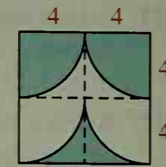
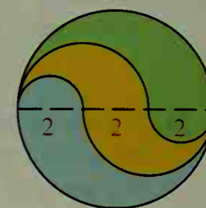


Ex. 24

23. A target consists of four concentric circles with radii 1, 2, 3, and 4.
   a. Find the area of the bull's eye and of each ring of the target.
   b. Find the area of the nth ring if the target contains n rings and a bull's eye.

24. The shaded region in the diagram at the right above is formed by drawing four quarter-circles within a square of side 8. Find the area of the shaded region. (*Hint*: It is possible to give the answer without using pencil and paper or a calculator.)

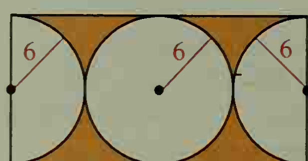


Ex. 25

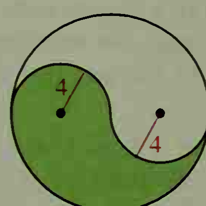
25. The figure at the right consists of semicircles within a circle. Find the area of each shaded region.

Find the area of each shaded region. In Exercise 28, leave your answer in terms of r.

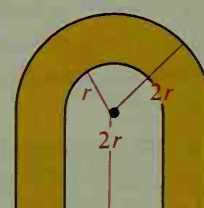
26.



27.

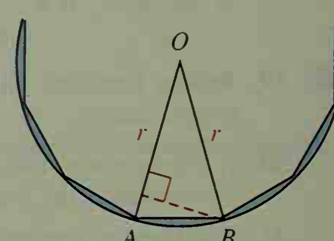


28.



29. Draw a square and its inscribed and circumscribed circles. Find the ratio of the areas of these two circles.

30. Draw an equilateral triangle and its inscribed and circumscribed circles. Find the ratio of the areas of these two circles.



Ex. 31

C **31.** The diagram shows part of a regular polygon of 12 sides inscribed in a circle with radius r. Find the area enclosed between the circle and the polygon in terms of r. Use $\pi \approx 3.14$.

32. A regular octagon is inscribed in a circle with radius r. Find the area enclosed between the circle and the octagon in terms of r. Use $\pi \approx 3.14$ and $\sqrt{2} \approx 1.414$.

33. A regular polygon with apothem a is inscribed in a circle with radius r.
   a. Complete: As the number of sides increases, the value of a gets nearer to _?_ and the perimeter of the polygon gets nearer to $2\pi r$.
   b. In the formula $A = \frac{1}{2}ap$, replace a by r, and p by $2\pi r$. What formula do you get?

34. Find the circumference of a circle inscribed in a rhombus with diagonals 12 cm and 16 cm.

35. Draw any circle O and any circle P. Construct a circle whose area equals the sum of the areas of circle O and circle P.