Unit 5: Right Triangle Trigonometry **Name:**_____
Day 15 Regular Polygons **Date:** _____ **Hour:** _____
(PH 9-5)

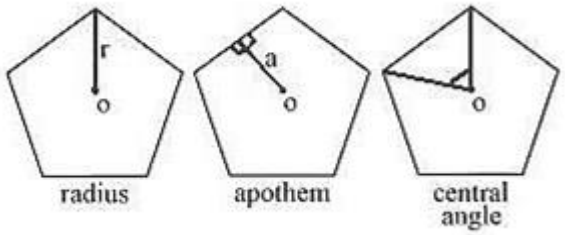
A **regular polygon** has all of its sides and angles equal.

The **center of a regular polygon** is equidistant from the vertices.

A **radius** connects the center to a vertex.

The **apothem** is the distance from the center to a side.

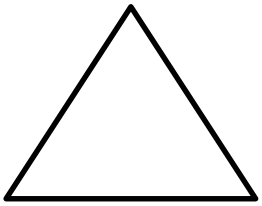
A **central angle** of a regular polygon has its vertex at the center, and its sides pass through consecutive vertices.



CENTRAL ANGLE MEASURE of a REGULAR *n*-GON: **central angle =** $\frac{360^\circ}{n}$

Example 1: Name each figure shown below. Draw the radii. Then find the measure of each central angle and the measure of each base angle in the resulting triangles.

a.

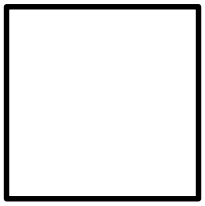


Name: _____

Central angles: _____

Base angles: _____

b.

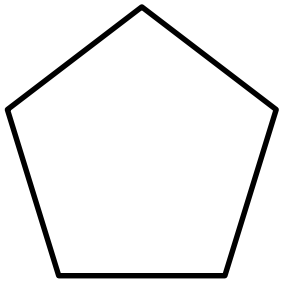


Name: _____

Central angles: _____

Base angles: _____

c.

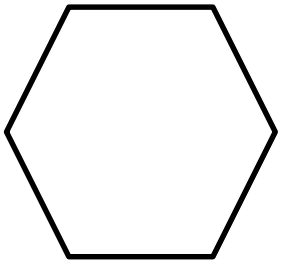


Name: _____

Central angles: _____

Base angles: _____

d.



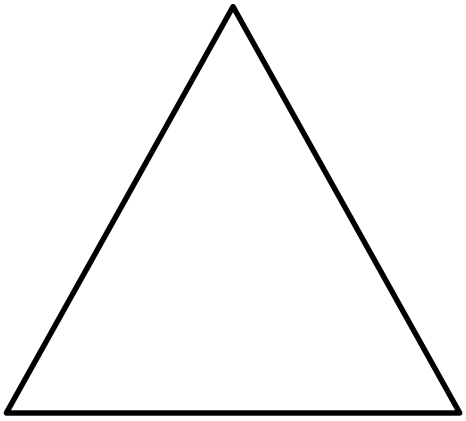
Name: _____

Central angles: _____

Base angles: _____

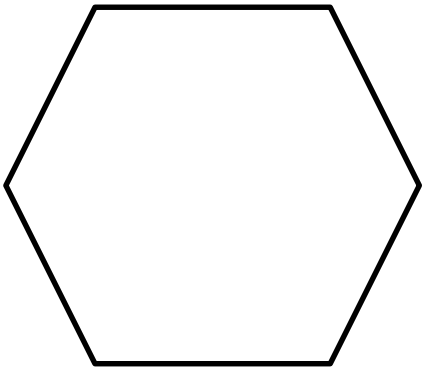
Number of Sides	Name of Polygon
3	Triangle
4	Quadrilateral
5	Pentagon
6	Hexagon
7	Heptagon
8	Octagon
9	Nonagon
10	Decagon
12	Dodecagon
n	*n*- gon

Example 2: **Find the PERIMETER of a regular triangle with side length 4 cm to the nearest tenth. Find the length of an apothem and the radius. Use what you know about special right triangles to solve. Leave answers in simplest radical form.**



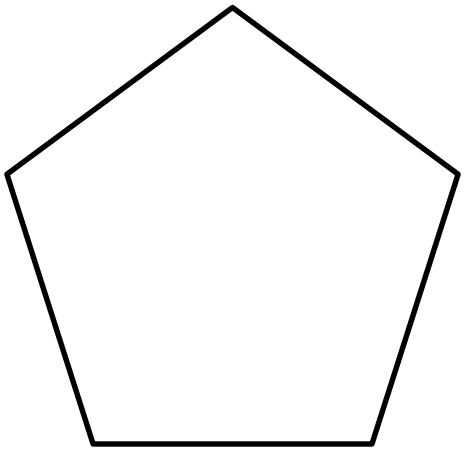
Perimeter: _____ **Apothem:** _____ **Radius:** _____

TRY THIS ONE: **Find the PERIMETER of a regular hexagon with side length 8 cm. Find the length of an apothem and the radius. Use what you know about special right triangles to solve. Leave answers in simplest radical form.**



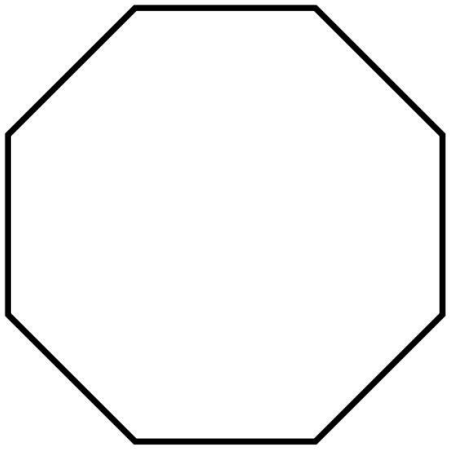
Perimeter: _____ **Apothem:** _____ **Radius:** _____

Example 3: Find the PERIMETER of a regular pentagon with side length 10 cm. Find the length of an apothem and the radius. Use SOH CAH TOA to solve and round to the nearest tenth.



Perimeter: _____ **Apothem:** _____ **Radius:** _____

TRY THIS ONE: Find the PERIMETER of a regular octagon with side length 12 cm. Find the length of an apothem and the radius. Use SOH CAH TOA to solve and round to the nearest tenth.

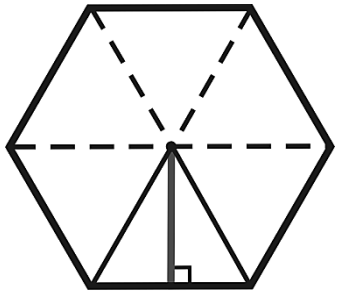


Perimeter: _____ **Apothem:** _____ **Radius:** _____

Homework: Unit 5 Day 15 Worksheet

Unit 5: Right Triangle Trigonometry **Name:**_____
Day 15 Worksheet **Date:** _____ **Hour:** _____
(PH 9-5)

Use the regular hexagon at right to answer the following questions. Each side is 10 cm long.



1. **Each dashed line segment is a(n) _____.**
2. **The perpendicular segment is a(n) _____.**
3. **Find the measure of the central angle.**
4. **Find the measure of the base angles.**
5. **Find the length of the radius.**
6. **Find the length of the apothem. Leave answer in simplest radical form.**
7. **Find the perimeter.**

8. What is the perimeter, radius, and apothem of an equilateral triangle with 3 inch sides?

The stop sign shown is a regular octagon. Its perimeter is about 80 inches.

9. What is the measure of each central angle?

10. What is the length of each side?

11. Find the apothem of the stop sign. Round to the nearest tenth.

12. Find the length of the radius.