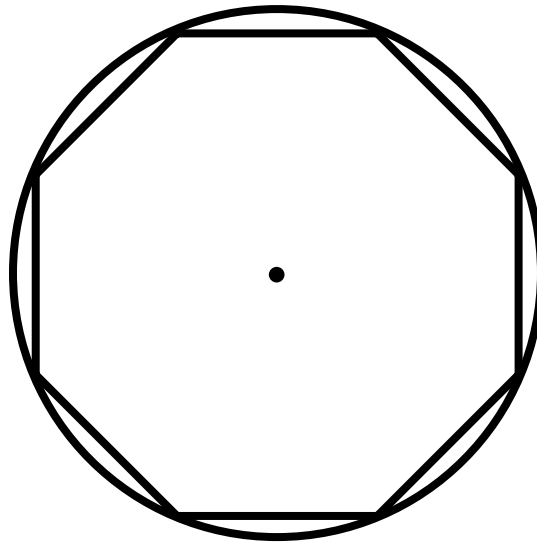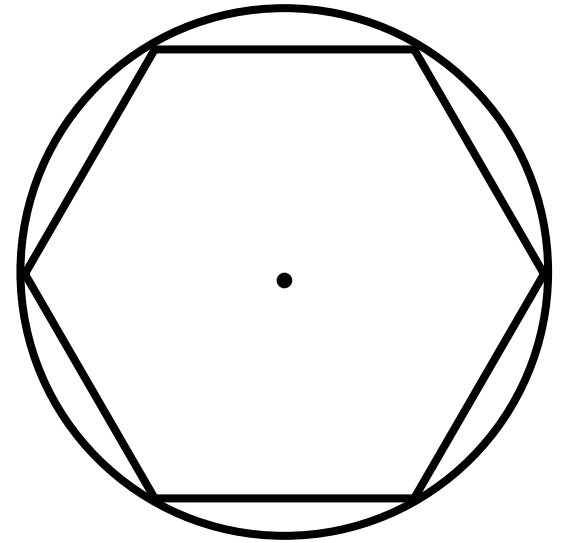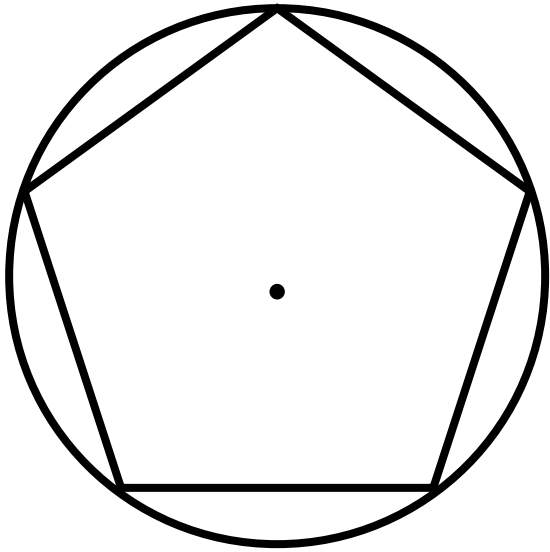# 10.6

Area and Perimeter of Regular Polygons

Draw radii from the center of the regular polygons to their vertices.

What is the relationship between the number of triangles drawn and the number of sides of each polygon?

2) What can you say is the relationship between all the triangles within one polygon?

3) What is an <u>APOTHEM</u>?

4) Draw one apothem on each of the polygons.

5) Knowing the above information, how would you find the area of a regular polygon?

6) What information is necessary to do this?

Area Formulas for Regular Polygons

POK

Variables used in the following formula:

A = Area
P = Perimeter
s = Length of one of the sides of the polygon
a = Apothem
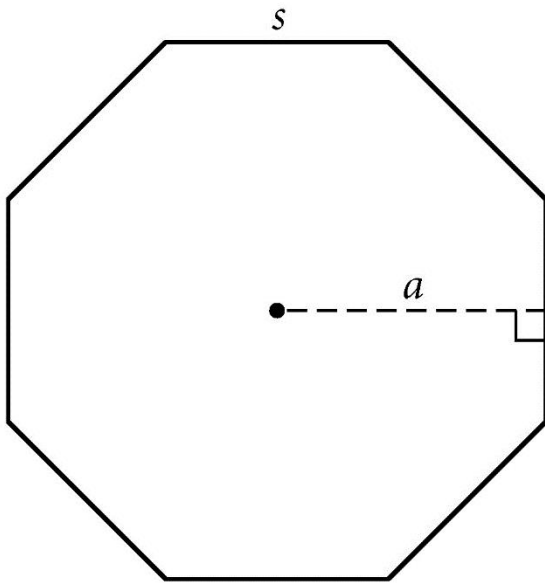**n = Number of sides in the polygon**

PRACTICE

Find the area of the regular polygon given the following information.

1) Pentagon: $a \approx 3$ cm and $s \approx 4.4$ cm

2) Decagon: $a \approx 5.7$ cm and $s \approx 3.7$ cm

3) Octagon: $a \approx 12.1$ cm and $p \approx 80$ cm

4) $s = 12$ cm and
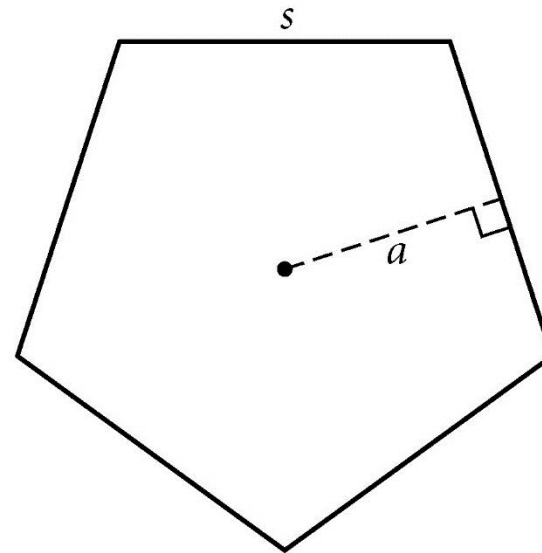$a \approx 14.5$ cm.

$A \approx$ _____

5) $a = 6$ cm and
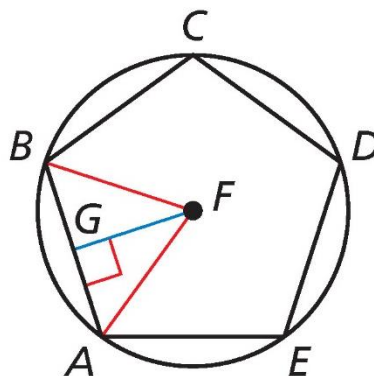$A \approx 130.8$ cm^2.

$p \approx$ _____

6) In the diagram, *ABCDE* is a regular pentagon inscribed in $\odot F$. Find each angle measure.
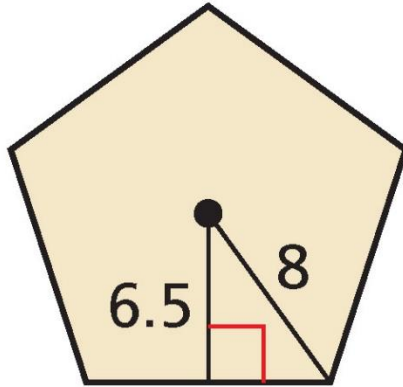

a. $m\angle AFB$

b. $m\angle AFG$

c. $m\angle GAF$

PRACTICE

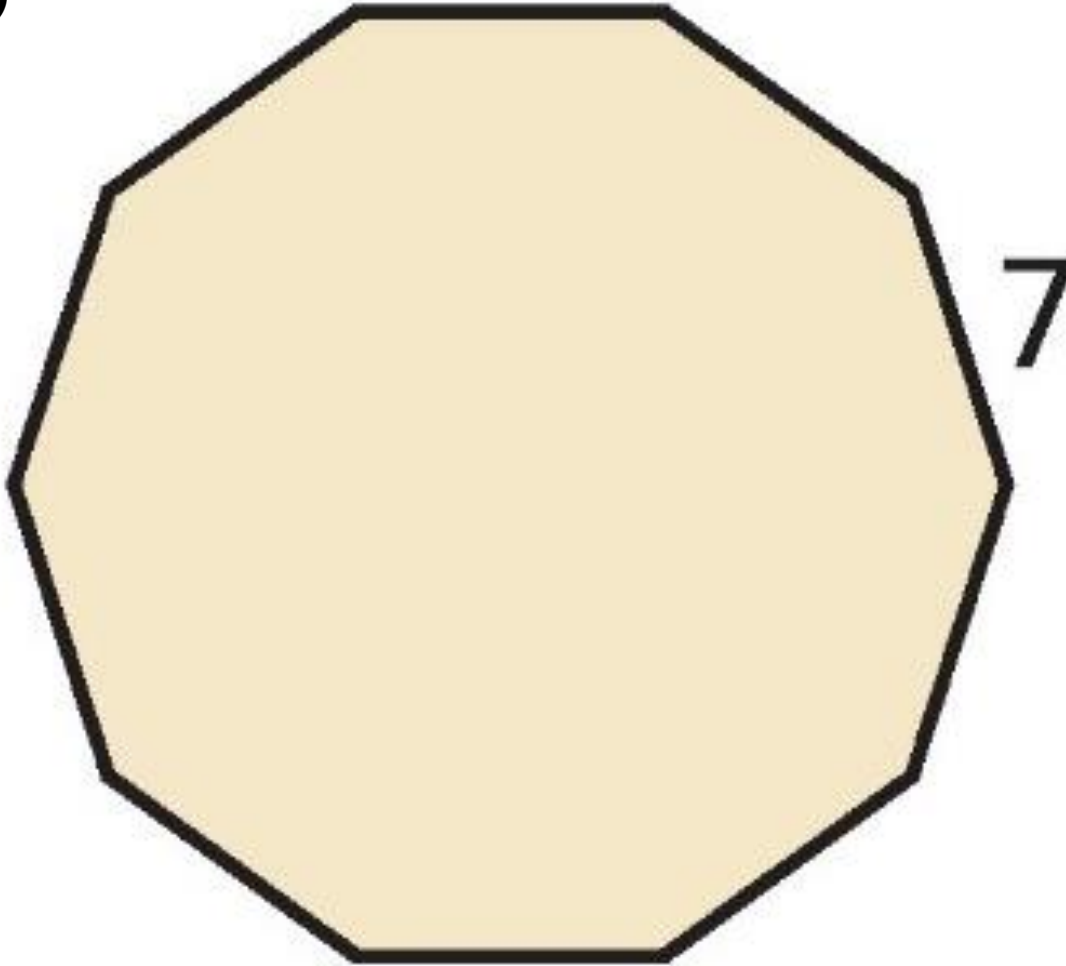**Find the area of the regular polygon given the following information.**

7)

PRACTICE

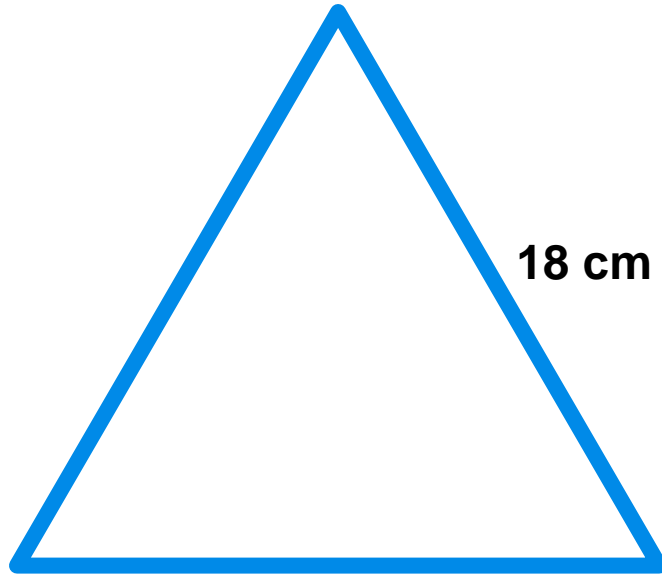**Find the area of the regular polygon given the following information.**

8)

7

PRACTICE

Find the area of the equilateral triangle.
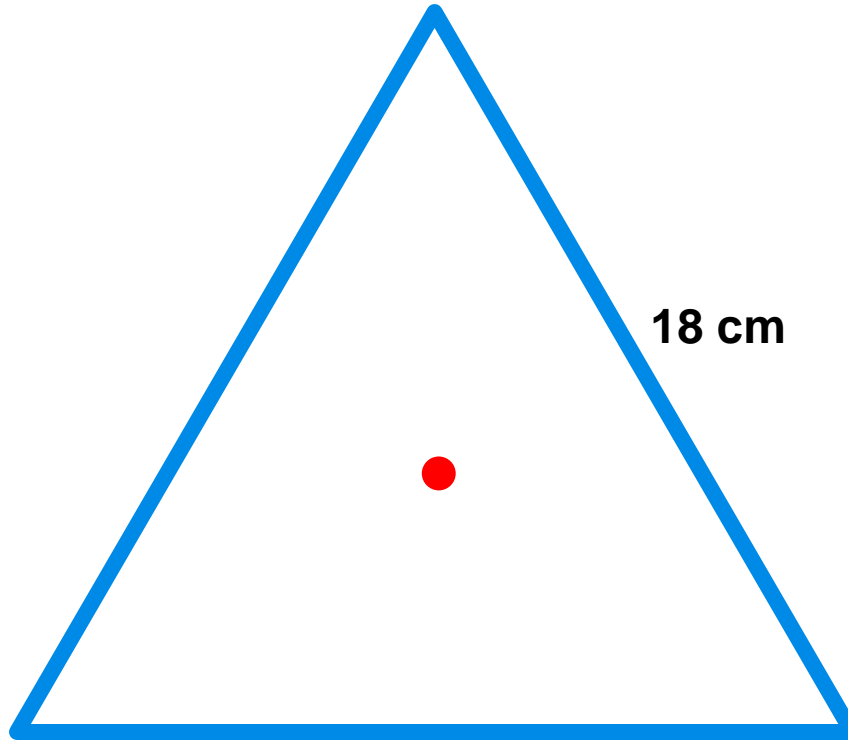
9)

18 cm

SYNTHESIS

Find distance from the centroid of this equilateral triangle to the midpoint of one of the sides.
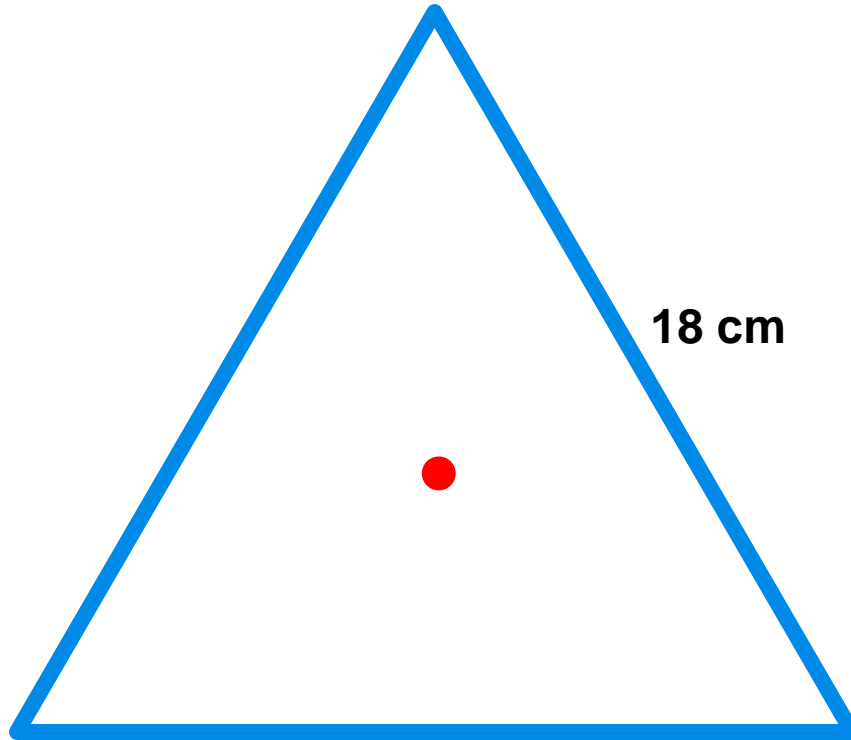
10)

18 cm

SYNTHESIS

Find distance from the centroid of this equilateral triangle to one of the vertices.

11)

18 cm

Find the circumference of the circumscribed circle.

12)

18 cm