

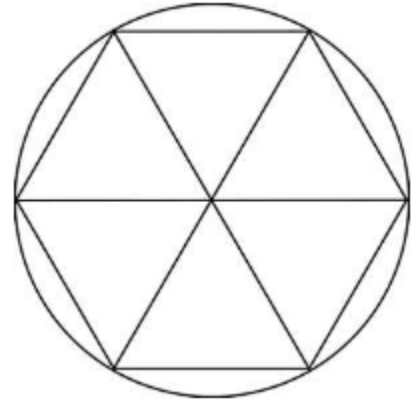
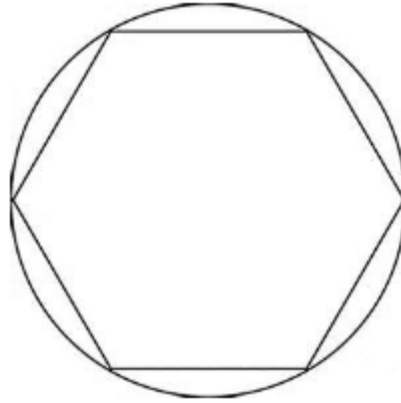
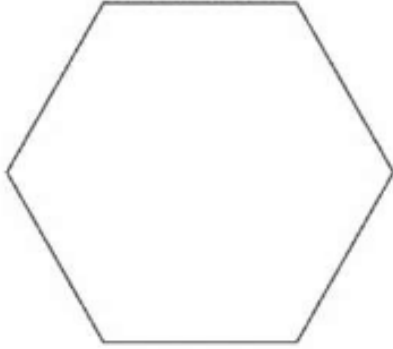
# 9.3 Area of Regular Polygons

## NOTES

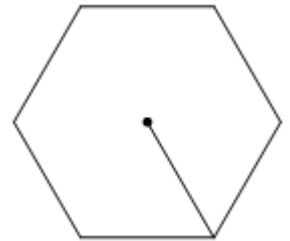
Write your questions here!



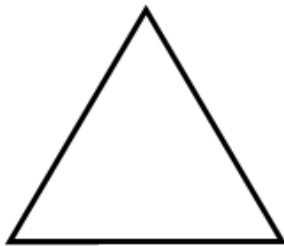
**Regular Polygons:**



**Area of a Regular Polygon =**



**Finding the central angle:**



Write your questions here!

**SPECIAL RIGHT TRIANGLES**

$30^\circ - 60^\circ - 90^\circ$

$45^\circ - 45^\circ - 90^\circ$

**PYHTAGOREAN THEOREM**

$$a^2 + b^2 = c^2$$

**TRIG FUNCTIONS**

sin

cos

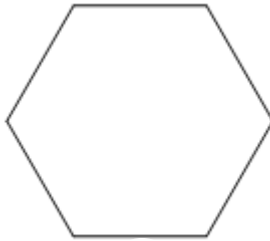
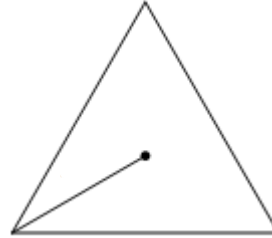
tan

**TRY IT! Find the area of the following regular polygons:**

**Octagon**

**Apothem = 4 ft**

**Side = 6 ft**



**A regular pentagon with perimeter 40 cm.**

**Summarize your notes!**

**POLYGONS**

# of Sides	NAME
3	Triangle
4	Quadrilateral
5	Pentagon
6	Hexagon
7	Heptagon
8	Octagon
9	Nonagon
10	Decagon
11	Undecagon
12	Dodecagon
n	n-gon

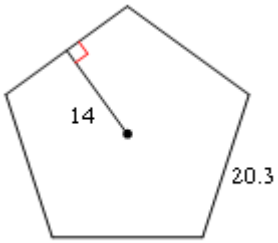
# 9.3 PRACTICE

Find the area of each. Label your answer!

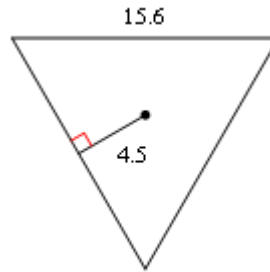
1.  
Nonagon  
Apothem = 14 cm  
Side = 8 cm

2.  
Dodecagon  
Apothem = 8.5 in  
Side = 12.2 in

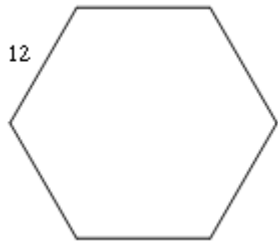
3.



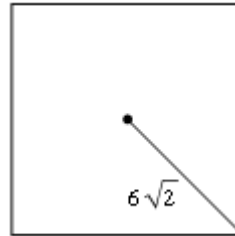
4.



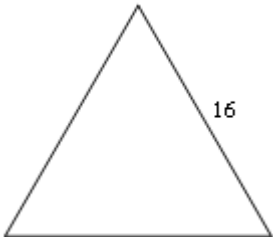
5.



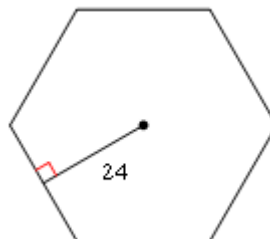
6.



7.



8.



**Draw the following. Find the area. Label your answer!**

9. A square with apothem of 4 in and perimeter of 32 in.

10. A regular pentagon with each side of 5 cm.

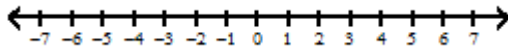
11. A regular hexagon with an apothem of 4 feet.

12. A square with radius 10 m.

**ALGEBRA REVIEW**

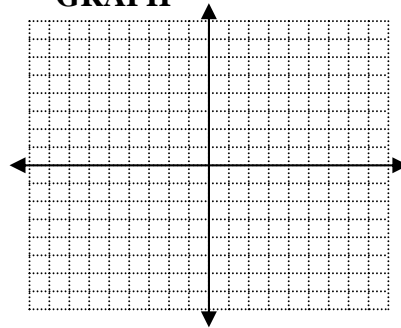
**SOLVE**

$$5 - 2(3 - 2x) < 35$$



**GRAPH**

$$3y = 2x - 9$$

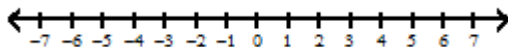


**MULTIPLY**

$$(2x - 5)(3x + 4)$$

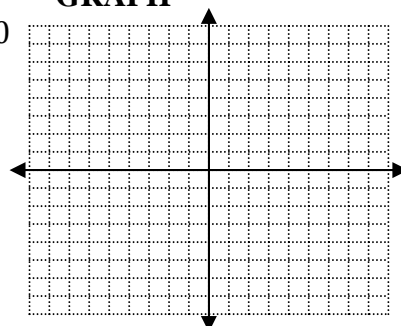
**SOLVE**

$$-4x - 5 \geq -11 - 6x$$



**GRAPH**

$$4x + 5y \leq 10$$



**FACTOR**

$$2x^2 - x - 3$$

# 9.3 APPLICATION

1. Find the area. Label your answer!

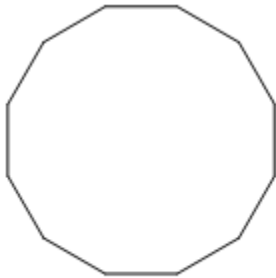
Heptagon  
 Apothem = 6.5 mi  
 Side = 4 mi

2. Draw a picture. Find the area. Label your answer!

An equilateral triangle with radius of 15 cm and perimeter of  $45\sqrt{3}$  cm.

**Watch the application walk through video if you need extra help getting started!**

1. Find the area of the regular dodecagon.



Perimeter = 60 ft

2. **SAT PREP** Below are sample SAT questions. The SAT is the main standardized test that colleges look at for admission. One is multiple choices; the other is free response where you must grid in your answer. Blow it up.

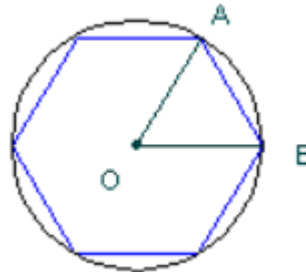
## MULTIPLE CHOICE

What is the measure of a central angle of a regular octagon?

- A.  $8^\circ$
- B.  $30^\circ$
- C.  $36^\circ$
- D.  $45^\circ$
- E.  $60^\circ$

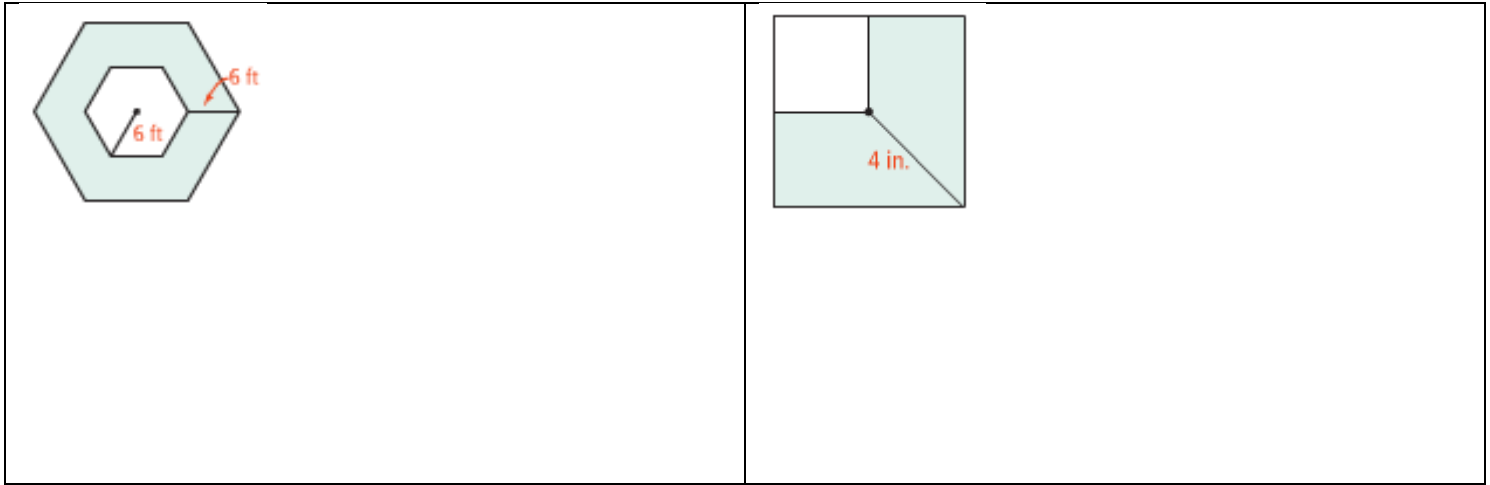
## GRID IN

A regular hexagon is inscribed in a circle with radius 10. What is the measure of one side of the hexagon?

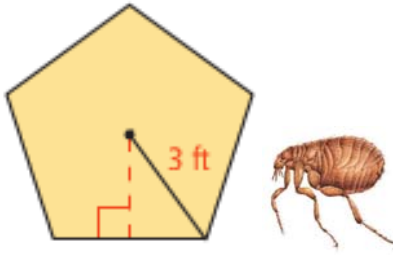


<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	0	0	0
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9

3. **SHADED REGION** The polygons are regular polygons. Find the area of the shaded region.



4. **PERIMETER** Don't forget about perimeter. Perimeter is the length of all sides added together. Think about walking around the edge of the figure, how far would you walk. (It helps to pretend you are a flea so you can visualize walking around the figure, plus fleas can jump really high.)

<p><b>Use the picture to the right to find...</b></p> <p>Perimeter =</p>  <p>Area =</p>	
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5. Mr. Sullivan is really getting into baton. He wants to share his new routine with Mr. Brust's 4 year old daughter who is also really into baton. During the routine, Sully loses control of a baton and accidentally smashes Mr. Brust's beautiful stain glass hexagonal window with radius of 2 ft. It will cost 15 dollars per square foot to replace the window. How much does Mr. Sullivan have to pay to have it repaired?

