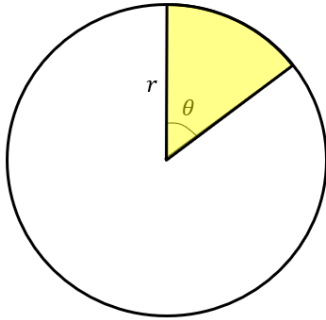


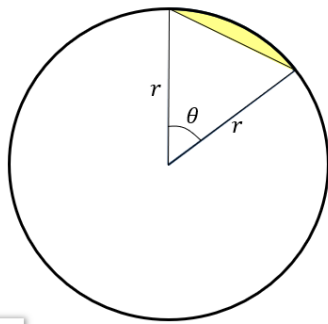
Sector Area



Area using Degrees =

Area using Radians =

Segment Area



A segment is the region bound between a chord and the circumference.

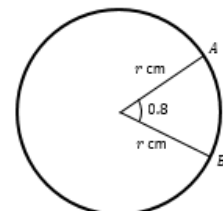
This is just a sector with a triangle cut out.

Recall that the area of a triangle is $\frac{1}{2}ab \sin C$ where C is the 'included angle' (i.e. between a and b)

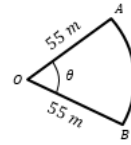
Area using radians:

Examples

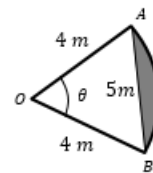
1. In the diagram, the area of the minor sector AOB is 28.9 cm^2 . Given that $\angle AOB = 0.8$ radians, calculate the value of r .



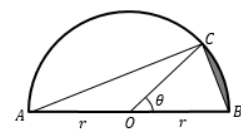
2. A plot of land is in the shape of a sector of a circle of radius 55 m. The length of fencing that is erected along the edge of the plot to enclose the land is 176 m. Calculate the area of the plot of land.



3. In the diagram above, OAB is a sector of a circle, radius 4m. The chord AB is 5m long. Find the area of the shaded segment.



4. In the diagram, AB is the diameter of a circle of radius r cm, and $\angle BOC = \theta$ radians. Given that the area of $\triangle AOC$ is three times that of the shaded segment, show that $3\theta - 4 \sin \theta = 0$.



Test Your Understanding

6.

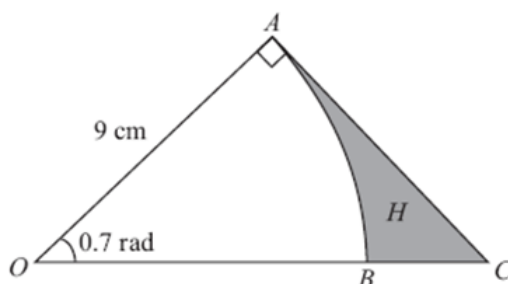


Figure 1

Figure 1 shows the sector OAB of a circle with centre O , radius 9 cm and angle 0.7 radians.

(a) Find the length of the arc AB . (2)

(b) Find the area of the sector OAB . (2)

The line AC shown in Figure 1 is perpendicular to OA , and OBC is a straight line.

(c) Find the length of AC , giving your answer to 2 decimal places. (2)

The region H is bounded by the arc AB and the lines AC and CB .

(d) Find the area of H , giving your answer to 2 decimal places. (3)

Extension

[MAT 2012 1J]

If two chords QP and RP on a circle of radius 1 meet in an angle θ at P , for example as drawn in the diagram on the left, then find the largest possible area of the shaded region RPQ , giving your answer in terms of θ .

