9.3 Area of Similar Polygons
Geometry

Name: _____
Date: _____ Per: _____

Determine the ratio of the areas, given the ratio of the sides of a polygon.

1. $\frac{3}{5}$

2. $\frac{1}{4}$

3. $\frac{7}{2}$

4. $\frac{6}{11}$

Determine the ratio of the sides of a polygon, given the ratio of the areas.

5. $\frac{1}{36}$
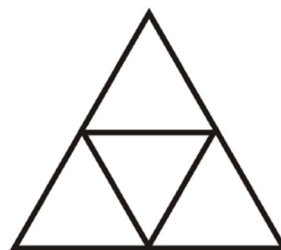
6. $\frac{4}{81}$

7. $\frac{49}{9}$

8. $\frac{25}{144}$

Answer the following questions using the triangle below.

9. What is the ratio of the areas of the large triangle to one of the small triangles?

10. What is the scale factor of the large triangle   to the small triangle?

11. If the area of the large triangle is 20 units², what is the area of a small triangle? (Hint: Use the scale factor from above.)

12. Two rectangles are similar with a scale factor of $\frac{4}{7}$. If the area of the larger rectangle is 294 in², find the area of the smaller rectangle.

13. Two triangles are similar with a scale factor of $\frac{1}{3}$. If the area of the smaller triangle is 22 ft², find the area of the larger triangle.

14. The ratio of the areas of two similar squares is $\frac{16}{81}$. If the length of a side of the smaller square is 24 units, find the length of a side in the larger square.

15. The ratio of the areas of two right triangles is $\frac{2}{3}$. If the length of the hypotenuse of the larger triangle is 48 units, find the length of the smaller triangle's hypotenuse.

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

10 cm
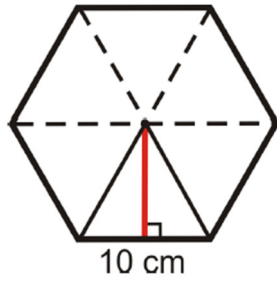
1. Each dashed line segment is a(n) _____.

2. The red line segment is a(n) _____.

3. There are _____ congruent triangles in a regular hexagon.

4. In a regular hexagon, all the triangles are _____.

5. Find the radius of this hexagon.

6. Find the apothem.   7. Find the perimeter.   8. Find the area.

Find the area and perimeter of each of the following regular polygons. Round your answer to the nearest hundredth.

9.

16

10.

2

11.

20

12.

5

13.

8
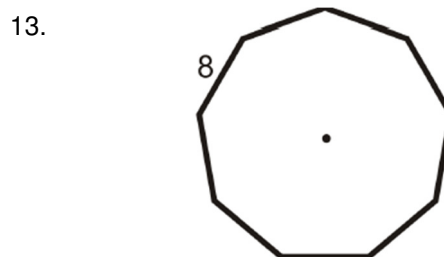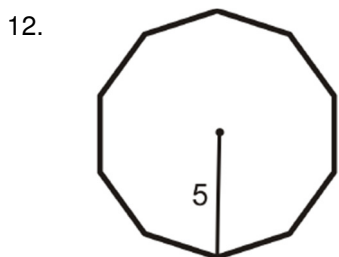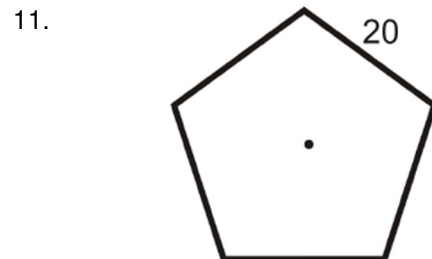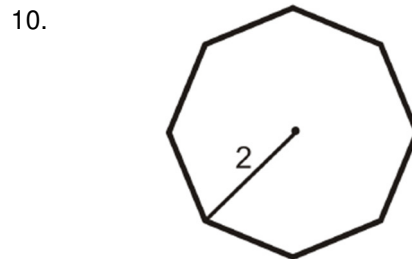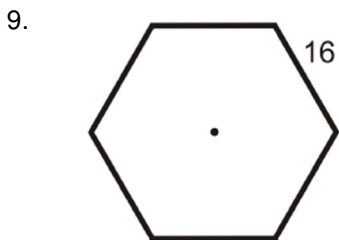
Unit 9 Modeling   Name_____

The space station orbiting the earth uses radar to communicate with tracking stations on Earth's surface. The space station is in a geostationary orbit. That means that the space station is always on the line through the center of the Earth and Tracking Station 2. From the perspective of Station 1, the space station is on the horizon and from the perspective of Station 2, the space station is always directly overhead as in the following diagram. The angle between the lines from the space station to the stations is 9.5°. A technician is flying from one station to the other in a direct path along the Earth's surface. Assume the Earth is a sphere with radius 3959 miles.

Show work for full credit. Round to the nearest thousandth. Use the approximation $\pi = 3.14$.

Station 1, 9.5°, Station 2, C
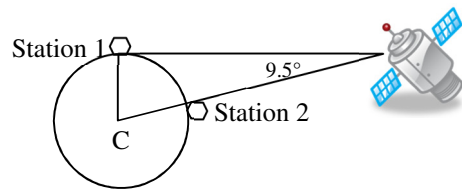
Part 1

How long will it take her to fly from Station 1 to Station 2 along that arc if she travels an average of 500 mph?
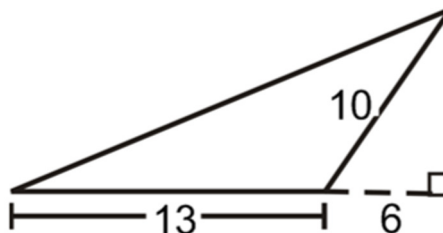
Part 2

How far is it from the satellite to the center of the Earth?

Part 3

If the signal starts at Station 1, goes to the satellite, then to Station 2, how far has it traveled?

1.) Find the area and the perimeter of the triangle below. (Show ALL work for full credit.)

10

13   6

2.) Given an equilateral triangle with a perimeter of 45 inches. Find the area to the nearest square inch. (Hint: Draw the picture and think of properties of an equilateral triangle.)
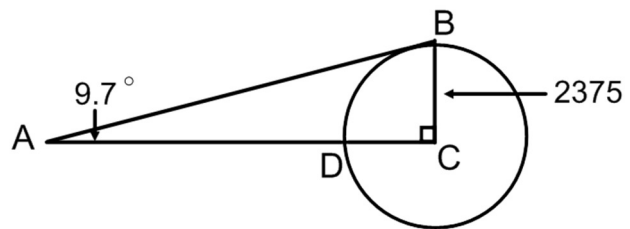
3.) If the shaded triangle is equilateral, with side lengths of 20m, what is the area of the circle not covered by the triangle?
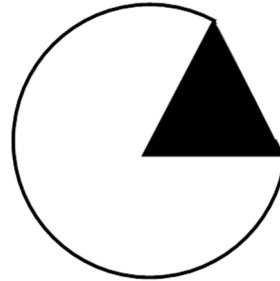
4.) Use the figure at the right to answer the questions below.

a.) Find the measure of angle B.

b.) Find the arc length of BD.
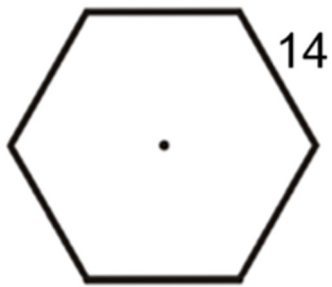
c.) Find the length of AB.

d.) Find the length of AC, and then the length of AD.

5.) Two rectangles are similar with a scale factor of $\frac{4}{7}$. If the area of the larger rectangle is 294in², find the area of the smaller rectangle.

Find the area and perimeter of each of the following regular polygons. Round your answer to the nearest hundredth.

6.)

14

7.)

4