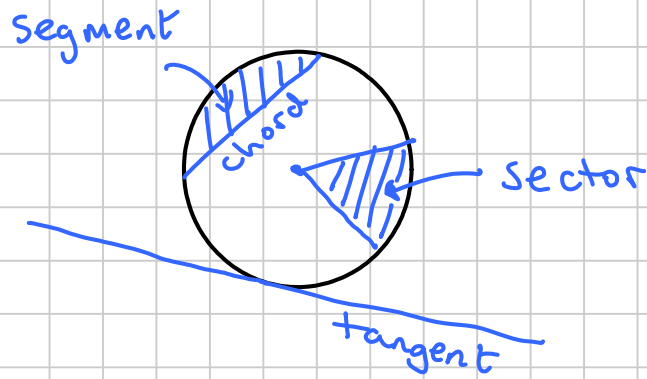
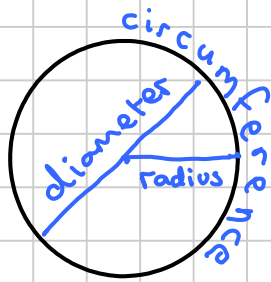


CIRCLES AND PI

Note Title

05/10/2010

Circle Words



Circumference and Area

π is the ratio of the circumference (C) to the diameter (d) of a circle.

π is an irrational number - it cannot be written exactly.

$$\begin{aligned} C &= \pi d \\ A &= \pi r^2 \end{aligned}$$

($A = \text{Area}$, $r = \text{radius}$)

Examples

① The diameter of a bicycle wheel is 80cm.

(a) Find the circumference.

(b) Find how many times the wheel turns in travelling 1 km.

(a) $C = \pi \times 80 = 251.3 \text{ cm}$

(b) $1 \text{ km} = 1000 \text{ m}$
 $= 100\,000 \text{ cm}$

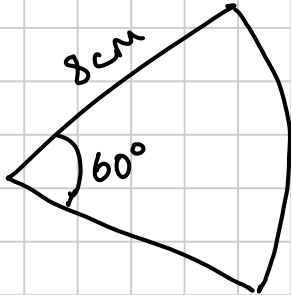
$$\text{No of turns} = \frac{100\,000}{251.3} = \underline{\underline{397.9}}$$

- ② Find the area of a circular flower bed with a diameter of 3m.

$$\text{radius} = \frac{3\text{m}}{2} = 1.5\text{m}$$

$$\text{Area} = \pi \times 1.5^2 = \underline{\underline{7.1\text{m}^2}}$$

③



Find the area and perimeter of this shape.

$$60^\circ \text{ is } \frac{1}{6} \text{ of } 360^\circ$$

so this is $\frac{1}{6}$ of a circle

$$\text{Area} = \frac{1}{6} \times \pi \times 8^2 = 33.5 \text{ cm}^2$$

$$\begin{aligned} \text{Perimeter} &= \frac{1}{6} \times \pi \times 16 + 8 + 8 \\ &= 24.4 \text{ cm} \end{aligned}$$

$$\text{Whole circumference} = \pi d = \pi \times 16$$

$$\text{Curved part} = \frac{1}{6} \times \pi \times 16$$

- ④ A circular running track 400m long is to be built. What should be the radius of the track.

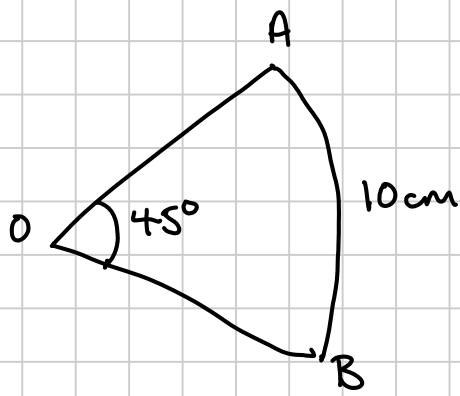
$$\pi d = 400\text{m}$$

$$d = \frac{400}{\pi}$$

$$= 127.3 \dots$$

$$\text{radius} = \frac{127.3 \dots}{2} = \underline{\underline{63.7 \text{ m} (3 \text{ sf})}}$$

5



Find the area of this shape.

$$45^\circ \text{ is } \frac{1}{8} \text{ of } 360^\circ$$

$$\text{So whole circumference} = 10 \times 8 = 80 \text{ cm.}$$

$$\text{So } d = \frac{80}{\pi} = 25.4 \dots \text{ cm}$$

$$r = \frac{d}{2} = 12.7 \dots \text{ cm}$$

$$\begin{aligned} \text{Whole Area} &= \pi \times 12.7 \dots^2 \\ &= 509.2958 \dots \end{aligned}$$

$$\text{Area of sector} = \frac{509.2958 \dots}{8} = \underline{\underline{63.7 \text{ cm}^2}}$$