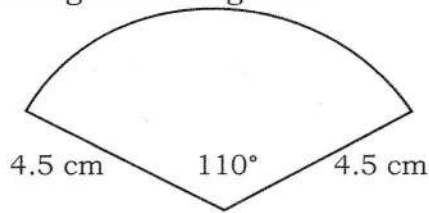


SECTORS AND ARCS - PRACTICE QUESTIONS

1.

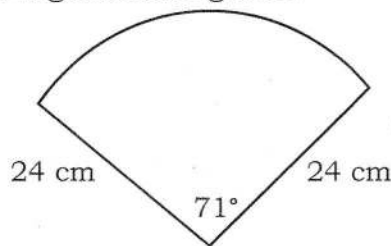
Find the area of the sector, to 2 significant figures.



$$\pi \times 4.5^2 \times \frac{110}{360} = 19.4386\dots$$
$$= \underline{19 \text{ cm}^2}$$

2.

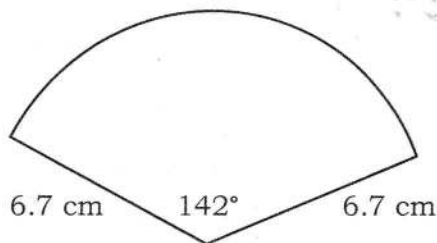
Find the area of the sector, to 3 significant figures.



$$\pi \times 24^2 \times \frac{71}{360} = 356.8849\dots$$
$$= \underline{357 \text{ cm}^2}$$

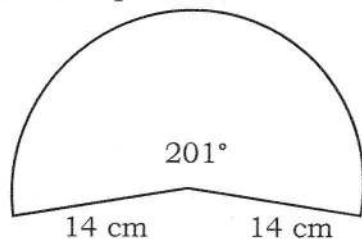
3.

Find the area of the sector, to the nearest square centimetre.



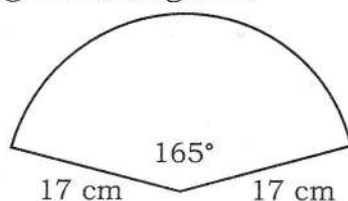
$$\pi \times 6.7^2 \times \frac{142}{360} = 55.62695\dots$$
$$= \underline{56 \text{ cm}^2}$$

4.
Find the length of the arc, to 1 decimal place.



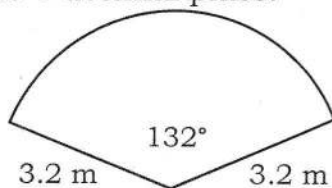
$$\pi \times 14 \times 2 \times \frac{201}{360} = 49.11356\dots = \underline{49.1\text{ cm}}$$

5.
Find the length of the arc, to 3 significant figures.



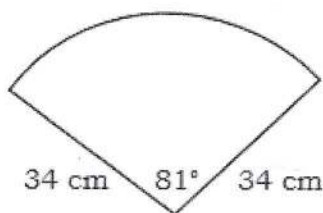
$$\pi \times 17 \times 2 \times \frac{165}{360} = 48.9564\dots = \underline{49.0\text{ cm}}$$

6.
Find the perimeter of the sector, to 1 decimal place.



$$\pi \times 3.2 \times 2 \times \frac{132}{360} + 3.2 + 3.2 = 13.7722\dots = \underline{13.8\text{ m}}$$

7.
Find the perimeter of the sector, to 3 significant figures.

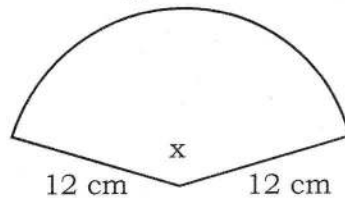


$$\pi \times 34 \times 2 \times \frac{81}{360} + 34 + 34 = 116.066\dots = \underline{116\text{ cm}}$$

8.

The area of the sector below is 198 cm^2 .

Find the size of angle x , to the nearest degree.



$$\pi \times 12^2 \times \frac{x}{360} = 198$$

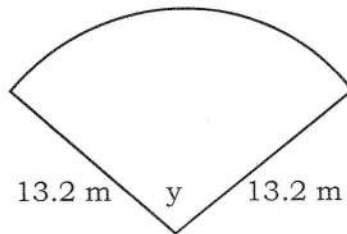
$$x = 157.563\dots$$

$$= \underline{158^\circ}$$

9.

The sector below has an arc length of 26.6 metres.

Find the size of angle y , to 3 significant figures.



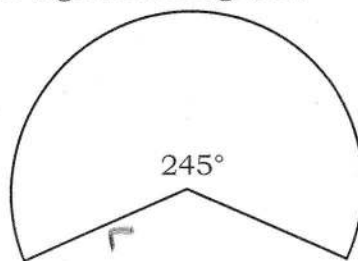
$$\pi \times 13.2 \times 2 \times \frac{y}{360} = 26.6$$

$$y = 115.4596\dots = \underline{115^\circ}$$

10.

The area of the sector below is 307 cm^2 .

Find the radius of the sector, to 3 significant figures.



$$\pi \times r^2 \times \frac{245}{360} = 307$$

$$r^2 = 143.59\dots$$

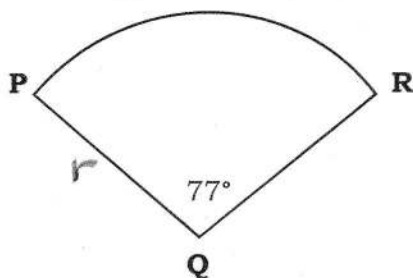
$$r = 11.9829\dots$$

$$= \underline{12.0 \text{ cm}}$$

11.

The length of the arc PR is 58 cm.

Find the length of PQ, to 2 significant figures.



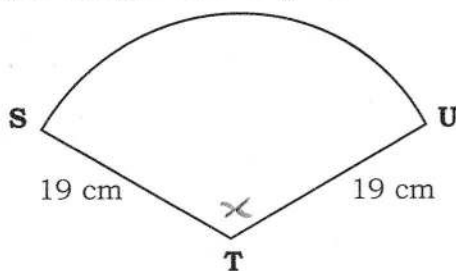
$$\pi \times r \times 2 \times \frac{77}{360} = 58$$

$$r = 43.1578... = \underline{43 \text{ cm}}$$

12.

The area of the sector STU is 456 cm².

Find the length of the arc SU, to 2 significant figures.



$$\pi \times 19^2 \times \frac{x}{360} = 456$$

$$x = 144.74...$$

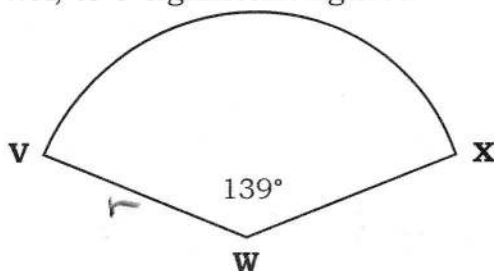
$$\text{Arc length} = \pi \times 19 \times 2 \times \frac{x}{360}$$

$$= \underline{48 \text{ cm}}$$

13.

The length of the arc VX is 79 cm.

Find the area of the sector VWX, to 3 significant figures.



$$\pi \times r \times 2 \times \frac{139}{360} = 79$$

$$r = 32.563...$$

$$\text{Area} = \pi \times r^2 \times \frac{139}{360}$$

$$= 1286.26... \\ = \underline{1290 \text{ cm}^2}$$

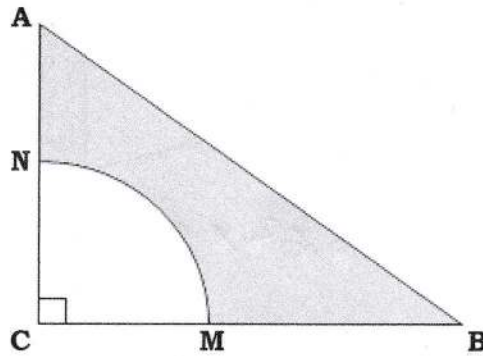
14.

NMC is a sector of a circle which has radius 5 cm.

AN = 3.5 cm and MB = 6.4 cm.

Find the area of the shaded region, to the nearest square centimetre.

$$\begin{aligned} AC &= 3.5 + 5 \\ &= 8.5 \text{ cm} \\ CB &= 6.4 + 5 \\ &= 11.4 \text{ cm} \end{aligned}$$



$$\text{Area of } \triangle ABC = \frac{8.5 \times 11.4}{2} = 48.45 \text{ cm}^2$$

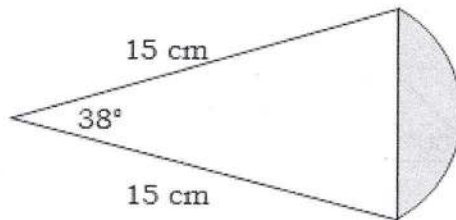
$$\text{Area of NMC} = \pi \times 5^2 \times \frac{90}{360} = 19.634 \dots \text{ cm}^2$$

$$\begin{aligned} \text{Area} &= 48.45 - 19.634 \dots = 28.815 \dots \\ &= \underline{\underline{29 \text{ cm}^2}} \end{aligned}$$

15.

The shape below is a sector of a circle.

Find the area of the shaded region, to 3 significant figures.



$$\text{Area of sector} = \pi \times 15^2 \times \frac{38}{360} = 74.61282552 \text{ cm}^2$$

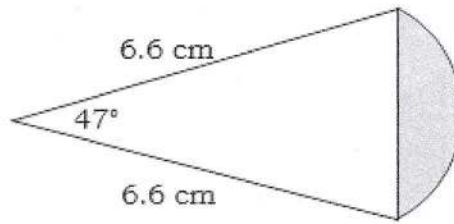
$$\text{Area of triangle} = \frac{1}{2} \times 15 \times 15 \times \sin(38) = 69.26191597 \text{ cm}^2$$

$$\begin{aligned} \text{Shaded region} &= 74.61 \dots - 69.26 \dots \\ &= 5.35090 \dots \\ &= \underline{\underline{5.35 \text{ cm}^2}} \end{aligned}$$

16.

The shape below is a sector of a circle.

Find the area of the shaded region, to 3 significant figures.



$$\text{Area of sector} = \pi \times 6.6^2 \times \frac{47}{360} = 17.86623742$$

$$\text{Area of triangle} = \frac{1}{2} \times 6.6 \times 6.6 \times \sin(47) = 15.92888362$$

$$\text{Shaded region} = 17.86... - 15.923...$$

$$= 1.9373... = \underline{\underline{1.94 \text{ cm}^2}}$$

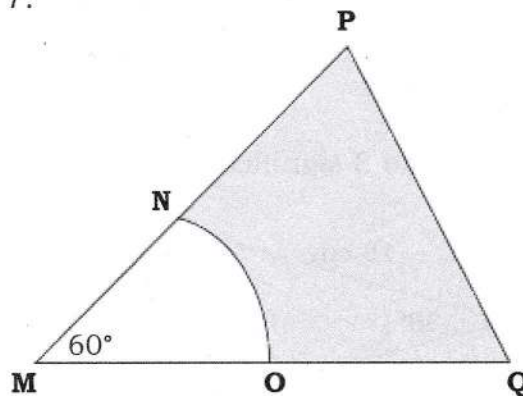
17.

Pictured below is a sector MNO contained within a scalene triangle MPQ.

The radius of the sector is 6 cm.

The ratio of MN : NP is 2 : 3.

The ratio of MO : OQ is 6 : 7.



Find the area of the shaded region, to 3 significant figures.

$$PM = 6 \div 2 \times 5 = 15 \text{ cm}$$

$$MQ = 6 \div 6 \times 7 = 7 \text{ cm}$$

$$\text{Area of triangle} = \frac{1}{2} \times 15 \times 7 \times \sin(60) = 45.4663337$$

$$\text{Area of sector} = \pi \times 6^2 \times \frac{60}{360} = 18.84955592$$

$$\text{Shaded region} = 45.466... - 18.849...$$

$$= 26.616...$$

$$= \underline{\underline{26.6 \text{ cm}^2}}$$