Trigonometry
Difficulty: Hard

Question Paper 5

Level	IGCSE
Subject	Maths (0580/0980)
Exam Board	CIE
Topic	Trigonometry
Paper	Paper 4
Difficulty	Hard
Booklet	Question Paper 5

Time allowed: **84 minutes**

Score: **/73**

Percentage: **/100**

Grade Boundaries:

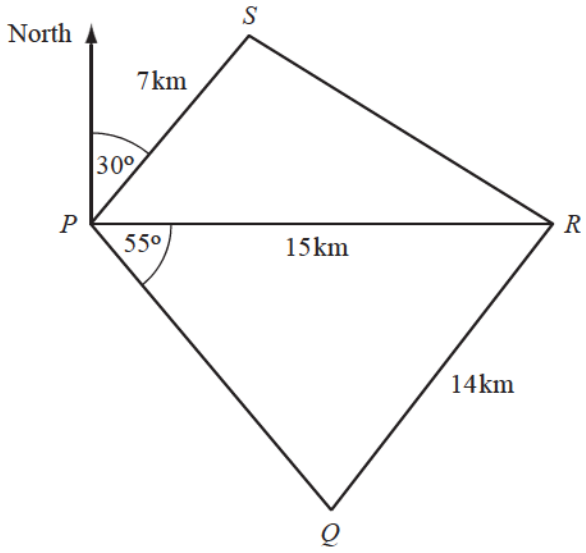
CIE IGCSE Maths (0580)

A*	A	B	C	D
>83%	67%	51%	41%	31%

CIE IGCSE Maths (0980)

9	8	7	6	5	4
>95%	87%	80%	69%	58%	46%

NOT TO SCALE



The quadrilateral $PQRS$ shows the boundary of a forest.
A straight 15 kilometre road goes due East from P to R.

(a) The bearing of S from P is 030° and $PS = 7$ km.

(i) Write down the size of angle SPR. [1]

(ii) Calculate the length of RS. [4]

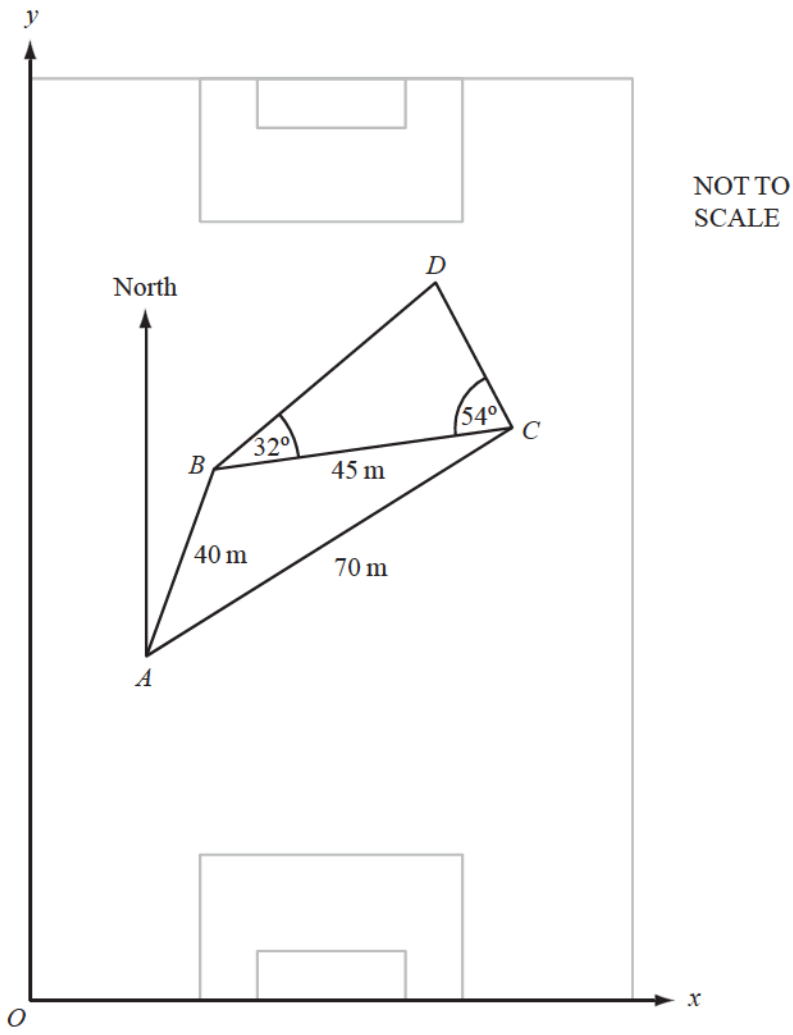
(b) Angle $RPQ = 55°$ and $QR = 14$ km.

(i) Write down the bearing of Q from P. [1]

(ii) Calculate the acute angle PQR. [3]

(iii) Calculate the length of PQ. [3]

(c) Calculate the area of the forest, correct to the nearest square kilometre. [4]



(a) During a soccer match a player runs from A to B and then from B to C as shown in the diagram.
$AB = 40$ m, $BC = 45$ m and $AC = 70$ m.

(i) Show by calculation that angle $BAC = 37°$, correct to the nearest degree. [3]

(ii) The bearing of C from A is 051°. Find the bearing of B from A. [1]

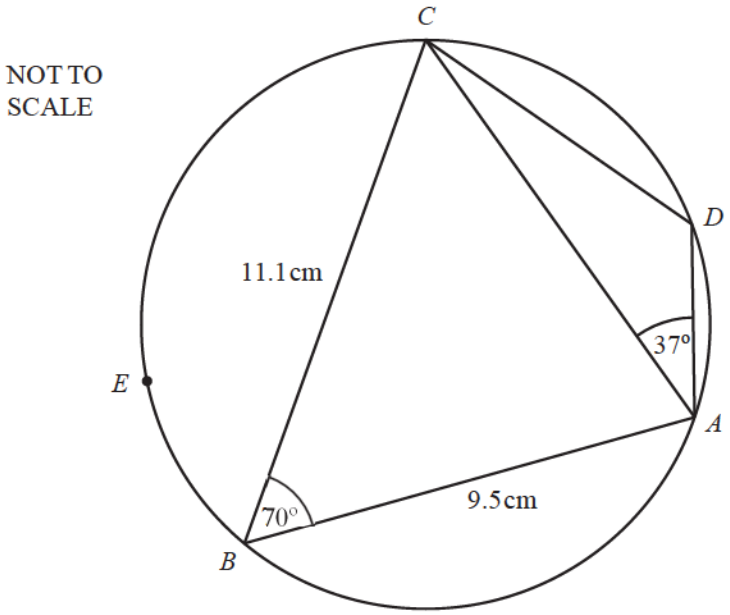
(iii) Calculate the area of triangle ABC. [3]

(b) x- and y-axes are shown in the diagram.
$\overrightarrow{AC} = \begin{pmatrix} p \\ q \end{pmatrix}$, where p and q are measured in metres.

(i) Show that $p = 54.4$. [2]

(ii) Find the value of q. [2]

(c) Another player is standing at D.
$BC = 45$ m, angle $BCD = 54°$ and angle $DBC = 32°$.
Calculate the length of BD. [4]



$ABCD$ is a cyclic quadrilateral.
$AB = 9.5$ cm, $BC = 11.1$ cm, angle $ABC = 70°$ and angle $CAD = 37°$.

(a) Calculate the length of AC. [4]

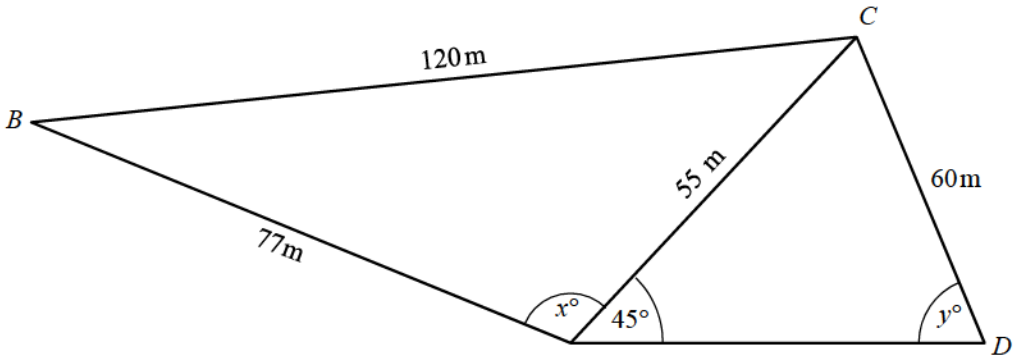
(b) Explain why angle $ADC = 110°$. [1]

(c) Calculate the length of AD. [4]

(d) A point E lies on the circle such that triangle ACE is isosceles, with $EA = EC$. [1]

(i) Write down the size of angle AEC.

(ii) Calculate the area of triangle ACE. [3]



NOT TO SCALE

In quadrilateral $ABCD$, $AB = 77$ m, $BC = 120$ m, $CD = 60$ m and diagonal $AC = 55$ m.
Angle $CAD = 45°$, angle $BAC = x°$ and angle $ADC = y°$.

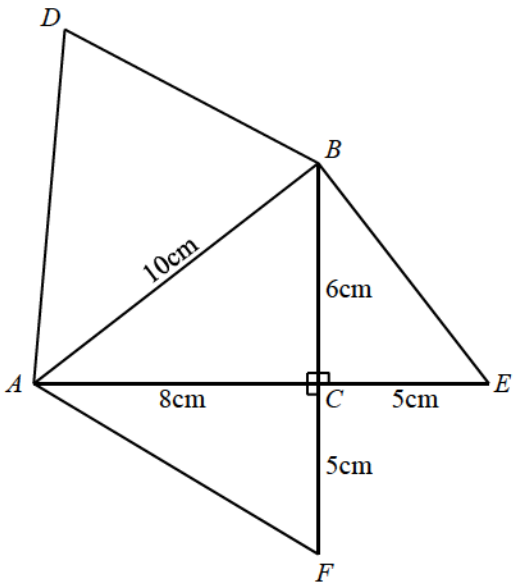
(a) Calculate the value of x. [4]

(b) Calculate the value of y. [4]

(c) The bearing of D from A is 090°.
Find the bearing of

(i) A from C, [2]

(ii) B from A. [2]



NOT TO SCALE

The diagram shows a sketch of the net of a solid tetrahedron (triangular prism).
The right-angled triangle ABC is its base.
$AC = 8$ cm, $BC = 6$ cm and $AB = 10$ cm. $FC = CE = 5$ cm.

(a) **(i)** Show that $BE = \sqrt{61}$ cm. [1]

(ii) Write down the length of DB. [1]

(iii) Explain why $DA = \sqrt{89}$ cm. [2]

(b) **Calculate** the size of angle DBA. [4]

(c) Calculate the area of triangle DBA. [3]

(d) Find the total surface area of the solid. [3]

(e) Calculate the volume of the solid.
[The volume of a tetrahedron is $\frac{1}{3}$ (area of the base) × perpendicular height.] [3]

6