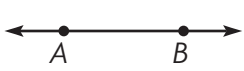
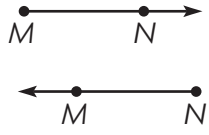
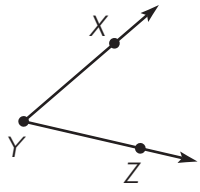
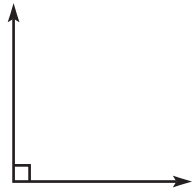
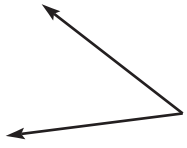
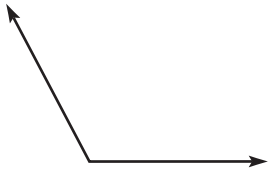
Name _____

Lines, Rays, and Angles

Name	What it looks like	Think
point *D*	D •	A **point** names a location in space.
line *AB*; $\overleftrightarrow{AB}$ line *BA*; $\overleftrightarrow{BA}$		A **line** continues without end in both directions.
line segment *AB*; $\overline{AB}$ line segment *BA*; $\overline{BA}$		"Segment" means part. A **line segment** is part of a line. It is named by its two endpoints.
ray *MN*; $\overrightarrow{MN}$ ray *NM*; $\overrightarrow{NM}$		A **ray** has one endpoint and continues without end in one direction. A ray is named using two points. The endpoint is always named first.
angle *XYZ*; $\angle XYZ$ angle *ZYX*; $\angle ZYX$ angle *Y*; $\angle Y$		Two rays or line segments that share an endpoint form an angle. The shared point is the vertex of the angle.

A **right angle** forms a square corner.	An **acute angle** is less than a right angle.	An **obtuse angle** is greater than a right angle and less than a straight angle.	A **straight angle** forms a line.
			

Draw and label an example of the figure.

1. $\overline{PQ}$

2. $\overrightarrow{KJ}$

3. obtuse $\angle FGH$

Name _____

Line Art

Use geometric figures to draw each of the following.

1. A flower using 1 line segment and 8 rays.

2. A sidewalk using 2 lines and 6 line segments.

3. Use geometric figures to draw your own design. Choose from points, lines, rays, segments, and angles.

4. Write Math Describe your design in Problem 3. Include the names of the figures you chose.

_____

_____

_____

_____

_____

_____

_____

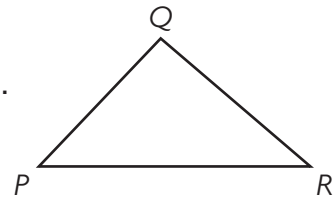
Name _____

Classify Triangles by Angles

A **triangle** is a polygon with 3 sides and 3 angles.
Each pair of sides joins at a vertex.

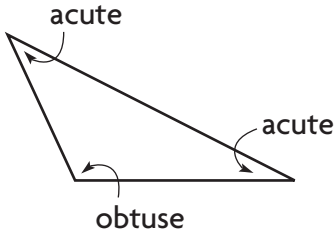
You can name a triangle by its vertices.

ΔPQR ΔQRP ΔRPQ
ΔPRQ ΔQPR ΔRQP

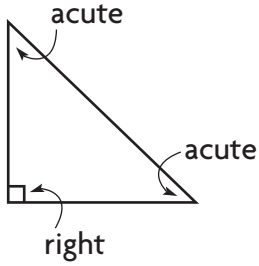


There are 3 types of triangles. All triangles have at least 2 acute angles.

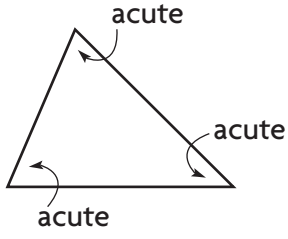
Obtuse triangle
one obtuse angle



Right triangle
one right angle

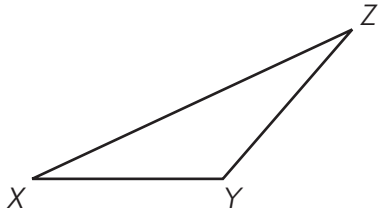


Acute triangle
three acute angles



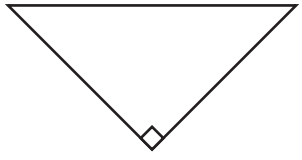
1. Name the triangle. Tell whether each angle is *acute*, *right*, or *obtuse*. A name for the triangle is _____.

$\angle X$ is _____.
$\angle Y$ is _____.
$\angle Z$ is _____.



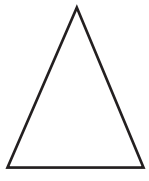
Classify each triangle. Write *acute*, *right*, or *obtuse*.

2.



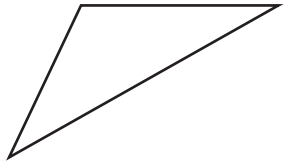
_____

3.



_____

4.



_____

Name _____

Triangle Living

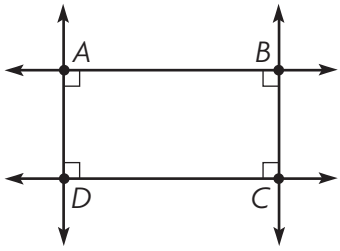
In the space below, draw a living room design using only acute, right, and obtuse triangles. Then color the acute triangles one color, the right triangles a second color, and the obtuse triangles a third color.

Stretch Your Thinking How could you use the triangles to create rectangles and squares?

Parallel Lines and Perpendicular Lines

Parallel lines are lines in a plane that are always the same distance apart. Parallel lines or line segments never meet.

In the figure, lines *AB* and *CD*, even if extended, will never meet.
The lines are parallel. Write $\overleftrightarrow{AB} \parallel \overleftrightarrow{CD}$.
Lines AD and BC are also parallel. So, $\overleftrightarrow{AD} \parallel \overleftrightarrow{BC}$.

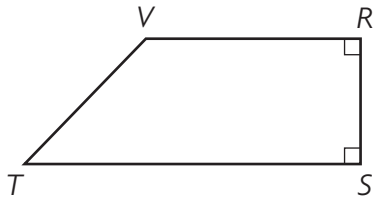


Intersecting lines cross at exactly one point. Intersecting lines that form right angles are **perpendicular.**

In the figure, lines AD and AB are perpendicular because they form right angles at vertex *A*. Write $\overleftrightarrow{AD} \perp \overleftrightarrow{AB}$.

Lines BC and CD are also perpendicular. So, $\overleftrightarrow{BC} \perp \overleftrightarrow{CD}$.

Use the figure for 1–3.



1. Name two sides that appear to be parallel.

_____

2. Name two sides that appear to be perpendicular.

_____

3. Name two sides that appear to be intersecting, but not perpendicular.

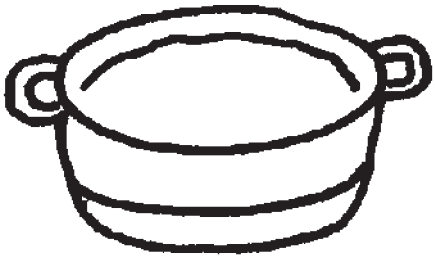
_____

Name _____

Alphabet Soup

Use all 26 capital letters of the alphabet. Place them into as many "soups" as possible.

1. Letters with parallel line segments



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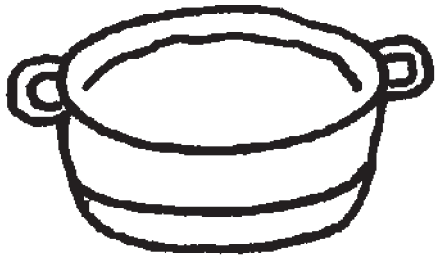
2. Letters with perpendicular line segments



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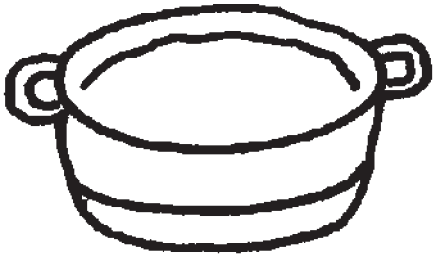
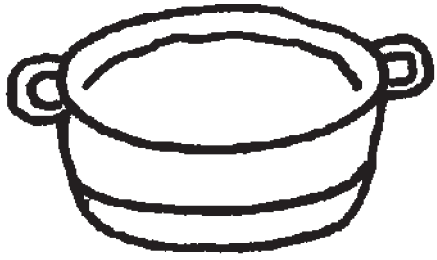
3. Letters with intersecting, but not perpendicular, line segments



_____

4. Letters with no parallel, perpendicular, or intersecting line segments

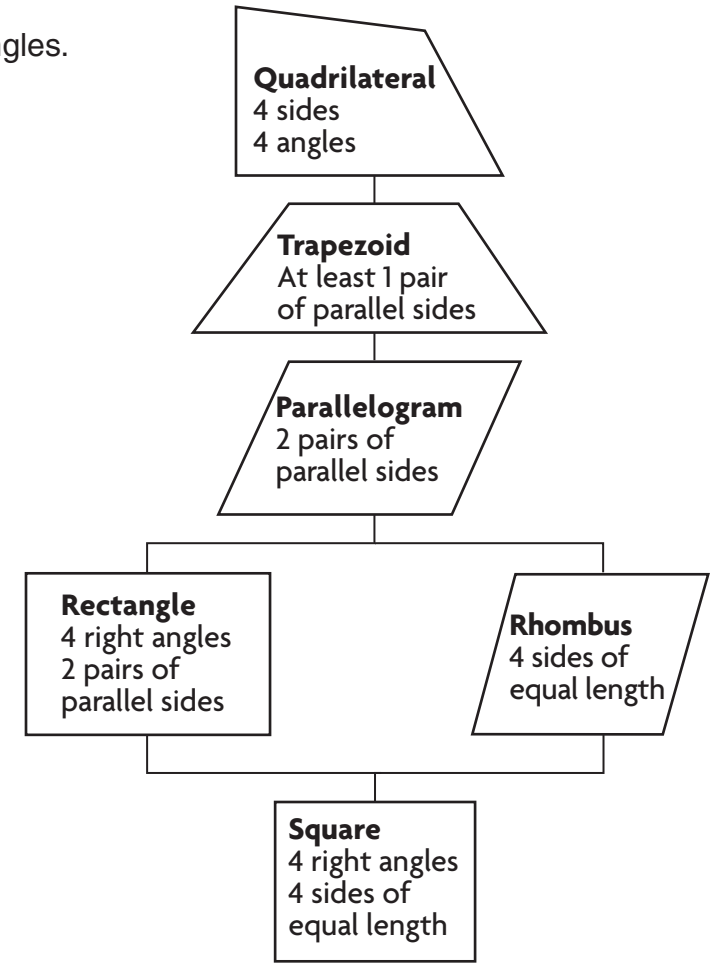


_____

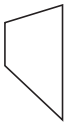
Name _____

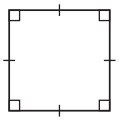
Classify Quadrilaterals

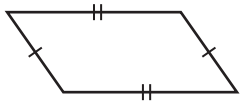
A **quadrilateral** is a polygon with 4 sides and 4 angles. Some quadrilaterals have special names:



Classify each figure as many ways as possible. Write *quadrilateral*, *trapezoid*, *parallelogram*, *rhombus*, *rectangle*, or *square*.

1. 

2. 

3. 

Name _____

Quad Logic

Read each statement carefully. Write *true* or *false*.

1. Some parallelograms are rectangles. _____
2. All trapezoids are parallelograms. _____
3. All squares are rectangles. _____
4. Some quadrilaterals are trapezoids. _____
5. Some rectangles are rhombuses. _____
6. All rhombuses are squares. _____
7. Some parallelograms are trapezoids. _____
8. All rectangles are squares. _____

Make each statement true. Write *All, No,* or *Some*.

9. _____ rectangles are parallelograms.
10. _____ squares are trapezoids.
11. _____ parallelograms are quadrilaterals.
12. _____ quadrilaterals are parallelograms.

13. **Stretch Your Thinking** Write three of your own quad-logic statements. Then exchange them with a classmate and complete each other's statements.

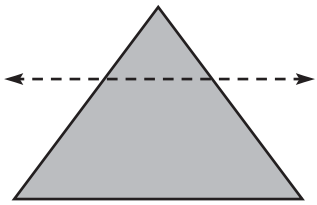
_____

_____

_____

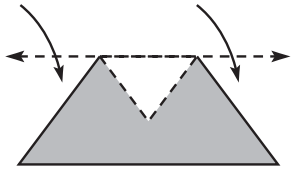
Line Symmetry

Tell whether the parts on each side of the line match. Is the line a line of symmetry?



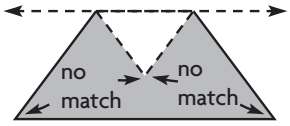
Step 1 Trace and cut out the shape.

Fold the shape along the dashed line.



Step 2 Tell whether the parts on each side match.

Compare the parts on each side.



The parts do not match.

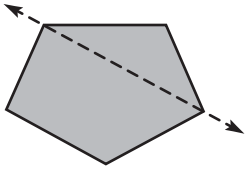
Step 3 Decide if the line is a line of symmetry.

The parts on each side of the line do not match.

So, the line is not a line of symmetry.

Tell if the line appears to be a line of symmetry. Write *yes* or *no*.

1.



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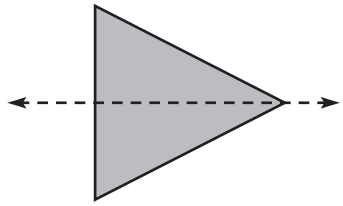
2.



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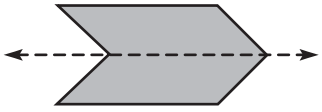
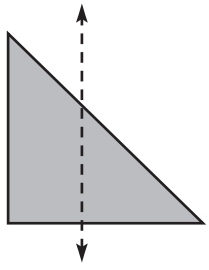
3.



_____

4.



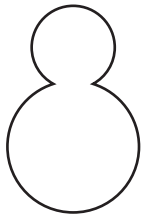
_____

Name _____

Swimming Pool Symmetry

The owner of the Seaside Symmetry Resort is designing a new swimming pool. The owner wants the pool to have line symmetry. Tell if each swimming pool design below appears to have line symmetry. If it does, draw a line or lines of symmetry.

1.

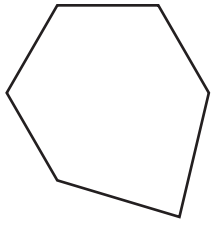


_____

2.

_____

3.



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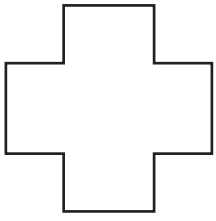
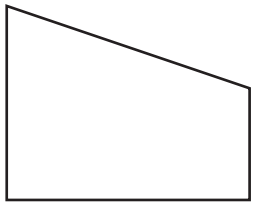
4.



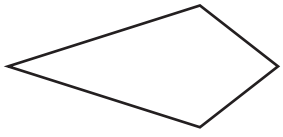
_____

5.



_____

6.



_____

7. The owner of the resort wants to build a pool that has four sides with equal length and four lines of symmetry. In what shape can the pool be built?

_____

8. Write Math Describe a strategy you could use to make a symmetrical design for a swimming pool.

_____

_____

_____

_____

_____

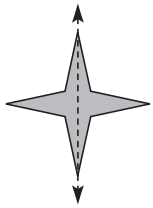
Name _____

Find and Draw Lines of Symmetry

Tell whether the shape appears to have zero lines, 1 line, or more than 1 line of symmetry. Write *zero, 1,* or *more than 1*.

Step 1 Decide if the shape has a line of symmetry.

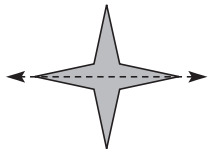
Trace and cut out the shape. Fold the shape along a vertical line.



Do the two parts match exactly? yes

Step 2 Decide if the shape has another line of symmetry.

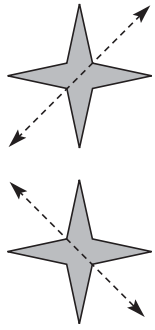
Open the shape and fold it along a horizontal line.



Do the two parts match exactly? yes

Step 3 Find any other lines of symmetry.

Think: Can I fold the shape in other ways so that the two parts match exactly?

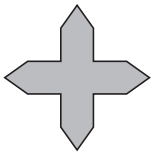


I can fold the paper diagonally two different ways, and the parts match exactly.

So, the shape appears to have more than 1 line of symmetry.

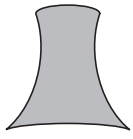
Tell whether the shape appears to have zero lines, 1 line, or more than 1 line of symmetry. Write *zero, 1,* or *more than 1.*

1.



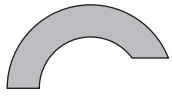
_____

2.



_____

3.



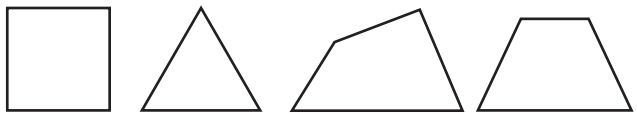
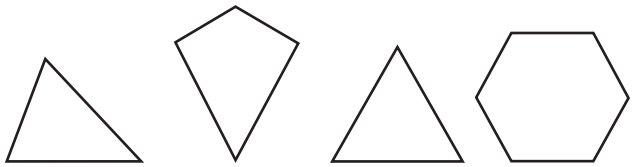
_____

Name _____

Symmetry Riddle

What did the 0 say to the 8?

To answer the riddle, use the decoding box for each word. For each shape, decide how many lines of symmetry it appears to have, and then use the code. For example, a square has 4 lines of symmetry, so write an N on the line below the square.

1. Word 1 Code Box Write C if the shape has no lines of symmetry. Write E if the shape has 1 line of symmetry. Write F if the shape has 2 lines of symmetry. Write I if the shape has 3 lines of symmetry. Write N if the shape has 4 lines of symmetry. Write R if the shape has 6 lines of symmetry.	**Word 1**  N _____ _____ _____ _____
2. Word 2 Code Box Write B if the shape has no lines of symmetry. Write E if the shape has 1 line of symmetry. Write G if the shape has 2 lines of symmetry. Write L if the shape has 3 lines of symmetry. Write O if the shape has 4 lines of symmetry. Write T if the shape has 6 lines of symmetry.	**Word 2**  _____ _____ _____ _____

3. Write Math Make up your own symmetry riddle and code boxes. Exchange riddles with your classmates and solve.

_____

_____

_____

_____

_____

Name _____

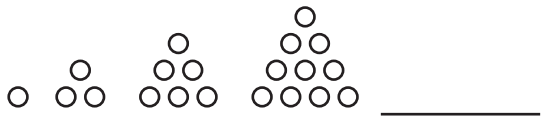
Problem Solving • Shape Patterns

Use the strategy *act it out* to solve pattern problems.

What might be the next three figures in the pattern below?

Read the Problem		
What do I need to find? I need to find the next three figures in the pattern.	**What information do I need to use?** I need to look for a group of figures that repeats.	**How will I use the information?** I will use pattern blocks to model the pattern and act out the problem.
Solve the Problem		
Look for a group of figures that repeats and circle that group. The repeating group is triangle, triangle, square, triangle, square. I used triangles and squares to model and continue the pattern by repeating the figures in the group. These are the next three figures in the pattern: 		

1. Describe a pattern. Draw what might be the next figure in your pattern.



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_____

_____

_____

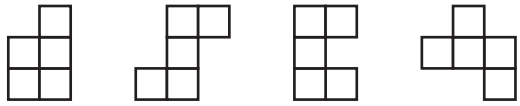
2. Use the pattern. How many circles will be in the sixth figure?

_____

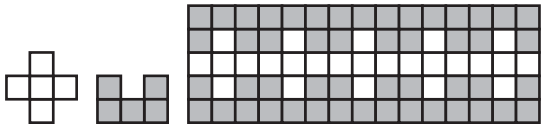
Name _____

Pentomino Patterns

A *pentomino* is a figure made of five same-size squares. Each square must share a side with its neighbor.

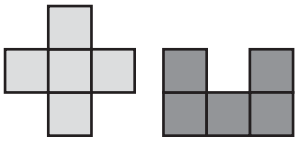


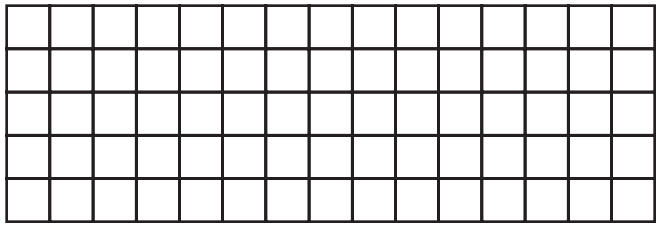
The pattern at the right uses two pentominoes to create a rectangular design.



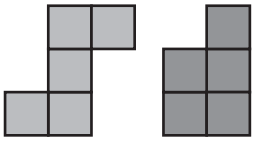
Use the pentominoes to create a rectangular design.

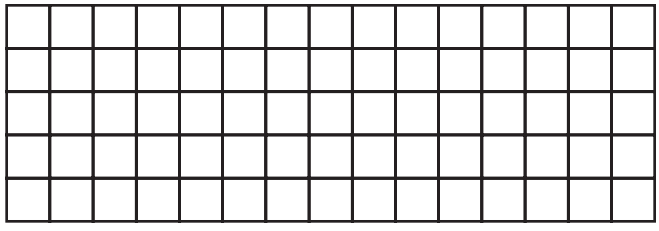
1.





2.





3.