RECOGNISING ACHIEVEMENT

Oxford Cambridge and RSA Examinations

General Certificate of Secondary Education

MATHEMATICS B (MEI)

PAPER 2 SECTION B
INTERMEDIATE TIER

1968/2315B

Specimen Paper 2003

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

Candidates answer on the question paper.

TIME 1 hour

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 a calculator for this paper.

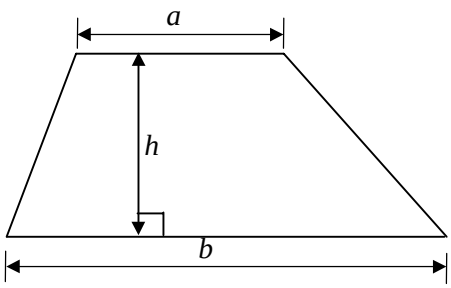
INFORMATION FOR CANDIDATES

- 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 13.

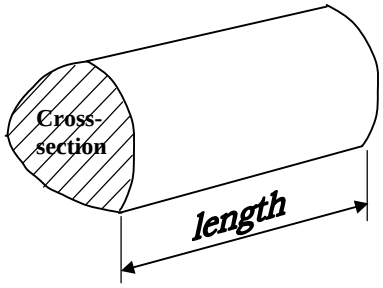
For Examiner's Use	
Section B	
TOTAL	

FORMULAE SHEET: INTERMEDIATE TIER

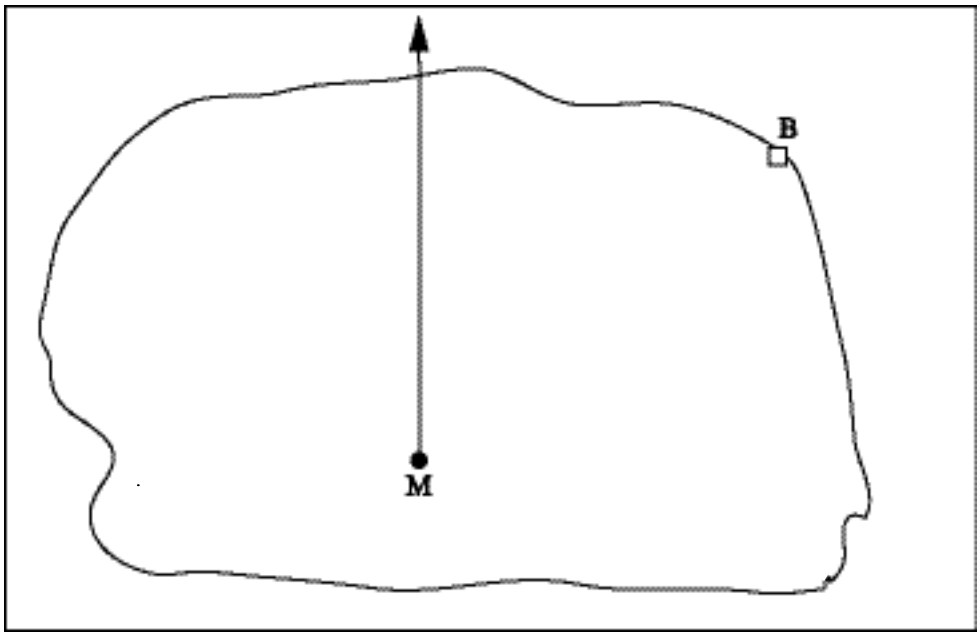
Area of trapezium = $\frac{1}{2}(a + b)h$



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



13 The diagram below shows the island of Great Minja.
M marks the centre of the village.
B marks the top of a beach ladder.



(a) Measure the bearing of B from M.

Answer *(a)* _____ [1]

(b) The scale of the diagram is 2 cm represents 1 km.
Vernon's Snout is 3 km from M on a bearing of 100°.
Mark the position of Vernon's Snout, label it V.

Answer *(b)* _____ [2]

14 Martin was on holiday in Spain.
The exchange rate was £1 = 253 pesetas.

(a) He changed £250 into pesetas.
How many pesetas did he receive?

Answer *(a)* _____ [2]

(b) He spent 3415 pesetas on a meal.
How much was this in pounds sterling?

Answer *(b)* £ _____ [2]

15 **(a)** Write down the next numbers in the sequence.

1 3 7 15 _____ [1]

(b) Write down the n^{th} term of this sequence.

4 9 14 19

Answer *(b)* _____ [2]

(c) Write down the next line in this pattern.

$3^2 + 4^2 = 5^2$
$5^2 + 12^2 = 13^2$
$7^2 + 24^2 = 25^2$
$9^2 + 40^2 = 41^2$

_____

Answer *(c)* _____ [2]

16 ABC is a triangle.
Angle B is twice angle A.
Angle C is 4º more than angle A.

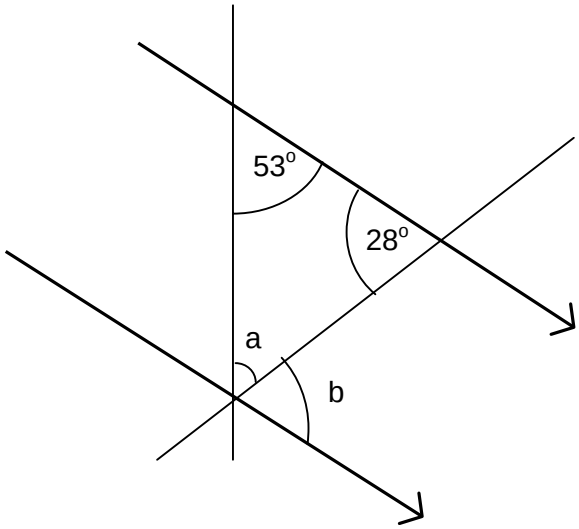
(a) Form an equation to show this information.

Answer *(a)* _____ [3]

(b) Solve your equation to find angle A.

Answer *(b)* _____ [2]

17 Look at the diagram below.



Not to scale

(a) **(i)** Find the size of angle a.

Answer *(a)(i)* _____ ° [1]

(ii) Give a reason for your answer.

Answer *(ii)* _____ [1]

(b) **(i)** Find the size of angle b.

Answer *(b)(i)* _____ ° [1]

(ii) Give a reason for your answer.

Answer *(ii)* _____ [1]

18 Evaluate the following, rounding your answers to three significant figures.

(a) $\frac{1}{3}+\frac{2}{5}+\frac{3}{7}+\frac{4}{9}$

Answer *(a)* _____ [1]

(b) $\frac{4.3\times5.3^2}{12.5+17.3}$

Answer *(b)* _____ [1]

(c) $\sqrt[3]{\frac{300}{4\pi}}$

Answer *(c)* _____ [1]

19 Use trial and improvement to find the positive root of the equation $x^3+5x=10$.
Show all your trials and give your answer to one decimal place.

Answer $x =$ _____ [4]

20 Jack buys a television for £281.53 including VAT at 17½%.
Find the price excluding VAT.

Answer £ _____ [3]

21 **(a)** Brandon, Chris and Dion share £195 in the ratio 3 : 4 : 8.
How much is Dion's share?

Answer *(a)* £ _____ [2]

(b) A triangle has a perimeter of 195 cm.
Explain why the sides cannot be in the ratio 3 : 4 : 8.

Answer (b) _____ [1]

(c) A box contains a large number of coloured balls.
They are red, green and yellow.
The ratio of red : green : yellow is 3 : 4 : 8.

Write down the probability that a ball, chosen at random, is green.

Answer *(c)* _____ [1]

22 The table shows the population and area, in square kilometres, of some countries.

Country	Population	Area
Norway	4.10×10^6	3.24×10^5
Portugal	9.70×10^6	9.21×10^4
Spain	3.68×10^7	5.05×10^5

(a) Find the combined area of Spain and Portugal.
Give your answer in standard form.

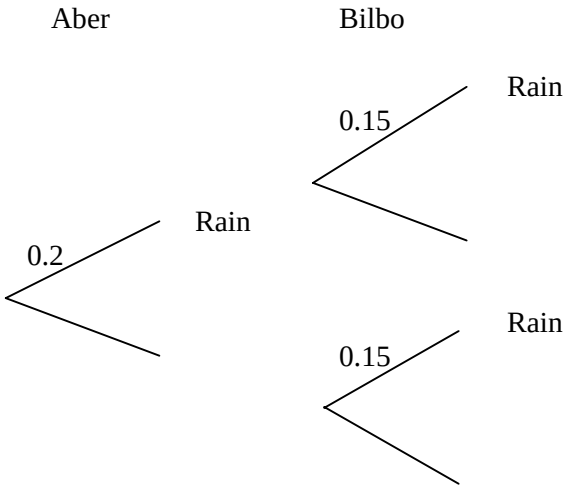
Answer *(a)* _____ km^2 [2]

(b) Calculate the population density of Norway.
Give your answer in number of people per square kilometre.

Answer *(b)* _____ [2]

23 The probability that it will rain in Aber on any day is 0.2.
The probability that it will rain in Bilbo on any day is 0.15.
These events are independent.

(a) Complete the tree diagram to show this information. [1]



(b) Calculate the probability that on any chosen day at random

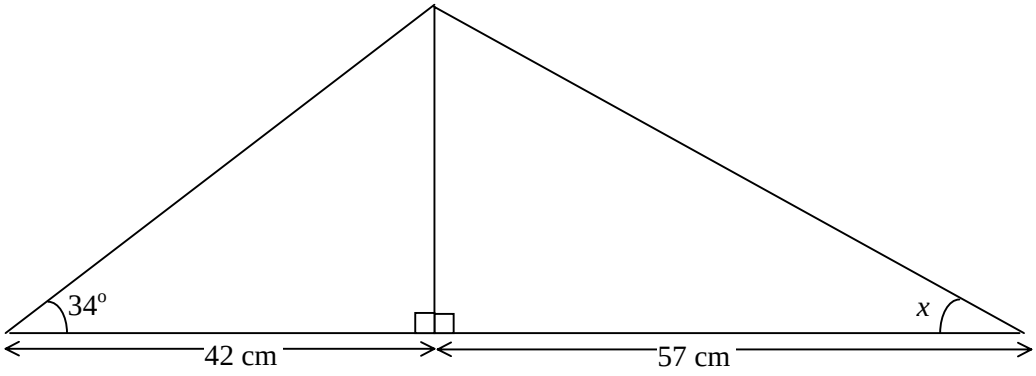
(i) it will rain in both places,

Answer *(b)(i)* _____ [2]

(ii) it will rain in only one of these places.

Answer *(ii)* _____ [3]

24 The diagram shows the design for part of a kite.



Calculate the size of the angle marked *x*.

Answer _____ ° [5]

RECOGNISING ACHIEVEMENT

Oxford Cambridge and RSA Examinations

General Certificate of Secondary Education

MATHEMATICS B

PAPER 2 SECTION B
INTERMEDIATE TIER

1968/2315B

MARK SCHEME

Specimen Paper 2003

SECTION B

13	**(a)**		(0) 49 ± 2°	B1	
	(b)		Correct angle	B1	
			Correct distance	B1	
14	**(a)**		250 x 253	M1	
			63 250	A1	
	(b)		3415/253	M1	
			£13.50	A1	
15	**(a)**		31	B1	
	(b)		$5n - 1$	B2	B1 if $5n$ seen
	(c)		$11^2 + 60^2 = 61^2$	B2	B1 if two numbers correct
16	**(a)**		$x + 3$	B1	
			$2x$	B1	
			$x + x + 4 + 2x = 180$	B1	
	(b)		$4x = 176$	M1	
			44	A1	
17	**(a)**	**(i)**	99	B1	
		(ii)	Angle sum of triangle = 180º	B1	
	(b)	**(i)**	28	B1	
		(ii)	Alternate angle	B1	
18	**(a)**		1.61	B1	
	(b)		4.05	B1	
	(c)		2.88	B1	
19			In [1,2] or better	M1	
			In [1.4, 1.5] or better	M1	
			In [1.4, 1.45] or better	M1	
			1.4	A1	
20			281.53/1.175	M2	M1 if 1.175 seen
			239.60	A1	

21	**(a)**	195 ÷ 15 x 8	M1	
		104	A1	
	(b)	104 is more than half perimeter so the other two sides can't meet	B1	
	(c)	4/15	B1	
22	**(a)**	$5.97(1) \times 10^5$	B2	B1 if correct value in incorrect form
	(b)	$(4.10 \times 10^6) / (3.24 \times 10^5)$	M1	
		12.65	A1	Allow 12.7, 12 or 13
23	**(a)**	Complete the tree with 0.8 and 0.85	B1	
	(b)	0.2 x 0.15	M1	
		0.03	A1	
	(c)	0.2 x 0.85 and 0.8 x 0.15	M1	
		Added	M1	
		0.29	A1	
24		Finding common side (h)	M1	
		h = 4.2 tan 34	M1	
		2.83 …	A1	
		tan x = 3.83 … / 5.7	M1	
		26.4°	A1	

Paper: 2315			Year: 2003 Specimen					Target grades					UAM marks			Notes	
Qn	NC Ref	Topic/Context	Nu	Man Alg	Non Mal Alg	SS	HD	E	D	C	B	M/S	PS	C	R	F/I	I/H
1	3.2	Properties of triangles and other rectilinear shapes				2		2									
2	2.3	Written methods	5					5				5				5	
3	4.4	Processing and representing data					4	3	1								
4	3.3	Properties of transformations				7			7					3		3	
5	2.3	Mental methods	3						3							3	
6	2.5	Inequalities		4						2	2						
7	4.4	Processing and representing data					4	4							2	4	
8	2.5	Index notation, Formulae		6						2	4						
9	3.4	Loci				3				3							3
10	2.3	Number operations and the relationships between them	3								3						
11	2.5	Quadratic equations, Simultaneous linear equations		6							6						
12	3.2	Properties of triangles and other rectilinear shapes				3					3						
13	3.4	Measures				3			3							3	
14	2.4	Solving numerical problems	4					4									
15	2.6	Sequences			5			3	2								
16	2.5	Equations		5					2	3							
17	3.2	Angles				4			4						2	4	
18	2.3	Number operations and the relationships between them, Calculator methods	3							3							3
19	2.5	Numerical methods			4					4							4
20	2.3	Number operations and the relationships between them	3								3						3
21	2.3, 4.4	Number operations and the relationships between them, Processing and representing data		3			1			4					1		
22	2.2	Powers and roots	4								4						4
23	4.4	Processing and representing data					6				6						
24	3.2	Properties of triangles and other rectilinear shapes				5					5	5					
		Total	25	24	9	27	15	21	22	21	36	10		3	5	22	17