Surname		Other Names	
Centre Number			Candidate Number									
Candidate Signature												

Leave blank

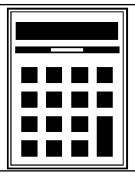
General Certificate of Secondary Education
November 2003

ASSESSMENT and QUALIFICATIONS ALLIANCE

MATHEMATICS (MODULAR) (SPECIFICATION B) 33005/I2
Module 5 Intermediate Tier
Paper 2 Calculator

Friday 14 November 2003 9.00 am to 10.15 am

In addition to this paper you will require:
- a calculator
- mathematical instruments.



For Examiner's Use	
Pages	**Mark**
3	
4 – 5	
6 – 7	
8 – 9	
10 – 11	
12 – 13	
14 – 15	
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.
- If your calculator does not have a π button, take the value of π to be 3.14 unless otherwise instructed in the question.

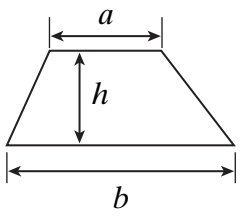
Information
- The maximum mark for this paper is 70.
- Mark allocations are shown in brackets.
- Additional answer paper, graph paper and tracing paper will be issued on request and must be tagged securely to this answer booklet.
- You are expected to use a calculator where appropriate.

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

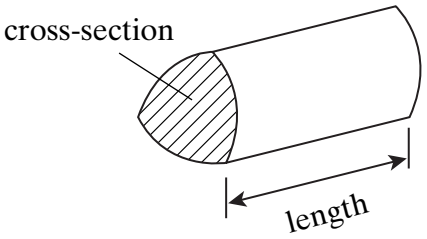
Formulae Sheet: Intermediate Tier

You may need to use the following formulae:

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

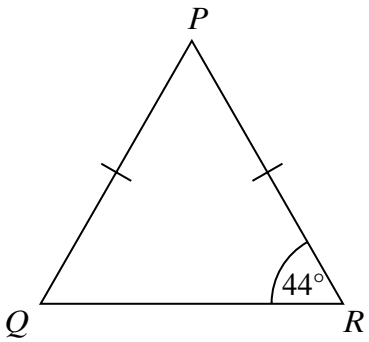


Volume of prism = area of cross-section × length



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

1 (a) Triangle PQR is isosceles.
$PQ = PR$
Angle $R = 44°$



Not drawn accurately

Calculate the size of angle P.

.....

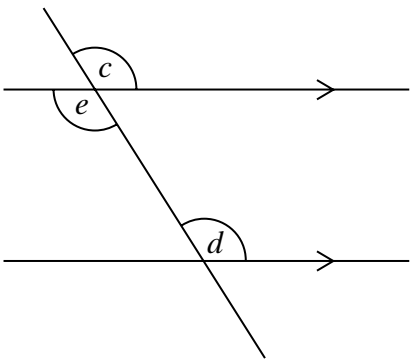
.....

.....

Answer ..... degrees *(2 marks)*

(b) The words in this list are used to describe angles.

alternate corresponding exterior interior opposite



Not drawn accurately

Choose a word from the list to describe each of these pairs of angles.

(i) c and d are ..... angles *(1 mark)*

(ii) d and e are ..... angles *(1 mark)*

4

2 (a) Simplify $2x + 3y + 5x - 2y - 4x$

.....

.....

.....

Answer ..... *(2 marks)*

(b) Multiply out

(i) $4(m - 1)$

.....

.....

Answer ..... *(1 mark)*

(ii) $p(p + 3)$

.....

.....

Answer ..... *(1 mark)*

3 Find $17\frac{1}{2}\%$ of £174.80

.....

.....

.....

Answer £ ..... *(2 marks)*

4 Dario and Ewan buy clothes in a sale.

BARGAIN SWEATERS ALL ONE PRICE	CUT-PRICE JEANS

Dario buys a sweater and a pair of jeans. These cost him £9.20
Ewan buys 3 sweaters and a pair of jeans. These cost him £15.10

What is the cost of a sweater?

.....

.....

.....

.....

Answer £ ..... *(3 marks)*

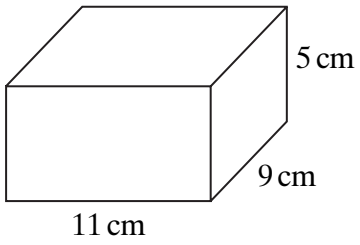
5 In triangle ABC, the side AB is 7 cm.
Angle $A = 40°$ and angle $B = 95°$.

Make an accurate drawing of the triangle in the space below.
The side AB has been drawn for you.

A *B*

(2 marks)

6 (a) A cuboid is 11 cm long, 9 cm wide and 5 cm high.



Not to scale

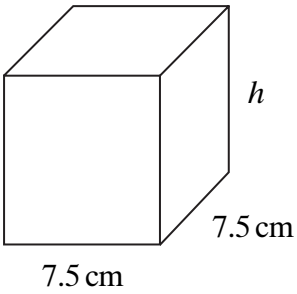
Calculate the volume of this cuboid.

.....

.....

Answer ..... cm^3 *(2 marks)*

(b) A second cuboid has the **same** volume and a square base of side 7.5 cm.



Not to scale

Calculate the height of the second cuboid (marked *h* on the diagram).

.....

.....

.....

Answer ..... cm *(2 marks)*

7 (a) Jan is making small cakes for a Christmas fair.
Each cake uses 7 g of flour.

How much flour does she use to make x cakes?

.....

Answer ..... g *(1 mark)*

(b) Ken has made y cakes.
He puts them into packs of 5.
He has n packs of cakes and 2 cakes left over.

Write down an equation which shows the relationship between y and n.

.....

.....

Answer $y =$ ..... *(2 marks)*

8 (a) Factorise $10a + 5$

.....

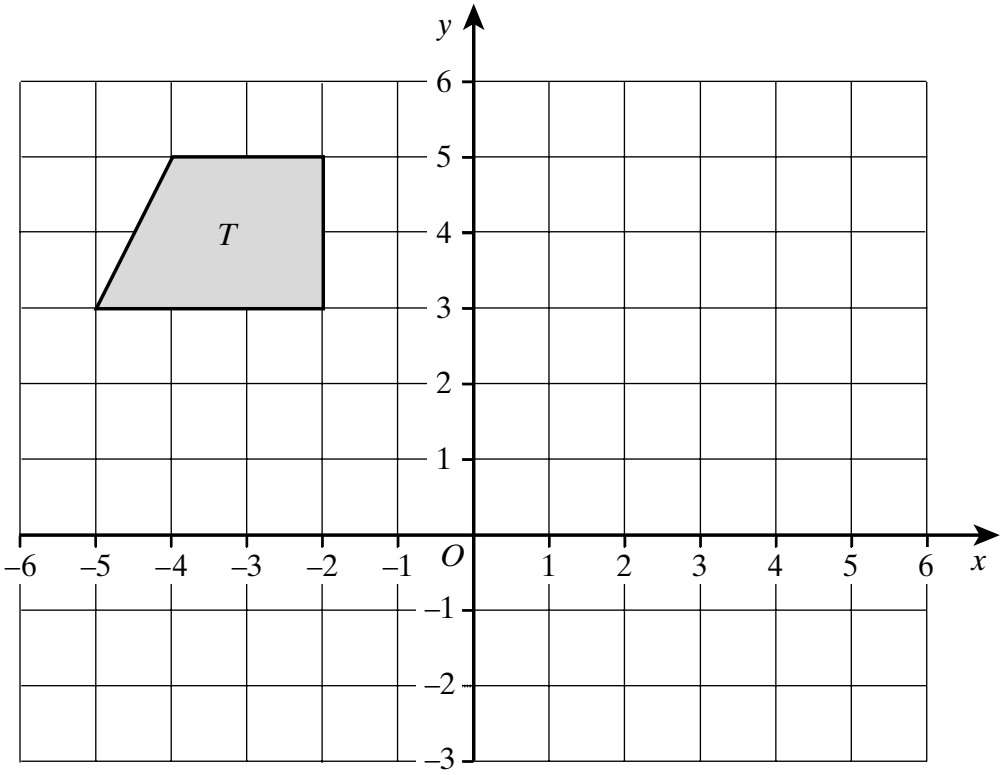
Answer ..... *(1 mark)*

(b) Factorise $c^2 - 4c$

.....

Answer ..... *(2 marks)*

9 The trapezium T has vertices at (–4,5), (–2,5), (–2,3) and (–5,3).



(a) Find the area of the trapezium.

.....

Answer ..... square units *(1 mark)*

(b) Draw the reflection of trapezium T in the line $y = 2$ and label it A.

(2 marks)

(c) Translate trapezium T 6 squares right, 2 squares down and label it B.

(1 mark)

10 Solve these equations.

(a) $6r + 2 = 8$

.....

.....

Answer $r =$ ..... *(2 marks)*

(b) $\frac{x}{4} = 8$

.....

.....

Answer $x =$ ..... *(1 mark)*

(c) $7s + 2 = 5s + 3$

.....

.....

.....

.....

Answer $s =$ ..... *(3 marks)*

(d) $\frac{12 - y}{3} = 5$

.....

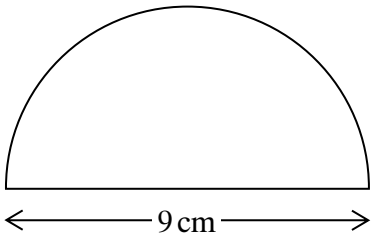
.....

.....

.....

Answer $y =$ ..... *(3 marks)*

11 A semi-circular protractor has a diameter of 9 cm.



Not drawn accurately

Calculate the perimeter.

.....

.....

.....

.....

Answer ..... cm *(3 marks)*

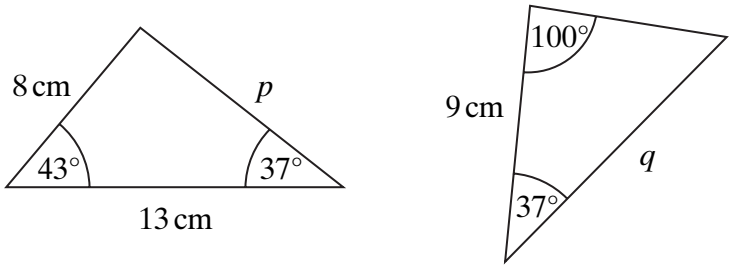
12 Gary is using trial and improvement to find a solution to the equation $x^3 - 5x = 56$.
This table shows his first two trials.

x	$x^3 - 5x$	**Comment**
4	44	Too small
5	100	Too big

Continue the table to find a solution to the equation.
Give your answer to 1 decimal place.

Answer x = ... *(3 marks)*

13 The two triangles shown below are congruent.



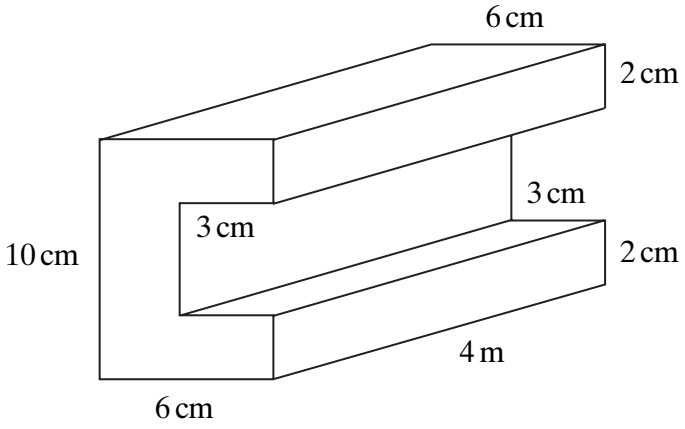
Not drawn accurately

Write down the values of p and q

.....

Answer p = ... cm q = ... cm *(2 marks)*

14 The diagram shows a beam of uniform cross-section and length 4 metres.



Not to scale

Calculate the volume of the beam.
Give your answer in cubic centimetres.

.....

.....

.....

.....

.....

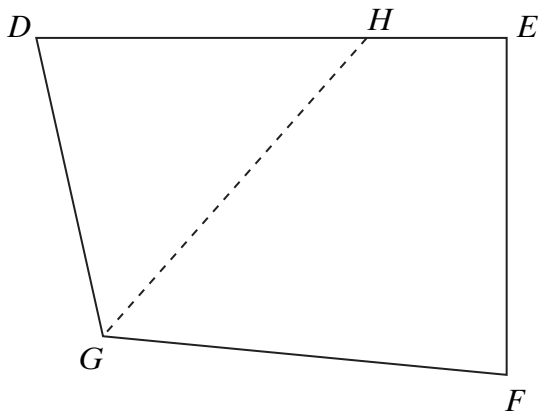
.....

Answer ..... cm^3 *(5 marks)*

13

Turn over ▶

15 The quadrilateral $DEFG$ is a scale drawing of a field.
The line GH bisects angle DGF.



Scale:
1 cm represents 10 m

(a) Construct the locus of points in the field which are 40 m from E.

(1 mark)

(b) Shade the area of the field which is more than 40 m from E **and** nearer to DG than to GF.

(1 mark)

16 Solve the equation $y^2 - 4y - 45 = 0$

.....

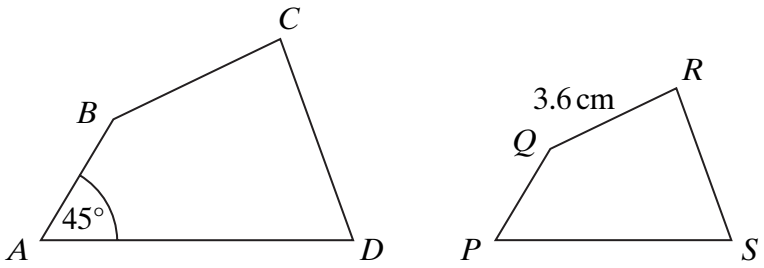
.....

.....

.....

Answer ..... *(3 marks)*

17 $PQRS$ is an enlargement of $ABCD$ with scale factor $\frac{2}{3}$.
QR = 3.6 cm
Angle BAD = 45°



Not to scale

(a) Calculate the length of BC.

.....

.....

.....

Answer ..... cm *(2 marks)*

(b) Find the size of angle QPS.

.....

Answer ..... degrees *(1 mark)*

18 Make t the subject of the formula $u = \frac{t}{3} + 5$

.....

.....

.....

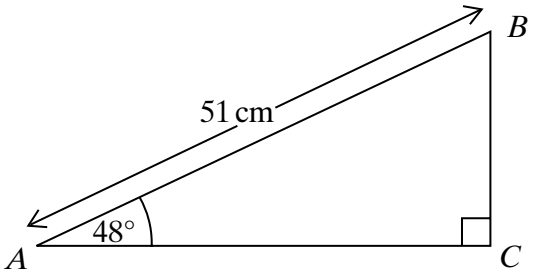
.....

Answer t =..... *(2 marks)*

10

Turn over ▶

19 ABC is a right-angled triangle.
$AB = 51\,\text{cm}$
Angle $CAB = 48°$



Not to scale

Find the length of BC.
Give your answer to a suitable degree of accuracy.

.....

.....

.....

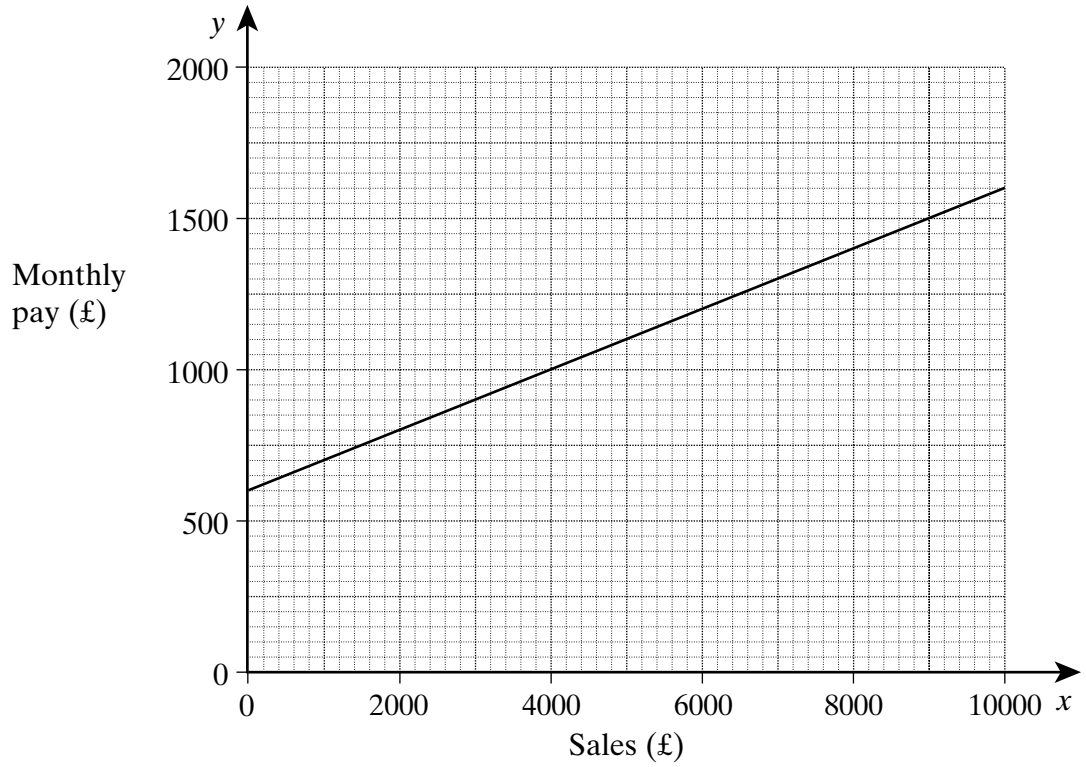
.....

.....

.....

Answer ..... cm *(4 marks)*

20 The graph shows how Ellie's monthly pay depends on her sales.



(a) Find the equation of the line in the form $y = mx + c$

.....

.....

.....

Answer y = ... *(3 marks)*

(b) Calculate Ellie's pay when her sales are £16 000.

.....

.....

.....

Answer £ ..... *(2 marks)*

END OF QUESTIONS

9