NAME _____ DATE _____ PERIOD _____

Study Guide and Intervention

7MR3.3, 7AF1.1

Polygons and Angles

An **interior angle** is any angle that lies inside a polygon. A **regular polygon** is a polygon whose sides and angles are congruent.

Example 1 **Find the sum of the measures of the interior angles of a tricontagon, which is a 30-sided polygon.**

$S = (n - 2)180°$ Write an equation.
$S = (30 - 2)180°$ Replace n with 30. Subtract.
$S = (28)180°$ Multiply.
$S = 5{,}040°$
The sum of the measures of the interior angles of a tricontagon is 5,040°.

Example 2 **The defense department of the United States has its headquarters in a building called the Pentagon because it is shaped like a regular pentagon. What is the measure of an interior angle of a regular pentagon?**

$S = (n - 2)180°$ Write an equation.
$S = (5 - 2)180°$ Replace n with 5. Subtract.
$S = (3)180°$ Multiply.
$S = 540°$
$540° \div 5 = 108°$ Divide by the number of interior angles to find the measure of one angle.
The measure of one interior angle of a regular pentagon is 108°.

Exercises

For Exercises 1–6, find the sum of the measures of the interior angles of the given polygon.

1. nonagon (9-sided) **1,260°**
2. 14-gon **2,160°**
3. 16-gon **2,520°**
4. hendecagon (11-sided) **1,620°**
5. 25-gon **4,140°**
6. 42-gon **7,200°**

For Exercises 7–12, find the measure of one interior angle of the given polygon. Round to the nearest hundredth if necessary.

7. hexagon **120°**
8. 15-gon **156°**
9. 22-gon **163.63°**
10. icosagon (20-sided) **162°**
11. 38-gon **170.53°**
12. pentacontagon (50-sided) **172.8°**