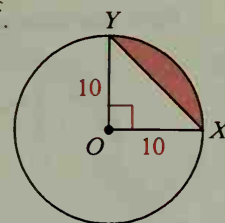


Example 2 Find the area of the shaded region bounded by \widehat{XY} and \overline{XY} .

Solution Area of sector $XOY = \frac{90}{360} \cdot \pi \cdot 10^2 = 25\pi$

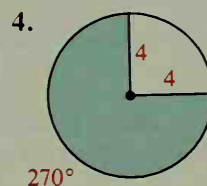
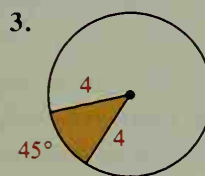
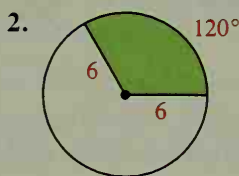
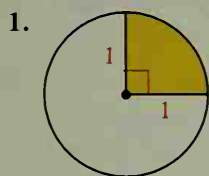
$$\text{Area of } \triangle XOY = \frac{1}{2} \cdot 10 \cdot 10 = 50$$

$$\text{Area of shaded region} = 25\pi - 50$$



Classroom Exercises

Find the arc length and area of each shaded sector.



- In a circle with radius 6, $m\widehat{AB} = 60$. Make a sketch and find the area of the region bounded by \widehat{AB} and \overline{AB} .
- A circle has area $160\pi \text{ cm}^2$. If a sector of the circle has area $40\pi \text{ cm}^2$, find the measure of the arc of the sector.
- Compare the areas of two sectors if
 - they have the same central angle, but the radius of one is twice as long as the radius of the other.
 - they have the same radius, but the central angle of one is twice as large as the central angle of the other.

Written Exercises

Sector AOB is described by giving $m\angle AOB$ and the radius of circle O .

Make a sketch and find the length of \widehat{AB} and the area of sector AOB .

A

1. 2. 3. 4. 5. 6. 7. 8. 9. 10.

$m\angle AOB$	30	45	120	240	180	270	40	320	108	192
radius	12	4	3	3	1.5	0.8	$\frac{9}{2}$	$1\frac{1}{5}$	$5\sqrt{2}$	$3\sqrt{3}$

- The area of sector AOB is 10π and $m\angle AOB = 100$. Find the radius of circle O .
- The area of sector AOB is $\frac{7\pi}{2}$ and $m\angle AOB = 315$. Find the radius of circle O .