

Edexcel GCE

Core Mathematics C2

Advanced Subsidiary

Geometry

Materials required for examination

Mathematical Formulae (Pink or Green)

Items included with question papers

Nil

Advice to Candidates

You must ensure that your answers to parts of questions are clearly labelled.
You must show sufficient working to make your methods clear to the Examiner.
Answers without working may not gain full credit.

1. In the triangle ABC , $AB = 8$ cm, $AC = 7$ cm, $\angle ABC = 0.5$ radians and $\angle ACB = x$ radians.

(a) Use the sine rule to find the value of $\sin x$, giving your answer to 3 decimal places.

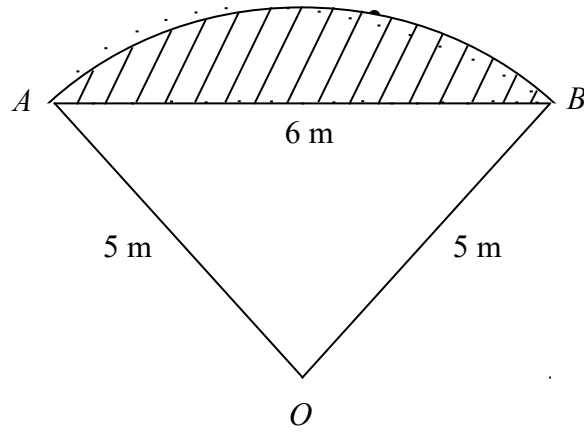
(3)

Given that there are two possible values of x ,

(b) find these values of x , giving your answers to 2 decimal places.

(3)

2.



In Figure 2 OAB is a sector of a circle, radius 5 m . The chord AB is 6 m long.

(a) Show that $\cos \hat{AOB} = \frac{7}{25}$.

(2)

(b) Hence find the angle \hat{AOB} in radians, giving your answer to 3 decimal places.

(1)

(c) Calculate the area of the sector OAB .

(2)

(d) Hence calculate the shaded area.

(3)

3.

Figure 2

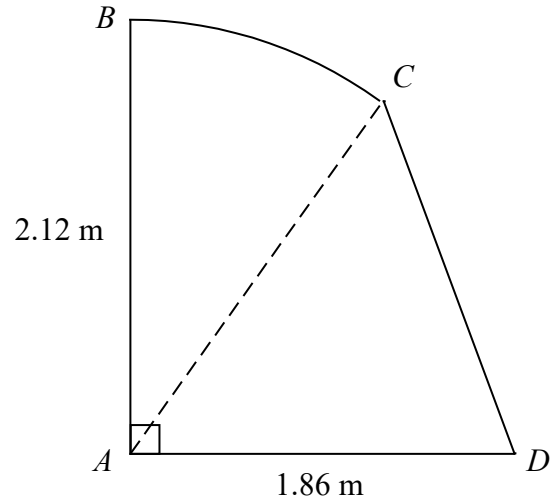


Figure 2 shows the cross-section $ABCD$ of a small shed.

The straight line AB is vertical and has length 2.12 m.

The straight line AD is horizontal and has length 1.86 m.

The curve BC is an arc of a circle with centre A , and CD is a straight line.

Given that the size of $\angle BAC$ is 0.65 radians, find

(a) the length of the arc BC , in m, to 2 decimal places, (2)

(b) the area of the sector BAC , in m^2 , to 2 decimal places, (2)

(c) the size of $\angle CAD$, in radians, to 2 decimal places, (2)

(d) the area of the cross-section $ABCD$ of the shed, in m^2 , to 2 decimal places. (3)

4.

Figure 2

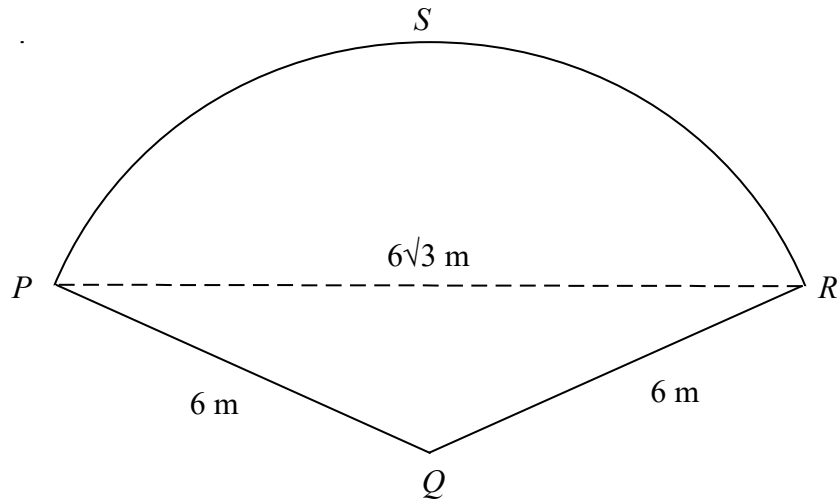


Figure 2 shows a plan of a patio. The patio $PQRS$ is in the shape of a sector of a circle with centre Q and radius 6 m.

Given that the length of the straight line PR is $6\sqrt{3}$ m,

(a) find the exact size of angle PQR in radians. (3)

(b) Show that the area of the patio $PQRS$ is 12π m². (2)

(c) Find the exact area of the triangle PQR . (2)

(d) Find, in m² to 1 decimal place, the area of the segment PRS . (2)

(e) Find, in m to 1 decimal place, the perimeter of the patio $PQRS$. (2)

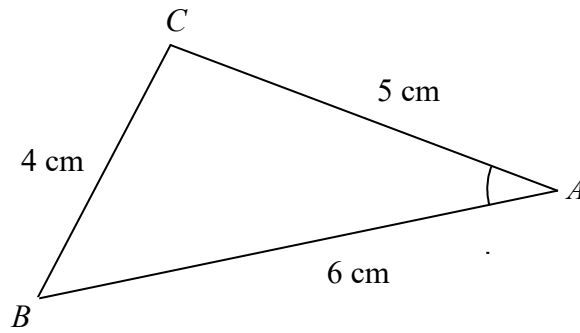


Figure 1

Figure 1 shows the triangle ABC , with $AB = 6$ cm, $BC = 4$ cm and $CA = 5$ cm.

(a) Show that $\cos A = \frac{3}{4}$.

(3)

(b) Hence, or otherwise, find the exact value of $\sin A$.

(2)

6.

Figure 1

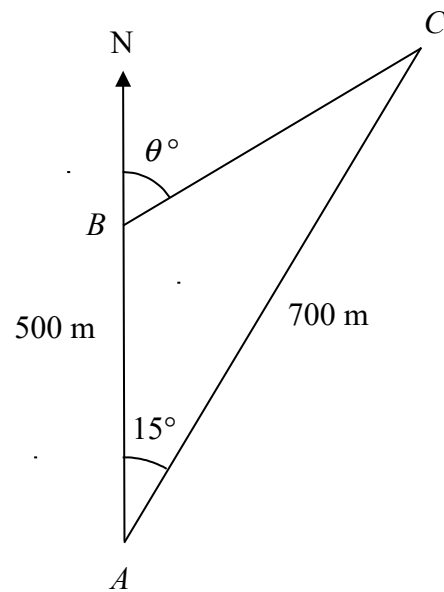


Figure 1 shows 3 yachts A , B and C which are assumed to be in the same horizontal plane. Yacht B is 500 m due north of yacht A and yacht C is 700 m from A . The bearing of C from A is 015° .

(a) Calculate the distance between yacht B and yacht C , in metres to 3 significant figures. (3)

The bearing of yacht C from yacht B is θ° , as shown in Figure 1.

(b) Calculate the value of θ . (4)

7.

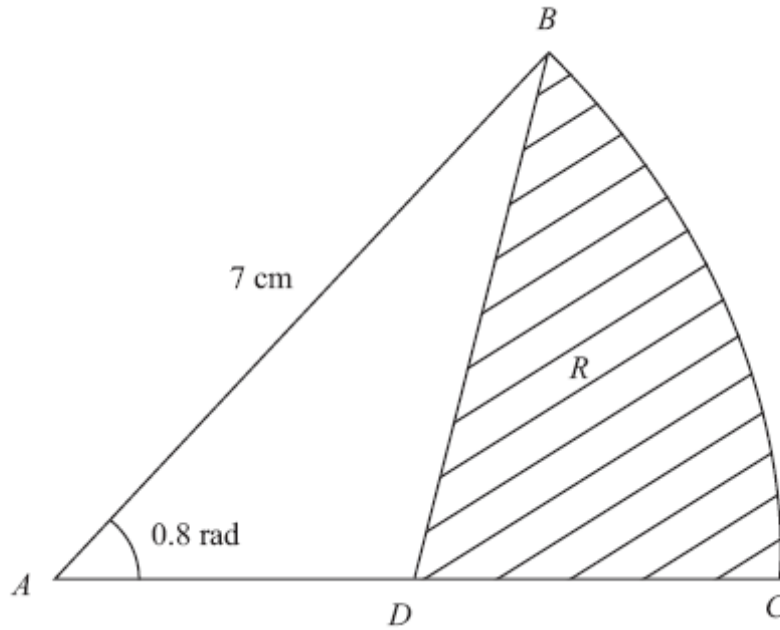


Figure 1

Figure 1 shows ABC , a sector of a circle with centre A and radius 7 cm.

Given that the size of $\angle BAC$ is exactly 0.8 radians, find

(a) the length of the arc BC , (2)

(b) the area of the sector ABC . (2)

The point D is the mid-point of AC . The region R , shown shaded in Figure 1, is bounded by CD , DB and the arc BC .

Find

(c) the perimeter of R , giving your answer to 3 significant figures, (4)

(d) the area of R , giving your answer to 3 significant figures. (4)

8.

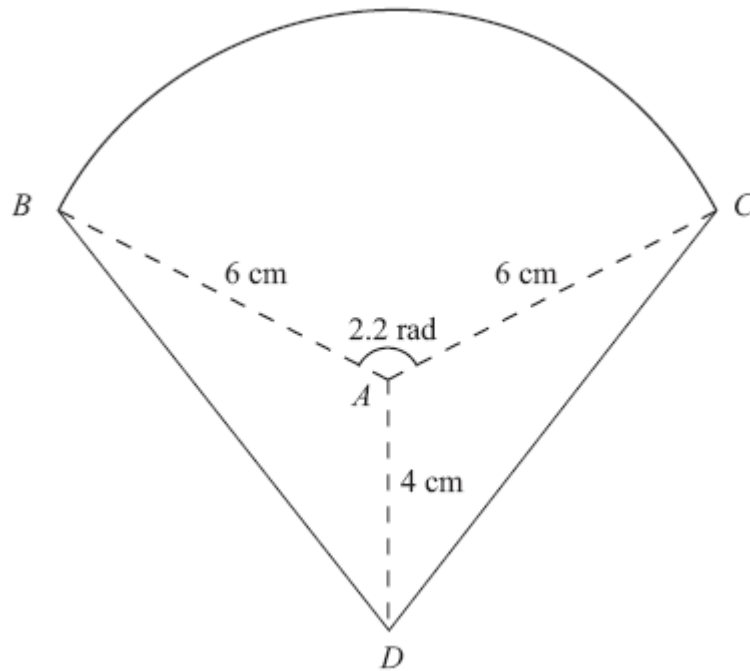


Figure 3

The shape BCD shown in Figure 3 is a design for a logo.

The straight lines DB and DC are equal in length. The curve BC is an arc of a circle with centre A and radius 6 cm. The size of $\angle BAC$ is 2.2 radians and $AD = 4$ cm.

Find

(a) the area of the sector BAC , in cm^2 , (2)

(b) the size of $\angle DAC$, in radians to 3 significant figures, (2)

(c) the complete area of the logo design, to the nearest cm^2 . (4)