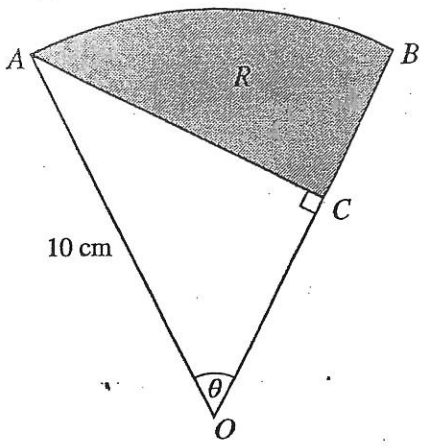
1



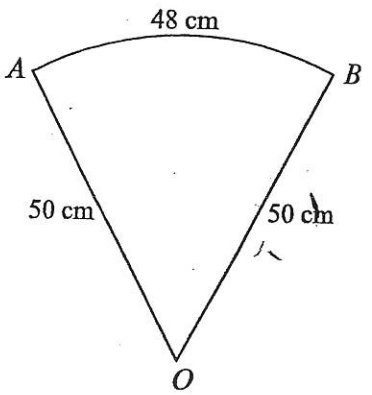
The diagram shows a sector OAB of a circle, centre O and radius 10 cm. Angle AOB is θ radians. The point C lies on OB and is such that AC is perpendicular to OB. The region R (shaded in the diagram) is bounded by the arc AB and by the lines AC and CB. The area of R is 22 cm^2.

(i) Show that $\theta = 0.44 + \sin\theta\cos\theta$. [4]

(ii) Show that θ lies between 0.9 and 1.0. [2]

2

2

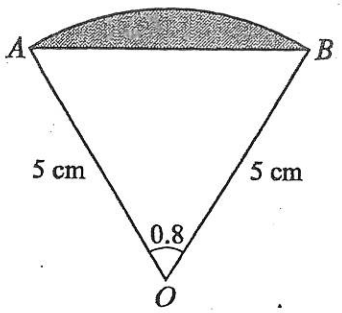


The diagram shows a sector of a circle with centre O and radius 50 cm. The length of the arc AB is 48 cm.

(i) Find the size, in radians, of angle AOB. [2]

(ii) Find the size, in degrees, of angle AOB. [1]

3



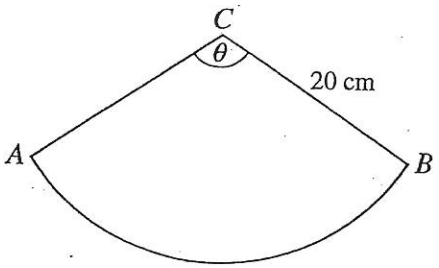
The diagram shows a sector of a circle with centre O and radius 5 cm. The angle AOB is 0.8 radians. Find

(i) the length of the arc AB, [1]

(ii) the area of the segment shaded in the diagram. [4]

2

4

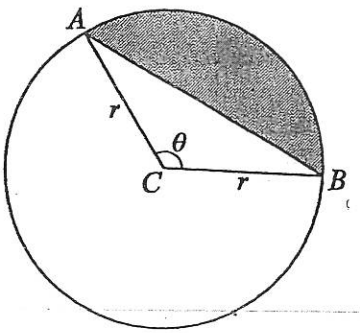


The diagram shows a sector of a circle with centre C and radius 20 cm. The angle ACB is θ radians. Given that the length of the arc AB is 46 cm, find

(i) the value of θ, [1]

(ii) the area of the sector. [2]

5



The diagram shows a circle with centre C and radius r. The chord AB is such that the angle $ACB = \theta$ radians. It is given that the area of the minor segment, shaded in the diagram, is one-fifth of the area of the whole circle.

(i) Show that $\theta = \frac{2}{5}\pi + \sin\theta$. [4]

(ii) Use an iteration process based on the equation in part **(i)**, with a starting value of 2, to find the value of θ correct to 1 decimal place. You should state the result of each iteration. [3]