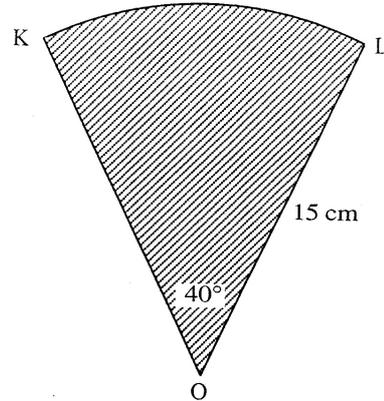


**7. Circle**

- Area of sector, arc length, angle of sector ..... 1  
 Angles in the circle, using Pythagoras with sectors and angles ..... 1

*NB There is considerable overlap between these questions and those on Pythagoras and Trigonometry.*

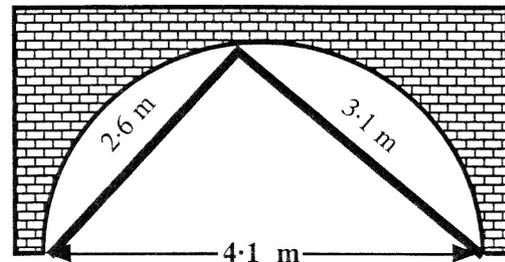
1. Sector KOL of a circle centre O and radius 15 centimetres is shown opposite.



Calculate the area of this sector.

2 KU

2. The central semi-circular archway under a bridge is to be strengthened. While the work is being carried out, 2 metal beams are to be set in place to support the archway.

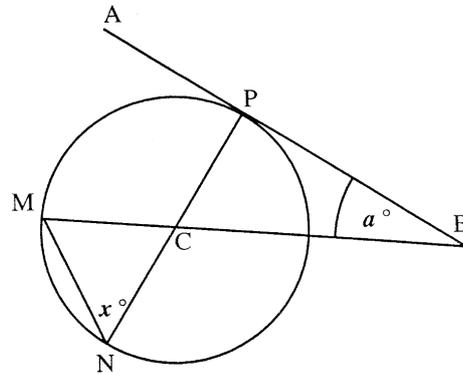


For safety reasons, the beams have to just meet on the circumference of the arch.

Will the beams fit this archway which is 4.1 metres wide ?

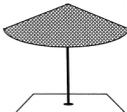
4 RE

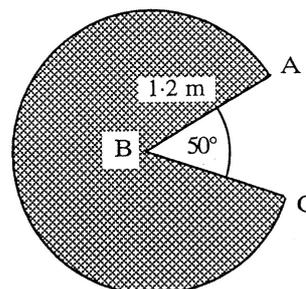
3. AB is a tangent to the circle with centre C. It meets the circle at the point P.



Use the information in the diagram to find an expression for x in terms of a.

3 RE

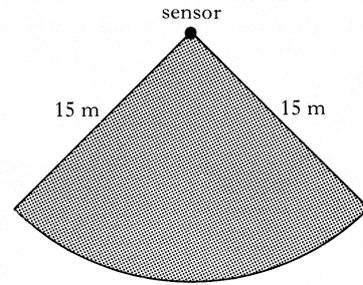
4.  June is replacing the fabric on her garden parasol. She uses a sector of a circle, with radius 1.2 metres.



Calculate the area of fabric needed to replace the old material.

4 KU

5. A sensor in a security system covers a horizontal area in the shape of a sector of a circle of radius 15 m.



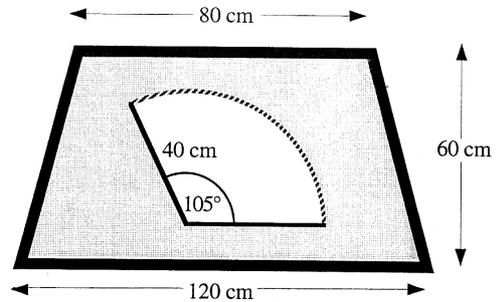
The area of the sector is 200 square metres.  
Find the length of the arc of the sector.

4 RE

6. The diagram shows the rear wiper on a car's back window.

The rear glass is in the shape of a **trapezium** with sizes given.

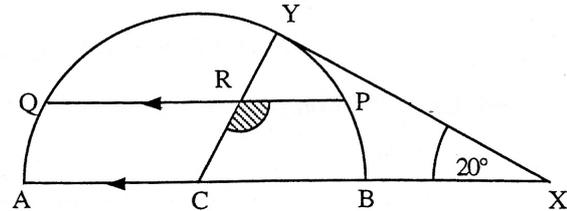
The wiper blade is 40 centimetres long and it sweeps through an angle of  $105^\circ$ .



Calculate the area of glass **NOT** cleaned by the wiper blade.

4 RE

7. In this diagram, AB is the diameter of the circle, centre C.  
X is a point of the line AB extended.  
XY is a tangent from X.  
QP is parallel to AB.



If  $\angle YXC = 20^\circ$ , calculate the size of the shaded angle ( $\angle PRC$ )

3 KU

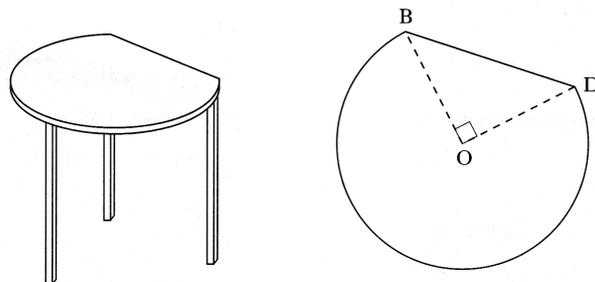
(*explain how you produced your answer*)

8. The diagram shows a table whose top is in the shape of part of a circle with centre, O, and radius 60 centimetres.

BD is a straight line.

Angle BOD is  $90^\circ$ .

Calculate the perimeter of the table top.



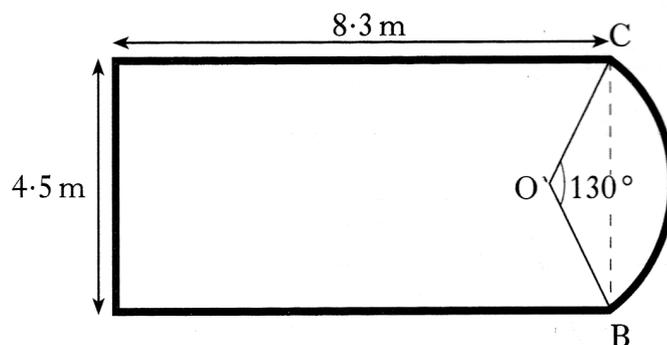
3 RE

9. The diagram shows a ceiling in the shape of a rectangle and a segment of a circle.

The rectangle measures 8.3 metres by 4.5 metres.

OB and OC are radii of the circle and angle BOC is  $130^\circ$ .

- a) Find the length of OB.



2 RE

A border has to be fitted around the perimeter of the ceiling.

- b) Find the length of border required.

4 RE