Surname		Other Names	
Centre Number			Candidate Number									
Candidate Signature												

For Examiner's Use

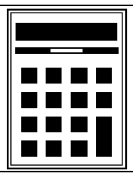
General Certificate of Secondary Education
November 2007

AQA
ASSESSMENT and QUALIFICATIONS ALLIANCE

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

Friday 9 November 2007 9.00 am to 10.15 am

For this paper you must have:
- a calculator
- mathematical instruments.



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.
- Answer the questions in the spaces provided.
- Use a calculator where appropriate.
- Do all rough work in this book.
- If your calculator does not have a π button, take the value of π to be 3.14 unless another value is given in the question.

Information

- The maximum mark for this paper is 70.
- The marks for questions are shown in brackets.
- You may ask for more answer paper, graph paper and tracing paper. This must be tagged securely to this answer book.

Advice

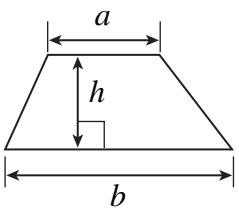
- In all calculations, show clearly how you work out your answer.

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

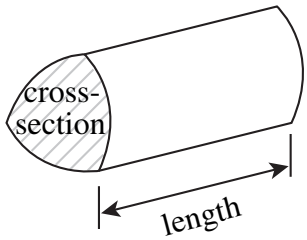
Formulae Sheet: Intermediate Tier

You may need to use the following formulae:

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



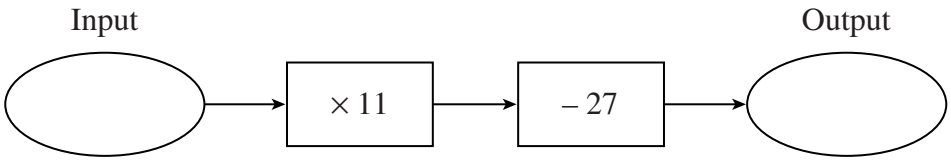
Volume of prism = area of cross-section × length



LEAVE MARGIN BLANK

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

1 (a) Here is a number machine.



(i) The input is – 3.
What is the output?

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

(ii) When the output is 17, what is the input?

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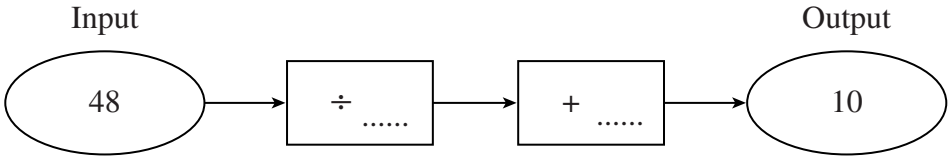
Answer ..... *(2 marks)*

(b) Here is a different number machine.
The input is 48 and the output is 10.



Complete the boxes to make the machine work.

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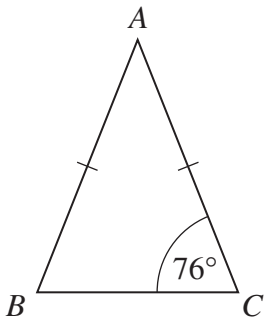
(1 mark)

Turn over ▶

4

2 (a) Triangle *ABC* is isosceles.
AB = *AC*
Angle *C* = 76°



Not drawn accurately

Calculate the size of angle *A*.

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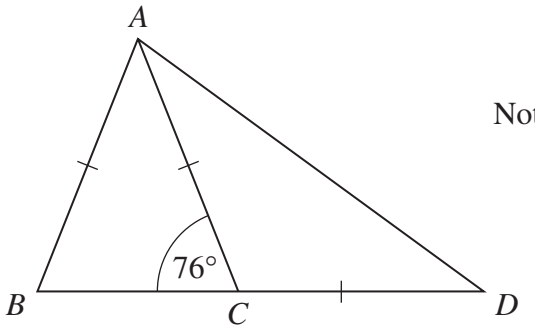
Answer ..... degrees *(2 marks)*

(b) Triangle *ACD* is also isosceles.
AC = *CD*



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Calculate the size of angle *D*.

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

3 When $x = 5$ and $y = -7$, find the value of

(a) $2x - 3y$

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

(b) $4xy$

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

(c) $\dfrac{y^2 - 4}{9}$

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

4 Calculate 27 % of 950.

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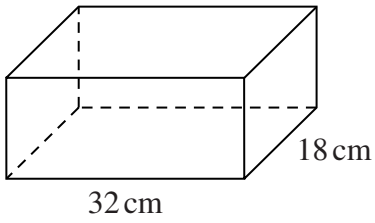
Answer ..... *(2 marks)*

5 The diagram shows a large empty box.
The length of the box is 32 cm.
The width of the box is 18 cm.
The volume of the box is 4608 cm^3.



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(a) Calculate the height of the box.

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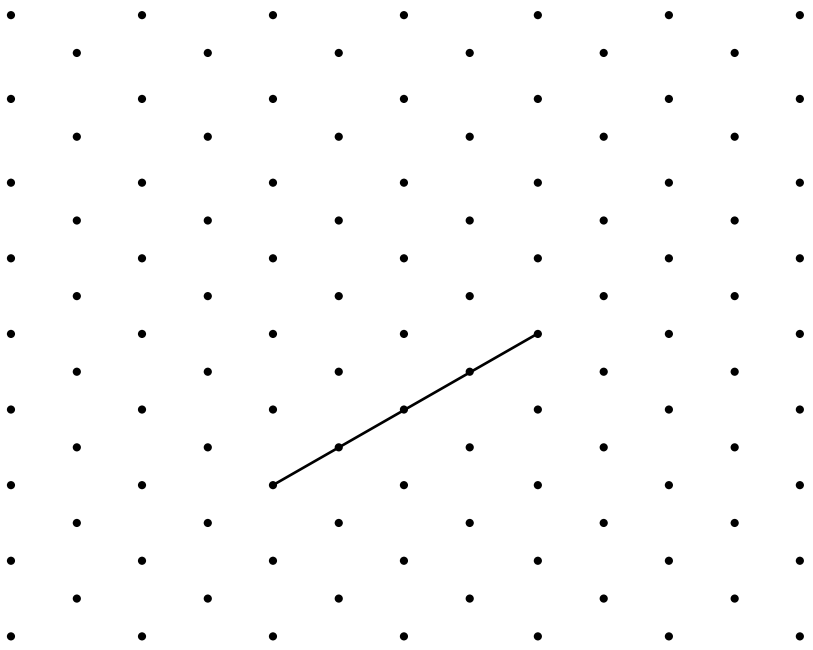
Answer ..... cm *(2 marks)*

(b) A small box is 4 cm long, 3 cm wide and 2 cm high.

Make an accurate drawing of the small box on the grid below.
One edge has been drawn for you.



(2 marks)

(c) What is the maximum number of small boxes that can be packed into the large empty box?

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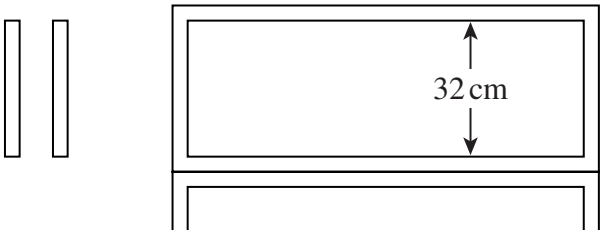
Answer ..... *(2 marks)*

6 Jenny has a storage unit with shelves 32 cm apart.
She has some files which she wants to store vertically on the shelves.
Her files are 13 inches high.



Not drawn accurately

You are given that 12 inches = 1 foot.

Can Jenny fit these files onto the shelves?
You **must** show your working.

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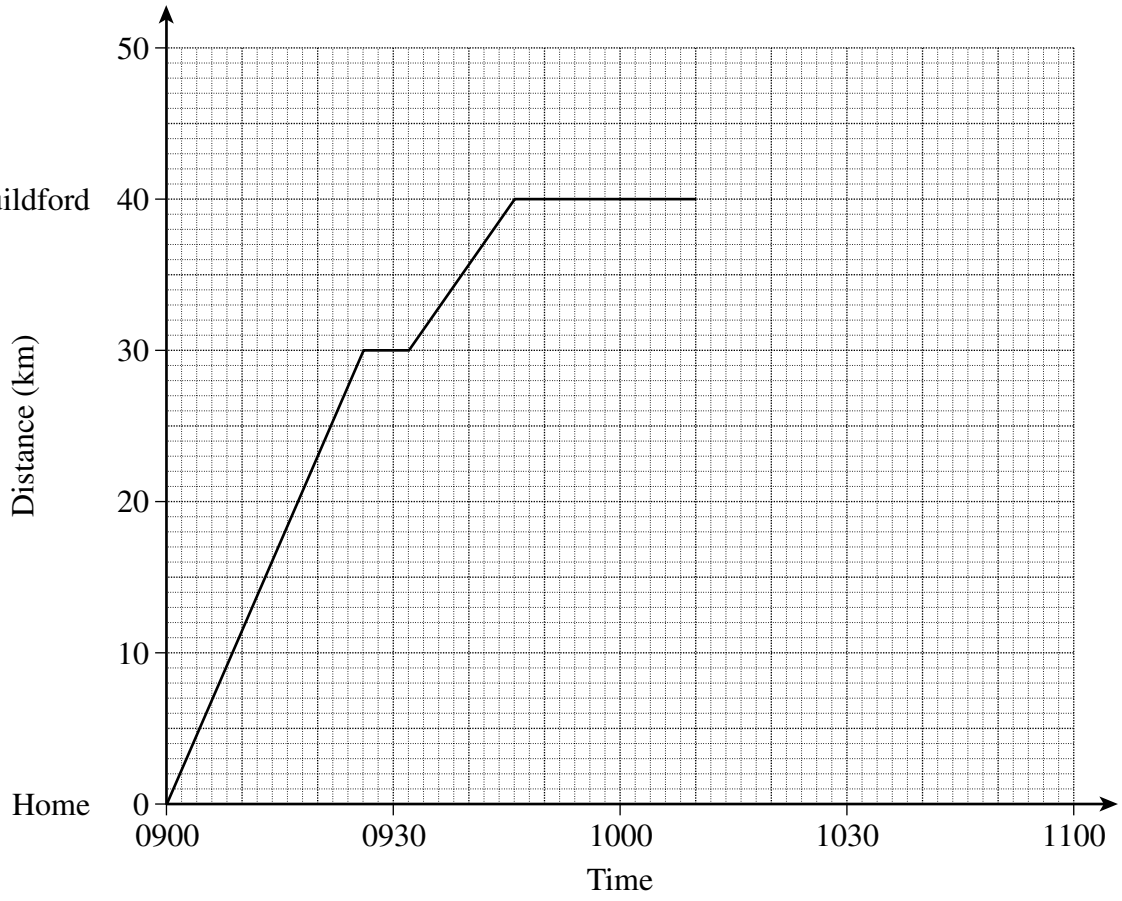
(3 marks)

7 Imran left home at 0900 to drive to Guildford, 40 kilometres away.
The graph shows his journey.



(a) How far did Imran travel in the first 20 minutes?

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

(b) Imran sat in a traffic jam for 6 minutes.

At what time did he start moving again?

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

(c) Explain how you can tell from the graph that he was travelling more slowly after the traffic jam.

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(1 mark)

(d) At 1010, he left Guildford and drove home at an average speed of 60 km/h.

(i) Show his return journey on the grid.

(2 marks)

(ii) At what time did he arrive home?

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

8 A circular lawn has a radius of 2.7 m.

Calculate the area of the lawn.
Give your answer to a suitable degree of accuracy.

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

9 The area of cross-section of a prism is 8.1 cm^2.
The length of the prism is 9.5 cm.

Calculate the volume of the prism.

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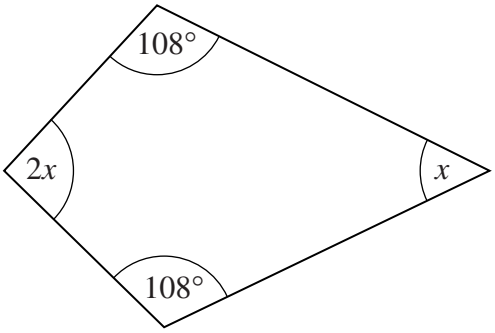
Answer ..... cm^3 *(2 marks)*

10 The angles of a kite are shown below.



Not drawn accurately

Calculate the value of x.

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

11 (a) Complete the table of values for the graph of $y = 3 - x^2$

x	−3	−2	−1	0	1	2	3
y	−6		2		2	−1	

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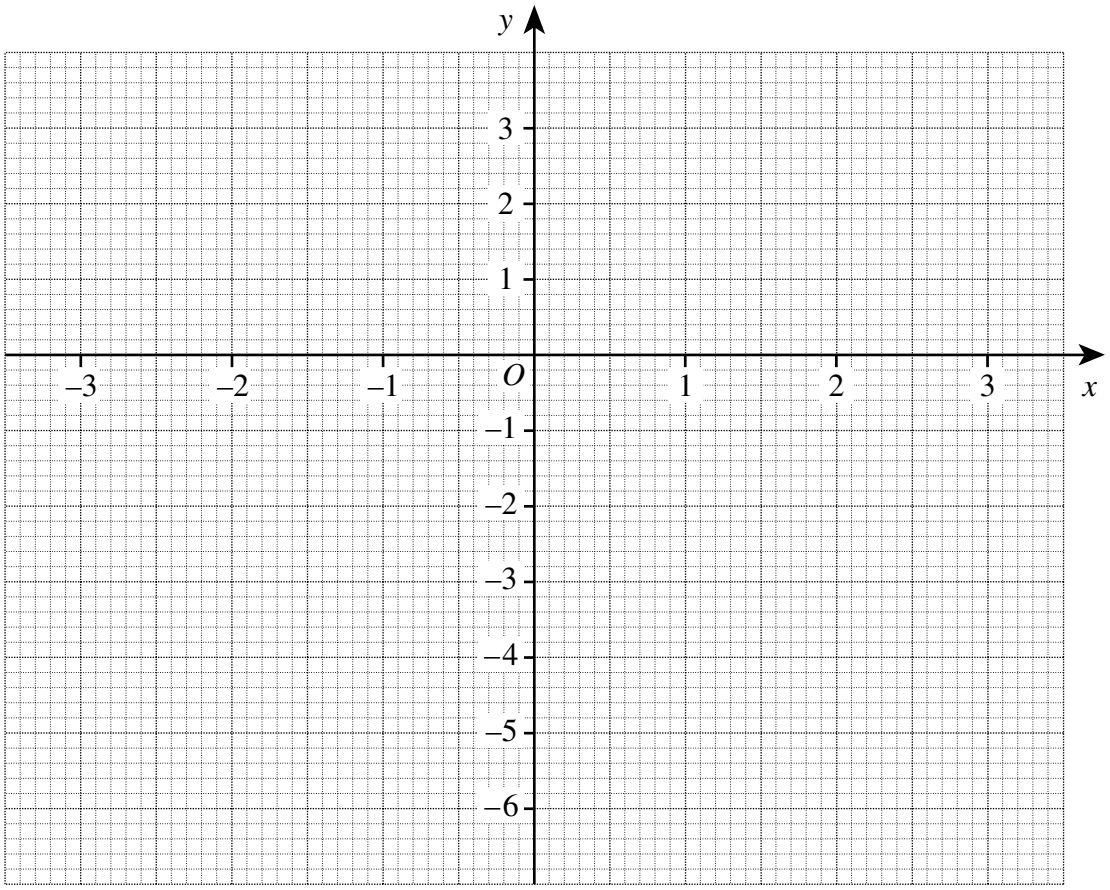
(2 marks)

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



(2 marks)

(c) Explain how you could use the graph to find the square root of 3.

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(1 mark)

12 A solution to the equation $x^3 + 3x = 56$ lies between 3 and 4.

x	$x^3 + 3x$	**Comment**
3	27 + 9 = 36	Too small

Use trial and improvement to find this solution.
Give your answer to 1 decimal place.

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

13 (a) n is an integer.

Write down **all** the solutions of the inequality $14 < 3n \leqslant 21$

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

(b) Expand and simplify $4(x + 1) - 2(x - 5)$

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

(c) Expand and simplify $(y - 3)(y - 4)$

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

(d) Factorise $p^2 + 2p - 15$

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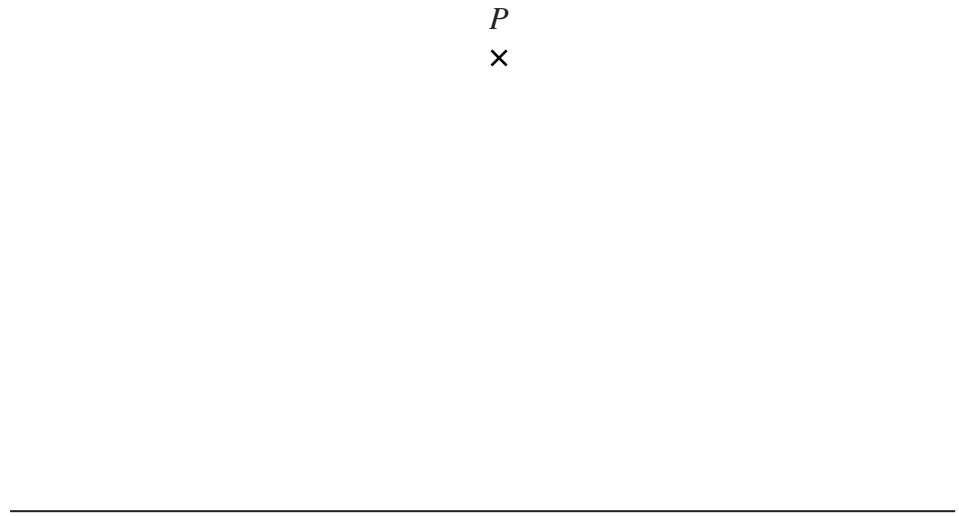
Answer ..... *(2 marks)*

14 The diagram shows a scale drawing of a straight road.
A walker is at point *P*.

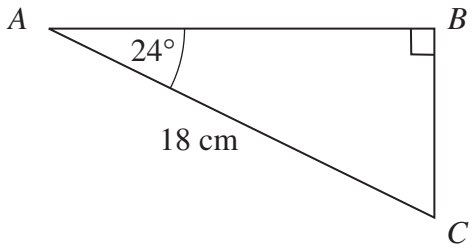
Scale: 1 cm represents 0.5 km



Use a ruler and compasses to construct the perpendicular from the point *P* to the road.
You **must** show all your construction lines and arcs.

(3 marks)

15 In triangle ABC, angle $B = 90°$
Angle $A = 24°$
$AC = 18\,\text{cm}$



Not drawn accurately

Calculate the length of BC.

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

16 Solve the simultaneous equations

$$2p - 3q = 13$$
$$5p + 2q = 4$$

You **must** show your working.
Do **not** use trial and improvement.

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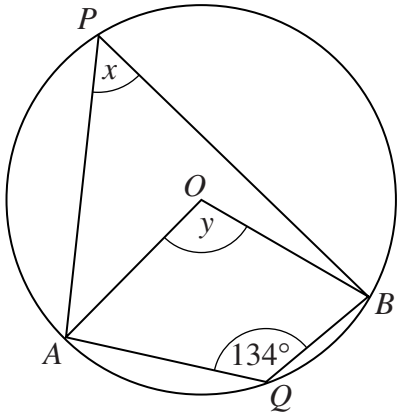
Answer $p =$ ..... , $q =$ ..... *(4 marks)*

Turn over for the next question

17 In the diagram, O is the centre of the circle.
A, P, B and Q are points on the circumference.
Angle $AQB = 134°$



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

Answer $x =$ ..... degrees

Reason .....

.....

(2 marks)

(b) Find the value of y.
Give a reason for your answer.

Answer $y =$ ..... degrees

Reason .....

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(2 marks)

END OF QUESTIONS