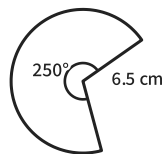


1 Arc length

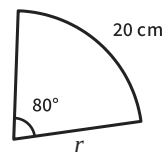
- a) Work out the perimeter of this sector. Give your answer to 1 decimal place.
- b) A sector has radius 12 cm and angle 75° . Find its arc length in terms of π .



$$\begin{aligned} \text{a) arc: } 250 \div 360 \times \pi \times 13 &= 28.36 \\ 28.36 + 6.5 + 6.5 &= 41.4 \text{ cm} \\ \text{b) } 75 \div 360 \times 24\pi &= 5\pi \text{ cm} \end{aligned}$$

2 Arc length

- a) The arc of this sector is 20 cm long. Work out the radius r to 1 decimal place.
- b) A sector of radius 9 cm has a perimeter of 30 cm. Work out its angle to 1 decimal place.

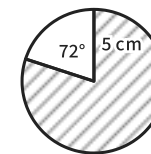


Not drawn accurately

$$\begin{aligned} \text{a) } 80 \div 360 \times 2\pi r &= 20, r = 14.3 \text{ cm} \\ \text{b) arc} &= 30 - 18 = 12 \text{ cm} \\ 12 \div 18\pi \times 360 &= 76.4^\circ \end{aligned}$$

3 Area of a sector

- a) A pizza 30 cm across is cut into 8 equal slices. Work out the area of one slice to 1 decimal place.
- b) Find the shaded area in terms of π .



$$\begin{aligned} \text{a) } \pi \times 15^2 \div 8 &= 88.4 \text{ cm}^2 \\ \text{b) } 360 - 72 &= 288^\circ \\ 288 \div 360 \times 25\pi &= 20\pi \text{ cm}^2 \end{aligned}$$

4 Area of a sector

- a) A sector has an angle of 40° and an area of 60 cm^2 . Work out its radius to 1 decimal place.
- b) A sector of radius 10 cm has an area of $25\pi \text{ cm}^2$. Find its arc length in terms of π .

$$\begin{aligned} \text{a) } 40 \div 360 \times \pi r^2 &= 60 \\ r^2 &= 171.89, r = 13.1 \text{ cm} \\ \text{b) } 25\pi \div 100\pi &= \frac{1}{4}, \text{ so the angle is } 90^\circ \\ \frac{1}{4} \times 20\pi &= 5\pi \text{ cm} \end{aligned}$$

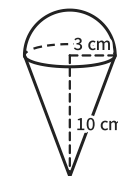
Area and volume 2

revision mat answers

5 Volume of cones, spheres and pyramids

$$\text{Cone: } V = \frac{1}{3}\pi r^2 h \quad \text{Sphere: } V = \frac{4}{3}\pi r^3$$

- a) Find the volume of a hemisphere of radius 6 cm to 1 decimal place.
- b) This solid is a cone with a hemisphere on top. Find its volume in terms of π .



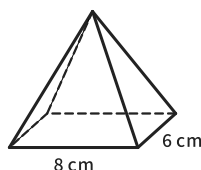
Not drawn accurately

$$\begin{aligned} \text{a) } 4\pi \times 6^3 \div 3 \div 2 &= 144\pi = 452.4 \text{ cm}^3 \\ \text{b) cone } \pi \times 3^2 \times 10 \div 3 &= 30\pi \\ 30\pi + 4\pi \times 3^3 \div 3 \div 2 &= 30\pi + 18\pi = 48\pi \text{ cm}^3 \end{aligned}$$

6 Volume of cones, spheres and pyramids

$$\text{Pyramid: } V = \frac{1}{3} \times \text{area of base} \times \text{height}$$

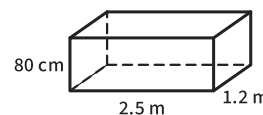
- a) This pyramid has a volume of 192 cm^3 . Work out its height.
- b) A cone of radius 4 cm has the same volume. Find its height to 1 decimal place.



$$\begin{aligned} \text{a) } 8 \times 6 \times h \div 3 &= 192, h = 12 \text{ cm} \\ \text{b) } \pi \times 4^2 \times h \div 3 &= 192 \\ h &= 576 \div 16\pi = 11.5 \text{ cm} \end{aligned}$$

7 Surface area of cuboids

- a) Work out the surface area of this cuboid in m^2 .
- b) Ade says doubling every length of a cuboid doubles its surface area. Show he is wrong with a 1 cm by 2 cm by 3 cm cuboid.



$$\begin{aligned} \text{a) } 80 \text{ cm} &= 0.8 \text{ m} \\ 2 \times (3 + 2 + 0.96) &= 11.92 \text{ m}^2 \\ \text{b) } 22 \text{ cm}^2 &\text{ becomes } 88 \text{ cm}^2, 4 \text{ times as much} \end{aligned}$$

8 Surface area of cuboids

A room is a cuboid 5 m long, 4 m wide and 2.5 m high. The four walls and the ceiling are painted.

- a) Work out the area to be painted.
- b) A litre of paint covers 12 m^2 . Paint comes in 2.5 litre tins. How many tins are needed?

$$\begin{aligned} \text{a) walls } 2 \times (5 + 4) \times 2.5 &= 45 \text{ m}^2, \text{ ceiling } 20 \text{ m}^2 \\ 45 + 20 &= 65 \text{ m}^2 \\ \text{b) } 65 \div 12 &= 5.42 \text{ litres, } \div 2.5 = 2.17 \\ &= 3 \text{ tins} \end{aligned}$$