

# Sector Areas and Arc Lengths

## Question Paper

<b>Level</b>	OCR
<b>Subject</b>	Maths
<b>Exam Board</b>	GCSE (9-1)
<b>Topic</b>	Basic Geometry
<b>Sub Topic</b>	Sector Areas and Arc Lengths
<b>Grade Level</b>	Grade 5
<b>Booklet</b>	Question Paper

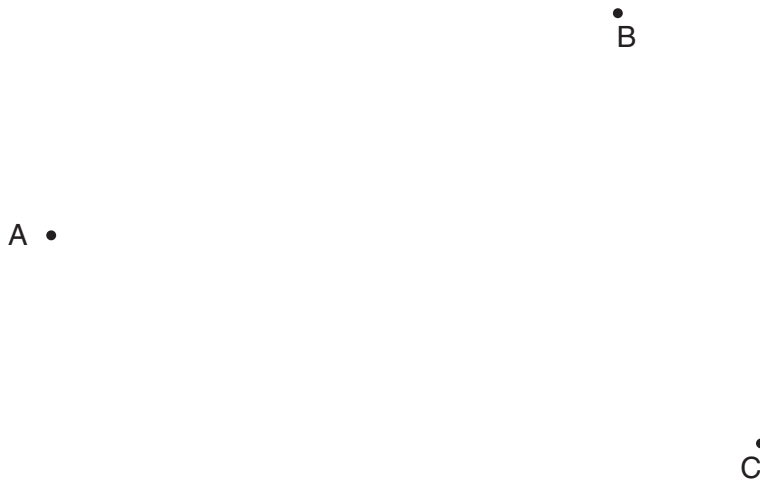
**Time Allowed:** 46 minutes

**Score:** /38

**Percentage:** /100

- 1 *In this question, you should use a ruler and a pair of compasses.  
Do not rub out your construction lines.*

The scale drawing shows two warning posts, A and B, on rocks at sea.  
It also shows the position of a buoy, C.

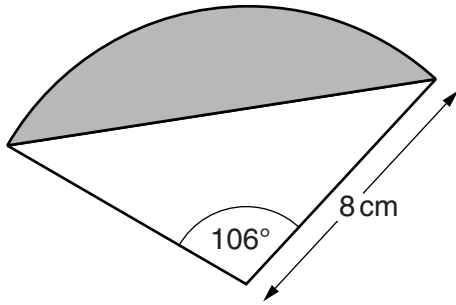


**Scale: 1 cm represents 50 m**

For safety, boats should follow a course that keeps the same distance from A as from B.  
The buoy at C makes a sound which can be heard up to 250 m away.

Construct the safe course for boats. Indicate clearly the part of the safe course where the sound from buoy C can be heard.

- 2 The diagram shows part of a circle, radius 8 cm.

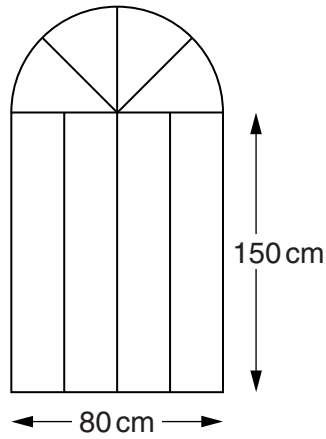


Not to scale

Calculate the area of the shaded segment.

\_\_\_\_\_  $\text{cm}^2$  [5]

- 3 A gate is made from strips of metal.  
The outline of the gate is a rectangle topped by a semicircle.



Not to scale

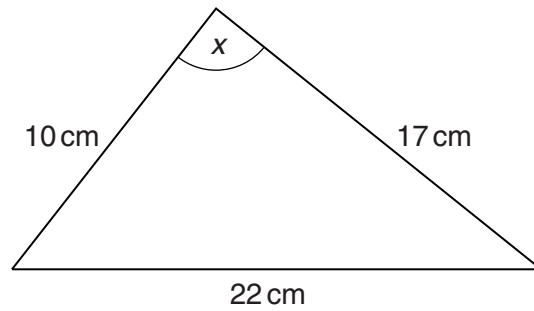
- (a) Explain why the maximum height of the gate is 190 cm.

.....  
..... [1]

- (b)\* Work out the total length of metal strip needed to make the gate.  
Give your answer correct to 3 significant figures.

(b) ..... cm [7]

- 4 Elaine has this triangular piece of material.

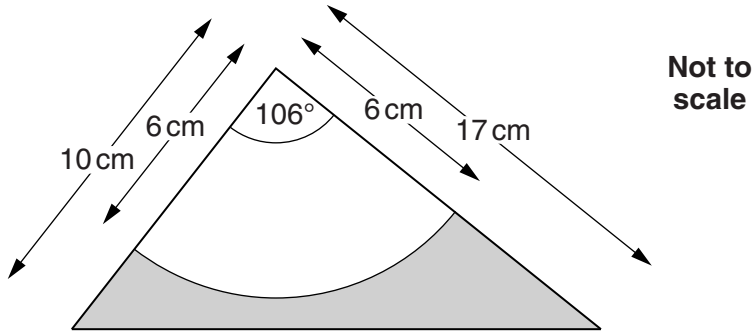


**Not to  
scale**

- (a) Show that  $x = 106^\circ$  correct to the nearest degree.

**[3]**

(b) From the material, Elaine cuts out a sector of a circle, radius 6 cm.



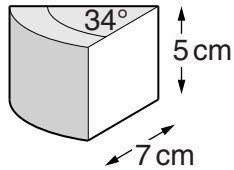
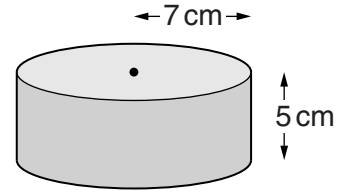
Find the area of the material left over, shown shaded.

(b) ..... cm<sup>2</sup> [6]

5 A cheese is a cylinder of radius 7 cm and depth 5 cm.

The cheese is totally covered with a thin coating of wax.

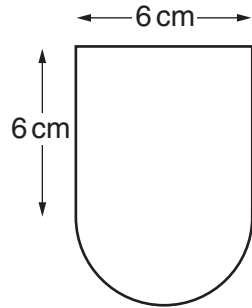
A slice of the cheese is cut so that the top is the sector of a circle of angle  $34^\circ$ .



Work out the area of the wax coating on this slice of cheese.

\_\_\_\_\_  $\text{cm}^2$  [6]

- 6 (a) The shape of a badge on a school uniform is a square joined to a semi-circle.



Not to scale

Show that the area of material used to make this badge is  $50.1 \text{ cm}^2$ , correct to 3 significant figures. [3]

- (b) A sign in front of the school has a picture of this badge. The picture is an enlargement of the badge. The area of the picture is  $16232.4 \text{ cm}^2$ .

Work out the linear scale factor of the enlargement.

(b) ..... [3]