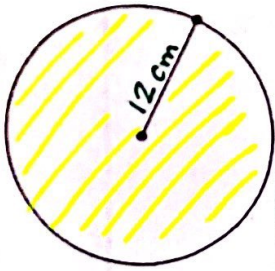


Area of a Sector of a Circle

Discovery

Find the area of the circle.



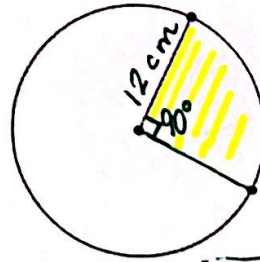
$$A = \pi r^2$$

$$A = \pi (12)^2$$

$$A = 144\pi \text{ cm}^2$$

$$A \approx 452.4 \text{ cm}^2$$

Find the area of the sector of the circle.



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

$$A = \frac{\pi (12)^2 (90)}{360}$$

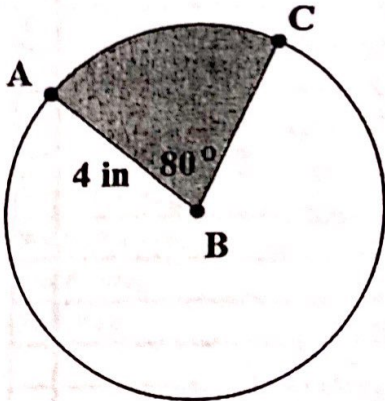
$$A = 36\pi \text{ cm}^2$$

$$A \approx 113.1 \text{ cm}^2$$

Formula for Area of a Sector of a Circle

$$\text{Sector area} = \frac{\pi r^2 \theta}{360}$$

Example 1: Find the area of the shaded sector ABC. Report your answer in terms of pi and as a decimal rounded to the tenths place.

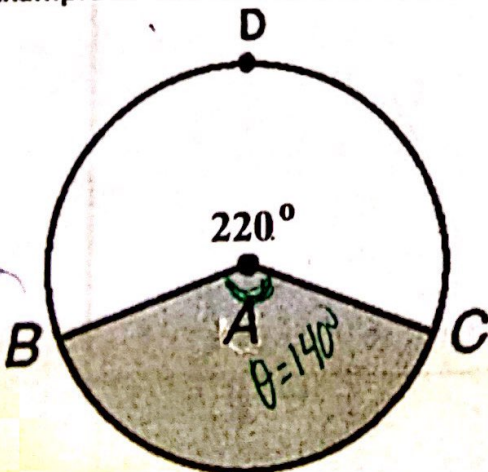


$$\text{Area of sector ABC} = \frac{\pi (4)^2 (80)}{360}$$

$$= \frac{32\pi}{9} \text{ in}^2$$

$$\approx 11.2 \text{ in}^2$$

Example 2: The area of the shaded sector BAC is $\frac{224\pi}{9} \approx 78.19 \text{ in}^2$. Find the radius. Round to the nearest inch.



$$\text{Sector area} \approx 78.19$$

$$\theta = 140^\circ$$

$$r = ?$$

$$\text{S.A.} = \frac{\pi r^2 \theta}{360}$$

$$(360) 78.19 = \frac{\pi (r)^2 (140)}{360} \cdot 360$$

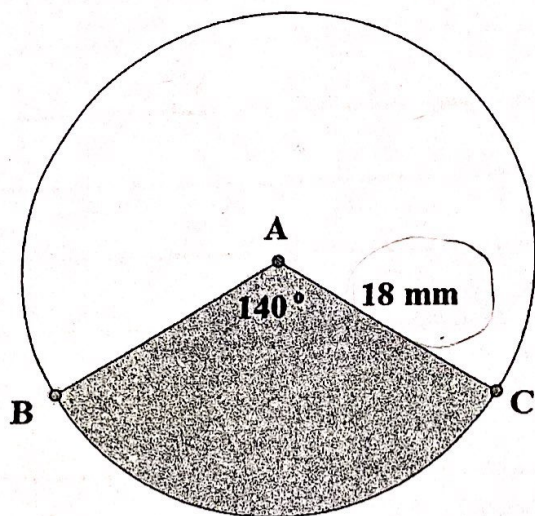
$$\frac{28148.4}{\pi (140)} = \frac{\pi r^2 (140)}{\pi (140)}$$

$$\sqrt{64} = \sqrt{r^2}$$

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

Try these!

1) Find the area of the shaded sector ABC. Report your answer in terms of pi and as a decimal rounded to the tenths place.



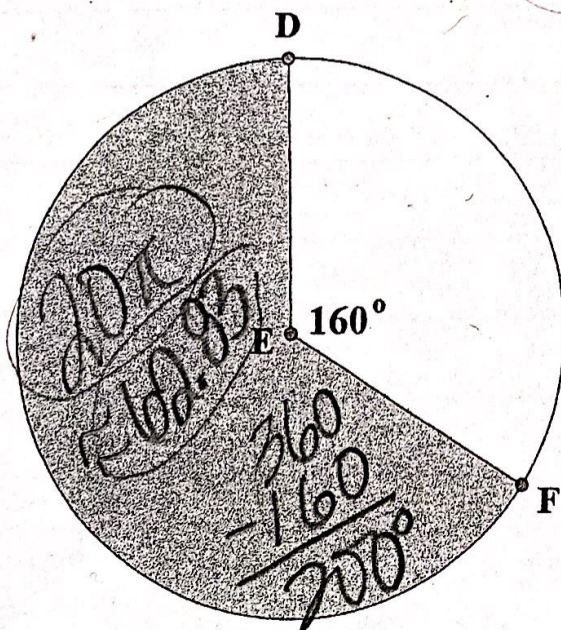
$$\text{Area of Sector} = \frac{\pi r^2 \theta}{360}$$

$$= \frac{\pi 18^2 (140^\circ)}{360}$$

$$A = 126\pi \text{ mm}^2$$

$$A \approx 395.8 \text{ mm}^2$$

2) The area of the shaded sector DEF is $20\pi \approx 62.83 \text{ ft}^2$. Find the radius. Round to the nearest foot.



$$\text{Area of Sector} = \frac{\pi r^2 \theta}{360}$$

$$20\pi = \frac{\pi r^2 (200^\circ)}{360}$$

$$\frac{200\pi \cdot r^2}{200\pi} = \frac{7200\pi}{200\pi}$$

$$r^2 = \sqrt{36}$$

$$r = 6$$

1) $126\pi = 395.8 \text{ mm}^2$

2) $r = 6 \text{ ft.}$