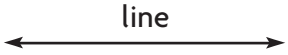
Describe Plane Shapes

You can use math words to describe plane shapes.

point

an exact position or location

line

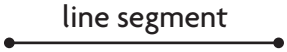


a straight path that goes in two directions without end

endpoints

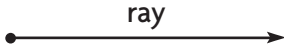
points that are used to show segments of lines

line segment



part of a line and has 2 endpoints

ray



part of a line that has 1 endpoint and continues in one direction

A **plane shape** is a shape on a flat surface. It is formed by points that make curved paths, line segments, or both. Plane shapes can be open or closed.

A **closed shape** starts and ends at the same point.

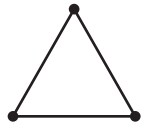
An **open shape** does not start and end at the same point.

Look at this plane shape called a triangle.

It is a **closed shape.**

It has **3 line segments.**

The line segments meet at the **endpoints.**



Circle all the words that describe the shape.

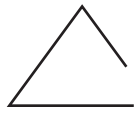
1.

line
line segment

2.

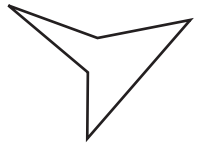
point
ray

3.



closed shape
open shape

4.



closed shape
open shape

Write whether the shape is *open* or *closed*.

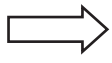
5.

_____

6.

_____

7.



_____

8.

_____

Name _____

Shape Up!

Read the description. Then draw the shape. If the shape cannot be drawn, write the word *impossible*.

1. a ray with two endpoints

2. a closed shape with 6 line segments

3. a part of a line with two endpoints

4. an open triangle

5. an open shape with 7 line segments

6. a closed shape with 3 line segments and a curved path

7. Write Math Nick says we cannot see any true lines in the real world. He thinks everything we call a *line* is really a line segment. Do you agree or disagree? **Explain**.

_____

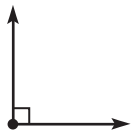
_____

Name _____

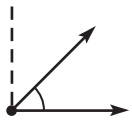
Describe Angles in Plane Shapes

There are different types of angles.

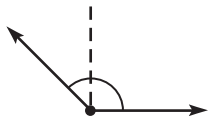
A **right angle** forms a square corner.



Some angles are less than a right angle.



Some angles are greater than a right angle.

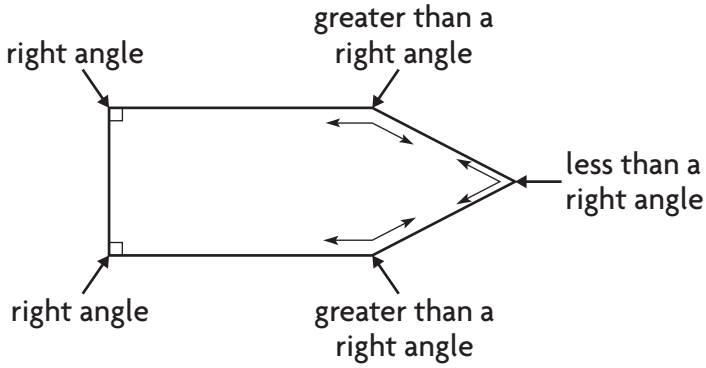


Look at this shape. Describe the angles.

There are 2 right angles.

There are 2 angles greater than a right angle.

There is 1 angle less than a right angle.

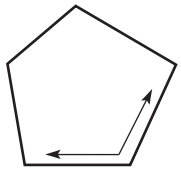


Use the corner of a sheet of paper to tell whether the angle is a *right angle*, *less than a right angle*, or *greater than a right angle*.

1.

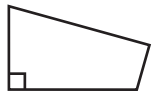
_____

2.



_____

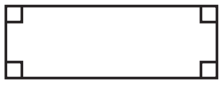
3.



_____

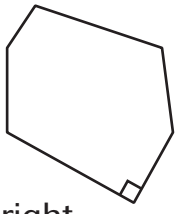
Write how many of each type of angle the shape has.

4.



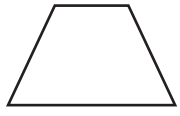
____ right
____ less than a right
____ greater than a right

5.



____ right
____ less than a right
____ greater than a right

6.



____ right
____ less than a right
____ greater than a right

Name _____

Look at My Angle!

Read the description. Then draw the closed shape. If the shape cannot be drawn, write *impossible*.

1. a shape that has 6 sides and 3 right angles

2. a triangle with 2 right angles

3. a shape that has 4 sides and 3 angles less than a right angle

4. a shape that has 4 sides and 2 angles greater than a right angle

5. a shape that has 4 sides, 3 right angles, and 1 angle less than a right angle

6. a shape that has 8 sides and 4 right angles

7. Write Math Choose a shape from above that cannot be drawn. **Explain** why the shape cannot be drawn.

_____

_____

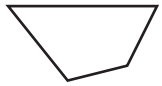
_____

Name _____

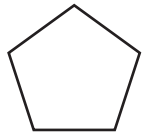
Identify Polygons

You can identify and name polygons by the number of sides and angles they have.

3 sides
3 angles
triangle

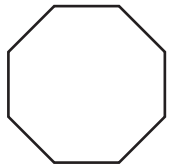


4 sides
4 angles
quadrilateral

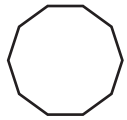


5 sides
5 angles
pentagon

6 sides
6 angles
hexagon



8 sides
8 angles
octagon



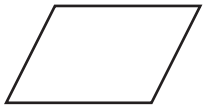
10 sides
10 angles
decagon

Describe and name this shape.

It has 4 sides.

It has 4 angles.

It is a **quadrilateral**.

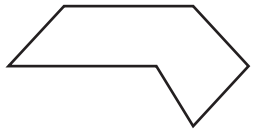


Describe and name this shape.

It has 6 sides.

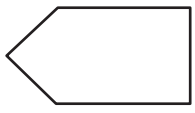
It has 6 angles.

It is a **hexagon**.



Write the number of sides and the number of angles. Then name the polygon.

1.

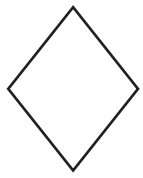


_____ sides

_____ angles

_____

2.



_____ sides

_____ angles

_____

Name _____

Name That Polygon

Sort and draw the shapes into two groups: shapes that are polygons and shapes that are not polygons.

Polygons	Not Polygons

1. Name the polygons above.

_____

_____

_____

_____

2. Draw a polygon that has six sides.

3. Write Math Can you draw a triangle that has 4 angles? **Explain**.

_____

_____

_____

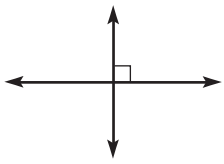
Name _____

Describe Sides of Polygons

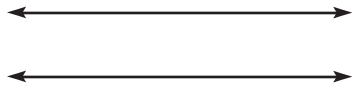
There are different types of line segments in polygons.

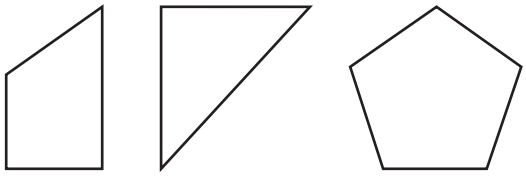
- **Intersecting lines** are lines that cross or meet. Intersecting lines form angles.

- **Perpendicular lines** are intersecting lines that cross or meet to form right angles.



- Lines that never cross or meet and are always the same distance apart are **parallel lines**. They never form angles.





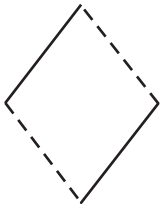
Which shape or shapes appear to have parallel sides? *A*

Which shape or shapes appear to have perpendicular sides? *A, B*

Which shape or shapes have intersecting sides? *A, B, C*

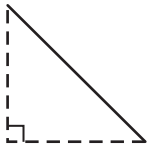
Look at the dashed sides of the polygon. Tell if they appear to be *intersecting*, *perpendicular*, or *parallel*. Write all the words that describe the sides.

1.



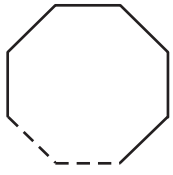
_____

2.



_____

3.



_____

Name _____

Side by Side

Decide if the polygon can have at least 1 pair of parallel sides, at least 1 pair of perpendicular sides, or both. Write *yes* or *no*. Then draw an example of the polygon.

1. triangle

parallel: _____

perpendicular: _____

2. quadrilateral

parallel: _____

perpendicular: _____

3. pentagon

parallel: _____

perpendicular: _____

4. hexagon

parallel: _____

perpendicular: _____

5. Write Math Choose another shape. Write your own exercise like 1–4 above. Then draw the shape to show the answer.

_____

_____

Name _____

Classify Quadrilaterals

You can classify quadrilaterals by their sides and by their angles.

2 pairs of opposite sides that are parallel

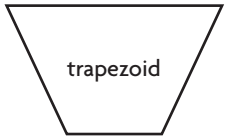
4 sides that are of equal length

4 right angles

2 pairs of opposite sides that are parallel

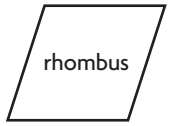
2 pairs of sides that are of equal length

4 right angles



at least 1 pair of opposite sides that are parallel

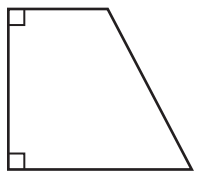
lengths of sides could be the same



2 pairs of opposite sides that are parallel

4 sides that are of equal length

How can you classify the quadrilateral?



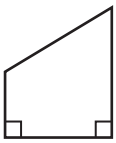
It has only 1 pair of opposite sides that are **parallel**.

The lengths of all 4 sides are **not equal**.

So, the quadrilateral is a **trapezoid**.

Circle all the words that describe the quadrilateral.

1.

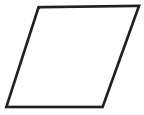


square

rhombus

trapezoid

2.

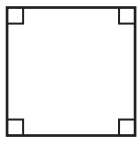


square

rectangle

quadrilateral

3.



square

rectangle

rhombus

Name _____

Quadrilateral Riddles

Read the riddles and name the shape that is being described.

1. I am a quadrilateral with exactly 1 pair of opposite sides that are parallel. What shape am I?

_____

2. I am a quadrilateral that always has 4 sides that are of equal length and 4 right angles. What shape am I?

_____

3. I am a quadrilateral with 2 pairs of opposite sides that are parallel, 2 pairs of sides that are of equal length, and 4 right angles. I am not a square. What shape am I?

_____

4. I am a polygon with 4 sides and 4 angles. I do not have any pairs of opposite sides that are parallel. What shape am I?

_____

5. Write Math Jerome drew a shape and described it as a square. Kayla described it as a rectangle. Luis described it as a rhombus. Can they all be correct? **Explain**.

_____

_____

_____

_____

_____

_____

_____

Name _____

Draw Quadrilaterals

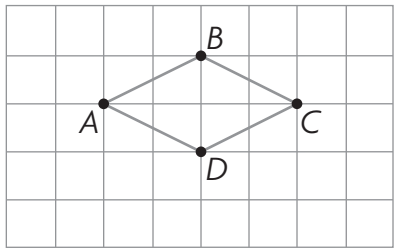
Use grid paper to draw a quadrilateral.

Step 1 Use a ruler to draw line segments. Connect *A* to *B*.

Step 2 Connect *B* to *C*.

Step 3 Connect *C* to *D*.

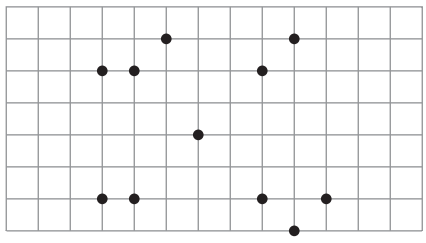
Step 4 Connect *D* to *A*.



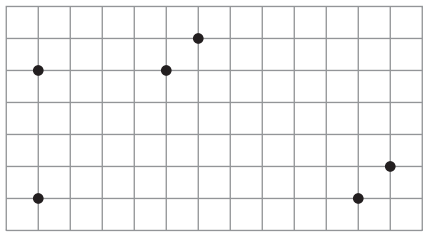
Write the name of your quadrilateral.

rhombus or trapezoid

1. Choose four endpoints, and connect them to make a square.

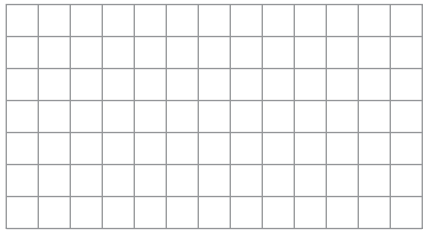


2. Choose four endpoints, and connect them to make a trapezoid with only 1 pair of opposite sides that are parallel.



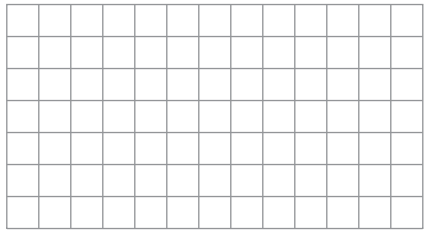
Use grid paper to draw a quadrilateral that is described. Name the quadrilateral you drew.

3. 4 right angles



_____

4. 2 pairs of opposite sides that are parallel

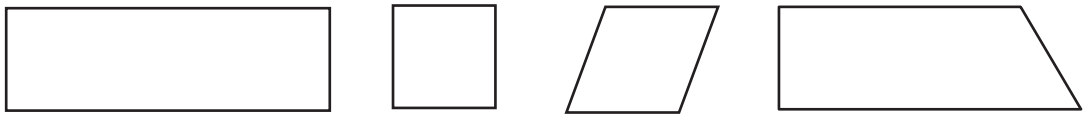


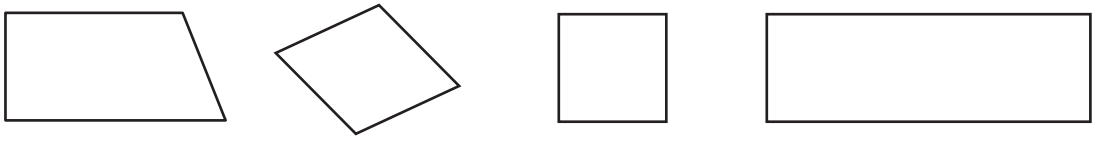
_____

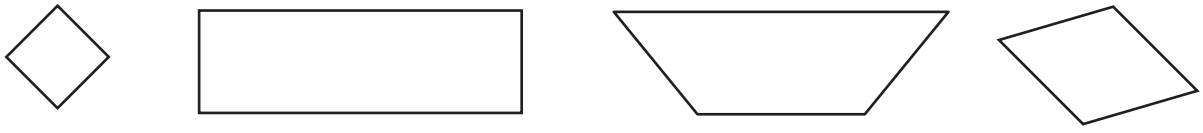
Name _____

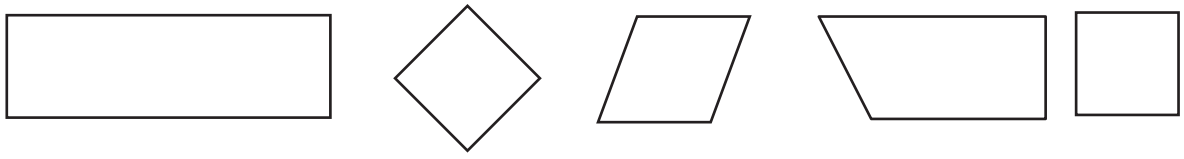
Why Doesn't It Belong?

For each group of quadrilaterals, identify the shape(s) that do not belong and explain why.

1. 

2. 

3. 

4. 

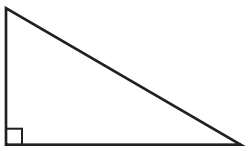
5. **Stretch Your Thinking** Draw your own group of four quadrilaterals. Challenge a classmate to identify the shape(s) that do not belong and explain why.

Name _____

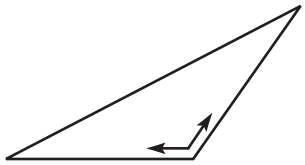
Describe Triangles

You can describe a triangle by its types of angles.

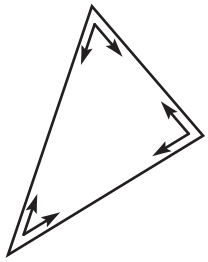
This triangle has 1 right angle.



This triangle has 1 angle greater than a right angle.

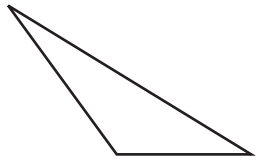


This triangle has 3 angles less than a right angle.

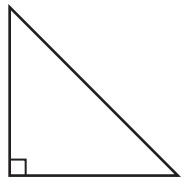


You can describe a triangle by the number of sides of equal length.

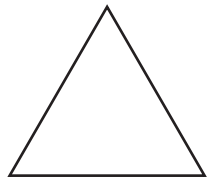
This triangle has 0 sides of the same length.



This triangle has 2 sides of the same length.



This triangle has 3 sides of the same length.

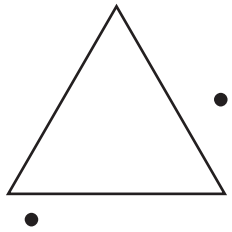


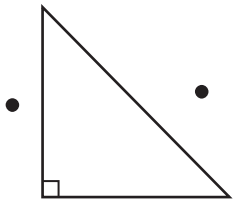
Draw a line to match the description of the triangle(s).

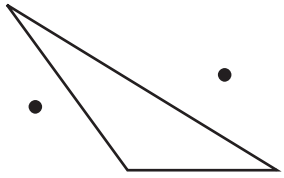
1. One angle is a right angle.

2. One angle is greater than a right angle.

3. Three angles are less than a right angle.







4. No sides are equal in length.

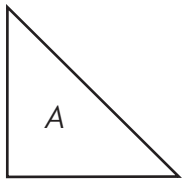
5. Two sides are equal in length.

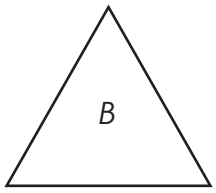
6. Three sides are equal in length.

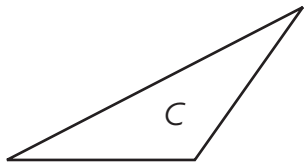
Name _____

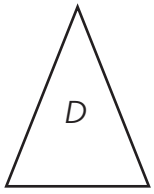
Sorting Triangles

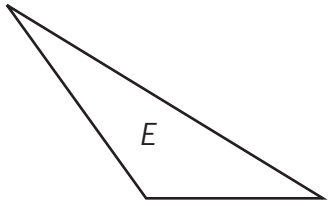
A description of a triangle is on each bucket. Write the letter of the triangle in all buckets that correctly describe it. Each triangle can go in at least two buckets. Some triangles can go in more than two buckets.

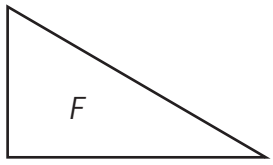


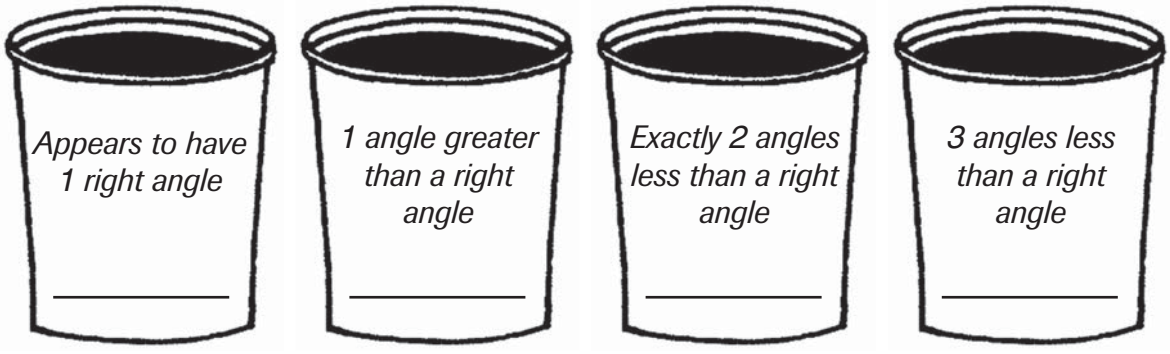




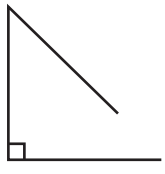








Sense or Nonsense? Beryl says the shape at the right will go in the first and last buckets because it has 1 right angle and 3 equal sides. Does her statement make sense? **Explain.**



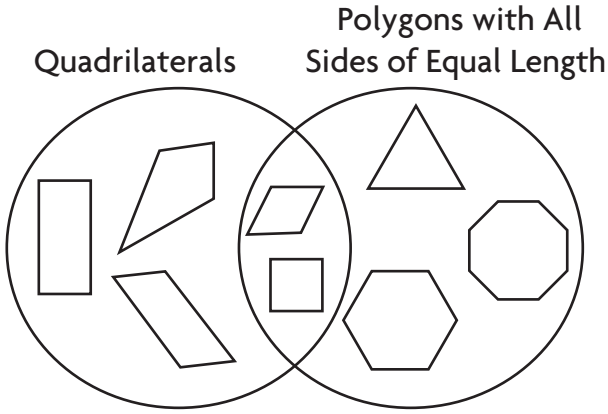
_____

_____

Name _____

Problem Solving • Classify Plane Shapes

A **Venn diagram** shows how sets of things are related. This Venn diagram shows how quadrilaterals and polygons with all sides of equal length are related. The shapes in the section where the circles overlap show shapes that belong to both groups.

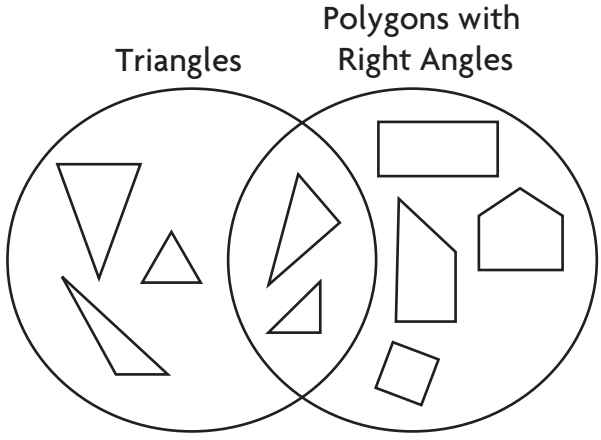


What types of polygons are in both circles?

Read the Problem	Solve the Problem
What do I need to find? what types of polygons are in both circles	What is true about all polygons in the circle labeled Quadrilaterals? They all have 4 sides.
What information do I need to use? The circles are labeled Quadrilaterals and Polygons with All Sides of Equal Length.	What is true about all polygons in the other circle? They all have sides of equal length.
How will I use the information? I will describe the shapes in the section where the circles overlap.	Which polygons are in the section where the circles overlap? shapes that are quadrilaterals and that have 4 sides that are of equal length So, a square and a rhombus are in the section where the circles overlap.

1. Brad drew the Venn diagram at the right. What type of shapes are in the section where the circles overlap?

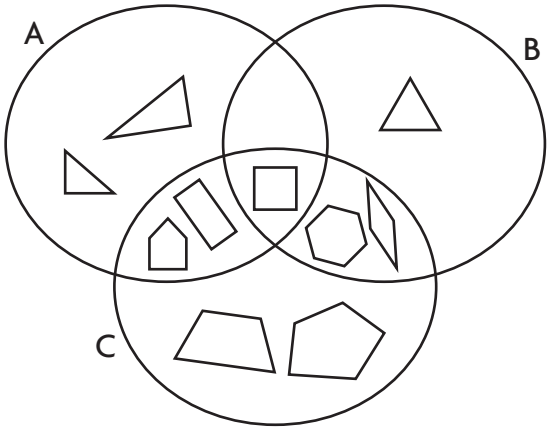
_____



Name _____

Triple Trouble

Some Venn diagrams have three overlapping circles. Look at the shapes in each circle of the Venn diagram below. Write a label for each circle.



1. Label for circle A: _____

_____

2. Label for circle B: _____

_____

3. Label for circle C: _____

_____

4. Write Math Is there a shape that belongs in the section where circles A and B overlap, but not circle C? **Explain**.

_____

_____

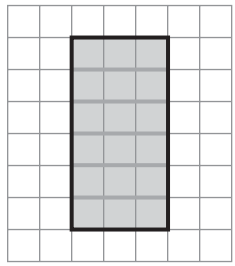
_____

Name _____

Relate Shapes, Fractions, and Area

You can separate a plane shape into equal parts to explore the relationship between fractions and area.

Divide the rectangle into 6 parts with equal area. Write the fraction that names the area of each part of the whole.



Step 1 Divide the rectangle into 6 parts with equal area. Use the grid to help you.

Step 2 Write the fraction that names each part of the divided whole.

Think: Each part is 1 part out of 6 equal parts.

Each part is $\frac{1}{6}$ of the whole shape's area.

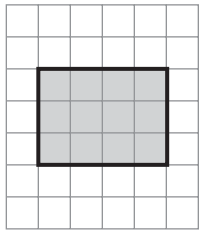
Step 3 Write the fraction that names the whole area.

Think: There are 6 equal parts.

The fraction that names the whole area is $\frac{6}{6}$.

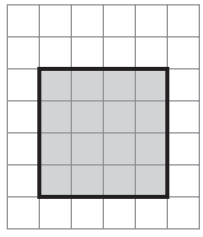
Divide the shape into parts with equal area. Write the area of each part as a unit fraction.

1. 4 equal parts



Each part is _____ of the whole shape's area.

2. 8 equal parts



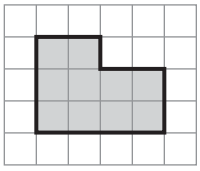
Each part is _____ of the whole shape's area.

Name _____

Secret Message

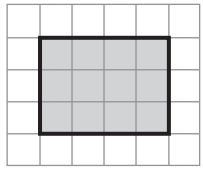
Divide the shape into the given number of parts of equal area. Write the fraction that names each part of the whole.

A 10 equal parts



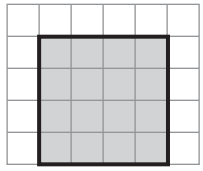
_____

F 4 equal parts



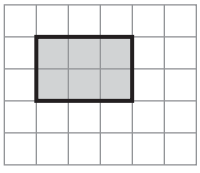
_____

H 8 equal parts



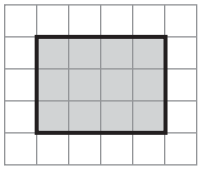
_____

I 6 equal parts



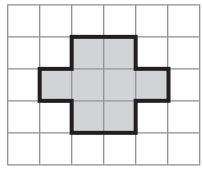
_____

M 12 equal parts



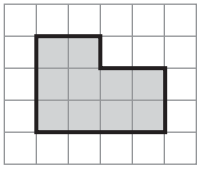
_____

N 2 equal parts



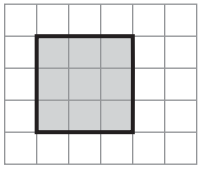
_____

S 5 equal parts



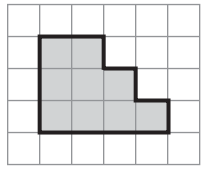
_____

T 9 equal parts



_____

U 3 equal parts



_____

Use the letter for each fraction to write the secret message.

$\frac{1}{12}$	$\frac{1}{10}$	$\frac{1}{9}$	$\frac{1}{8}$		$\frac{1}{6}$	$\frac{1}{5}$		$\frac{1}{4}$	$\frac{1}{3}$	$\frac{1}{2}$
M										