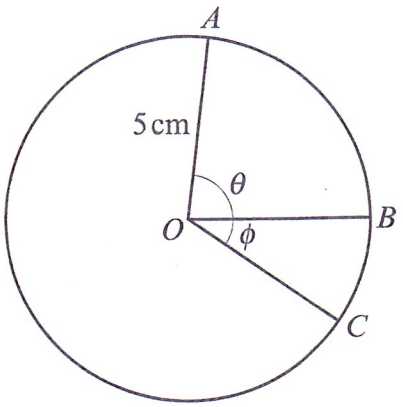
9.

JAN 2012
C2



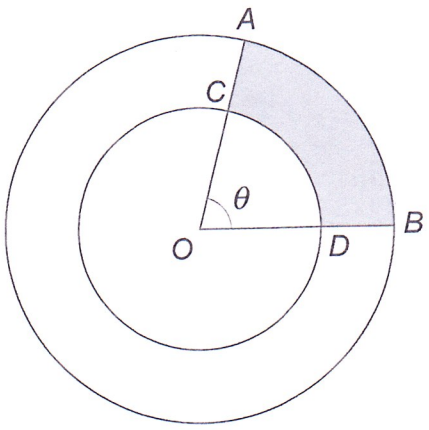
The diagram shows a circle with centre O and radius 5 cm. The points A, B and C lie on the circle and the angles θ and ϕ are measured in radians. The sum of the areas of the sectors AOB and BOC is 22·5 cm^2.

(a) Show that $\theta + \phi = 1{\cdot}8$. [2]

(b) Given that the arc AB is 3·5 cm longer than the arc BC, find the values of θ and ϕ. [4]

9.

MAY 2017
C2



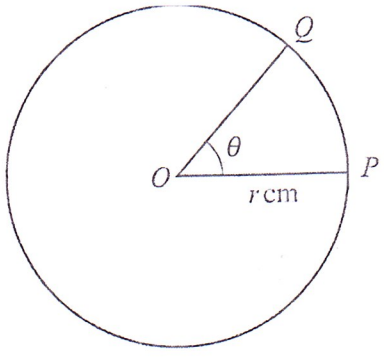
The diagram shows two concentric circles with common centre O. The radius of the larger circle is R cm and the radius of the smaller circle is r cm. The points A and B lie on the larger circle and are such that $A\hat{O}B = \theta$ radians. The smaller circle cuts OA and OB at the points C and D respectively. The sum of the lengths of the arcs AB and CD is L cm. The area of the shaded region $ACDB$ is K cm^2.

(a) (i) Write down an expression for L in terms of R, r and θ.

(ii) Write down an expression for K in terms of R, r and θ. [2]

(b) Given that $AC = x$ cm, use your results to part *(a)* to find an expression for K in terms of x and L. [3]

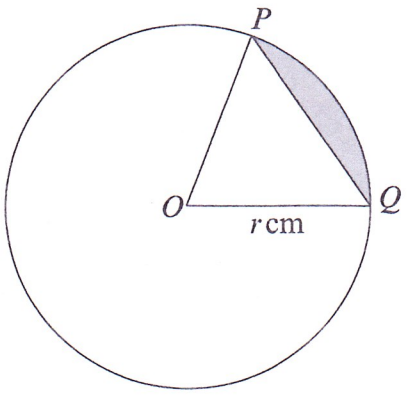
MAY 2011
C2



The diagram shows two points P and Q on a circle with centre O. The radius of the circle is r cm and $P\hat{O}Q = \theta$ radians. The length of the arc PQ is 7·6 cm and the area of the sector POQ is 36·1 cm^2. Find the values of r and θ. [5]

9.

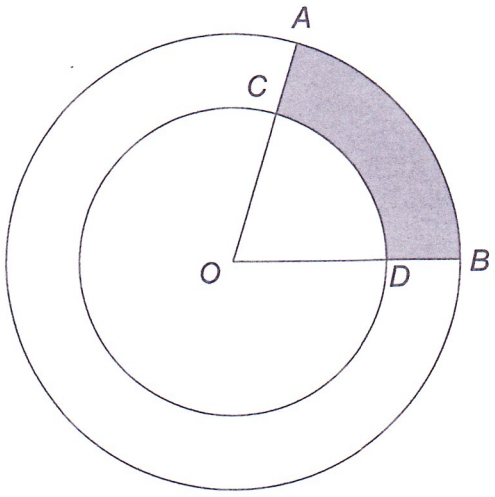
MAY 2012
C2



The diagram shows a circle with centre O and radius r cm. The points P and Q are on the circle and $P\hat{O}Q = 1{\cdot}12$ radians. Given that the area of the shaded region is $10{\cdot}35\,\text{cm}^2$, find the value of r. Give your answer correct to one decimal place. [5]

9.

JAN 2014
C2

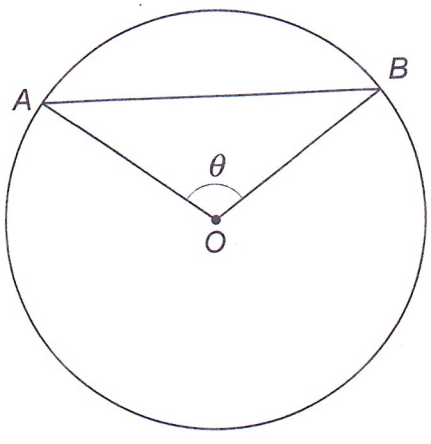


The diagram shows two concentric circles with a common centre O. The radius of the larger circle is 7 cm and the radius of the smaller circle is 4 cm. The points A and B lie on the larger circle and OA and OB cut the smaller circle at the points C and D respectively. The area of the shaded region $ACDB$ is $23{\cdot}1\,\text{cm}^2$. Find the perimeter of $ACDB$. [6]

1	2

A chord AB subtends an angle θ radians at the centre of a circle. The chord divides the circle into two segments whose areas are in the ratio 1 : 2.

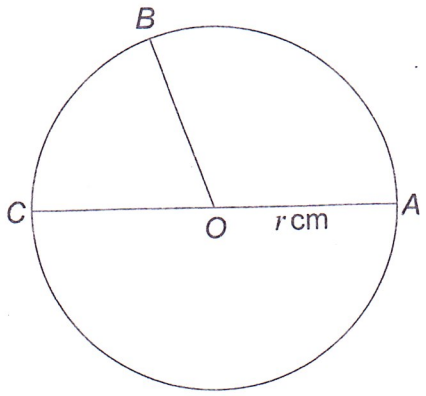
JUNE 2019
UNIT 3



a) Show that $\sin\theta = \theta - \frac{2\pi}{3}$. [4]

9.

MAY 2016
C2

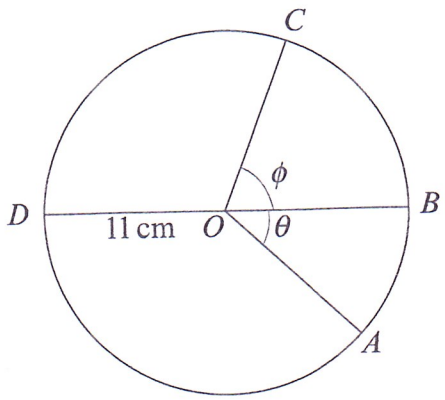


The diagram shows a sketch of a circle with centre O and radius r cm. Three points A, B and C lie on the circle. The line AC is a diameter of the circle and $A\hat{O}B = 2{\cdot}15$ radians.

Given that the area of sector BOC is $26\,\text{cm}^2$ less than the area of sector AOB, find the value of r. Give your answer correct to one decimal place. [5]

9.

JAN 2013
C2



The diagram shows a sketch of a circle with centre O and radius 11 cm. Four points A, B, C and D lie on the circle. The line BD is a diameter of the circle, $A\hat{O}B = \theta$ radians and $B\hat{O}C = \phi$ radians.

(a) The area of sector AOB is $43{\cdot}56\,\text{cm}^2$. Find the value of θ. [2]

(b) The length of the arc BC is 13 cm less than the length of the arc CD. Find the value of ϕ, giving your answer correct to two decimal places. [4]