

11.3 Areas of Circles and Sectors  
Geometry CP

Recall:

Circumference of a Circle =  $2\pi r$  or  $\pi d$

Area of a Circle =  $\pi r^2$

1. What is the area of the circular putting green shown to the nearest square foot?



$$\begin{aligned} d &= 20 & A &= \pi r^2 \\ r &= 10 & A &= \pi (10)^2 \\ & & &= 100\pi \text{ ft}^2 \end{aligned}$$

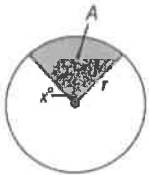
2. Find the radius of a circle with area 95 square centimeters.

$$\begin{aligned} A &= 95 & \text{radius} &= 5.5 \text{ cm} \\ 95 &= \pi r^2 \\ 30.2 &= r^2 \\ 5.5 &= r \end{aligned}$$

**Sector of a Circle:**

region of a circle bounded by a central angle and its intercepted major or minor arc

**Area of a Sector:**



$$\frac{\text{Area}}{\pi r^2} = \frac{x^\circ}{360^\circ}$$

3. A circular pizza has a diameter of 12 inches and is cut into 8 congruent slices. What is the area of one slice to the nearest hundredth?



$$\frac{A}{\pi r^2} = \frac{x^\circ}{360^\circ}$$

$$d = 12$$

$$r = 6$$

$$\frac{A}{\pi 6^2} = \frac{45}{360}$$

$$x^\circ = \frac{360}{8}$$

$$= 45^\circ$$

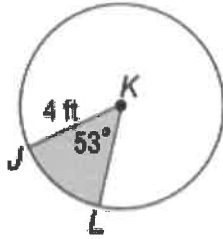
$$A = \frac{45}{360} (36\pi)$$

$$A = 14.1 \text{ in}^2$$

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4. Find the area of the shaded sector. Round to the nearest hundredth.

a.

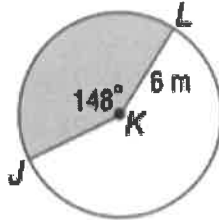


$$\frac{A}{\pi(4)^2} = \frac{53}{360}$$

$$A = \frac{53}{360} \cdot 16\pi$$

$$= 7.4 \text{ ft}^2$$

b.

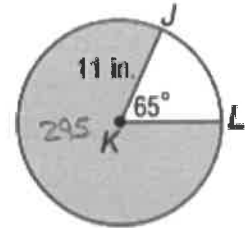


$$\frac{A}{\pi(6)^2} = \frac{148}{360}$$

$$A = \frac{148}{360} \cdot 36\pi$$

$$= 46.5 \text{ m}^2$$

c.



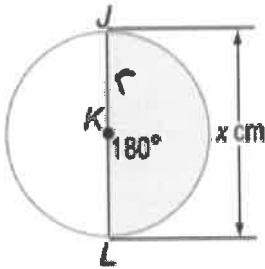
$$\frac{A}{\pi(11)^2} = \frac{295}{360}$$

$$A = \frac{295}{360} (121\pi)$$

$$= 311.5 \text{ in}^2$$

5. The area of the shaded region is given. Find  $x$ .

$$A = 66 \text{ cm}^2$$



area of sector

$$\frac{66}{\pi r^2} = \frac{180}{360}$$

$$66 = \frac{1}{2} \pi r^2$$

$$132 = \pi r^2$$

$$6.5 \text{ cm} = r$$

$$\boxed{13 \text{ cm} = d}$$

OR

area of semicircle

$$A = \frac{1}{2} \pi r^2$$

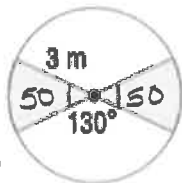
$$66 = \frac{1}{2} \pi r^2$$

$$6.5 = r$$

$$13 \text{ cm} = d$$

6. Find the area of the shaded region. Round to the nearest tenth.

a.



one shaded sector:

$$\frac{A}{\pi(3)^2} = \frac{50}{360}$$

$$A = \frac{50}{360} (9\pi)$$

$$= 3.9$$

$$\text{shaded} = 2(\text{area of one sector})$$

$$= 2(3.9)$$

$$\boxed{= 7.8 \text{ m}^2}$$

b.



large circle

$$d = 14$$

$$r = 7$$

white circle

$$r = 7/2$$

$$\text{shaded} = \text{large circle} - 2(\text{white circle})$$

$$= \pi(7)^2 - 2(\pi(7/2)^2)$$

$$= 153.9 - 76.9$$

$$= 77 \text{ mm}^2$$