

Oxford Cambridge and RSA Examinations
General Certificate of Secondary Education

MATHEMATICS B (MEI)
PAPER 2 SECTION A
INTERMEDIATE TIER

1968/2315A

Specimen Paper 2003

Additional materials: Geometrical instruments
Tracing paper (optional).

Candidates answer on the question paper.

Calculators are **not** allowed.

TIME 1 Hour.

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 NOT ALLOWED TO USE A CALCULATOR IN THIS PAPER.

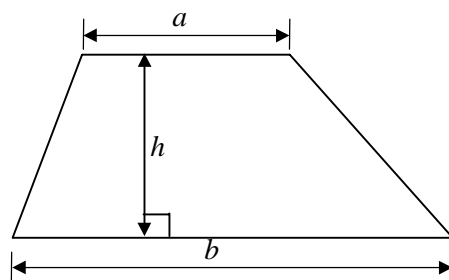
INFORMATION FOR CANDIDATES

- The number of marks is given in brackets [] at the end of each question or part question.

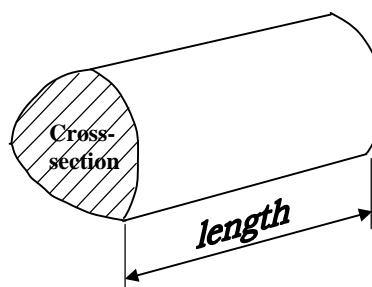
For Examiner's Use Only	
Section A	
Section B	
TOTAL	

FORMULAE SHEET: INTERMEDIATE TIER

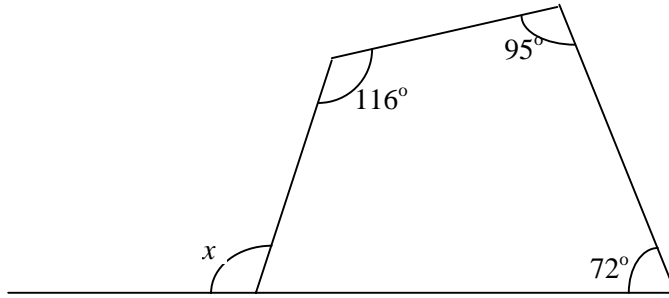
Area of trapezium = $\frac{1}{2}(a + b)h$



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



1 Look at the diagram below.



Find the angle x .

Answer _____ [2]

2 Sue is a maths teacher.
Last term she taught 360 lessons.
40% of the lessons were year 9 lessons.
25% of the lessons were year 10 lessons.
The rest were year 11 lessons.
How many year 11 lessons did Sue teach last term?

Answer _____ [5]

3 At Hightown College students choose one subject from each of the three blocks below.

BLOCK 1	BLOCK 2	BLOCK 3
History	Biology	Art
Geography	Chemistry	Music
	Physics	

A student is picked at random.

- (a) The probability that any student chooses History is 0.3.
Write down the probability that the student chooses Geography.

Answer (a) _____ [1]

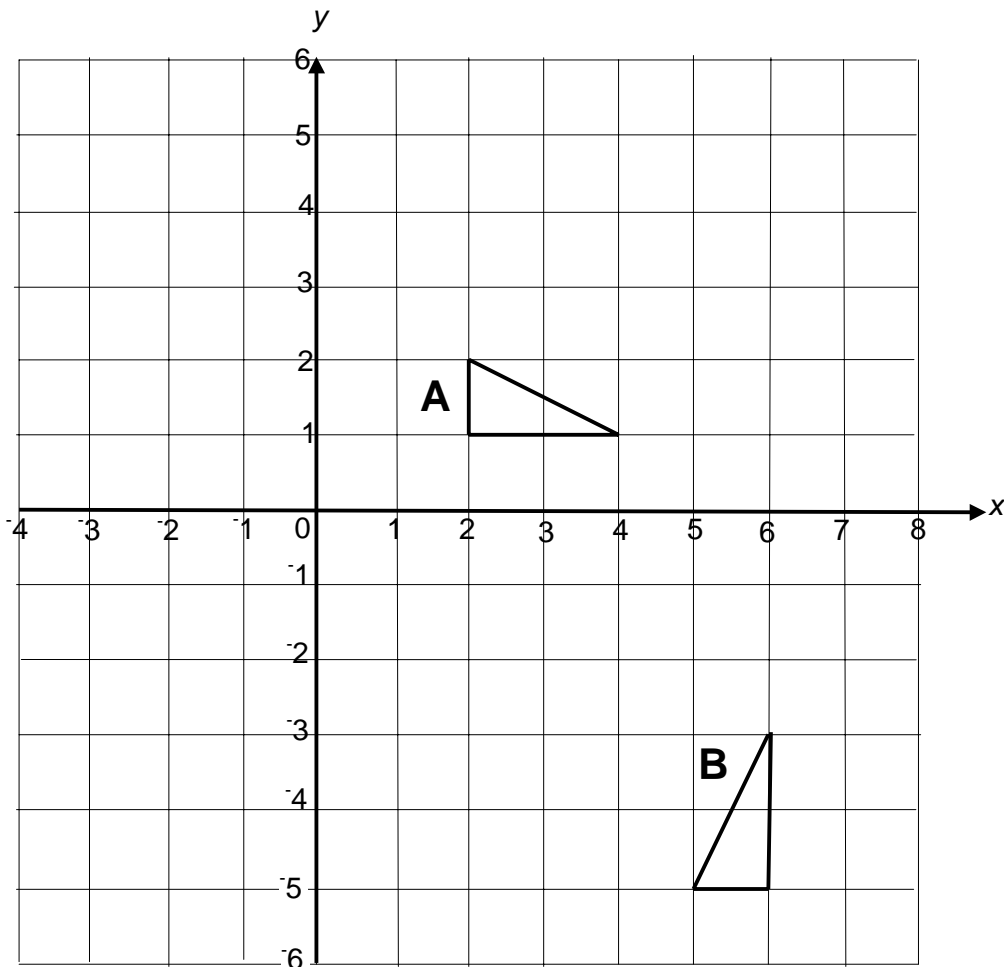
- (b) The probability that any student chooses Physics is 0.3.
Students are equally likely to choose Biology or Chemistry.
Find the probability that the student chooses Biology.

Answer (b) _____ [2]

- (c) Three times as many students choose Art as Music.
What is the probability that the student chooses Art?

Answer (c) _____ [1]

4 Shapes A and B are shown on the grid below.



(a) Enlarge shape A with centre (0,0) and scale factor 2.
Label the image D. [3]

(b) Write down the ratio of the perimeter of shape A to the perimeter of shape D.

Answer (b) _____ [1]

(c) Describe fully the single transformation that maps shape A onto shape B.

Answer (c) _____

_____ [3]

- 5 (a) **Estimate** the answer to this calculation.
You must show all the approximations you use.

$$\frac{39.8 \times 4.9}{20.3}$$

Answer (a) _____ [2]

- (b) The calculation below is correct.

$684 \times 27 = 18\,468$

Use this to calculate

$$18\,468 \div 270.$$

Answer (b) _____ [1]

6. Solve these inequalities.

(a) $4x - 3 < 7$

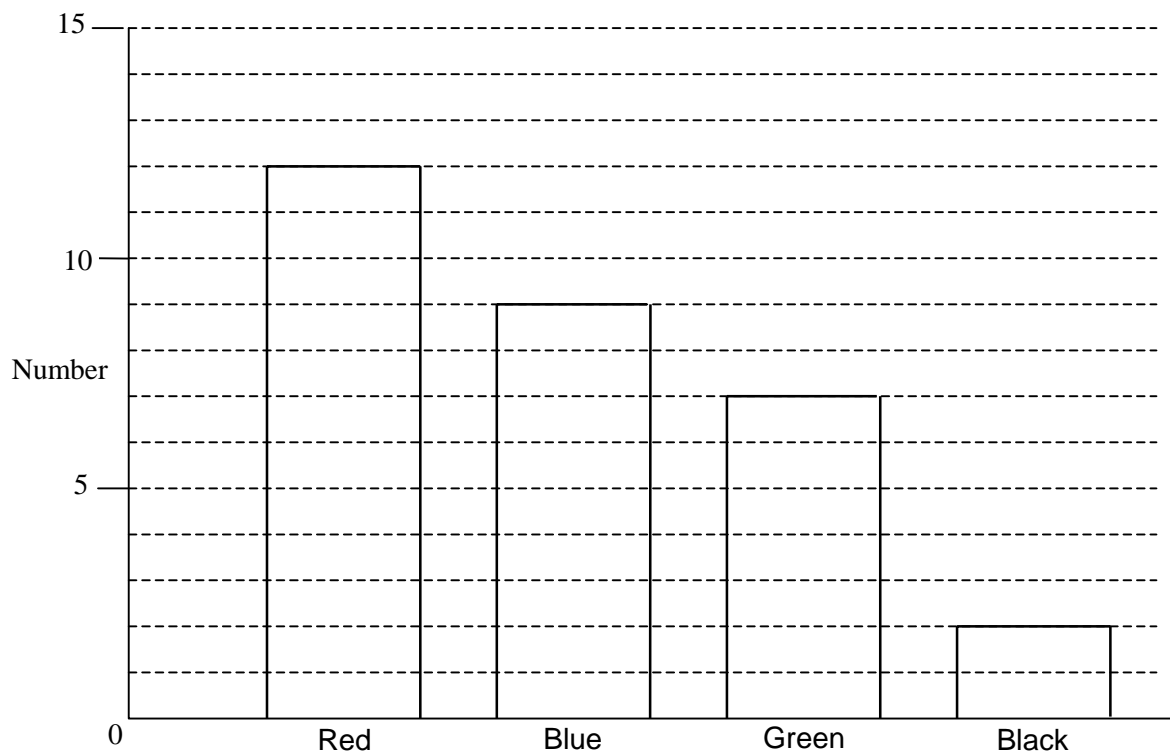
Answer (a) _____ [2]

(b) $11 + 2x > 5x - 7$

Answer (b) _____ [2]

- 7 A pack of 30 cards is used in a game.
Each card is coloured.

The number of cards of each colour is shown on the grid.



- (a) A card is chosen at random.
What is the probability that it is red or green?

Answer (a) _____ [1]

Each card has a shape on it.
The numbers of each shape on the 30 cards are given.

Circle	Triangle	Square	Diamond
12	11	6	1

- (b) A card is chosen at random.
What is the probability that it shows a circle or a triangle?

Answer (b) _____ [1]

- (c) Why is it not possible to find the probability that a card chosen at random is red and shows a circle.

Answer (c) _____

_____ [2]

8 (a) Simplify the following.

(i) $a^3 \times a^2$

Answer (a)(i) _____ [1]

(ii) $\frac{t^8}{t^4}$

Answer (ii) _____ [1]

(b) Multiply out

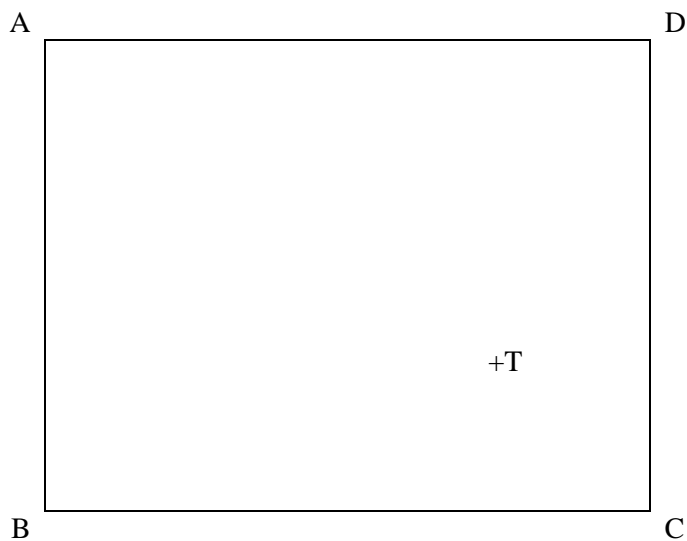
$(3x^3y)(xy^2)$.

Answer (b) _____ [2]

(c) Rearrange the formula $v^2 = u^2 + 2as$ to make u the subject.

Answer (c) _____ [2]

- 9 This is the plan of a garden drawn to a scale 1cm to 1m.
 Charlie is planting a new tree in the garden.
 There is already a tree at the point marked T.



The new tree must be

- (i) at least 3 metres from T,
- (ii) nearer to AB than it is to CD.

Shade the region where she could plant the tree. [3]

- 10 (a) How can you tell without dividing that when you convert $\frac{5}{6}$ into a decimal you will get a recurring decimal?

Answer (a) _____ [1]

- (b) Express $\frac{5}{6}$ as a recurring decimal.

Answer (b) _____ [2]

- 11 (a) Mohammed is solving a problem about rectangles.
The length of the longer side is x cm.
Solve this equation to find x .

$$x^2 - 2x - 24 = 0$$

Answer (a) $x =$ _____ [3]

- (b) Solve these simultaneous equations.

$$4x + 3y = 14$$

$$5x - y = 27$$

Answer (b) $x =$ _____

$y =$ _____ [3]

- 12 Mr and Mrs Ingram decide to convert their roof-space into an attic bedroom.
Fig.1 shows the roof space.

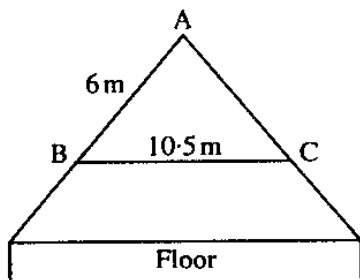


Fig 1

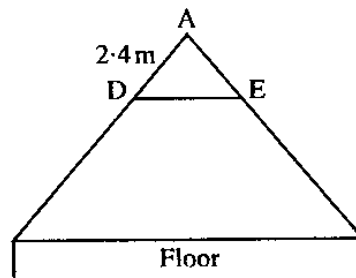


Fig 2

The wooden beam BC is parallel to the floor.
The length of BC is 10.5 metres.

The beam BC is replaced by a new beam DE, where DE is parallel to the floor.
This is shown in Fig. 2.

Using similar triangles ABC and ADE, find the length of DE.

Answer $DE =$ _____ m [3]

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MARK SCHEME

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SECTION A

1	Correct method 103°	M1 A1	B1 for 77°
2	(40/100) x 360 144 90 360 – (144 + 90) 126	M1 A1 B1 M1 A1	
3	(a) 0.7 (b) (1 – 0.3)/2 0.35 (c) 0.75	B1 M1 A1 B1	
4	(a) Correct figure (b) 1:2 (c) Rotation 90° anticlockwise About (7, 0)	B3 B1 B1 B1 B1	B2 for one side correct B1 for one vertex correct
5	(a) 40, 5, 20 10 (b) 68.4	M1 A1 B1	
6	(a) $4x < 10$ $x < 2.5$ (b) $18 > 3x$ $x < 6$	M1 A1 M1 A1	
7	(a) 19/30 (b) 23/30 (c) May not be independent (or equivalent)	B1 B1 B2	B1 for partially correct explanation

8	(a) (i)	a^5	B1	
	(ii)	t^4	B1	
	(b)	$3x^4y^3$	B2	B1 for x^4 or y^3 seen
	(c)	$u^2 = v^2 - 2as$	M1	
		$u = \sqrt{(v^2 - 2as)}$	A1	
9		Circle centre T, radius 3cm	B1	
		Line midway between AB and CD	B1	
		Correct shading	B1	
10	(a)	6 has a (prime) factor other than 2 and 5 does not	B1	
	(b)	$0.8\dot{3}$	B2	B1 for 0.83 ...
11	(a)	$(x - 6)(x + 4)$	M2	M1 for $(x - 6)(x + 4)$
		6 alone	A1	
	(b)	Eliminate x or y	M1	
		Substitute	M1	
		$x = 5, y = -2$	A1	
12		Find relevant ratio	M1	
		Use ratio to find DE	M1	
		4.2	A1	

