

**Starter:**

Find, without a calculator, the area and circumference of a circle with radius 10cm.

**Top Tips!**

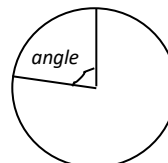
Learn the formulae:

$$\text{Area of a circle} = \pi r^2$$

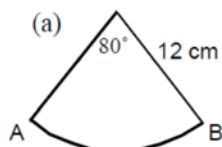
$$\text{Circumference of a circle} = \pi d$$

A sector is just a fraction of the area of a circle and an arc is just a fraction of the circumference.

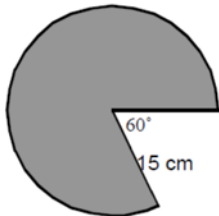
$$\text{So Area of sector} = \frac{\text{angle}}{360} \times \pi r^2 \quad \text{Length of arc} = \frac{\text{angle}}{360} \times \pi d$$

**Skills:**

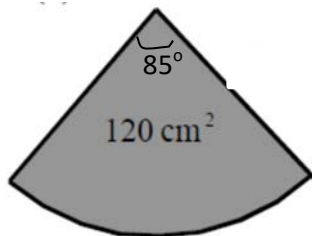
- 1) Calculate the length of the arc AB:



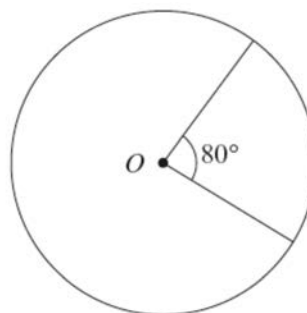
- 2) Calculate the area of the following sector:



- 3) In the following diagram, the area of the sector is  $120\text{cm}^2$ , find the length of the radius.

**Examination Question:****2012 Summer Link Applications U2 Higher Q13**

The diagram shows a circular flower bed, which is split into two sectors, one for spring flowers and the other for roses. The centre of the circle is O and the area of the minor sector is  $31.3\text{m}^2$ .



*Diagram not drawn to scale*

- Calculate the radius of the flower bed.
- Calculate the perimeter of the major sector of the flower bed.

**Assessment for Learning****Video / QR code**



**Starter:**

Find, without a calculator, the area and circumference of a circle with radius 10cm.

$$A = \pi \times 10^2$$

$$= 3.14 \times 100$$

$$= 314 \text{ cm}^2$$

$$C = \pi \times 20$$

$$= 3.14 \times 20$$

$$= 3.14 \times 10 \times 2$$

$$= 62.8 \text{ cm}$$

**Top Tips!**

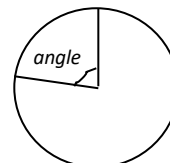
Learn the formulae:

**Area of a circle =  $\pi r^2$**

**Circumference of a circle =  $\pi d$**

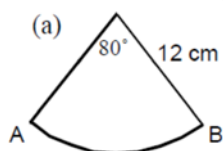
A sector is just a fraction of the area of a circle and an arc is just a fraction of the circumference.

So Area of sector =  $\frac{\text{angle}}{360} \times \pi r^2$       Length of arc =  $\frac{\text{angle}}{360} \times \pi d$



**Skills:**

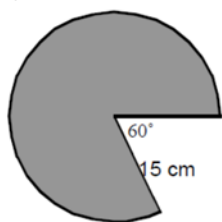
1) Calculate the length of the arc AB:



$$\frac{80}{360} \times \pi \times 24$$

$$= 16.8 \text{ cm}$$

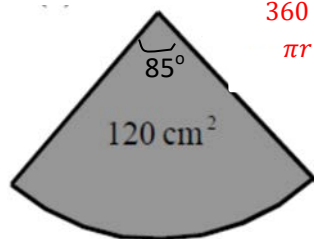
2) Calculate the area of the following sector:



$$\frac{300}{360} \times \pi \times 15^2$$

$$= 589 \text{ cm}^2$$

3) In the following diagram, the area of the sector is  $120 \text{ cm}^2$ , find the length of the radius.



$$\frac{85}{360} \times \pi r^2 = 120$$

$$\pi r^2 = 120 \div \frac{85}{360}$$

$$\pi r^2 = \frac{8640}{17}$$

$$r^2 = \frac{8640}{17} \div \pi$$

$$r^2 = 161.776 \dots$$

$$r = \sqrt{161.776 \dots}$$

$$r = 12.7 \text{ cm}$$

**Examination Question:**

**2012 Summer Link Applications U2 Higher Q13**

The diagram shows a circular flower bed, which is split into two sectors, one for spring flowers and the other for roses. The centre of the circle is O and the area of the minor sector is  $31.3 \text{ m}^2$ .

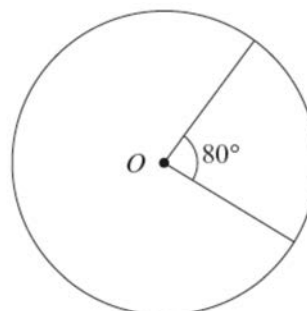


Diagram not drawn to scale

a) Calculate the radius of the flower bed.

$$\frac{80}{360} \times \pi r^2 = 31.3$$

$$\pi r^2 = 31.3 \div \frac{80}{360} = 140.85$$

$$r^2 = 140.85 \div \pi = 44.83 \dots$$

$$r = \sqrt{44.83 \dots} = 6.7 \text{ cm}$$

b) Calculate the perimeter of the major sector of the flower bed.

$$\text{Major arc} = \frac{280}{360} \times \pi \times 6.7 \times 2 = 32.7 \text{ cm}$$

$$\text{Perimeter} = 32.7 + 6.7 + 6.7 = 46.1 \text{ cm}$$

**Assessment for Learning**

**Video / QR code**

