Write your name here

Surname	Other names

Pearson Edexcel Level 3 GCE

Centre Number | | | | | |

Candidate Number | | | | |

Mathematics

Year 11 to Year 12 Transition Paper

Trigonometric Ratios

You must have:
Mathematical Formulae and Statistical Tables, calculator

Total Marks

Candidates may use any calculator permitted by Pearson regulations. Calculators must not have the facility for algebraic manipulation, differentiation and integration, or have retrievable mathematical formulae stored in them.

Instructions

- Use **black** ink or ball-point pen.
- If pencil is used for diagrams/sketches/graphs it must be dark (HB or B).
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions and ensure that your answers to parts of questions are clearly labelled.
- Answer the questions in the spaces provided
  – *there may be more space than you need.*
- You should show sufficient working to make your methods clear. Answers without working may not gain full credit.
- Answers should be given to three significant figures unless otherwise stated.

Information

- A booklet 'Mathematical Formulae and Statistical Tables' is provided.
- The marks for **each** question are shown in brackets
  – *use this as a guide as to how much time to spend on each question.*

Advice

- Read each question carefully before you start to answer it.
- Try to answer every question.
- Check your answers if you have time at the end.
- If you change your mind about an answer cross it out and put your new answer and any working out underneath.

Turn over ▶

Pearson

Calculators may NOT be used to answer these questions unless a symbol is shown next to the question.

1. Here is a right-angled triangle.

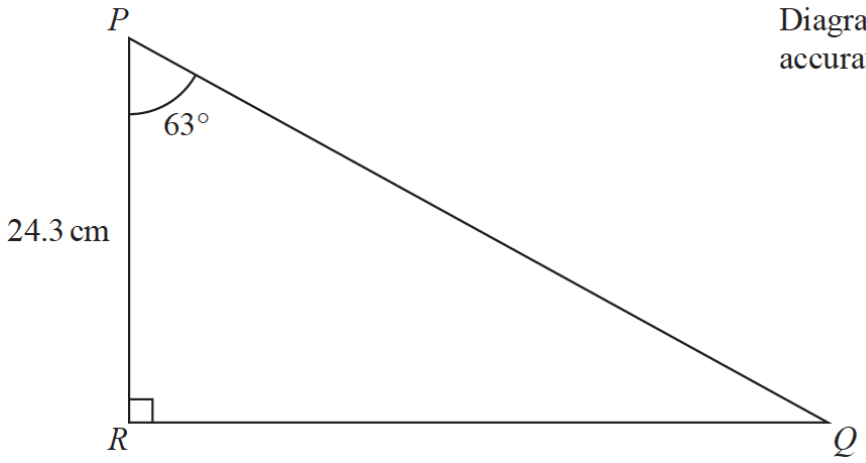


Diagram **NOT** accurately drawn

Calculate the length of PQ.

Give your answer correct to 3 significant figures.

(Total for Question 1 is 3 marks)

2.

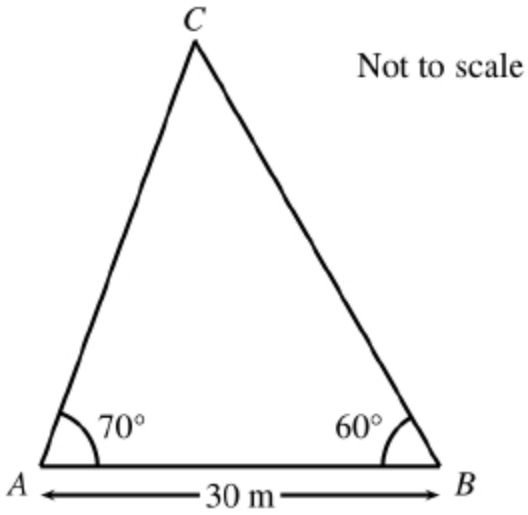


Figure 1

A triangular lawn is modelled by the triangle ABC, shown in Figure 1. The length AB is to be 30 m long.

Given that angle $BAC = 70°$ and angle $ABC = 60°$,

(a) calculate the area of the lawn to 3 significant figures.

(4)

(b) Why is your answer unlikely to be accurate to the nearest square metre?

(1)

(Total for Question 2 is 5 marks)

3.

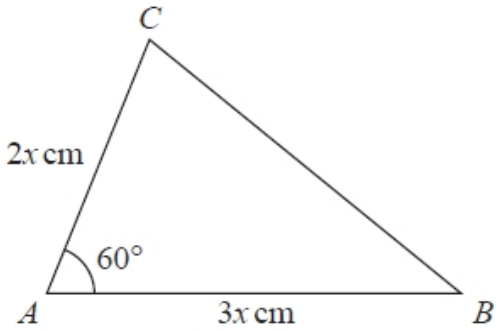


Figure 2

Figure 2 shows a sketch of a triangle ABC with $AB = 3x$ cm, $AC = 2x$ cm and angle $CAB = 60°$

Given that the area of triangle ABC is $18\sqrt{3}$ cm^2

(a) show that $x = 2\sqrt{3}$

(3)

(b) Hence find the exact length of BC, giving your answer as a simplified surd.

(3)

(Total for Question 3 is 6 marks)

4. *ABCD* is a quadrilateral.

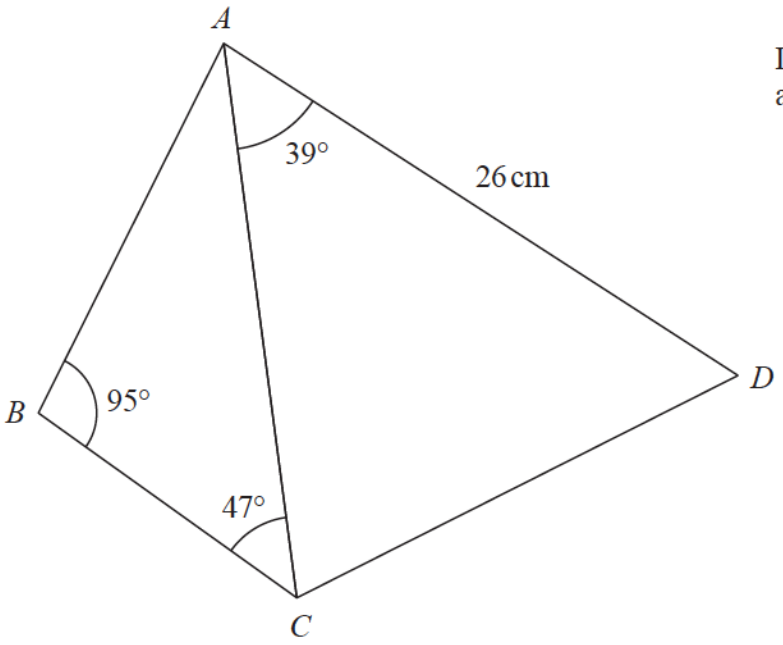


Diagram **NOT** accurately drawn

The area of triangle *ACD* is 250 cm^2

Calculate the area of the quadrilateral *ABCD*.

Show your working clearly.

Give your answer correct to 3 significant figures.

(Total for Question 4 is 6 marks)

5. Here is triangle ABC.

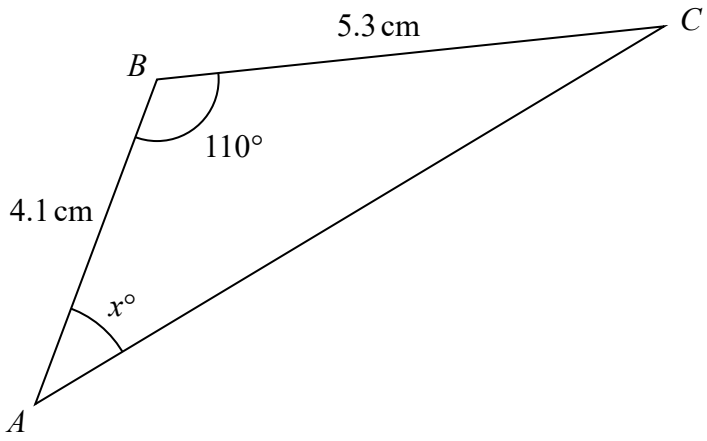


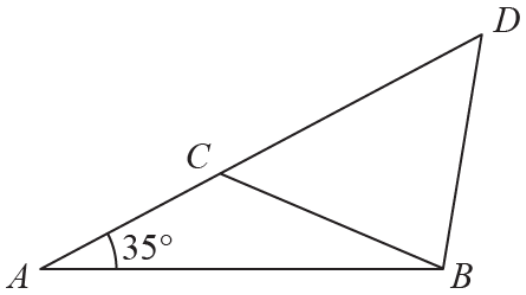
Diagram **NOT** accurately drawn

Calculate the value of x.

Give your answer correct to 3 significant figures.

(Total for Question 5 is 5 marks)

6.



Not to scale

Figure 3

Figure 3 shows the design for a structure used to support a roof.

The structure consists of four wooden beams, AB, BD, BC and AD.

Given $AB = 6.5$ m, $BC = BD = 4.7$ m and angle $BAC = 35°$

(a) find, to one decimal place, the size of angle ACB,

(3)

(b) find, to the nearest metre, the total length of wood required to make this structure.

(3)

(Total for Question 6 is 6 marks)

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7. A parallelogram $ABCD$ has area 40 cm^2

Given that AB has length 10 cm, BC has length 6 cm and angle DAB is obtuse, find

(a) the size of angle DAB, in degrees, to 2 decimal places,

(3)

(b) the length of diagonal BD, in cm, to one decimal place.

(2)

(Total for Question 7 is 5 marks)

8.

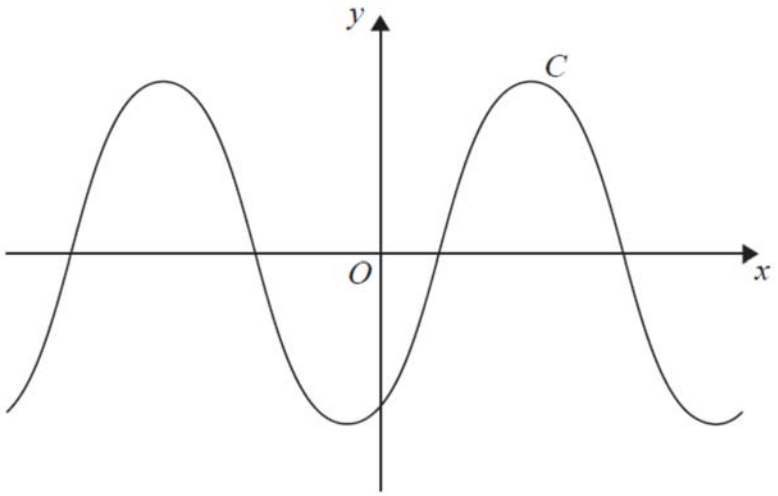

Figure 4

Figure 4 shows a sketch of the curve C with equation $y = \sin(x - 60°)$, $-360° \leq x \leq 360°$.

(a) Write down the exact coordinates of the points at which C meets the two coordinate axes.

(3)

(b) Solve, for $-360° \leq x \leq 360°$,

$$4 \sin(x - 60°) = \sqrt{6} - \sqrt{2}$$

showing each stage of your working.

(5)

(Total for Question 8 is 8 marks)

9.

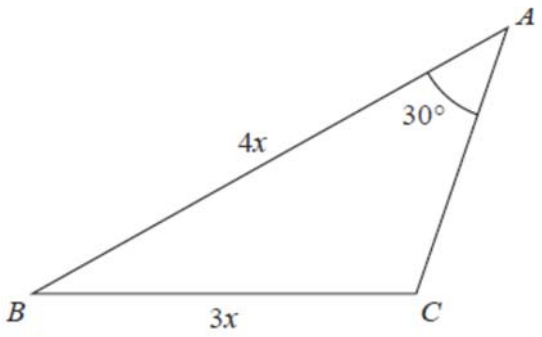

Figure 5

Figure 5 shows a sketch of a triangle ABC.

Given that $AB = 4x$, $BC = 3x$ and angle $BAC = 30°$

(a) show that $\sin ACB = \frac{2}{3}$

(2)

Given that angle ACB is obtuse,

(b) find the size of angle ABC, giving your answer in degrees, to 2 decimal places.

(2)

Given further that the area of triangle ABC is 20

(c) find the value of x to 2 decimal places,

(3)

(d) find the length of side AC to 2 decimal places.

(2)

(Total for Question 9 is 9 marks)

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10. In a triangle ABC, side AB has length 10 cm, side AC has length 5 cm, and angle BAC = θ where θ is measured in degrees. The area of triangle ABC is 15cm2

(a) Find the two possible values of cos θ

(4)

Given that BC is the longest side of the triangle,

(b) find the exact length of BC.

(2)

(Total for Question 10 is 6 marks)
