

# Lesson 80

## Construct Meaning

It is important to know many problem-solving strategies in mathematics. We use these strategies alone or in combination with each other to solve problems every day.

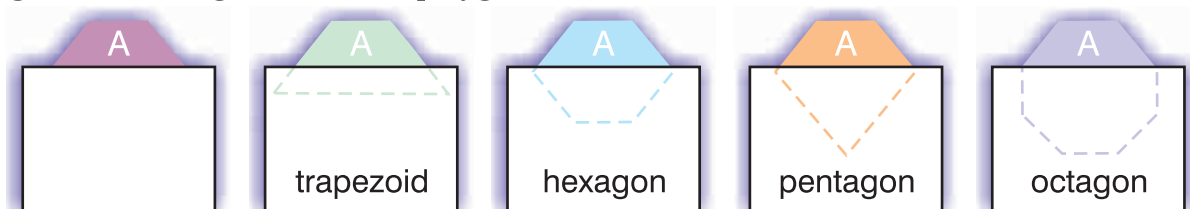
WRITE AN EQUATION

USE A KNOWN EQUATION

USE DATA FROM A TABLE

USE LOGICAL REASONING

Only part of Polygon A is showing. Visualize what may be hidden by the box using logical reasoning. Name each polygon.



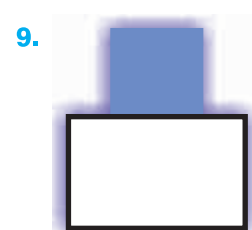
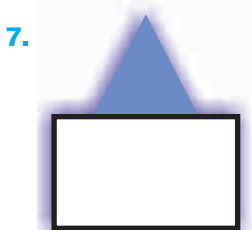
## Practice

Use Table 1 to solve the following.

- The angles in a parallelogram are  $60^\circ$ ,  $120^\circ$ , and  $60^\circ$ . What is the measure of the fourth angle?
- If a stop sign is a regular octagon, what is the measure of each of its angles?
- A triangle has angles that measure  $20^\circ$  and  $85^\circ$ . What is the measure of the third angle?
- The length of each of the five outer walls of the Pentagon building in Washington, D.C., is 921 feet. What is the angle where two walls of the Pentagon meet?
- What is the measure of each angle in a regular hexagon?
- Can a triangle have two right angles? Why or why not?

Polygon	Degrees	Table 1
Triangle	$180^\circ$	
Quadrilateral	$360^\circ$	
Pentagon	$540^\circ$	
Hexagon	$720^\circ$	
Octagon	$1,080^\circ$	

Write the names of some of the polygons which may be hidden by each box.




# Problem Solving: Polygons and Solids

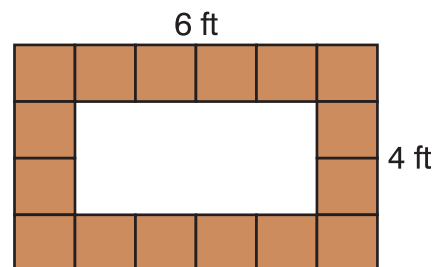
In 1752, a mathematician names Leonhard Euler made a discovery that is true for solid figures. He wrote his findings in an equation:

$$\text{Faces} + \text{Vertices} - \text{Edges} = 2$$

Use the information about a cube to try Euler's equation. Then solve the following problems using the information from Table 2. Write an equation to show your work.

Table 2	Solid	Faces	Vertices	Edges
	cube	6	8	12
	triangular pyramid	4	4	
	square pyramid	5		8
	triangular prism	5		9
	rectangular prism	6	8	

10. How many edges are on a triangular pyramid?
11. What is the total number of vertices on a triangular prism?
12. How many vertices are found on a square pyramid?
13. The number of edges on a rectangular prism is .
14. Paul and his parents are planning to construct a frame for a flowerbed using large blocks of wood. The frame will be a 6-foot by 4-foot rectangle. The blocks of wood may be purchased as 1-foot squares for \$3 each or 1-foot by 2-foot rectangles for \$5 each. Paul drew a picture to determine the cost of using the square blocks. What will be the cost of the frame using the square blocks? the rectangular blocks?
15. Megan said, "I can draw a parallelogram, a rhombus, a rectangle, a square, and a trapezoid by drawing only two polygons." Is that possible? If so, use a ruler to draw the two polygons.



## Moments with Careers

My dad is a carpenter. He uses math in his work to estimate lumber and concrete and to figure roof pitches and proper stair layout.

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