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.
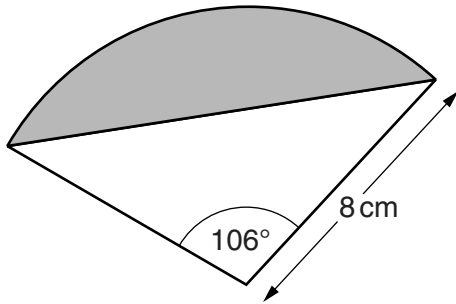
B

A •

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.

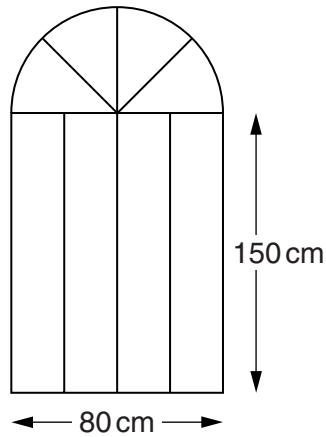**[4]**

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

Not to scale

Calculate the area of the shaded segment.

_____ cm^2 **[5]**

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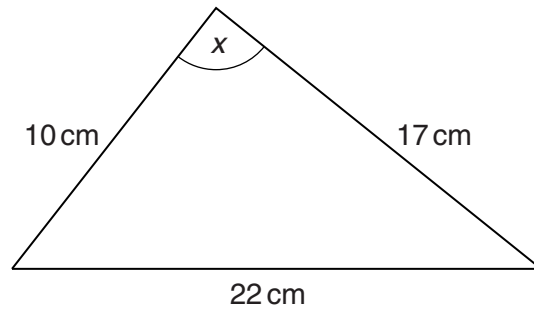The outline of the gate is a rectangle topped by a semicircle.

Not to scale

150 cm

80 cm

(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
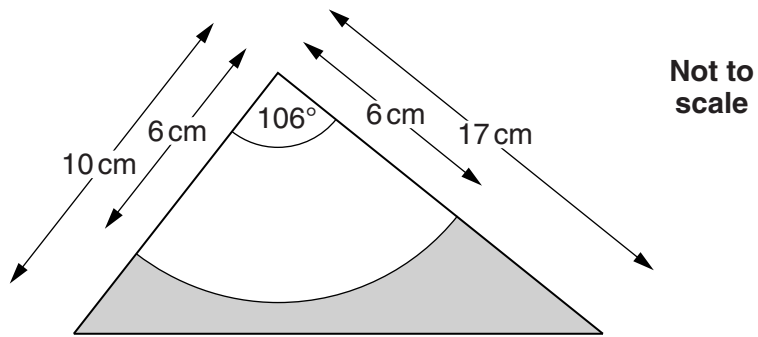
10 cm

17 cm

22 cm

x

(a)   Show that *x* = 106° correct to the nearest degree.   **[3]**

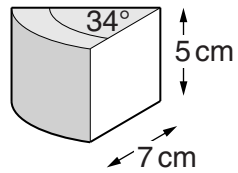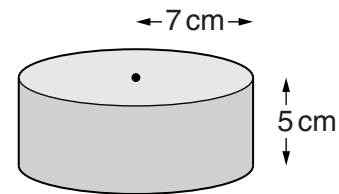**(b)** From the material, Elaine cuts out a sector of a circle, radius 6 cm.

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

(b) .... cm^2 **[6]**

5 A cheese is a cylinder of radius 7 cm and depth 5 cm.
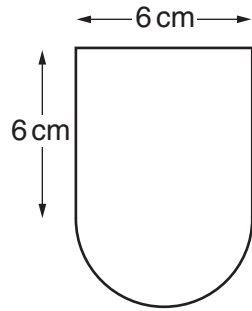
The cheese is totally covered with a thin coating of wax.

A slice of the cheese is cut so that the top is the sector of a circle of angle 34°.

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

_____ 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 cm², 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 cm².

Work out the linear scale factor of the enlargement.

(b) .... **[3]**