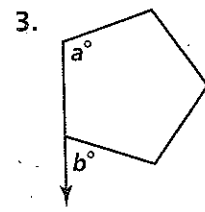
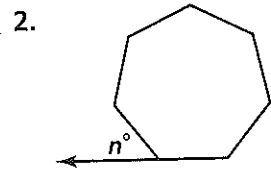
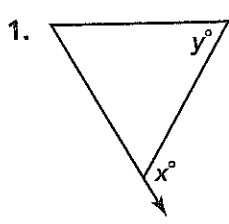


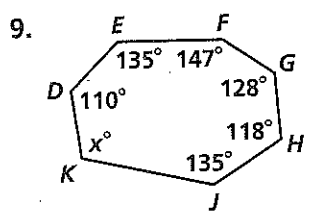
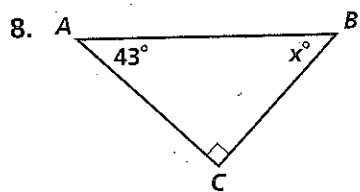
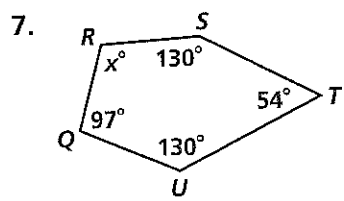
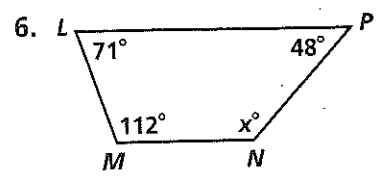
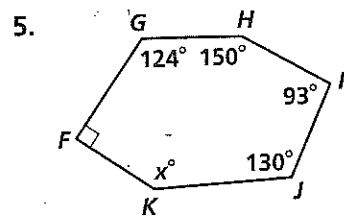
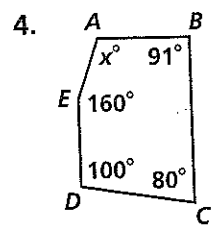
# Practice 3-4

## The Polygon Angle-Sum Theorems

Find the values of the variables for each polygon. Each is a regular polygon.



Find the missing angle measures.



For a regular 12-sided polygon, find each of the following.

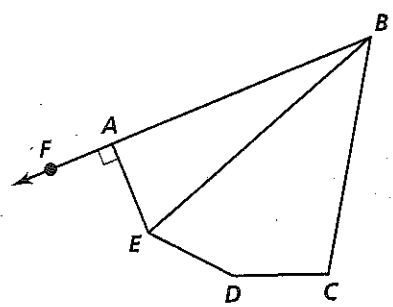
- 10. the measure of an exterior angle
- 11. the measure of an interior angle

The measure of an interior angle of a regular polygon is given. Find the number of sides.

- 12. 120
- 13. 108
- 14. 135

Identify each item in Exercises 15–18 in the figure.

- 15. quadrilateral
- 16. exterior angle
- 17. pair of supplementary angles
- 18. pentagon
- 19. A regular polygon has an exterior angle of measure 18. How many sides does the polygon have?



# Reteaching 3-4

## The Polygon Angle-Sum Theorems

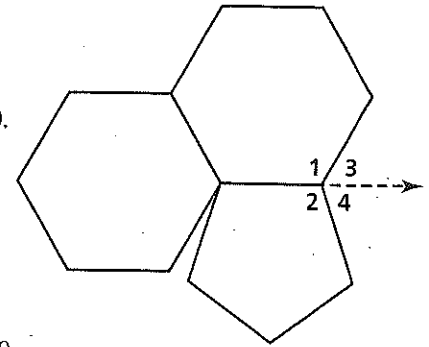
**OBJECTIVE:** Finding the sum of the measures of the interior and exterior angles of polygons

**MATERIALS:** None

### Example

A pattern of regular hexagons and regular pentagons covers a soccer ball. Find the measures of an interior and an exterior angle of the hexagon and an interior and an exterior angle of the pentagon.

- The sum of the measures of the interior angles of a hexagon equals  $(n - 2)180 = (6 - 2)180 = 720$ .
- $m\angle 1 = 720 \div 6 = 120$ .
- The sum of the measures of the exterior angles of a hexagon equals 360.
- $m\angle 3 = 360 \div 6 = 60$ .
- The sum of the measures of the interior angles of a pentagon equals  $(5 - 2)180 = 540$ .
- $m\angle 2 = 540 \div 5 = 108$ .
- The sum of the measures of the exterior angles of a pentagon equals 360.
- $m\angle 4 = 360 \div 5 = 72$ .
- An interior angle of the hexagon measures 120, and an exterior angle measures 60.
- An interior angle of the pentagon measures 108, and an exterior angle measures 72.



### Exercises

Sometimes regular octagons are pieced around a square to form a quilt pattern.

1. Classify  $\angle 1$ ,  $\angle 2$ ,  $\angle 3$ , and  $\angle 4$  as interior or exterior angles.
2. Find the measures of  $\angle 1$ ,  $\angle 2$ ,  $\angle 3$ , and  $\angle 4$ .
3. Classify  $\angle 1$ ,  $\angle 2$ ,  $\angle 3$ , and  $\angle 4$  as interior angles, exterior angles, or neither.
4. Find the measures of  $\angle 1$ ,  $\angle 2$ ,  $\angle 3$ , and  $\angle 4$ .

