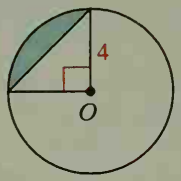
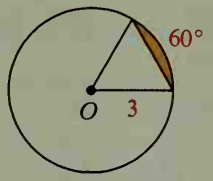
Find the area of each shaded region. Point O marks the center of a circle.

B

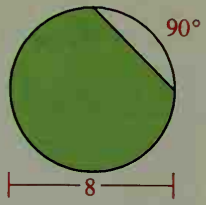
13.



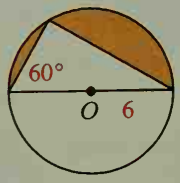
14.



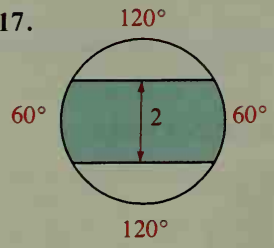
15.



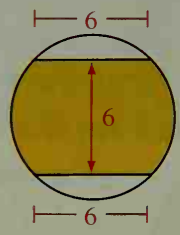
16.



17.



18.



19. A rectangle with length 16 cm and width 12 cm is inscribed in a circle. Find the area of the region inside the circle but outside the rectangle.

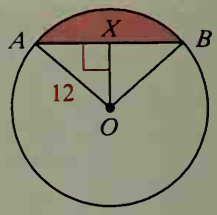
20. From point P, $\overline{PA}$ and $\overline{PB}$ are drawn tangent to circle O at points A and B. If the radius of the circle is 6 and $m\angle APB = 60$, find the area of the region outside the circle but inside quadrilateral $AOBP$.

You may wish to use a calculator for Exercises 21–23. Use $\pi \approx 3.14$.

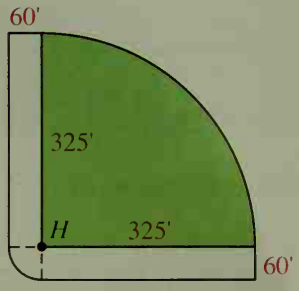
21. Chord AB is 18 cm long and the radius of the circle is 12 cm.

a. Use trigonometry to find the measures of $\angle AOX$ and $\angle AOB$, correct to the nearest integer.

b. Find the area of the shaded region to the nearest square centimeter. Use $\sqrt{7} \approx 2.646$.



22. The diagram shows some dimensions in a baseball stadium. H represents home plate. Approximate the ratio of the areas of fair territory (shaded region) and foul territory (nonshaded region).



23. A cow is tied by a 25 m rope to the corner of a barn as shown. A fence keeps the cow out of the garden. Find, to the nearest square meter, the grazing area. Use $\sqrt{2} \approx 1.414$.