Maths Rules

Section A

1. Convert the following angles in radians into degrees

a) π b) $\frac{\pi}{4}$ c) $\frac{\pi}{6}$ d) $\frac{2\pi}{3}$ e) 2π f) $\frac{\pi}{12}$

2. Convert the following angles in degrees into radians. Give your answers in terms of π.

a) $90°$ b) $60°$ c) $270°$ d) $135°$ e) $300°$ f) $10°$

3. A circle has radius has radius 1.2 metres.

Find the length of the arc which subtends an angle of $\frac{\pi}{10}$ radians at the centre of the circle.

4. A circle has radius has radius 5 cm.

Find the area of the sector which subtends an angle of $\frac{\pi}{3}$ radians at the centre of the circle.

5. A circle has radius has radius 2 cm.

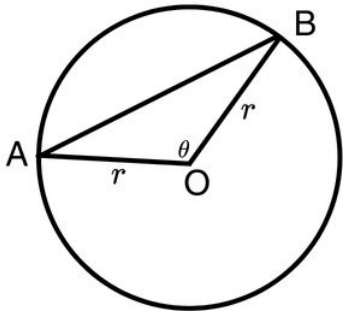
Find the perimeter of the sector which subtends an angle of 2 radians at the centre of the circle.

Section B

6. A sector of a circle has radius 13 cm. The area of the sector is 25 cm^2.
Find the perimeter of the sector.

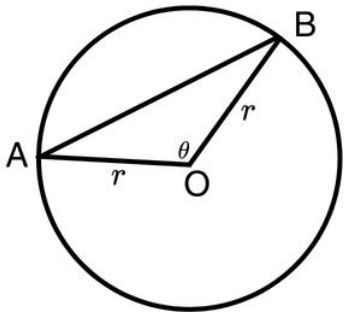
7. A sector has radius r and area 4 cm^2. The perimeter of the sector is twice that of the area of the sector.
Show that $r = 2$.

8. The figure below shows a sector AOB.



Given that the radius $r = 10$ and the length of the arc AB is 14π, find the size of the triangle AOB.

9. The figure below shows a sector AOB.

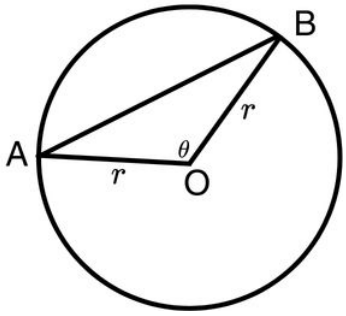


The radius $r = 3.5$cm. The triangle AOB has area 10 cm^2.

Find the length of the perimeter of the circle. Give your answer rounded to 3 significant figures.

Section C

10. The figure below shows a sector AOB.

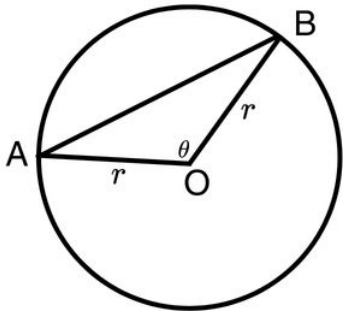


The area of the segment enclosed by the straight line AB and the arc AB has the same area as the triangle AOB.

Show that $\theta = 2\sin\theta$.

11. In a circle, the major sector is three times the major sector etc

The figure below shows a sector AOB.



The area of the minor segment is $\frac{1}{4}$ of the size of the major segment.

Show that $\theta = \dfrac{3\sin\theta + 2\pi}{5}$.