

# Areas of Circles & Sectors

$$\text{Area} = \pi r^2$$

$$C = 2\pi r \text{ or } C = \pi d$$

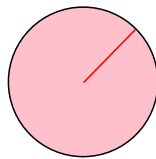
$$\frac{\text{arc length}}{2\pi r} = \frac{m\widehat{AC}}{360}$$

$$\frac{\text{Area sector}}{\pi r^2} = \frac{m\widehat{AB}}{360}$$



## Area of a Circle

$$A = \pi r^2$$



Find the indicated measure.

Find the area of a circle with a radius of 16 cm.

$$A = \pi r^2 \quad A = \pi(16)^2$$

$$A = 256\pi \text{ cm}^2$$

$$\approx 804.25 \text{ cm}^2$$

Find the diameter of a circle with an area of  $529\pi \text{ in}^2$ .

$$A = \pi r^2$$

$$529\pi = \pi r^2$$

$$\sqrt{529} = \sqrt{r^2}$$

$$r = 23$$

$$d = 46 \text{ in}$$

Find the radius of a circle with an area of  $201 \text{ ft}^2$ .

$$201 = \pi r^2$$

$$\frac{201}{\pi} = \frac{\pi r^2}{\pi}$$

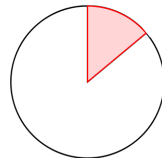
$$\sqrt{63.98} = \sqrt{r^2}$$

$$8 \text{ ft} = r$$

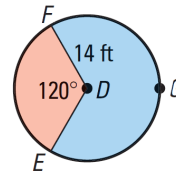
Sector of a circle—the region bounded by two radii of a circle and their intercepted arc

**Area of a Sector**

$$\frac{\text{Area of Sector}}{\pi r^2} = \frac{m\widehat{\text{Arc}}}{360^\circ}$$



Find the indicated measure.  $A = \pi(14)^2 = 196\pi$



Area of red sector

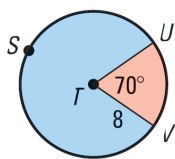
$$\frac{X}{196\pi} = \frac{120^\circ}{360^\circ}$$

$$X = 65.33\pi \text{ ft}^2$$

$$\approx 205.25 \text{ ft}^2$$

$$\frac{\text{Area of Sector}}{\pi r^2} = \frac{m\widehat{\text{Arc}}}{360^\circ}$$

Find the indicated measure.



Area of blue sector

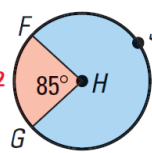
$$\frac{X}{64\pi} = \frac{290^\circ}{360^\circ}$$

$$X = 51.56\pi \text{ u}^2$$

$$\approx 161.98 \text{ u}^2$$

$$\frac{\text{Area of Sector}}{\pi r^2} = \frac{m\widehat{\text{Arc}}}{360^\circ}$$

Find the indicated measure.



Area of the circle

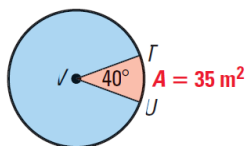
$$A = 214.37 \text{ cm}^2$$

$$\frac{214.37}{X} = \frac{85^\circ}{360^\circ}$$

$$X \approx 907.92 \text{ cm}^2$$

$$\frac{\text{Area of Sector}}{\pi r^2} = \frac{m\widehat{\text{Arc}}}{360^\circ}$$

Find the indicated measure.



$$\frac{\text{Area of Sector}}{\pi r^2} = \frac{m\widehat{\text{Arc}}}{360^\circ}$$

Radius of the circle

$$\frac{35}{x} = \frac{40}{360}$$

$$x = \frac{315}{\pi} = \frac{\pi r^2}{\pi}$$

$$\sqrt{100.27} = \sqrt{r^2}$$

$$10.014 \approx r$$