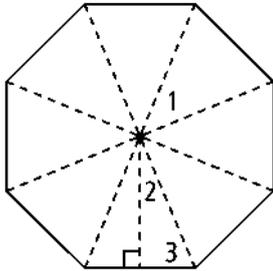## Practice

10-3
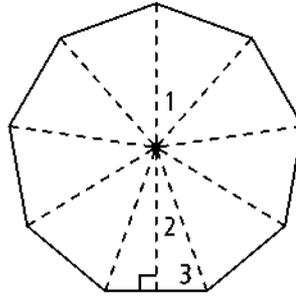
Areas of Regular Polygons

Form G

Each regular polygon has radii and apothem as shown. Find the measure of each numbered angle.
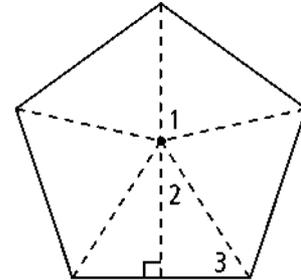
1.

2.

3.

Find the area of each regular polygon with the given apothem _a_ and side length _s_.

4. pentagon, $a = 4.9$ in., $s = 7.1$ in.

5. hexagon, $a = 12.1$ ft, $s = 14$ ft

6. octagon, $a = 20.8$ m, $s = 17.2$ m

7. nonagon, $a = 50.9$ m, $s = 37$ m

8. decagon, $a = 31$ in., $s = 20.1$ in.

9. dodecagon, $a = 40.6$ m, $s = 21.7$ m

Find the area of each regular polygon. Round your answer to the nearest tenth.

10.

12 in.

11.

20 cm

12.

8.6 ft
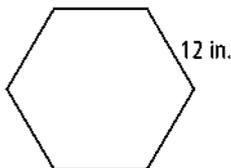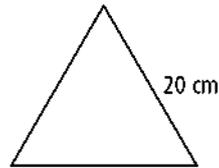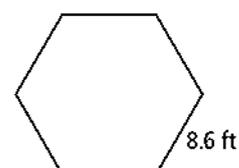
13. Your math teacher draws a regular hexagon with a circle circumscribed around it. The radius of the circle is 5 m. To the nearest tenth, what is the area of the hexagon?

Find the measures of the angles formed by (a) two consecutive radii and (b) a radius and a side of the given regular polygon.

14. hexagon

15. square

16. octagon

17. pentagon

18. 15-gon

19. 20-gon

Practice (continued)   Form G

10-3

Areas of Regular Polygons

Find the area of each regular polygon with the given radius or apothem. If your answer is not an integer, leave it in simplest radical form.

20.

21.

22.

8 mm

5.5√3 m

16√3 in.

23.

24.

25.

3.3 ft

$\frac{20}{3}$ yd

20 mm

26. A soccer ball's outer covering is made by stitching together 12 regular pentagons and 20 regular hexagons. Both polygons have a side length of 3 cm. The pentagons have an apothem of 2.06 cm. To the nearest whole number, what is the total surface area of the soccer ball?

27. A stop sign is a regular octagon. Each side of the sign is 12.6 in. long. The area of the stop sign is 770 in.^{2}. What is the length of the apothem to the nearest whole number?

28. A quilter is cutting fabric for her quilt. She has several pieces of fabric from an old project that are in the shape of regular octagons. She wants to cut the octagons into right triangles. If she divides each octagon into 16 triangles, what is the measure of the non-right angles of each triangle?

29. An equilateral triangle has a perimeter of 36 cm. Find its area to the nearest tenth.

30. The logo for a school is an equilateral triangle inscribed inside a circle. The seniors are painting the logo on an outside wall of the school. The radius of the circle will be 6 feet. Find the area of the triangle.

31. Algebra Find the length of one side of each of the regular polygons named below if its area is 64 ft^2. Round your answer to the nearest tenth.

   a. triangle   **b.** hexagon