

## 12.2 Areas of Sectors of Circles Notes

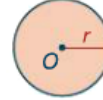
**Essential Understanding** You can find the area of a circle when you know its radius. You can use the area of a circle to find the area of part of a circle formed by two radii and the arc the radii form when they intersect with the circle.

*Take note*

### Theorem 72 Area of a Circle

The area of a circle is the product of  $\pi$  and the square of the radius.

$$A = \pi r^2$$



### Problem 1 Finding the Area of a Circle

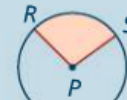
**Sports** What is the area of the circular region on the wrestling mat?



**Got It?** a. What is the area of a circular wrestling region with a 42-ft diameter?

A **sector of a circle** is a region bounded by an arc of the circle and the two radii to the arc's endpoints. You name a sector using one arc endpoint, the center of the circle, and the other arc endpoint.

The area of a sector is a fractional part of the area of a circle. The area of a sector formed by a  $60^\circ$  arc is  $\frac{60}{360}$ , or  $\frac{1}{6}$ , of the area of the circle.



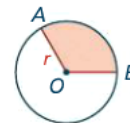
Sector *RPS*

*Take note*

### Theorem 73 Area of a Sector of a Circle

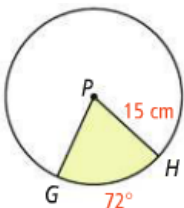
The area of a sector of a circle is the product of the ratio  $\frac{\text{measure of the arc}}{360}$  and the area of the circle.

$$\text{Area of sector } AOB = \frac{m\overline{AB}}{360} \cdot \pi r^2$$



### Problem 2 Finding the Area of a Sector of a Circle

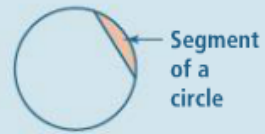
What is the area of sector *GPH*? Leave your answer in terms of  $\pi$ .



**Got It?** A circle has a radius of 4 in. What is the area of a sector bounded by a  $45^\circ$  minor arc? Leave your answer in terms of  $\pi$ .

A part of a circle bounded by an arc and the segment joining its endpoints is a **segment of a circle**.

To find the area of a segment for a minor arc, draw radii to form a sector. The area of the segment equals the area of the sector minus the area of the triangle formed.

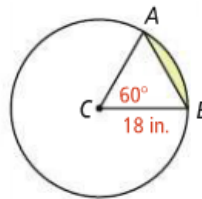


$$\text{Area of a triangle: } A = \frac{1}{2}bh \text{ or } A = \frac{1}{2} \cdot \text{side} \cdot \text{side} \cdot \sin(\text{Angle})$$



**Problem 3** Finding the Area of a Segment of

What is the area of the shaded segment shown at the right? answer to the nearest tenth.



**Got It?** What is the area of the shaded segment shown at the right? Round your answer to the nearest tenth.

