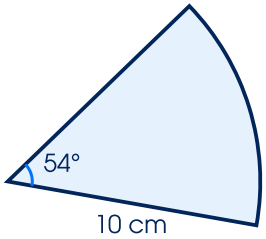
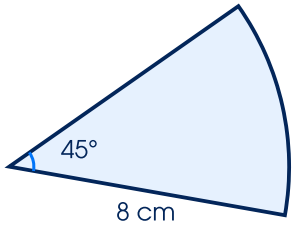
GCSE HIGHER · REVISION MAT 4

Arc length and sector area

1 Find the arc length, to 1 d.p.



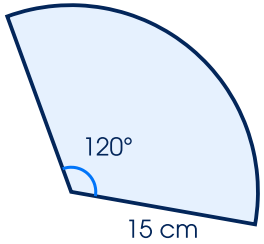
2 Find the area of the sector, to 1 d.p.



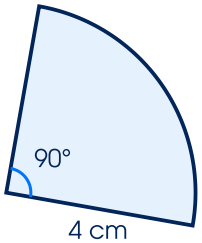
3 Explain why doubling the angle of a sector doubles its arc length.

4 A clock's minute hand is 15 cm long.

How far does its tip travel in 20 minutes?

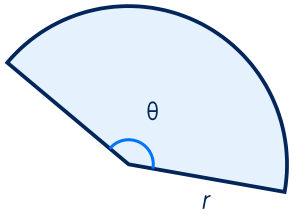


5 Show that the perimeter of a quarter circle of radius 4 cm is $(2\pi + 8)$ cm.

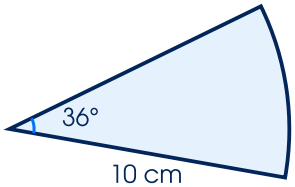


6 A sector has arc length 5π cm and area 15π cm^2.

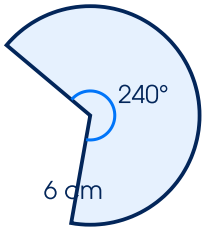
Find its radius and angle.



7 Show that a sector of radius 10 cm and angle 36° has area 10π cm^2.



8 This sector is folded to make a cone, with no overlap.



Find the radius and height of the cone.

ANSWERS · REVISION MAT 4

Arc length and sector area

1 3π

9.4 cm

2 8π

25.1 cm²

3 **The arc is $\frac{\theta}{360}$ of the circumference, so it is proportional to θ.**

4 $\frac{1}{3} \times 30\pi = 10\pi$

31.4 cm

5 Arc $\frac{1}{4} \times 8\pi = 2\pi$

Plus two radii: $2\pi + 8$

6 Area $= \frac{1}{2}rl \Rightarrow r = 6$

$\frac{\theta}{360} \times 12\pi = 5\pi$

$r = 6$ cm, $\theta = 150°$

7 $\frac{36}{360} \times 100\pi$

$= 10\pi$

8 Arc $= \frac{2}{3} \times 12\pi = 8\pi = 2\pi r$

Radius 4 cm

Height $\sqrt{36 - 16} = 4.47$ cm

Mr&Mrs MATHS