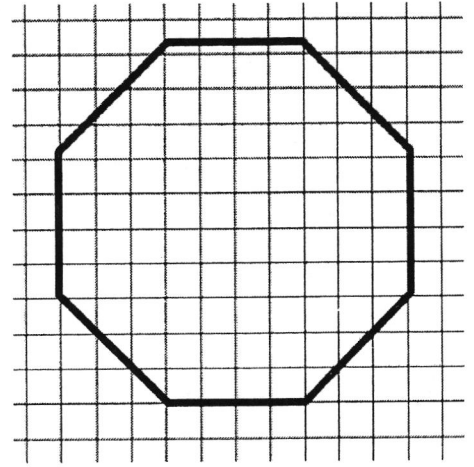
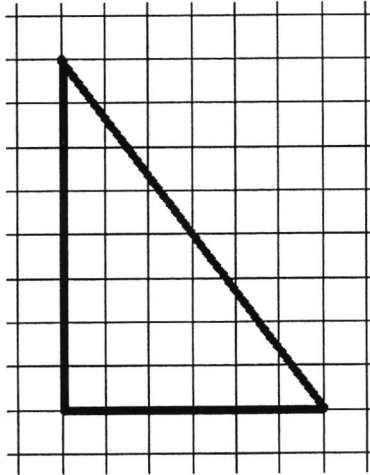
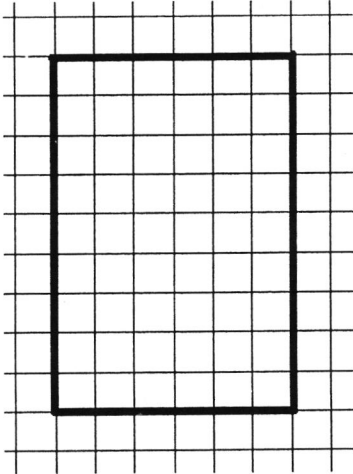


Geometry
WS Area of a regular polygon

Name _____
Period _____

Part 1 AREA by counting boxes

Find the area of each of the following polygons by counting (or estimating) the number of boxes in the shape.

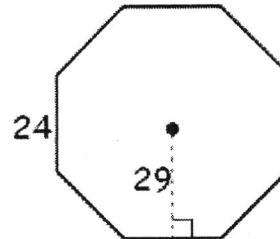


Part 2 AREA of regular polygons

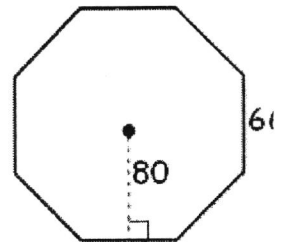
The picture at the right shows 2 regular octagons.

Regular shapes are shapes that have all sides the same length and all angles the same measure.
What is a regular shape?

Octagon #1



Octagon #2



To find the area of a regular polygon, first we need to find the measure of each side. In octagon #1 each side measures 24 units. What is the measure of each side in octagon #2?

Next you need to find the perimeter. Take the measure of each side, and multiply by the number of sides. In octagon #1: $24 \times 8 \text{ sides} = 192$. What is the perimeter in octagon #2?

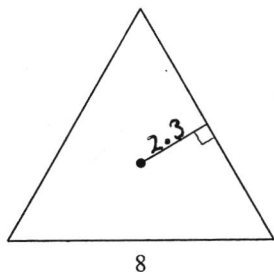
The APOTHEM is the distance from a side to the center of a regular polygon. The apothem of octagon #1 is 29. What is the apothem of octagon #2?

Finally, to find the area, we use the formula $\text{Area} = \frac{1}{2} \times \text{apothem} \times \text{perimeter}$. In octagon #1, that is $\frac{1}{2} \times 29 \times 192 = 2,784u^2$. What is the area of Octagon #2?

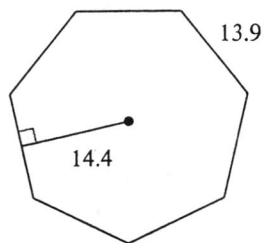
Area of Regular Polygons

Find the area of each regular polygon. Leave your answer in simplest form.

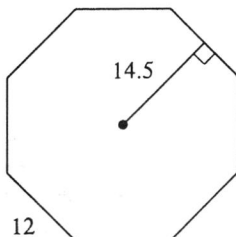
1)



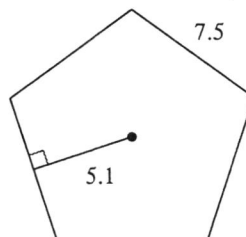
2)



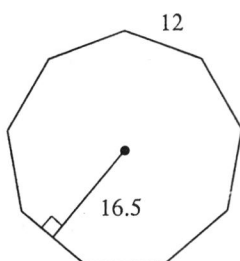
3)



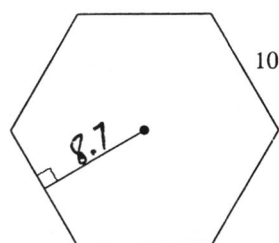
4)



5)



6)



- 7) pentagon
apothem = 7.3
side = 10.6

- 8) triangle
apothem = 14
side = 48.5