Write your name, centre number and candidate number in the boxes below.

Surname	Other names

Centre number | | | | | |

Candidate number | | | | |

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Sine rule, cosine rule and area of a triangle

Time allowed: 1 hour 20 minutes

Subject code **0580**

Mathematics

Questions from Paper 2 and Paper 4

You must have: a ruler marked in centimetres and millimetres, a protractor, compasses, a pen, an HB pencil and an eraser.
You may use a calculator.

Total marks

/ 64

Instructions

- Answer every question in the space provided on this paper.
- Write in black or dark blue ink. Pencil may be used for diagrams and graphs.
- Fill in your name, centre number and candidate number above.
- Show your working: a correct method can earn marks even if the answer is wrong.
- Unless a question says otherwise, give answers that are not exact to 3 significant figures, and angles in degrees to 1 decimal place.

Information

- This paper has 10 questions worth 64 marks in total.
- The marks for each question or part are shown in brackets, for example [3].

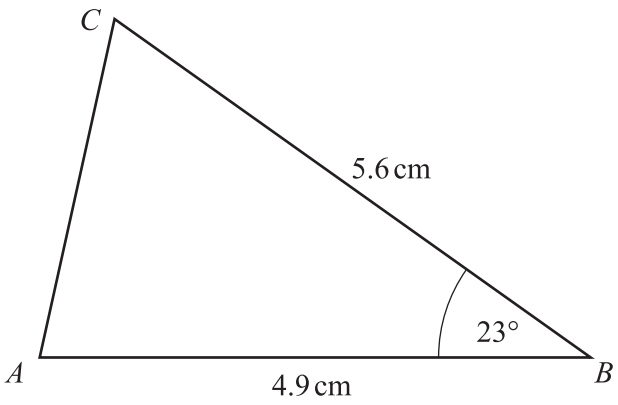
Advice

- Read every question through once before you write anything.
- Use the marks in brackets to judge how long to spend on each part.
- If you finish early, go back and check your working.

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Print at 100% (Actual size) so diagrams keep their real measurements.

1



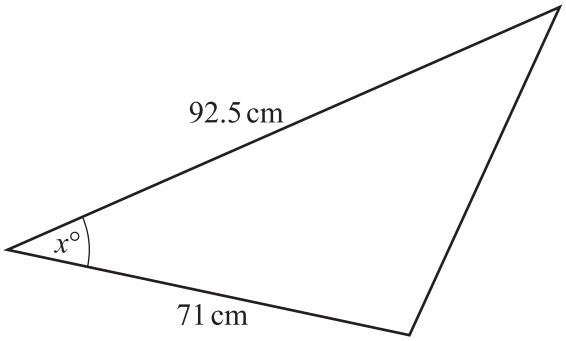
NOT TO SCALE

Calculate the area of triangle ABC.

..... cm^2 [2]

Area of a triangle Click for more variations

2



NOT TO SCALE

The diagram shows a triangle with an acute angle marked $x°$.
The area of the triangle is $2143\ cm^2$.

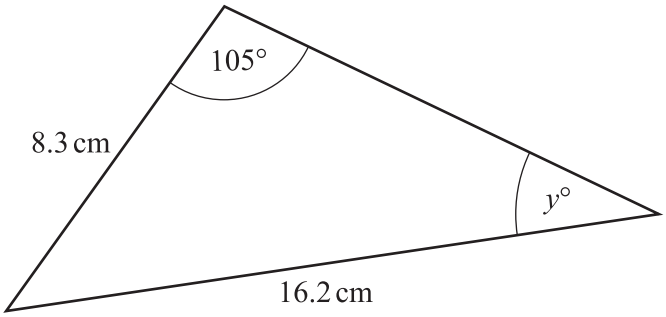
Work out the value of x.

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$x =$ ..... [2]

Area of a triangle Click for more variations

3



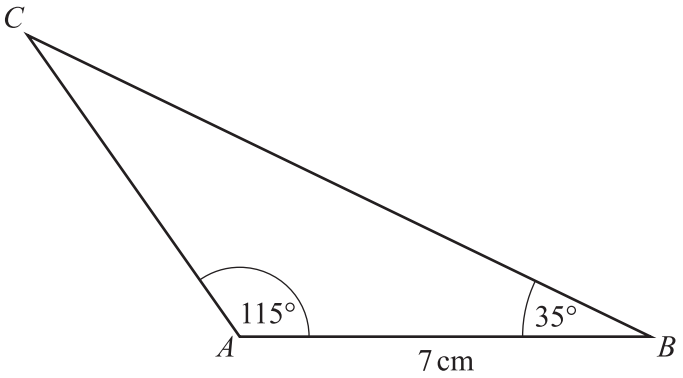
NOT TO SCALE

Calculate the value of y.

$y =$ ..... [3]

The sine rule Click for more variations

4



NOT TO SCALE

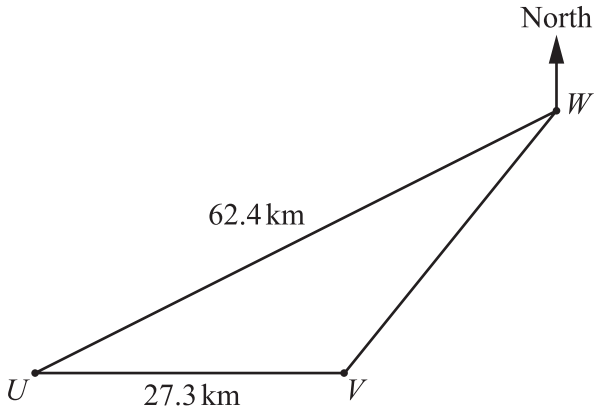
Calculate the length BC.

$BC =$ ..... cm [4]

The sine rule Click for more variations

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5



NOT TO SCALE

The diagram shows the position of three towns, U, V and W.
U is due west of V and angle $UVW = 125°$.

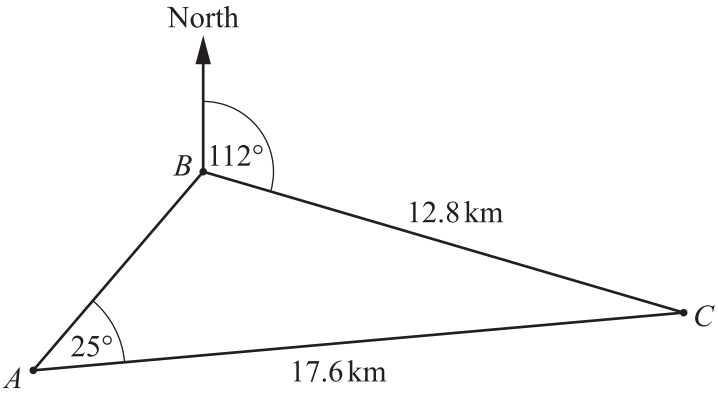
Calculate the bearing of U from W.

..... [4]

The sine rule Click for more variations

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6



NOT TO SCALE

The diagram shows the positions of three ships A, B and C.
$AC = 17.6$ km, $BC = 12.8$ km and angle $BAC = 25°$.
The bearing of C from B is 112° and angle ABC is obtuse.

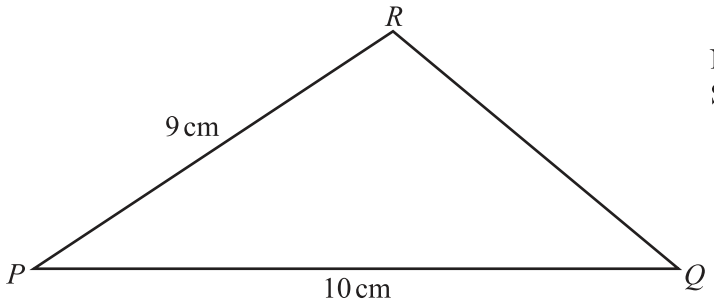
Calculate the bearing of B from A.

..... [5]

The sine rule Click for more variations

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7



NOT TO SCALE

The area of triangle PQR is $38.5\,\text{cm}^2$.

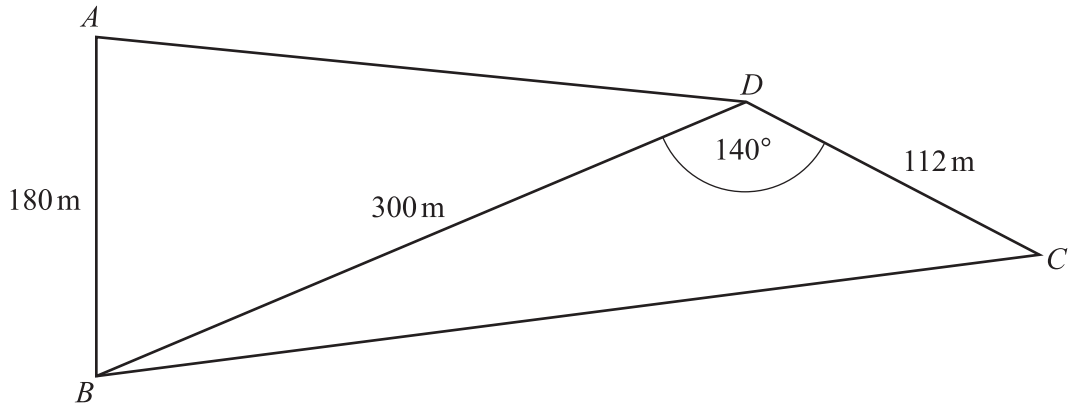
Calculate the length QR.

Answer QR = ... cm [6]

The cosine rule Click for more variations

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8



NOT TO SCALE

The diagram shows a field, *ABCD*, in the shape of a quadrilateral.
BD is a straight path across the field.

(a) Calculate *BC*.

BC = ... m [3]

(b) Calculate angle *DBC*.

Angle *DBC* = ... [3]

(c) The total area of the field, *ABCD*, is 35 900 m^2.

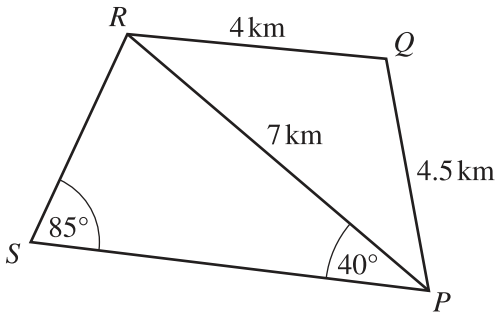
Work out the length of the shortest distance from *D* to *AB*.

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..... m [4]

(a) The cosine rule (b) The sine rule (c) SOHCAHTOA Click for more variations

9



NOT TO SCALE

The diagram shows five straight roads.
$PQ = 4.5$ km, $QR = 4$ km and $PR = 7$ km.
Angle $RPS = 40°$ and angle $PSR = 85°$.

(a) Calculate angle PQR and show that it rounds to 110.7°.

Answer(a)

[4]

(b) Calculate the length of the road RS and show that it rounds to 4.52 km.

Answer(b)

[3]

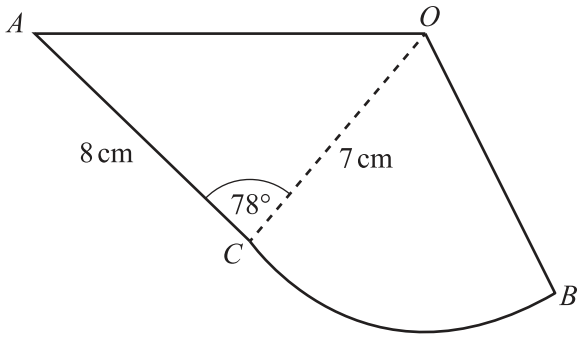
(c) Calculate the area of the quadrilateral $PQRS$.
[Use the value of 110.7° for angle PQR and the value of 4.52 km for RS.]

Answer(c) ..... km^2 [5]

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(a) The cosine rule (b) The sine rule (c) Area of a triangle Click for more variations

10



NOT TO SCALE

The diagram shows a design made from a triangle AOC joined to a sector OCB.
$AC = 8$ cm, $OB = OC = 7$ cm and angle $ACO = 78°$.

(a) Use the cosine rule to show that $OA = 9.47$ cm, correct to 2 decimal places.

[4]

(b) Calculate angle OAC.

Angle $OAC =$ ..... [3]

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(c) The perimeter of the design is 29.5 cm.

Show that angle $COB = 41.2°$, correct to 1 decimal place.

[5]

(d) Calculate the total area of the design.

..... cm^2 [4]

(a) The cosine rule (b) The sine rule (c) Arc length and sector area (d) Area of a triangle

Click for more variations

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