RECOGNISING ACHIEVEMENT

Oxford Cambridge and RSA Examinations

General Certificate of Secondary Education

MATHEMATICS B (MEI)
PAPER 1 SECTION B
INTERMEDIATE TIER

1968/2312B

Specimen Paper 2003

Additional materials: Electronic calculator
Geometrical instruments
Tracing paper (optional)

Candidates answer on the question paper.

TIME 45 minutes.

Candidate Name	Centre Number	Candidate Number

INSTRUCTIONS TO CANDIDATES

- Write your name in the space above.
- Write your Centre number and Candidate number in the boxes above.
- Answer **all** the questions.
- Write your answers, in blue or black ink, in the spaces provided on the question paper.
- Read each question carefully and make sure you know what you have to do before starting your answer.
- Show all your working. Marks may be given for working which shows that you know how to solve the problem, even if you get the answer wrong.

You are expected to use an electronic calculator for this paper.

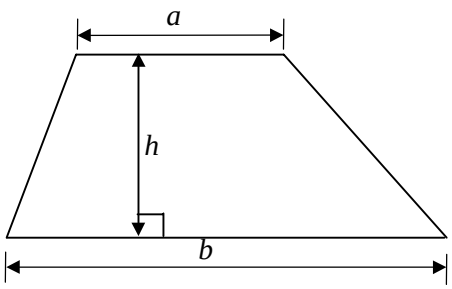
INFORMATION FOR CANDIDATES

- The number of marks is given in brackets [ ] at the end of each question or part question.
- Unless otherwise instructed in the question, take π to be 3.142 or use the π button on your calculator.
- Section B begins with question 11.

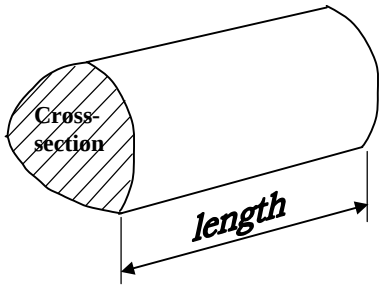
For Examiner's Use Only	
Section B	
TOTAL	

FORMULAE SHEET: INTERMEDIATE TIER

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



Volume of prism = (area of cross section) × length



11 **(a)** Simplify this expression.

$5a - 2b - 3a + b$

Answer *(a)* _____ [2]

(b) Solve this equation.

$6x + 11 = 14$

Answer *(b)* _____ [2]

(c) Multiply out

$2\,(3x - 1)$.

Answer *(c)* _____ [1]

12 The school play is seen by 208 people.
One eighth of them had free seats.
The rest paid £2.25 each.
How much did they pay in total?

Answer £ _____ [4]

13 A group of fifty people were asked how many lottery tickets they had bought last week.
The results are shown in the table.

Number of tickets	0	1	2	3	4	5	6	10
Number of people (frequency)	21	5	7	3	1	8	0	5

Calculate the mean number of tickets bought.

Answer _____ [3]

14 **(a)**

Explain carefully why it is not possible to find the area of this parallelogram.

Answer (a) _____ [1]

(b) A parallelogram PQRS is made up of 4 rods.
PQ = SR = 10 cm. PS = QR = 5 cm.
The joins at P, Q, R and S can move so that different parallelograms can be made.

The rod SR is fixed.
At the start, P is on SR (diagram 1).
P moves anticlockwise round S forming different sized parallelograms.
(Diagram 2 shows one of these.)
In the final position P is on RS (diagram 3).

Diagram 1

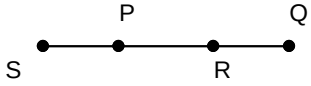


Diagram 2

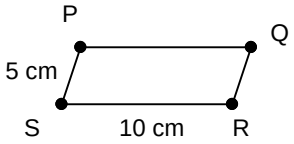
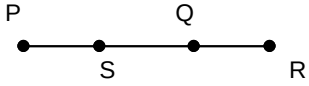


Diagram 3



Describe how the area of the parallelogram changes as P moves round S.

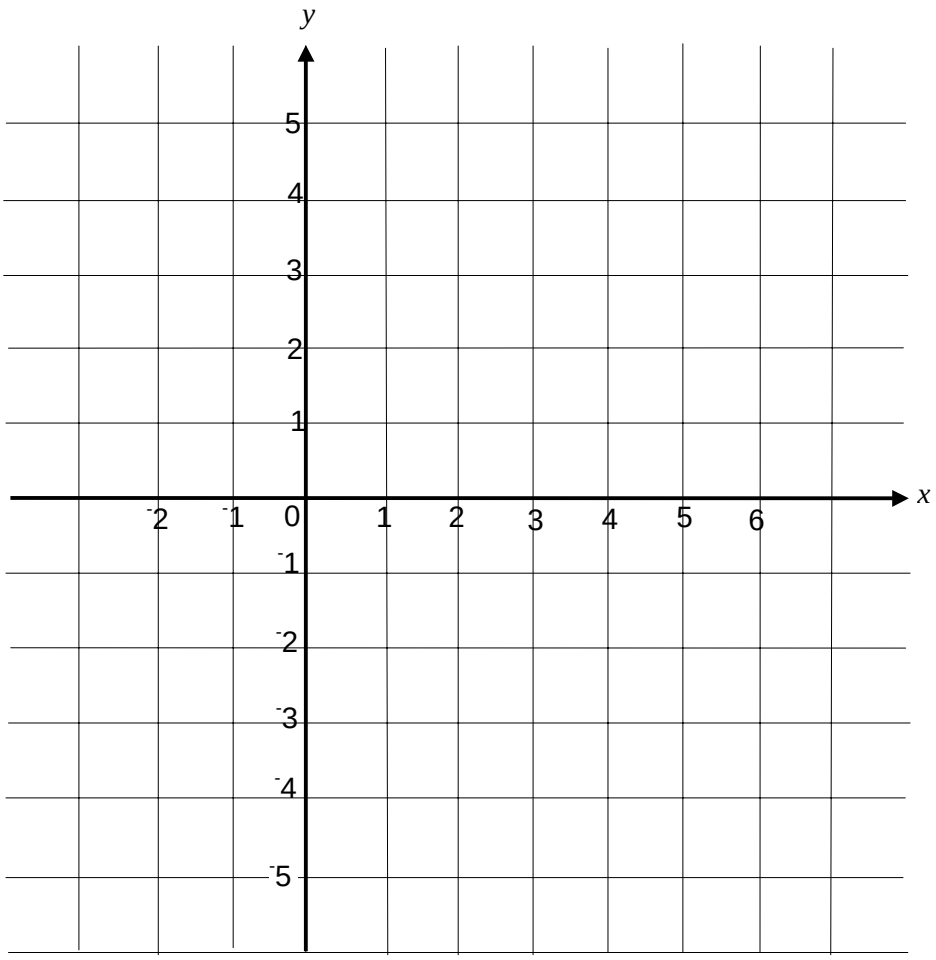
Answer (b) _____

_____ [2]

15 **(a)** Complete the table of values for $y = x - 3$. [1]

x	-1	0	1	2	3	4	5
y	-4		-2		0		2

(b) Draw the graph of $y = x - 3$ on the grid below. [1]



(c) On the same axes draw the graph of $x + y = 4$. [2]

(d) Write down the coordinates of the point of intersection of your two lines.

Answer *(d)* (_____ , _____) [1]

16 Ben is making a chocolate cake.

CHOCOLATE CAKE	
250g flour	35g cocoa
100g butter	250g sugar
2 eggs	175ml milk
Serves 8 people.	

(a) Find the ratio of cocoa to flour.
Give your answer in the lowest terms.

Answer *(a)* _____ [2]

Ben is making a chocolate cake for 12 people.

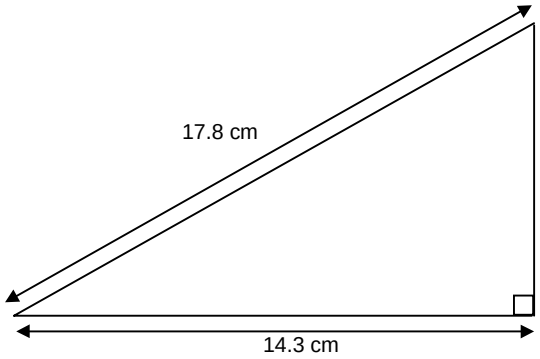
(b) How many grams of butter does he need?

Answer *(b)* _____ grams [1]

17 £2000 is invested in an account paying 4.2% interest per annum compound interest.
Find the total value of the investment after 2 years.

Answer £ _____ [2]

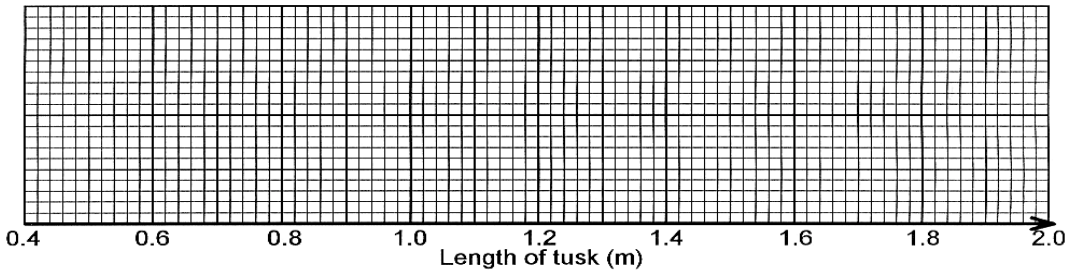
18 A triangular prism is 25.1cm long.
Its cross-section is shown below.



Calculate the volume of this prism.
Give your answer to a suitable degree of accuracy.

Answer _____ cm^3 [7]

19 A game warden measured seven elephant tusks seized in a raid on a poachers' camp.
The lengths in metres were 0.83, 1.22, 1.87, 1.45, 1.02, 1.33, 1.61.
On the grid below draw a box plot to show these data. [4]



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MARK SCHEME

Specimen Paper 2003

SECTION B

11	**(a)**	2a	B1	
		2a – b	B1	
	(b)	$6x = 3$	M1	
		$x = 0.5$	A1	
	(c)	$6x – 2$	B1	
12		208/8	M1	
		208 –26	M1	Allow f.t
		182 x 2.25	M1	Allow f.t
		409.50	A1	Do not accept 409.5
13		((21x0) + (5x1) + … + (5x10)) /50	M2	M1 for numerator
		2.44	A1	
14	**(a)**	Perpendicular height required	B1	
	(b)	Increases to 50 cm^2 (or until PS is vertical) then decreases	B2	B1 for increase then decrease
15	**(a)**	–3 –1 1	B1	
	(b)	Correct straight line	B1	
	(c)	Through (0,4)	B1	
		Through (4, 0)	B1	
	(d)	(3.5, 0.5)	B1	
16	**(a)**	35: 250	M1	B1 for 50 : 7
		7: 50	A1	
	(b)	150	B1	
17		2000 x 1.042 (= 2084)	M1	
		2084 x 1.042 = 2171.53	A1	
18		17.8^2 + or – 14.3^2	M1	
		$\sqrt{112.35}$	M1	
		10.599… any accuracy	A1	May be implicit in second A1
		$\frac{1}{2}$ (10.599… x 14.3)	M1	
		Then x 25.1	M1	
		1902… any accuracy	A1	
		1900 or 1902	A1	
19		Median 1.33	M1	
		Quartiles at 1.02, 1.61	M1	
		Box drawn correctly	A1	
		Whiskers to 0.83, 1.87	A1	

Paper: 2312			Year:2003 Specimen					Target grades					UAM marks				
Qn	NC Ref	Topic/Context	Nu	Man Alg	Non Mal Alg	SS	HD	E	D	C	B	M/S	PS	C	R	Notes F/I	I/H
1	2.4	Solving numerical problems	3					3									
2	3.4	Mensuration				3			3							3	
3	4.2	Specifying the problem & planning					4		4						2	4	
4	3.4	Mensuration				3		3								2	
5	2.3	Number operations and the relationship between them	2							2							
6	2.4	Solving numerical problems	2		3			5						3			
7	2.5	Equations		3						3							3
8	2.4, 3.3	Solving numerical problems, Properties of transformations	2			4			2	4							
9	2.5, 2.6	Formulae, Graphs of linear functions		4	1					2	3						5
10	2.2	Integers	2							2				1	1		2
11	2.5	Use of symbols, Equations		5				4	1								
12	2.3	Written methods	4					4				4	3			4	
13	4.4	Processing and representing data					3		3								
14	3.1, 3.4	Communicating, Reasoning, Mensuration				3			3					2	1		
15	2.6	Graphs of linear functions			5			2	3								
16	2.2	Ratio	3						3							3	
17	2.3	Written methods	2							2							2
18	3.2	3-D shapes				7				7		6					6
19	4.4	Processing and representing data					4				4						4
		Total	20	12	9	20	11	21	22	22	7	10	3	5	4	16	22