

Oxford Cambridge and RSA Examinations
General Certificate of Secondary Education

MATHEMATICS B (MEI)
PAPER 1 SECTION B
HIGHER TIER

1968/2313B

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

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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 in this paper.

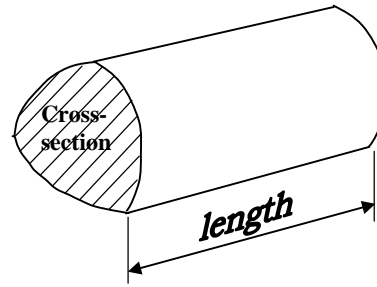
INFORMATION FOR CANDIDATES

- 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: HIGHER TIER

Volume of prism = (area of cross section) \times length

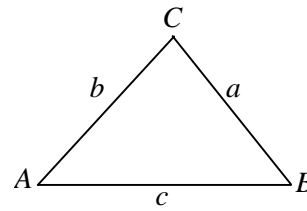


In any triangle ABC

Sine rule $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

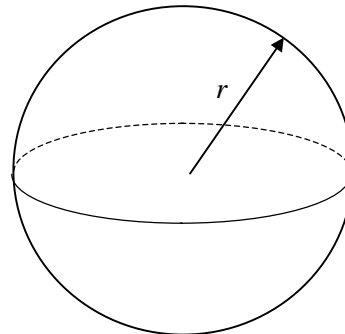
Cosine rule $a^2 = b^2 + c^2 - 2bc \cos A$

Area of triangle = $\frac{1}{2} ab \sin C$



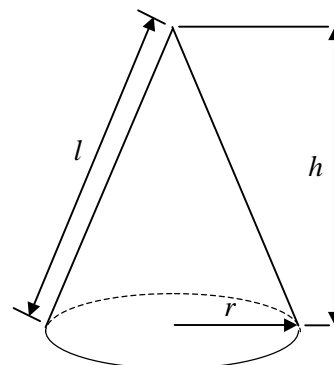
Volume of sphere = $\frac{4}{3} \pi r^3$

Surface area of sphere = $4\pi r^2$



Volume of cone = $\frac{1}{3} \pi r^2 h$

Curved surface area of cone = $\pi r l$



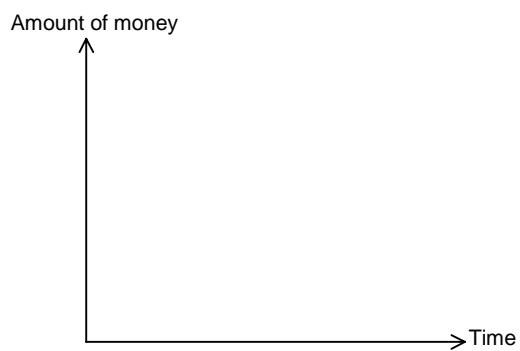
The Quadratic Equation

The solution of $ax^2 + bx + c = 0$ where $a \neq 0$, are given by $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

- 11 £2000 is invested in an account paying 4.2% interest per annum compound interest.
(a) Find the total value of the investment after 3 years.

Answer (a) £ _____ [3]

- (b) Draw a sketch showing how the amount of money in the account varies with time.

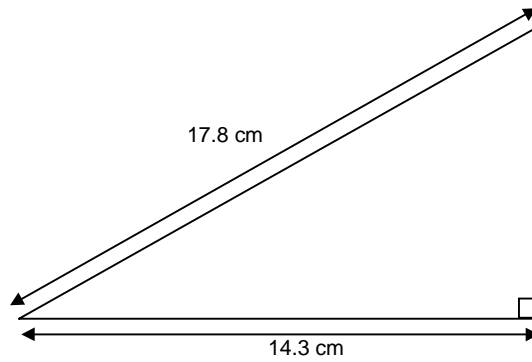


[2]

- 12 Solve these simultaneous equations algebraically.
 $4x - 3y = 20$
 $8x - y = 30$

Answer $x =$ _____ $y =$ _____ [3]

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



Calculate the volume of this prism.

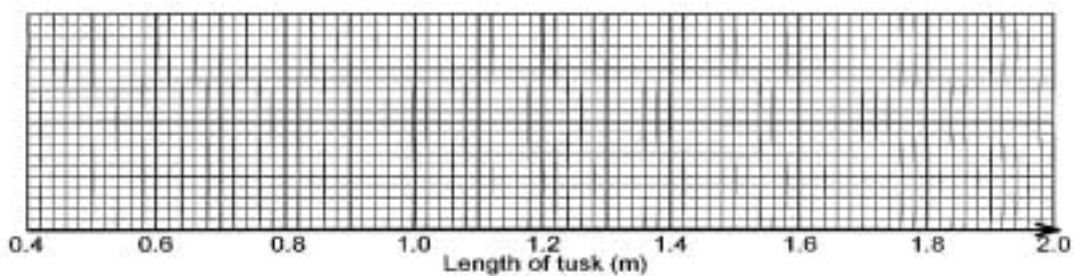
Answer _____ cm³ [6]

- 14 Solve this equation.

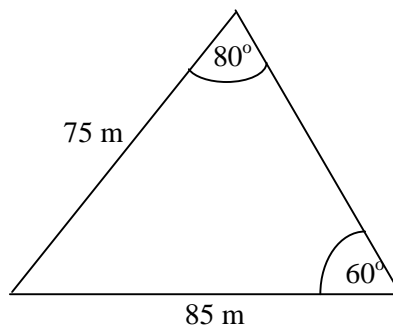
$$x^2 - 10x + 7 = 0$$

Answer $x =$ _____ [3]

- 15 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]



16 The diagram shows a triangular field. Calculate its area.



Answer _____ m^2 [3]

17 A racing car travelled 88 miles in 27 minutes.
Both measurements are correct to the nearest whole unit.
Find the car's greatest possible average speed in miles per hour.
Give your answer to two decimal places.

Answer _____ mph [4]

- 18 The diagram shows a sector of a circle.
 The perimeter of the sector is 115.1 centimetres.
 The radius of the circle is 25.4 centimetres.
 Calculate the angle of the sector.

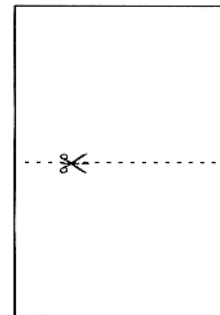


Answer _____ ° [4]

- 19 When you cut a piece of A4 paper in half, as shown,
 you get two pieces of A5 paper.

Ignoring its thickness, A5 paper is similar to A4 paper.

Express the length of A5 paper as a percentage of the
 length of A4 paper. Explain your work, and give your
 answer to a sensible degree of accuracy.



Answer _____

[4]

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MARK SCHEME

Specimen Paper 2003

SECTION B

11 (a)	$2000 \times 1.042 (= 2084)$	M1	
	$2084 \times 1.042 = (2171.528 \text{ or } 2171.53)$	M1	
	$2171... \times 1.042 = 2262.73$	A1	
(b)	Correct curve	B2	B1 for correct shape through origin
12	Elimination of x or y	M1	
	$x = 3.5$	A1	
	$y = -2$	A1	
13	$17.8^2 + \text{or} - 14.3^2$	M1	
	$\sqrt{112.35}$	M1	
	10.599 ... any accuracy	A1	May be implied in second A1
	$\frac{1}{2}(10.599 \dots) \times 14.3$	M1	
	Then $\times 25.1$	M1	
	1900 or 1902	A1	
14	$x = \frac{-(-10) \pm \sqrt{(-10)^2 - 4 \times 1 \times 7}}{2 \times 1}$	M1	
	9.24	A1	
	0.76	A1	
15	Median = 1.33	M1	
	quartiles at 1.02, 1.61	M1	
	Box drawn correctly	A1	
	Whiskers to 0.83, 1.87	A1	
16	40 seen	M1	
	$0.5 \times 85 \times 75 \times \sin 40^\circ$	M1	
	= 2050	A1	Accept 2048(.88...)
17	Used 88.5, 26.5	M1 M1	
	$60 \times 88.5 / 26.5 = 200.38$	M1 A1	
18	$115.1 - 2 \times 25.4 (= 64.3)$	M1	
	$2\pi \times 25.4 (= 159.59...)$	M1	
	$64.3 \times 360 / 159.59... = 145$	M1 A1	
19	Area scale factor = 0.5	M1	
	Length scale factor = $\sqrt{0.5}$	M1	
	= 0.707... = 71%	A1 A1	Accept answer in [70, 71]

Paper: 2313			Year:2003 Specimen					Target grades				UAM Marks			Notes		
Qn	NC Ref	Topic/Context	Nu	Man Alg	Non Mal Alg	SS	HD	C	B	A	A*	M/S	PS	C	R	F/I	I/H
1	2.5	Equations, Index notation		6				4	2								3
2	2.3	Mental methods	3						3								
3	2.5	Simultaneous linear equations		2				2									
4	2.2	Integers	4					4						1	1		2
5	2.5, 2.6	Formulae, Graphs of linear functions		3	1			2	3								5
6	3.3	Properties of transformation				3			1	2							
7	2.5	Quadratic equations		3					3								
8	4.4	Processing and representing data					4			4							
9	2.6	Quadratic functions, Other functions			3				3								
10	4.1	Reasoning					3				3				3		
11	2.3	Written methods	3		2			5									2
12	2.5	Simultaneous linear equations		3					3								
13	3.2	3-D shapes				6		6				6					6
14	2.5	Linear equations			3					3							
15	4.4	Processing and representing data					4		4								4
16	3.4	Mensuration				3				3							
17	3.4	Measures	4							4							
18	3.4	Mensuration				4				4		4					
19	3.1	Problem solving, communication				4					4		3	1			
		Total	14	18	9	20	11	23	22	20	7	10	3	2	4		22

