

Surname						Other Names					
Centre Number						Candidate Number					
Candidate Signature											

Leave blank

General Certificate of Secondary Education
June 2004



MATHEMATICS (MODULAR) (SPECIFICATION B) 33005/I1
Module 5 Intermediate Tier
Paper 1 Non-Calculator

Tuesday 8 June 2004 1.30 pm to 2.45 pm

<p>In addition to this paper you will require:</p> <ul style="list-style-type: none"> mathematical instruments. <p>You must not use a calculator.</p>	
------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--

For Examiner's Use	
Pages	Mark
3	
4 – 5	
6 – 7	
8 – 9	
10 – 11	
12 – 13	
14 – 15	
16 – 17	
TOTAL	
Examiner's Initials	

Time allowed: 1 hour 15 minutes

Instructions

- Use blue or black ink or ball-point pen. Draw diagrams in pencil.
- Fill in the boxes at the top of this page.
- Answer **all** questions in the spaces provided.
- Do all rough work in this booklet.

Information

- The maximum mark for this paper is 70.
- Mark allocations are shown in brackets.
- Additional answer paper, graph paper and tracing paper will be issued on request and must be tagged securely to this answer booklet.

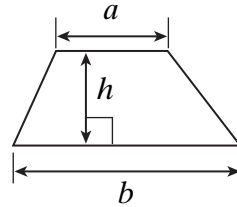
Advice

- In all calculations, show clearly how you work out your answer.

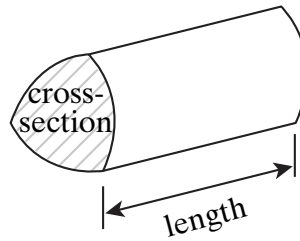
Formulae Sheet: Intermediate Tier

You may need to use the following formulae:

Area of trapezium = $\frac{1}{2}(a+b)h$

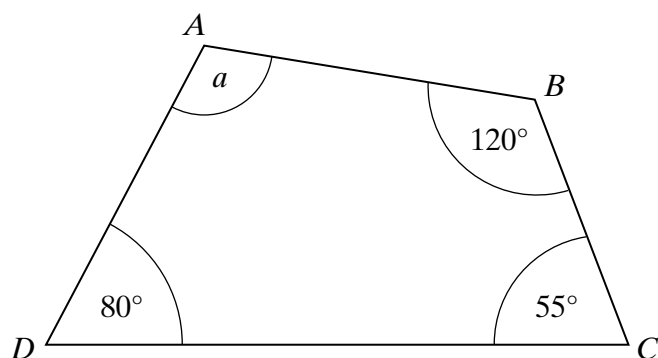


Volume of prism = area of cross-section \times length



Answer **all** questions in the spaces provided.

- 1 $ABCD$ is a quadrilateral.



Not drawn accurately

Work out the value of a .

.....

.....

.....

Answer degrees (2 marks)

- 2 (a) Find the value of $5p + 2q$ when $p = 4$ and $q = -7$

.....

.....

Answer (2 marks)

- (b) Find the value of $u^2 - v^2$ when $u = 5$ and $v = 3$

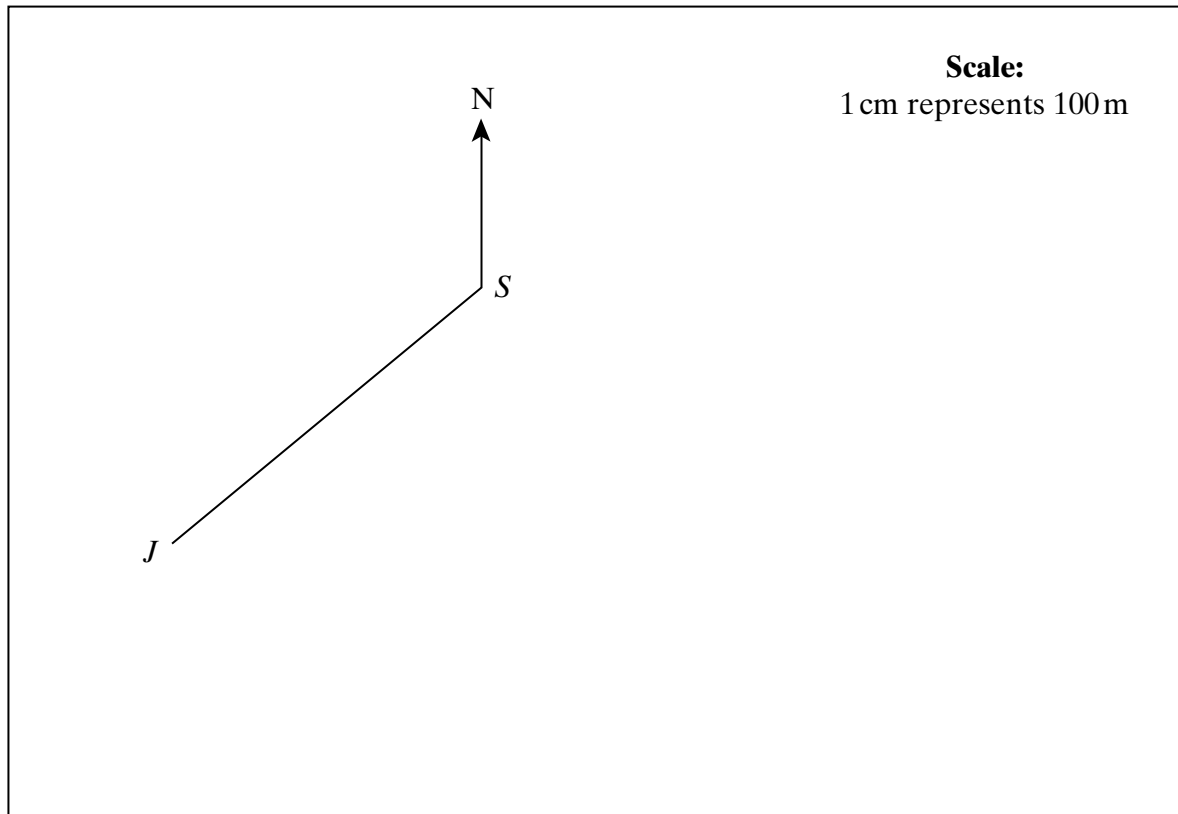
.....

.....

Answer (2 marks)

Turn over ►

- 3 The diagram shows the positions of Joe's house, J , and the local shop, S .
The diagram is drawn to scale.
1 cm represents 100 m.



- (a) Use the diagram to calculate the actual distance from Joe's house to the shop.

.....
.....

Answer metres (2 marks)

- (b) Measure and write down the three figure bearing of Joe's house from the shop.

.....

Answer^o (1 mark)

- (c) Kate's house, K , is 450 metres from the shop on a bearing of 120° .
Mark the position of K on the diagram.

(2 marks)

4 Which of these fractions is closest to $\frac{1}{4}$?

You **must** show your working.

$$\frac{1}{5} \quad \frac{3}{10} \quad \frac{7}{20} \quad \frac{7}{30}$$

.....

.....

.....

.....

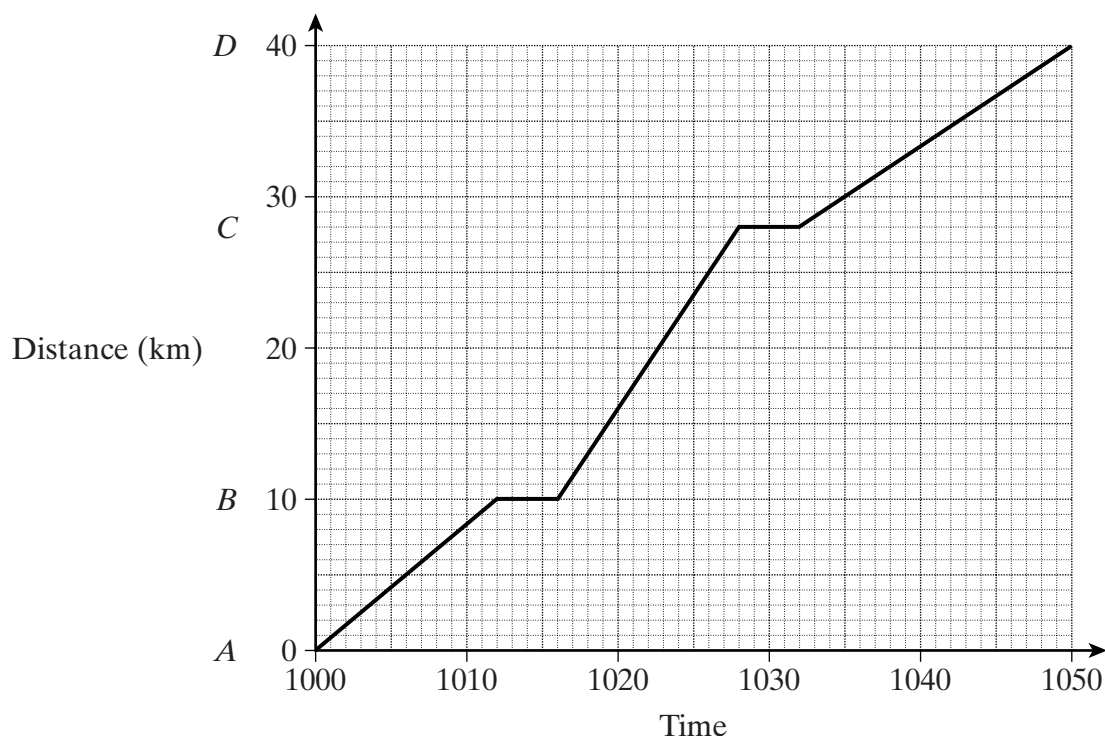
.....

Answer (3 marks)

TURN OVER FOR THE NEXT QUESTION

Turn over ►

- 5 The graph shows a train journey from A to D , stopping at B and C .



- (a) What is the time when the train leaves B ?

Answer (1 mark)

- (b) How far is it from A to C ?

Answer km (1 mark)

- (c) During which part of the journey did the train travel the fastest?
Explain your answer.

Answer

Explanation

.....

(2 marks)

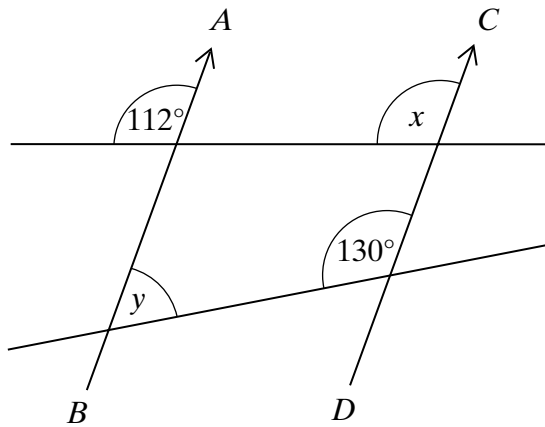
- (d) Calculate the speed of the train from A to B in kilometres per hour.

.....

.....

Answer km/h (2 marks)

- 6 In the diagram, AB is parallel to CD .



Not drawn accurately

- (a) State the value of x .
Give a reason for your answer.

Answer degrees

Reason

.....
(2 marks)

- (b) Find the value of y .

.....
.....

Answer degrees (2 marks)

Turn over ►

7 Solve these equations

(a) $4x - 7 = 5$

.....

.....

Answer $x =$ (2 marks)

(b) $2(y + 5) = 28$

.....

.....

.....

Answer $y =$ (3 marks)

(c) $7z + 2 = 9 - 3z$

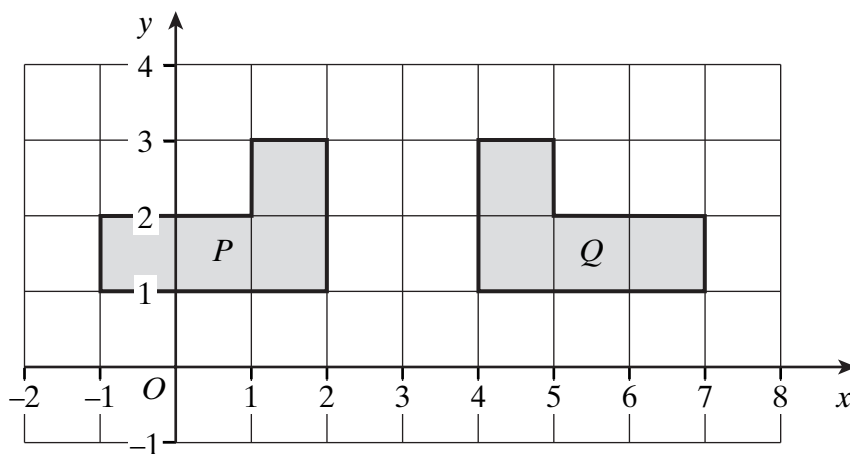
.....

.....

.....

Answer $z =$ (3 marks)

- 8 (a) The diagram shows two shapes P and Q .

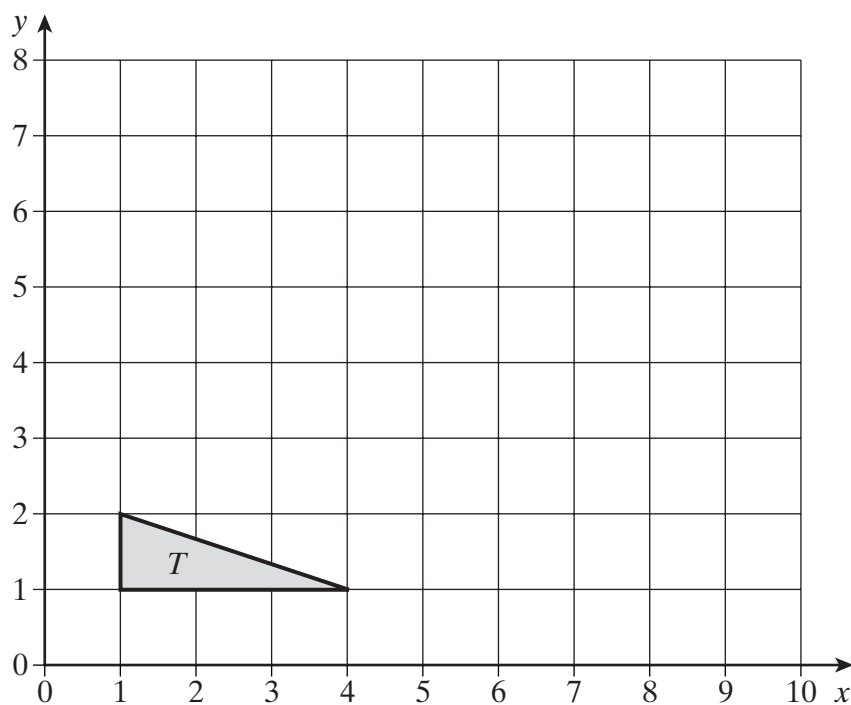


Describe fully the **single** transformation which takes shape P to shape Q .

.....

 (2 marks)

- (b) The vertices of triangle T are $(1,1)$, $(1,2)$ and $(4,1)$.



Enlarge triangle T by scale factor 2, with $(0,0)$ as the centre of enlargement.

(3 marks)

Turn over ►

9 A sequence of numbers is shown.

2 5 8 11 14

(a) Find an expression for the n th term of the sequence.

.....
.....

Answer (2 marks)

(b) Explain why 99 will not be a term in this sequence.

.....
.....
.....
(2 marks)

- 10 (a) The line LM is drawn below.



Use ruler and compasses to construct the perpendicular bisector of LM .
You **must** show clearly all your construction arcs.

(2 marks)

- (b) Complete the sentence.

The perpendicular bisector of LM is the locus of points which are

.....
(1 mark)

Turn over ►

11 Here is a list of quadrilaterals.

kite rectangle rhombus square trapezium

For each of the following descriptions, choose the correct name from the list.
You may find it helpful to sketch the quadrilaterals in the spaces provided.

- (a) One pair of sides are parallel.
The other two sides are not parallel.

Answer (1 mark)

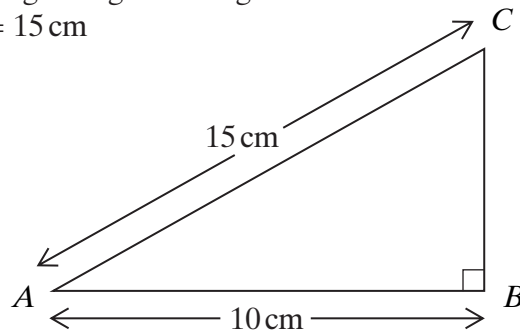
- (b) All the angles are the same size.
Only opposite sides are equal.

Answer (1 mark)

- (c) All the sides are the same length.
The diagonals are not equal in length.

Answer (1 mark)

- 12 (a) The diagram shows a right-angled triangle ABC .
 $AB = 10\text{ cm}$ and $AC = 15\text{ cm}$



Not drawn
accurately

Calculate the length of BC .
 Leave your answer as a square root.

.....

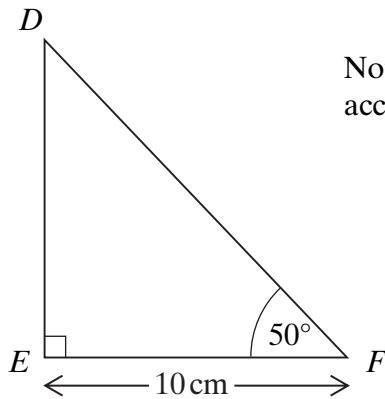
.....

.....

.....

Answer cm (3 marks)

- (b) The diagram shows a right-angled triangle DEF .
 $EF = 10\text{ cm}$
 Angle $F = 50^\circ$



Not drawn
accurately

Angle	Sine	Cosine	Tangent
40°	0.643	0.766	0.839
50°	0.766	0.643	1.192

Use the table of data to work out the length of DE .

.....

.....

.....

.....

Answer cm (3 marks)

Turn over ►

- 13** (a) Complete the table of values for $y = 2x^2 - 4x - 1$

x	-2	-1	0	1	2	3
y	15		-1		-1	5

.....

.....

.....

.....

(2 marks)

- (b) On the grid opposite, draw the graph of $y = 2x^2 - 4x - 1$ for values of x from -2 to +3.

(2 marks)

- (c) An approximate solution of the equation $2x^2 - 4x - 1 = 0$ is $x = 2.2$

- (i) Explain how you can find this from the graph.

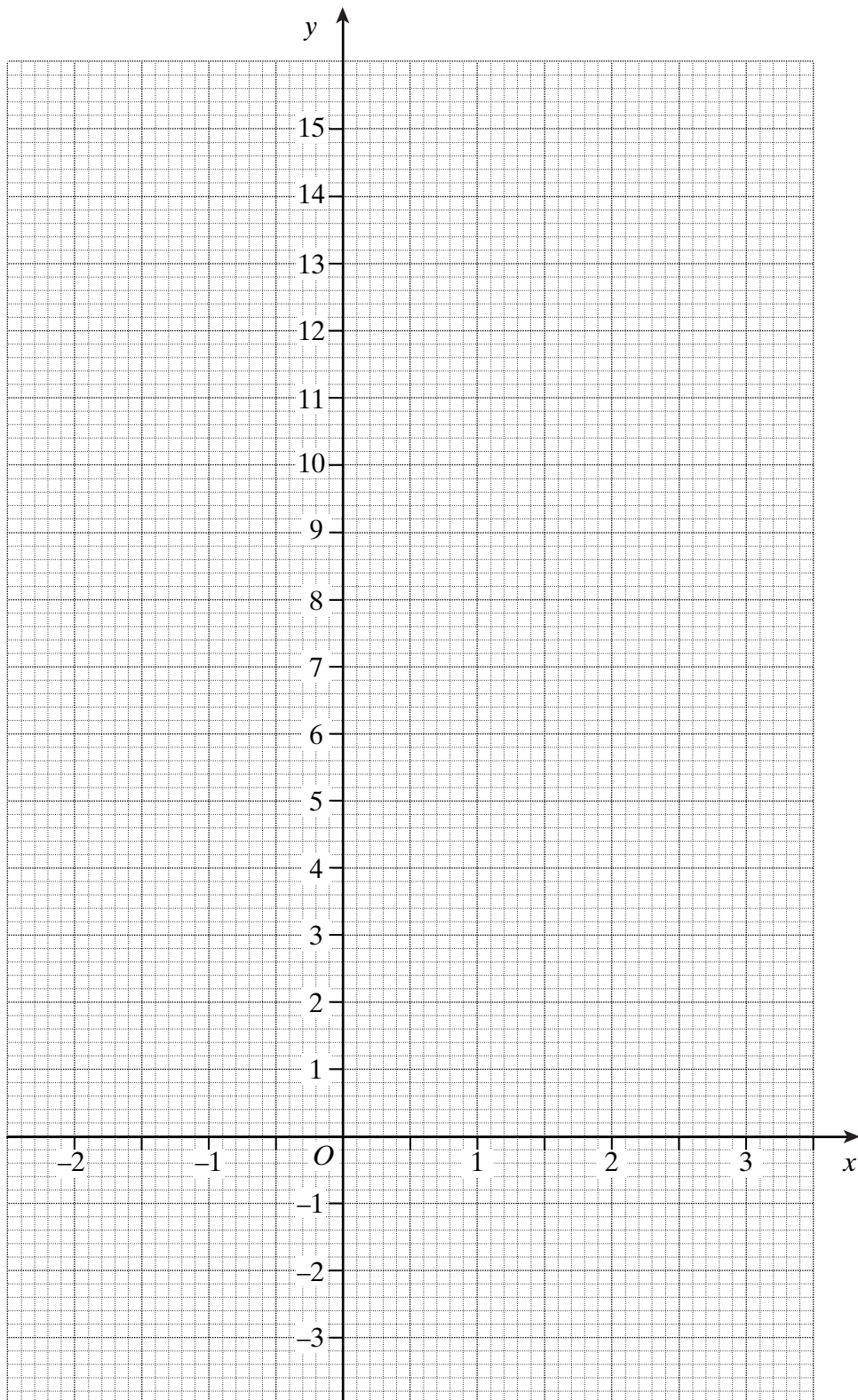
.....

.....

(1 mark)

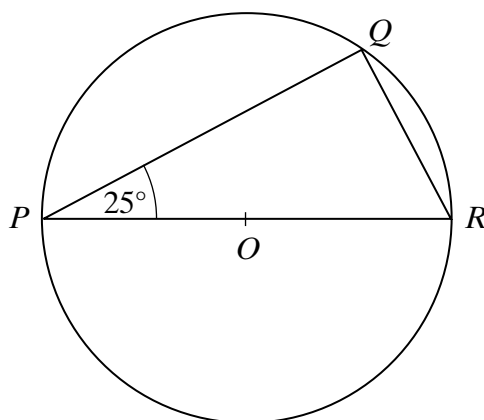
- (ii) Use your graph to write down another solution of this equation.

Answer $x =$ (1 mark)



Turn over ►

- 14 (a) In the diagram, O is the centre of the circle and P , Q and R are points on the circumference.
Angle $P = 25^\circ$



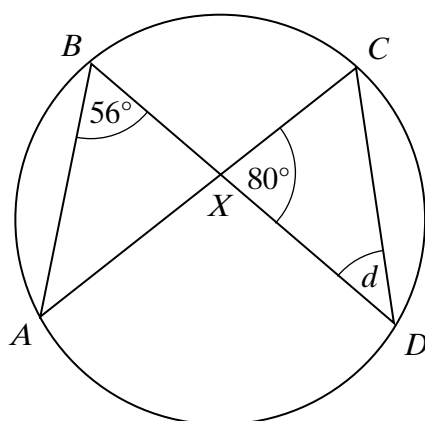
Not drawn accurately

Work out the size of angle R .

.....
.....

Answer degrees (2 marks)

- (b) A , B , C and D are four points on the circumference of another circle.
 AC meets BD at X .
Angle $ABD = 56^\circ$ and angle $CXD = 80^\circ$



Not drawn accurately

Work out the value of angle d .
You **must** show all your working.

.....
.....
.....

Answer degrees (3 marks)

15 Factorise $x^2 - 10x + 25$

.....

.....

Answer (2 marks)

16 Solve the simultaneous equations

$$4x + 3y = 5$$

$$2x - 5y = 9$$

You **must** show your working.

Do **not** use trial and improvement.

.....

.....

.....

.....

.....

.....

.....

.....

Answer $x =$, $y =$ (4 marks)

END OF QUESTIONS

THERE ARE NO QUESTIONS PRINTED ON THIS PAGE

THERE ARE NO QUESTIONS PRINTED ON THIS PAGE

THERE ARE NO QUESTIONS PRINTED ON THIS PAGE