Geometry
Lesson #7: Area of a Regular Polygon

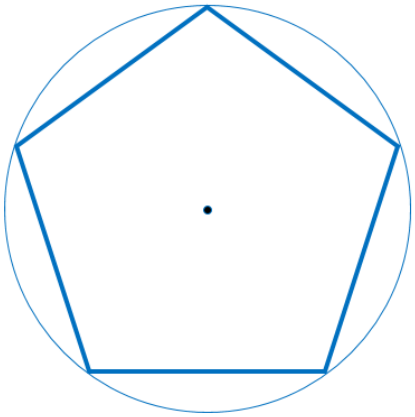
Name: _____
Period: _____

Core Concept

A ***regular polygon*** is _____ and _____

Regular Polygons, vocabulary and formulas:

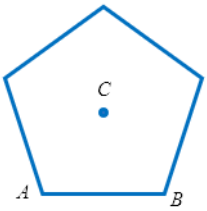
- Center
- Central Angle
- Radius
- Apothem
- Area Formula



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

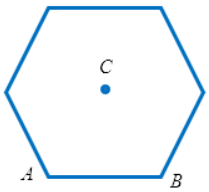
Find the measure of the central angle for each regular polygon.

Pentagon



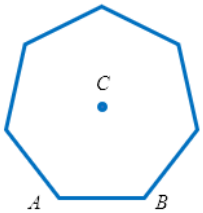
$m\angle ACB$

Hexagon



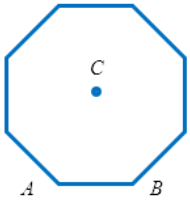
$m\angle ACB$

Heptagon



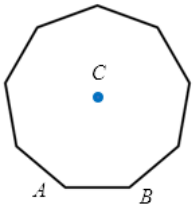
$m\angle ACB$

Octagon



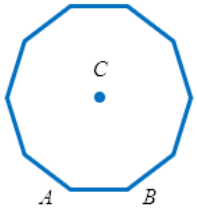
$m\angle ACB$

Nonagon



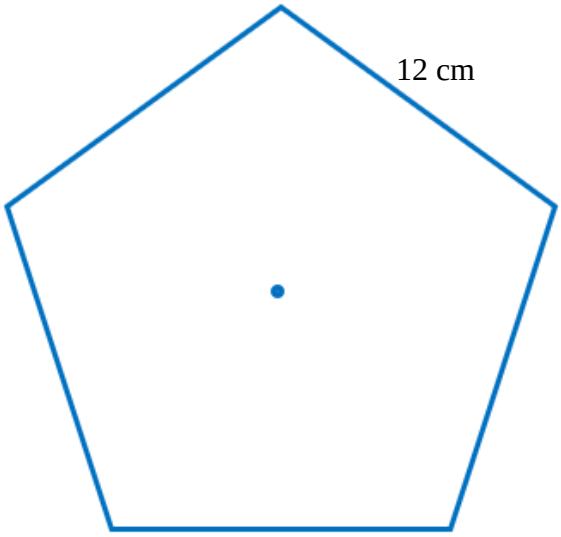
$m\angle ACB$

Decagon



$m\angle ACB$

1) Find the area of the regular pentagon with side length 12 cm.



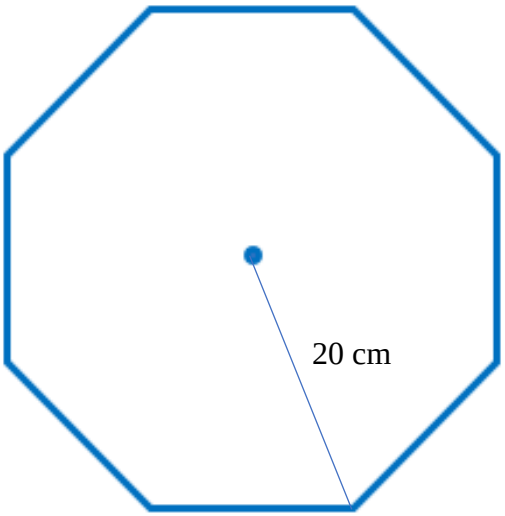
Side Length: 12 cm

Apothem = _____

Perim = _____

Area = _____

2) Find the area of the regular octagon with a radius of 20 cm.



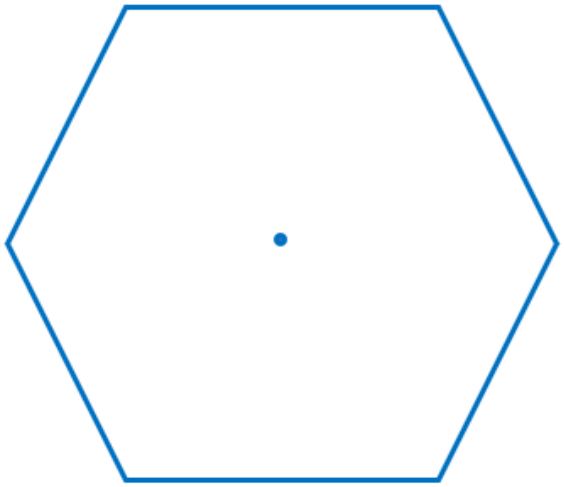
Side Length: _____

Apothem = _____

Perim = _____

Area = _____

3) Find the area of a regular hexagon with a side length of 18 cm. Note: You can get an exact form of the answer using special right triangles or a decimal approximation using trigonometry. Either option is acceptable. (or try both! ☺)



Side Length: 18 cm

Apothem = _____

Perim = _____

Area = _____

HW #7: Do work on separate paper.

1) Find the area a regular **nonagon** with a side length of 16 cm.	2) Find the area of a regular **pentagon** with an apothem of 20 cm.	3) Find the area of a regular **hexagon** with a side length of 14 cm.
4) A square with a side length of 10 cm has an area of 100 cm^2. Show that you can use the $A = \frac{1}{2}(apothem)(perimeter)$ formula to get the same area. Draw the figure.		5) Find the area of an equilateral triangle with an apothem of 5 cm. Draw the figure.

Answers: Classwork: 15.30, 15.59 or $9\sqrt{3}$, 18.48, 108, 122.40, 841.86 or $486\sqrt{3}$, 1131.00

HW:, 144, $7\sqrt{3}$ or 12.12, 14.53, 1582.56, 84, 1453.00, $294\sqrt{3}$ or 509.22, $75\sqrt{3}$ or 129.90, 21.98, 145.30