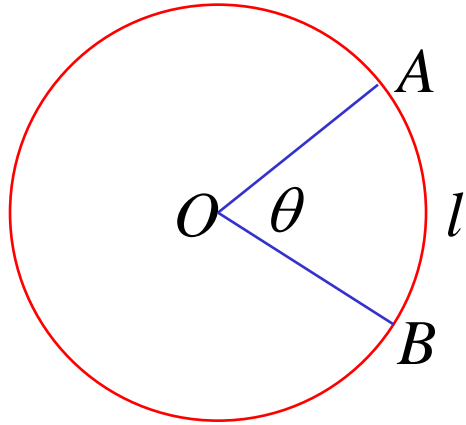


# Trigonometric Functions

$$360^\circ = 2\pi \text{ radians}$$

## Arcs & Sectors



$$C = 2\pi r$$
$$l = \frac{\theta}{2\pi} \times 2\pi r$$
$$l = r\theta$$

$$A = \pi r^2$$
$$A_{OAB} = \frac{\theta}{2\pi} \times \pi r^2$$
$$A_{OAB} = \frac{1}{2} r^2 \theta$$

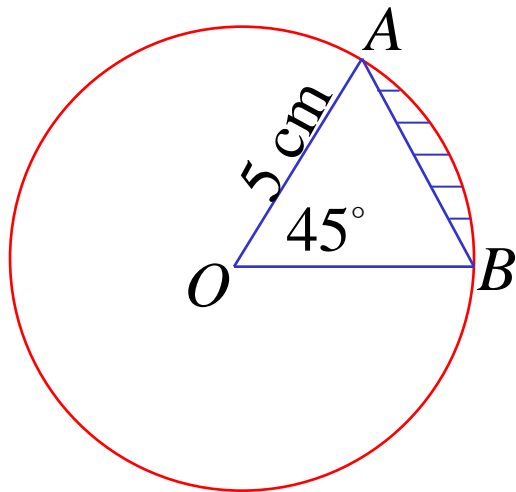
OAB is a sector

AB is an arc

Length of an arc;  $l = r\theta$

Area of a sector;  $A = \frac{1}{2} r^2 \theta$

e.g.



$$\begin{aligned}l_{AB} &= r\theta \\ &= 5\left(\frac{\pi}{4}\right) \\ &= \frac{5\pi}{4} \text{ cm}\end{aligned}$$

$$\begin{aligned}A_{OAB} &= \frac{1}{2}r^2\theta \\ &= \frac{1}{2}(5)^2\left(\frac{\pi}{4}\right) \\ &= \frac{25\pi}{8} \text{ cm}^2\end{aligned}$$

$$\text{Area minor segment}_{AB} = \frac{1}{2}r^2\theta - \frac{1}{2}r^2 \sin \theta$$

$$\begin{aligned}&= \frac{1}{2}r^2(\theta - \sin \theta) \\ &= \frac{1}{2}(5)^2\left(\frac{\pi}{4} - \sin \frac{\pi}{4}\right)\end{aligned}$$

$$= \frac{25}{2}\left(\frac{\pi}{4} - \frac{1}{\sqrt{2}}\right)$$

$$= \frac{25\pi\sqrt{2} - 100}{8\sqrt{2}} \text{ cm}^2$$

**Exercise 14B; 2 to 24 evens, 25, 28\***