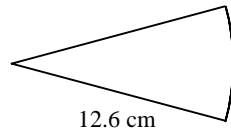
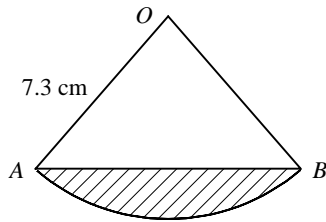


1



The diagram shows a sector of a circle of radius 12.6 cm.
Given that the perimeter of the sector is 31.7 cm, find its area.

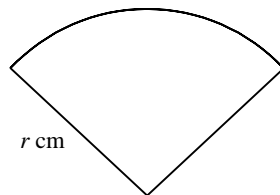
2



The diagram shows a sector OAB of a circle, centre O and radius 7.3 cm.
Given that the area of the sector is 38.4 cm^2 , find

- the size of $\angle AOB$ in radians,
- the perimeter of the shaded segment.

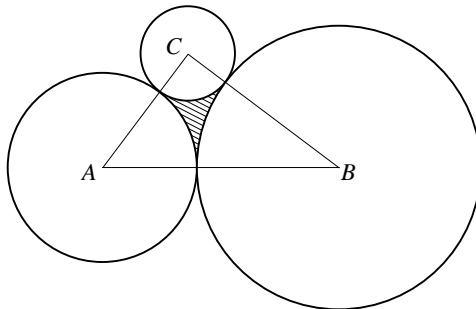
3



The diagram shows a sector of a circle of radius r cm. The area of the sector is 40 cm^2 .

- Show that the perimeter of the sector is $(2r + \frac{80}{r})$ cm.
- Hence find the set of values of r for which the perimeter of the sector is less than 26 cm.

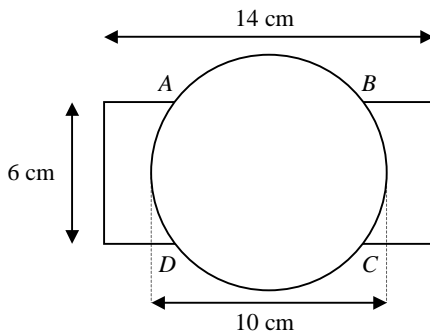
4



The diagram shows three circles with centres A , B and C , and radii 4 cm, 6 cm and 2 cm respectively. Each circle touches the other two circles.

- Prove that triangle ABC is a right-angled triangle.
- Find $\angle ABC$ in radians to 2 decimal places.
- Show that the area of the shaded region enclosed by the three circles is 1.86 cm^2 to 3 significant figures.

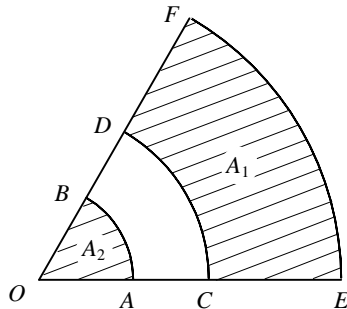
5



The diagram shows a company logo which consists of a circle of diameter 10 cm drawn on top of a rectangle measuring 6 cm by 14 cm. The centres of the circle and rectangle are coincident and the two shapes intersect at A , B , C and D .

- Find the length of the chord of the circle AB .
- Show that the perimeter of the logo is 42.5 cm to 3 significant figures.
- Find the area of the logo.

6



AB , CD and EF are arcs of concentric circles, centre O , such that $OACE$ and $OBDF$ are straight lines as shown in the diagram. The area of the shaded region $CEFD$ is denoted by A_1 and the area of the shaded sector OAB by A_2 .

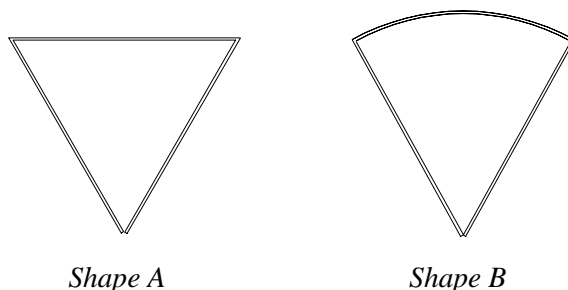
Given that $OA = r$ cm, $AC = 2$ cm, $OE = 8$ cm and $\angle AOB = \theta$ radians,

- find an expression for A_1 in terms of r and θ .

Given also that $A_1 = 7A_2$,

- show that $r = 2.5$

7



Shape A

Shape B

A girl is playing with a paper clip. She straightens the wire and then bends it to form an equilateral triangle, *Shape A* above. She then curves one side of the triangle to form a sector of a circle, *Shape B* above.

Find, to 1 decimal place, the percentage change in the area enclosed by the paper clip when it is changed from *Shape A* to *Shape B*, indicating whether this is an increase or decrease.