THEME: GEOMETRY AND MEASURES

TOPIC: CIRCLE PROPERTIES – Lesson 9

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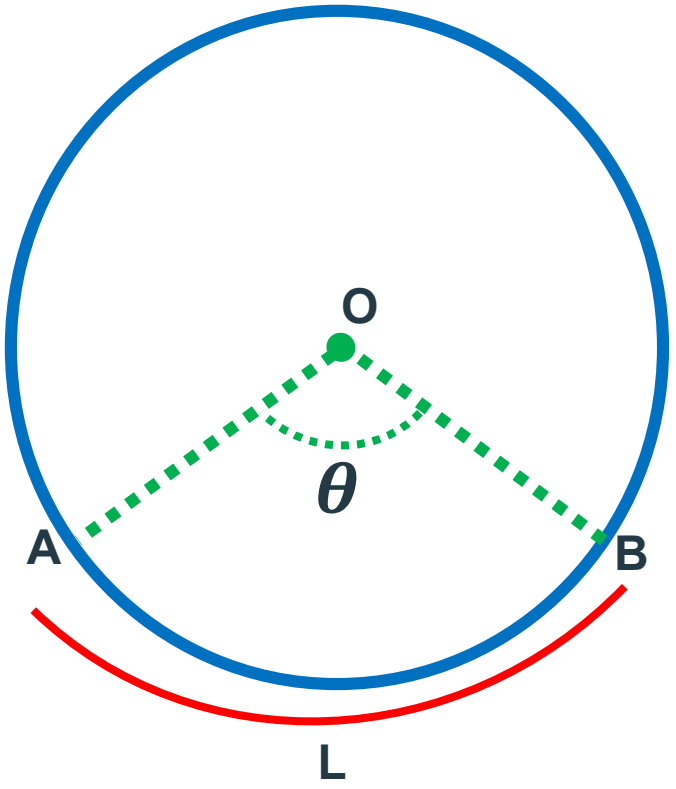
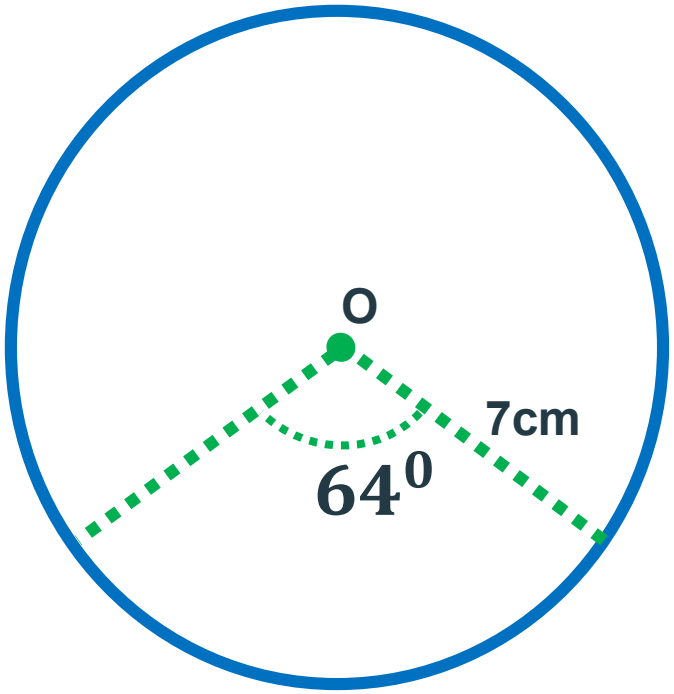
LEARNING OUTCOME

- By the end of this lesson you should be able to find the length of an arc and also apply the knowledge learnt to different scenarios

LENGTH OF AN ARC



ACTIVITY : Given the circle below with center O ,Find the length of the minor arc



Activity

- A chord of a circle subtends an angle of 102^0 at its centre. Find the length of the chord if the radius of the circle is 4.5 cm

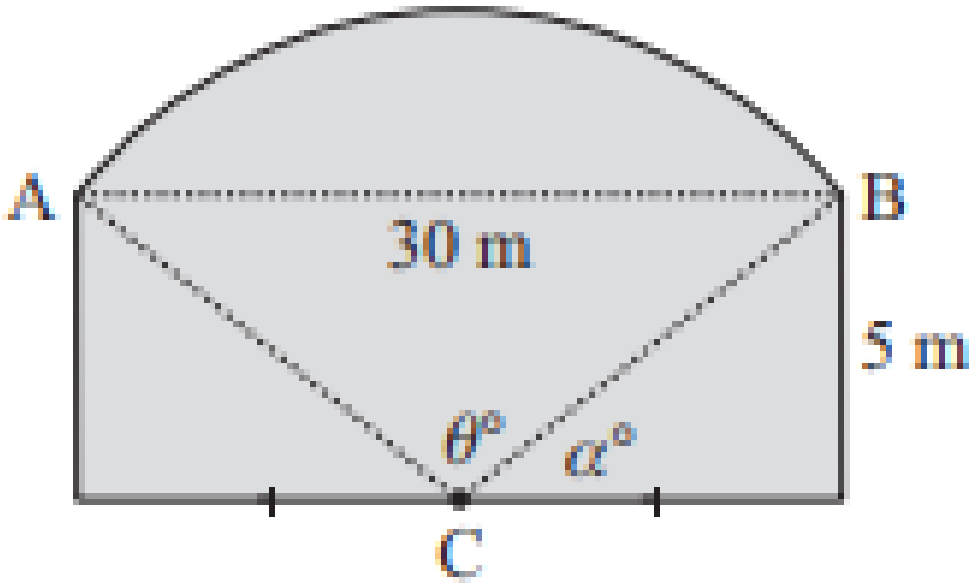
Activity

The end wall of a building has the shape illustrated, where the centre of arc AB is at C. Find:

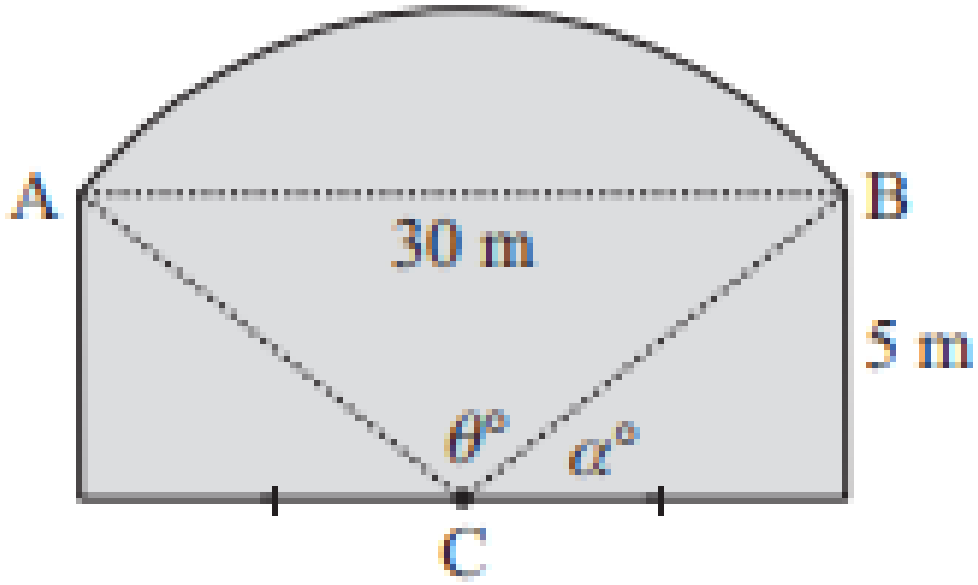
a) θ^0 to 4 significant figures

b) $\propto^0$ to 4 significant figures

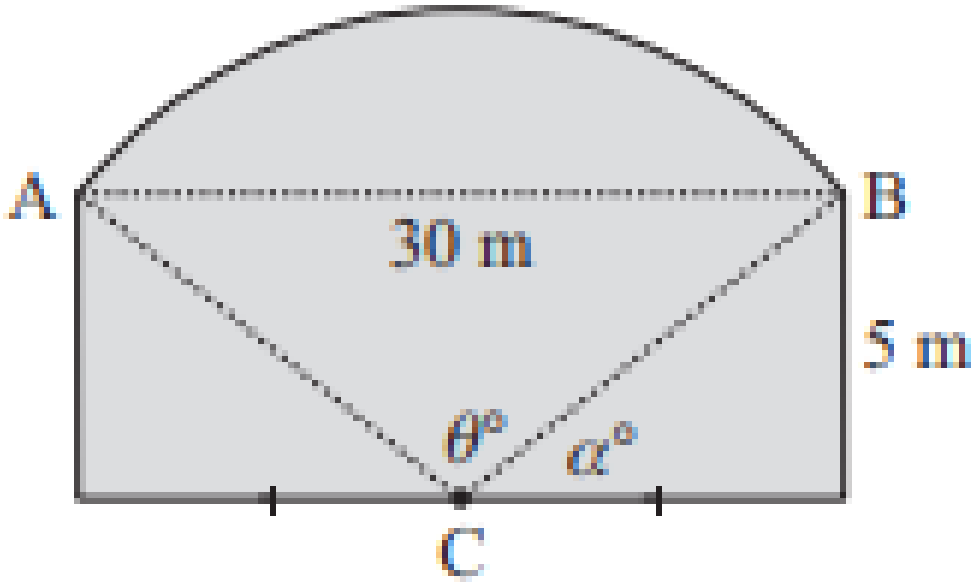
c) the area of the wall.



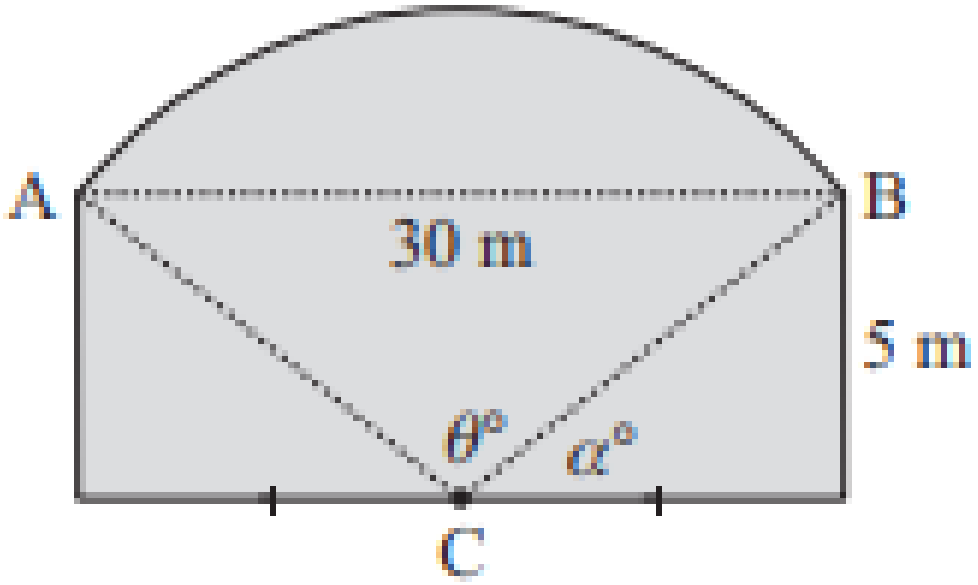
a) θ^0 to 4 significant figures



$\propto^{0}$to 4 significant figures

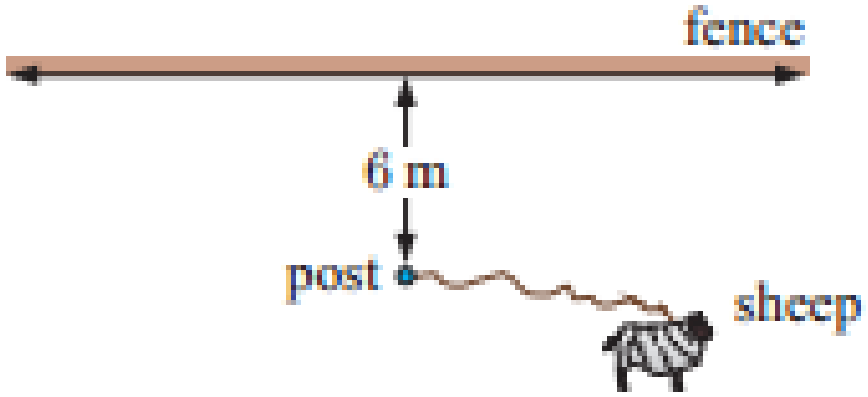


(c) the area of the wall.



Activity

Mr. Joel is a farmer who specializes in rearing sheep. He ties one of his sheep to a **fixed post**, which is positioned **6 metres away** from a **long, straight fence**. The sheep is tethered to the post using a **rope that is 9 metres long**, allowing it to graze within a specific range around the post. However, the presence of the fence restricts part of this grazing area, so the sheep can only access the portion that is not obstructed by the fence. Your task is to calculate the **total grazing area available for the sheep**, considering the restricted portion caused by the fence.



Activity

A square field with a side length of **8 metres** has a goat tied to a post located at the centre of the field. The goat is tethered to the post using a **rope of length 4.5 metres**, allowing it to move within a specific range. The rope length restricts the goat's grazing area to within 4.5 metres of the post.Your task is to determine the area of the square field that the goat can actually reach, considering the boundaries of the field.

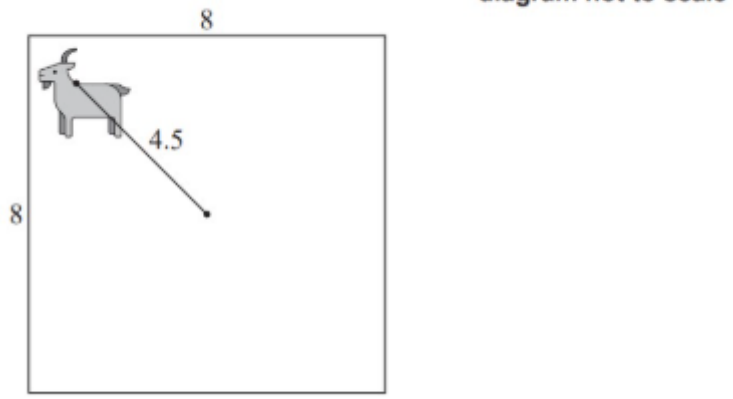
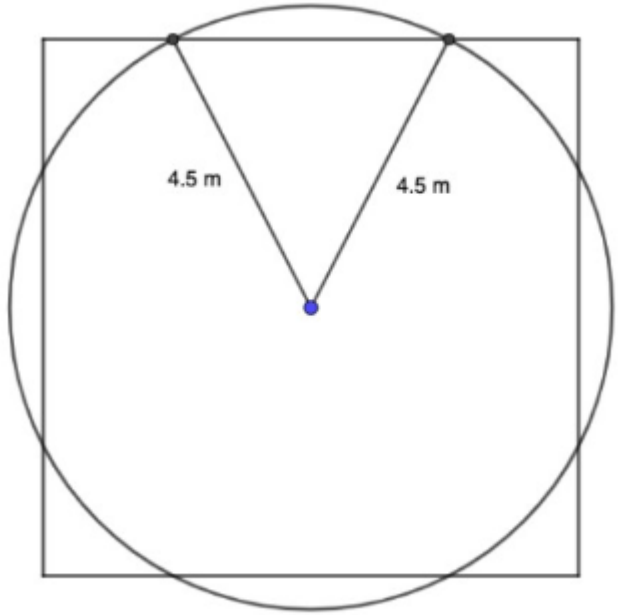


diagram not to scale

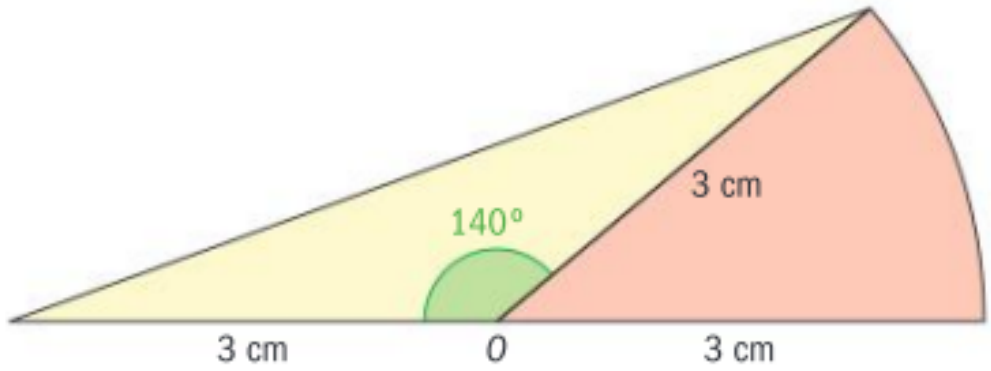

4.5 m
4.5 m

A logo for a sports team is made up of a sector of a circle and a triangle in two colours, as shown. The sector of the circle has a centre at O and the circle has a radius of 3 cm.

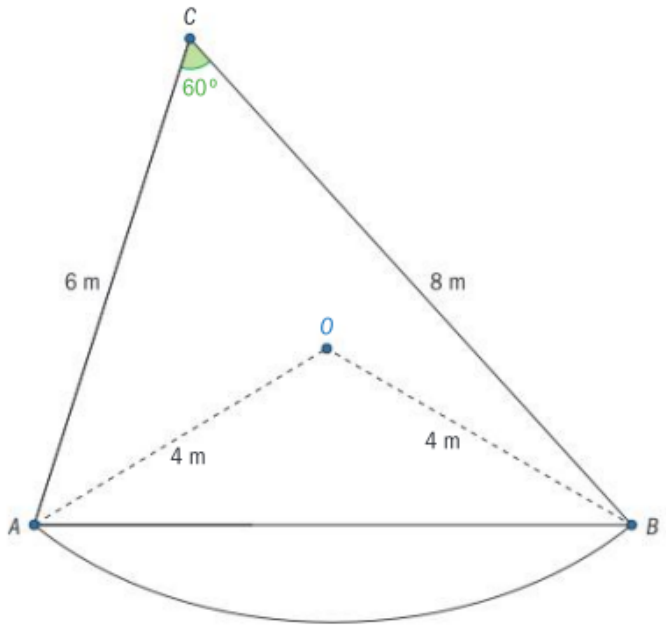
Find the area of:

a. the triangular section

b. the sector.



13. A garden consists of a lawn in the shape of a triangle, shown as ABC in the diagram, and a flower bed formed by the arc of a circle, centre O with a radius of 4 m. The length of AC is 6 m, the length of BC is 8 m and angle $A\hat{C}B = 60°$

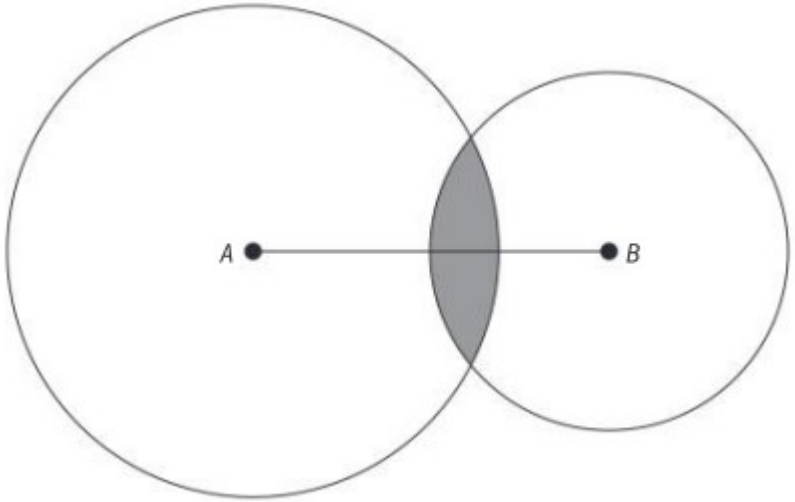


The owner of the garden wants to buy some decorative edging to go around the flower bed.

a. Find the length of the side AB.

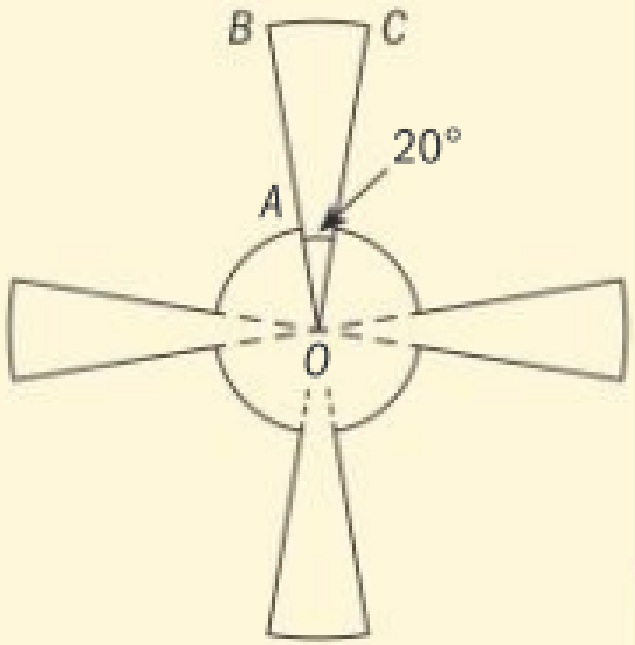
b. Hence, find the length of edging the owner needs to buy.

Boat A is situated 10 km away from boat B, and each boat has a marine radio transmitter on board. The range of the transmitter on boat A is 7 km, and on boat B it is 5 km. The region in which both transmitters can be detected is represented by the shaded region in the diagram. Find the area of this region



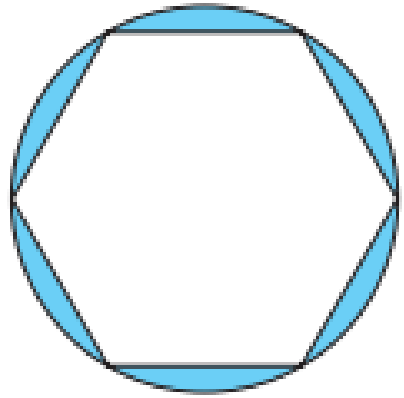
This diagram shows a metallic pendant made out of four equal sectors of a larger circle of radius $OB = 9$ cm and four equal sectors of a smaller circle of radius $OA = 3$ cm.
Angle $BOC = 20°$

Find the area of the pendant.



Activity

The diagram alongside shows a circular entertainment area. It has a paved hexagonal area with plants growing in the garden (shown as the shaded sectors). If the radius of the circle is 7 metres, find the area of the garden.



A farmer has a circular garden as shown in the picture, whichhas different types of trees, plants and flowers. In the garden there are two mango trees A and B such that AB = 10m.
Similarly there are two ashoka trees C and D at the same distance 10m. AB subtends 120 at the centre O and AC is at a distance of 5m from the centre. The radius of the circle is 13m.

(a) What is the angle subtended by CD at the centre O?

(b) What is the distance between mango tree A and ashoka tree C?

(c) Find ∠OCD