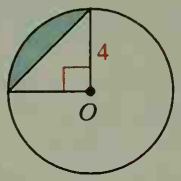
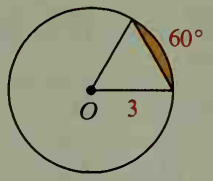
**Find the area of each shaded region. Point $O$ marks the center of a circle.**

**B**

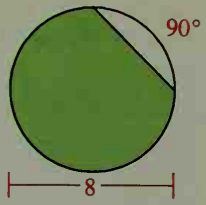
**13.**



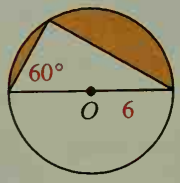

**14.**



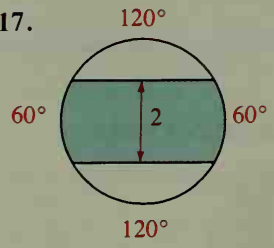

**15.**



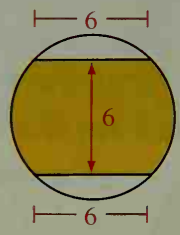

**16.**




**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.

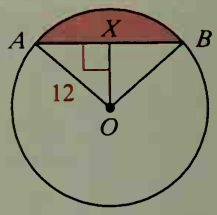
**20.** From point $P$, $\overline{PA}$ and $\overline{PB}$ are drawn tangent to circle $O$ at points $A$ and $B$. If the radius of the circle is 6 and $m\angle APB = 60$, find the area of the region outside the circle but inside quadrilateral $AOBP$.

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

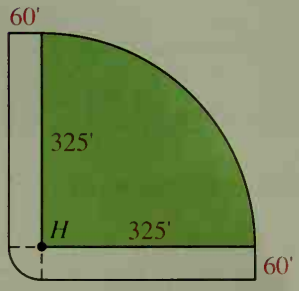
**21.** Chord $AB$ is 18 cm long and the radius of the circle is 12 cm.

**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 $\sqrt{2} \approx 1.414$.