

# Arcs and Sectors

## Calculating circumference

$$\begin{aligned} \text{a) } C &= \pi D \\ &= \pi \times 25 \\ &= 78.5 \text{ m} \end{aligned}$$

$$\begin{aligned} \text{b) } C &= \pi D \\ &= \pi \times 645 \\ &= 2026.3 \text{ mm} \end{aligned}$$

$$\begin{aligned} \text{c) } C &= \pi D \\ &= \pi \times 3.5 \\ &= 11 \text{ cm} \end{aligned}$$

$$\begin{aligned} \text{d) } C &= \pi D \\ &= \pi \times 2 \times 2 \\ &= 12.6 \text{ m} \end{aligned}$$

$$\begin{aligned} \text{e) } C &= \pi D \\ &= \pi \times 2 \times 5.4 \\ &= 33.9 \text{ cm} \end{aligned}$$

$$\begin{aligned} \text{f) } C &= \pi D \\ &= \pi \times 2 \times 7.9 \\ &= 49.6 \text{ mm} \end{aligned}$$

$$\begin{aligned} \text{g) } C &= \pi D \\ &= \pi \times 3 \\ &= 9.4 \text{ m} \end{aligned}$$

$$\begin{aligned} \text{h) } C &= \pi D \\ &= \pi \times 2 \times 5 \\ &= 31.4 \text{ m} \end{aligned}$$

$$\begin{aligned} \text{i) } C &= \pi D \\ &= \pi \times 2 \times 4.5 \\ &= 28.3 \text{ m} \end{aligned}$$

$$\begin{aligned} \text{Perimeter} &= (9.4 \div 2) + 3 \\ &= 7.7 \text{ m} \end{aligned}$$

$$\begin{aligned} \text{Perimeter} &= (31.4 \div 2) + 10 \\ &= 25.7 \text{ m} \end{aligned}$$

$$\begin{aligned} \text{Perimeter} &= (28.3 \div 4) + 9 \\ &= 16.1 \text{ m} \end{aligned}$$

## Calculating Arc Length

$$\begin{aligned} \text{1. Arc AB} &= \frac{x}{360} \times D \\ &= \frac{45}{360} \times \pi \times 14 \\ &= 5.5 \text{ cm} \end{aligned}$$

$$\begin{aligned} \text{2a) Minor Arc AB} &= \frac{120}{360} \times \pi \times 12 \\ &= 12.6 \text{ cm} \end{aligned}$$

$$\begin{aligned} \text{b) Minor Arc AB} &= \frac{135}{360} \times \pi \times 10 \\ &= 11.8 \text{ cm} \end{aligned}$$

$$\begin{aligned} \text{c) Minor Arc} &= \frac{100}{360} \times \pi \times 8 \\ &= 7.0 \text{ cm} \end{aligned}$$

$$\begin{aligned} \text{d) Minor Arc} &= \frac{120}{360} \times \pi \times 18 \\ &= 18.8 \text{ cm} \end{aligned}$$

$$\begin{aligned} \text{3a) Major Arc} &= \frac{240}{360} \times \pi \times 12 \\ &= 25.1 \text{ cm} \end{aligned}$$

$$\begin{aligned} \text{b) Major Arc} &= \frac{225}{360} \times \pi \times 10 \\ &= 19.6 \text{ cm} \end{aligned}$$

$$\begin{aligned} \text{c) Major Arc} &= \frac{260}{360} \times \pi \times 8 \\ &= 18.2 \text{ cm} \end{aligned}$$

$$\begin{aligned} \text{d) Major Arc} &= \frac{240}{360} \times \pi \times 18 \\ &= 37.7 \text{ cm} \end{aligned}$$

$$4a) AL = \frac{135}{360} \times \pi \times 16 = 18.8 \text{ mm}$$

$$b) AL = \frac{225}{360} \times \pi \times 28 = 54.98 \text{ cm}$$

$$c) AL = \frac{160}{360} \times \pi \times 24 = 39.1 \text{ m}$$

$$d) AL = \frac{300}{360} \times \pi \times 20 = 52.4 \text{ cm}$$

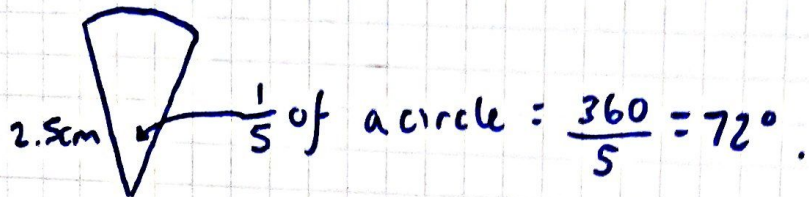
$$5a) AL = \frac{45}{360} \times \pi \times 30 = 11.8 \text{ cm}$$

$$\text{Perimeter} = 11.8 + 15 + 15 = 41.8 \text{ cm}$$

$$b) AL = \frac{100}{360} \times \pi \times 40 = 34.9 \text{ mm}$$

$$\text{Perimeter} = 34.9 + 20 + 20 = 74.9 \text{ mm}$$

6.



$$AL = \frac{1}{5} \times \pi \times 5$$

$$= 3.14 \text{ cm}$$

$$\text{Perimeter} = 3.14 + 5 = 8.14 \text{ cm}$$



Area of a circle.

$$a) A = \pi r^2 \quad \leftarrow 25 \div 2$$
$$= \pi \times 22.5^2$$
$$= 490.9 \text{ m}^2$$

$$b) A = \pi r^2$$
$$= \pi \times 322.5^2$$
$$= 326745.3 \text{ mm}^2$$

$$c) A = \pi r^2 \quad \leftarrow 3.5 \div 2$$
$$= \pi \times 1.75^2$$
$$= 9.6 \text{ cm}^2$$

$$d) A = \pi r^2$$
$$= \pi \times 2^2$$
$$= 12.6 \text{ m}^2$$

$$e) A = \pi r^2$$
$$= \pi \times 5.4^2$$
$$= 91.6 \text{ cm}^2$$

$$f) A = \pi r^2$$
$$= \pi \times 7.9^2$$
$$= 196.1 \text{ mm}^2$$

$$g) A = (\pi r^2) \div 2$$
$$= (\pi \times 1.5^2) \div 2$$
$$= 3.5 \text{ m}^2$$

$$h) A = (\pi r^2) \div 2$$
$$= (\pi \times 5^2) \div 2$$
$$= 39.3 \text{ m}^2$$

$$i) A = (\pi r^2) \div 4$$
$$= (\pi \times 4.5^2) \div 4$$
$$= 15.9 \text{ m}^2$$

Calculating Sector Area

$$1. SA = \frac{45}{360} \times \pi \times 10^2$$
$$= 39.3 \text{ cm}^2$$

$$2a) \text{ Minor sector } A = \frac{120}{360} \times \pi \times 5^2$$
$$= 26.2 \text{ cm}^2$$
$$b) \text{ Minor sector } A = \frac{135}{360} \times \pi \times 6^2$$
$$= 42.4 \text{ cm}^2$$

$$3a) \text{ Major sector } A = \frac{315}{360} \times \pi \times 10^2 \quad \leftarrow 360 - 45$$
$$= 274.9 \text{ cm}^2$$
$$b) \text{ Major sector } A = \frac{240}{360} \times \pi \times 5^2$$
$$= 52.4 \text{ cm}^2$$

$$4a) SA = \frac{140}{360} \times \pi \times 6^2$$
$$= 43.98 \text{ cm}^2$$
$$b) SA = \frac{230}{360} \times \pi \times 20^2$$
$$= 802.9 \text{ mm}^2$$
$$c) SA = \frac{170}{360} \times \pi \times 7.5^2$$
$$= 83.4 \text{ m}^2$$

$$d) SA = \frac{60}{360} \times \pi \times 12.5^2$$
$$= 54.5 \text{ cm}^2$$
$$e) SA = \frac{300}{360} \times \pi \times 7^2$$
$$= 128.28 \text{ cm}^2$$
$$f) SA = \frac{105}{360} \times \pi \times 8.7^2$$
$$= 69.4 \text{ cm}^2$$

$$5. \text{ Minor sector } A = \frac{30}{360} \times \pi \times 25^2 \quad \leftarrow 360 - 330$$
$$= 163.6 \text{ m}^2$$

# Calculating sector radius/diameter/angle

$$1. \quad AL = \frac{x}{360} \pi D$$

$$6.28 = \frac{x}{360} \times \pi \times 16$$

$$x = \frac{6.28 \times 360}{16\pi} = 45^\circ$$

$$2a) \quad AL = \frac{x}{360} \pi D$$

$$8.37 = \frac{x}{360} \times \pi \times 8$$

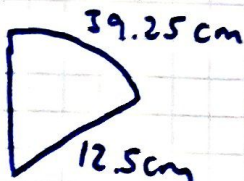
$$x = \frac{8.37 \times 360}{8\pi} = 119.9^\circ$$

$$b) \quad AL = \frac{x}{360} \pi D$$

$$62.8 = \frac{x}{360} \times \pi \times 30$$

$$x = \frac{62.8 \times 360}{30\pi} = 239.8^\circ$$

3.



$$AL = \frac{x}{360} \pi D$$

$$39.25 = \frac{x}{360} \times \pi \times 25$$

$$x = \frac{39.25 \times 360}{25\pi} = 179.9^\circ$$

$$4a) \quad AL = \frac{x}{360} \pi D$$

$$18 = \frac{x}{360} \times \pi \times 14$$

$$x = \frac{18 \times 360}{14\pi} = 147.3^\circ$$

$$b) \quad AL = \frac{x}{360} \pi D$$

$$38.5 = \frac{x}{360} \times \pi \times 26$$

$$x = \frac{38.5 \times 360}{26\pi} = 169.7^\circ$$

$$c) \quad 70 = \frac{x}{360} \times \pi \times 36$$

$$x = \frac{70 \times 360}{36\pi} = 222.8^\circ$$

$$d) \quad 37.5 = \frac{x}{360} \times \pi \times 40$$

$$x = \frac{37.5 \times 360}{40\pi} = 107.4^\circ$$

$$5a) \quad 241.78 = \frac{x}{360} \times \pi \times 84$$

$$x = \frac{241.78 \times 360}{84\pi} = 329.8^\circ$$

$$b) \quad SA = \frac{x}{360} \pi r^2$$

$$= \frac{229.8}{360} \times \pi \times 4^2$$

$$= 5076.9 \text{ mm}^2$$