

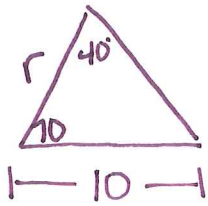
Name: Key

Hour: \_\_\_\_\_

## Area of Regular Polygons- Given a Side Length HW

Directions: Find the area of the regular polygon. Show all work. Round to the nearest tenth if needed.

1. Find the area of a regular nonagon with perimeter of 90cm.



$$\cos(70) = \frac{5}{r}$$

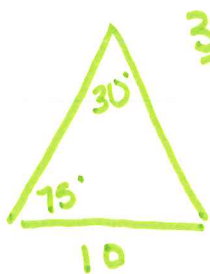
$$\boxed{r = 14.6 \text{ cm}}$$

$n = 9 \rightarrow \boxed{S = 10}$

$$A = 9 \cdot \frac{1}{2} \cdot 14.6 \cdot 14.6 \sin(40)$$

$$\boxed{A \approx 616.6 \text{ cm}^2}$$

2. Find the area of a regular dodecagon with perimeter of 120m.



$\frac{360}{n} = \theta$

$$\cos(75) = \frac{5}{r}$$

$$\boxed{r = 19.3 \text{ m}}$$

$n = 12 \text{ sides}$

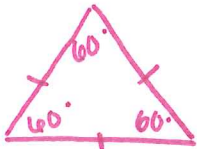
$$\frac{120}{12} = 10 = S$$

$$A = 12 \cdot \frac{1}{2} \cdot 19.3^2 \sin(30)$$

$$A \approx 1117.47$$

$$\boxed{A \approx 1117.5 \text{ m}^2}$$

3. Find the area of a regular triangle with perimeter of 21 km.



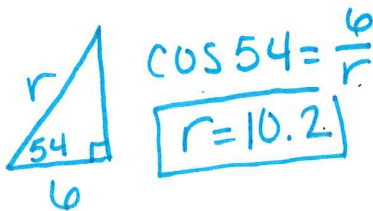
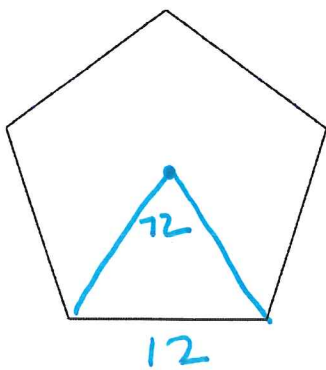
$$A = \frac{1}{2} \cdot 7 \cdot 7 \sin(60)$$

$$\boxed{A \approx 21.2 \text{ km}^2}$$

← or you could do it as above.  
If you do it this way for # 3 make sure you can explain why you did it.

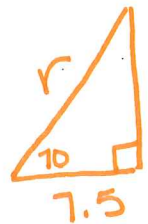
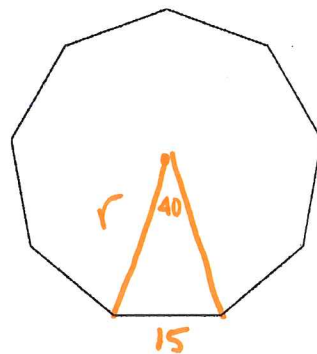
3.  $s = 12 \text{ m}$

4.  $S = 15 \text{ ft}$



$$\cos(54) = \frac{6}{r}$$

$$\boxed{r = 10.2}$$



$$\cos(70) = \frac{7.5}{r}$$

$$\boxed{r = 21.9 \text{ ft}}$$

$$A = 5 \cdot \frac{1}{2} \cdot 10.2 \cdot 10.2 \sin(72)$$

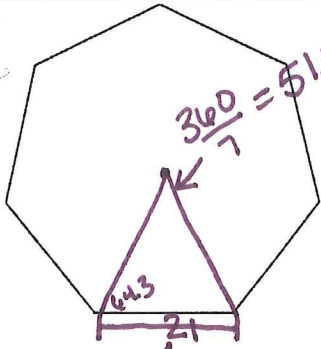
$$\boxed{A \approx 247.4 \text{ m}^2}$$

$$A = 8 \cdot \frac{1}{2} \cdot 21.9 \cdot 21.9 \sin(40)$$

$$\boxed{A \approx 1387.3 \text{ ft}^2}$$

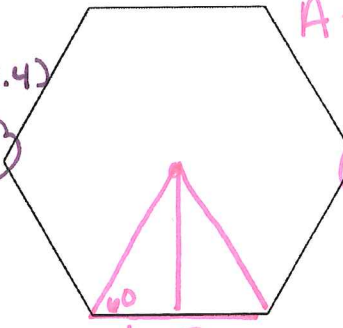
5.  $s = 21\text{km}$

6.  $s = 2\text{m}$

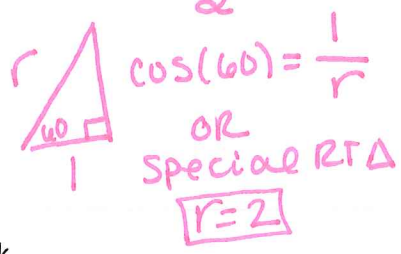
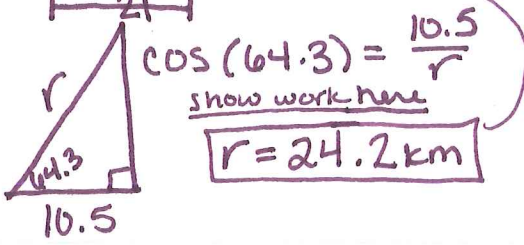


$A = 7 \frac{1}{2} 24.2 \times 24.2 \sin(51.4)$   
 $A \approx 6101.9 \text{ km}^2$

$A = 6 \frac{1}{2} \cdot 2^2 \cdot \sin(60)$

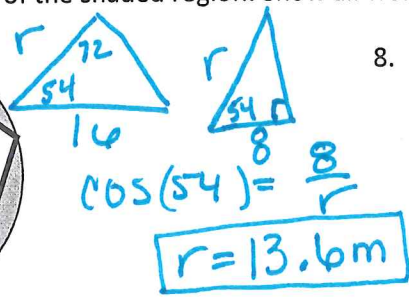
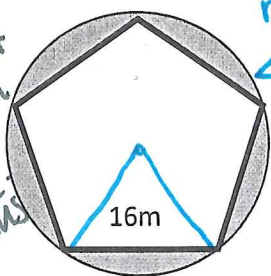


$A \approx 10.4 \text{ m}^2$

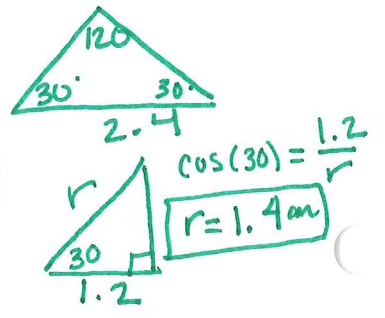
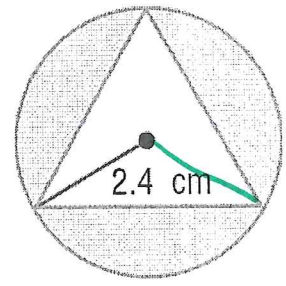


Directions: Find the area of the shaded region. Show all work.

7. Circle + Pentagon have SAME RADIUS



8.



$A = \text{Circle} - \text{pentagon}$   
 $= \pi r^2 - n \frac{1}{2} ab \sin \theta$   
 $= \pi (13.6)^2 - 5 \frac{1}{2} 13.6 \times 13.6 \sin(72)$   
 $A \approx 141.3 \text{ m}^2$

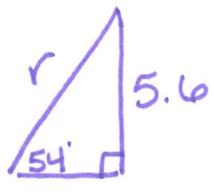
$A = \text{Circle} - \text{triangle}$   
 $A = \pi r^2 - n \frac{1}{2} ab \sin \theta$   
 $A = \pi (1.4)^2 - 3 \frac{1}{2} 1.4^2 \sin(120)$   
 $A \approx 3.6 \text{ cm}^2$

Spiral: Using Apothem and Radius

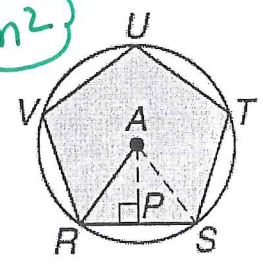
Directions: Find the area of the regular pentagon given the information provided.

9.  $AP = 5.6 \text{ cm}$

10.  $AR = 12 \text{ m}$



You need more work then what is here!  
 $\sin(54) = \frac{5.6}{r}$   
 $r = 6.9$



$A \approx 342.4 \text{ m}^2$

$A = 113.2 \text{ cm}^2$

again must show work!