



# 6-1 Additional Practice

## The Polygon Angle-Sum Theorems

For Exercises 1–4, find the sum of the interior angles and the measure of each interior angle for the given regular polygons. Round to the nearest tenth as needed.

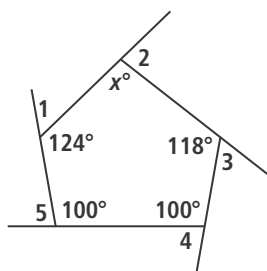
- 12-gon  **$1,800^\circ$ ;  $150^\circ$**
- 102-gon  **$18,000^\circ$ ;  $176.5^\circ$**
- 90-gon  **$15,840^\circ$ ;  $176^\circ$**
- 36-gon  **$6,120^\circ$ ;  $170^\circ$**

For Exercises 5–8, given the measure of an interior angle of a regular polygon, how many sides does each polygon have?

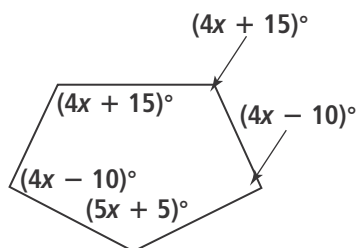
- $174^\circ$  **60**
- $156^\circ$  **15**
- $165^\circ$  **24**
- $177.5^\circ$  **144**

For Exercises 9–12, given the measure of an exterior angle of a regular polygon, how many sides does the polygon have?

- $12^\circ$  **30**
- $45^\circ$  **8**
- $18^\circ$  **20**
- $14.4^\circ$  **25**
- What is the measure of each exterior angle?  **$x = 25$**



$$\begin{aligned} m\angle 1 &= \mathbf{56^\circ} \\ m\angle 2 &= \mathbf{82^\circ} \\ m\angle 3 &= \mathbf{62^\circ} \\ m\angle 4 &= \mathbf{80^\circ} \\ m\angle 5 &= \mathbf{80^\circ} \end{aligned}$$



- Understand** Why is the sum of the interior angles of a polygon always a multiple of 180?

**Any polygon can be decomposed into  $n - 2$  triangles, and the sum of the interior angles of a triangle is  $180^\circ$ .**

- Apply** Archeologists discover four outer walls of an ancient building, as shown. If the missing walls are the same lengths as the discovered walls, how many sides did the original building have? Explain.

**Suppose  $n$  is the total number of sides:**

$$\begin{aligned} \frac{180(n - 2)}{n} &= 156 \\ 180n - 360 &= 156n \\ n &= 15 \end{aligned}$$

