

Oxford Cambridge and RSA Examinations

General Certificate of Secondary Education

Mathematics C (Graduated Assessment) 1966/2342A (I)
INTERMEDIATE TIER TERMINAL PAPER – SECTION A

Specimen Paper 2003

Candidates answer on the question paper.

Additional materials:

Tracing paper (optional)
Geometrical instruments
Pie chart scale

TIME 1 hour

Candidate Name	Centre Number	Candidate Number												
	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 15%; height: 20px;"></td> <td style="width: 15%; height: 20px;"></td> <td style="width: 15%; height: 20px;"></td> <td style="width: 15%; height: 20px;"></td> <td style="width: 15%; height: 20px;"></td> <td style="width: 15%; height: 20px;"></td> </tr> </table>							<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 15%; height: 20px;"></td> <td style="width: 15%; height: 20px;"></td> <td style="width: 15%; height: 20px;"></td> <td style="width: 15%; height: 20px;"></td> <td style="width: 15%; height: 20px;"></td> <td style="width: 15%; height: 20px;"></td> </tr> </table>						

INSTRUCTIONS TO CANDIDATES

- Write your name, 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.
- There is a space after most questions. Use it to do your working. In many questions marks will be given for correct working even if the answer is incorrect.

INFORMATION FOR CANDIDATES

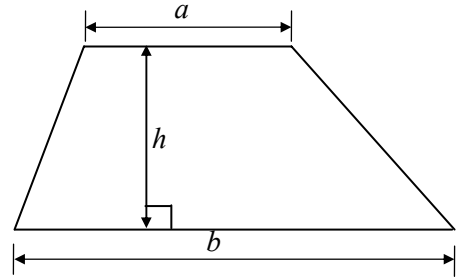
- The number of marks is given in brackets [] at the end of each question or part question.
- The total mark available for this section is 50.

For Examiner's use only	
Section A	
Section B	
Total	

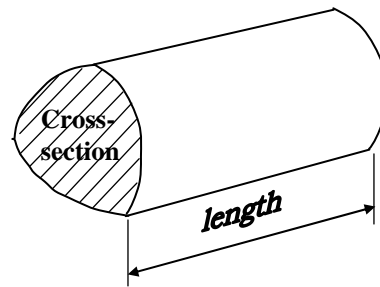
WARNING
You are not allowed to use a calculator in Section A of this paper.

FORMULA SHEET: INTERMEDIATE TIER

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



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



- 1 Farida is looking for a car to buy.
The car she likes is priced at £5600.
The hire purchase terms are

Deposit $\frac{1}{4}$ of the purchase price

PLUS

36 monthly instalments of £175.50.

Calculate how much will she pay altogether for the car on hire purchase.

£ _____ [5]

5

2 Solve these equations.

(a) $4x + 1 = 13$

(a) $x =$ _____ [1]

(b) $5x - 2 = 3x + 9$

(b) $x =$ _____ [2]

3

3 (a) Mark drives 34 890 miles in a year.
He wants to know roughly how many miles this is per week.

Write down a calculation Mark could do in his head to **estimate** how many miles he drives each week.

(a) _____ = _____ miles [3]

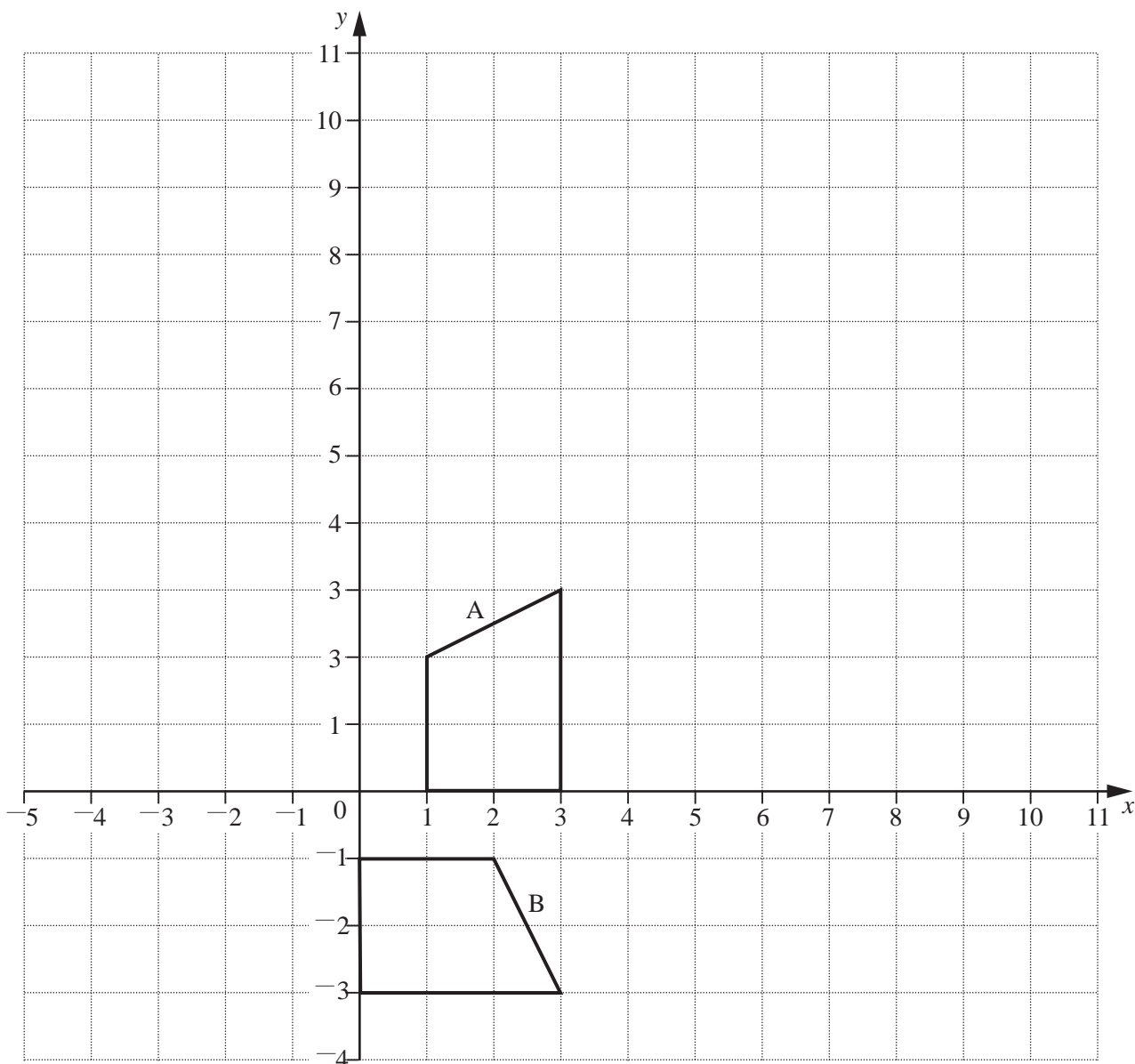
(b) On Thursday Mark drives 132 km in 1 hour 30 minutes.

Calculate his average speed in kilometres per hour.

(b) _____ km/h [3]

6

4



The diagram shows shapes A and B.

- (a) Draw the reflection of shape A in the y axis.
Label this shape C. [1]

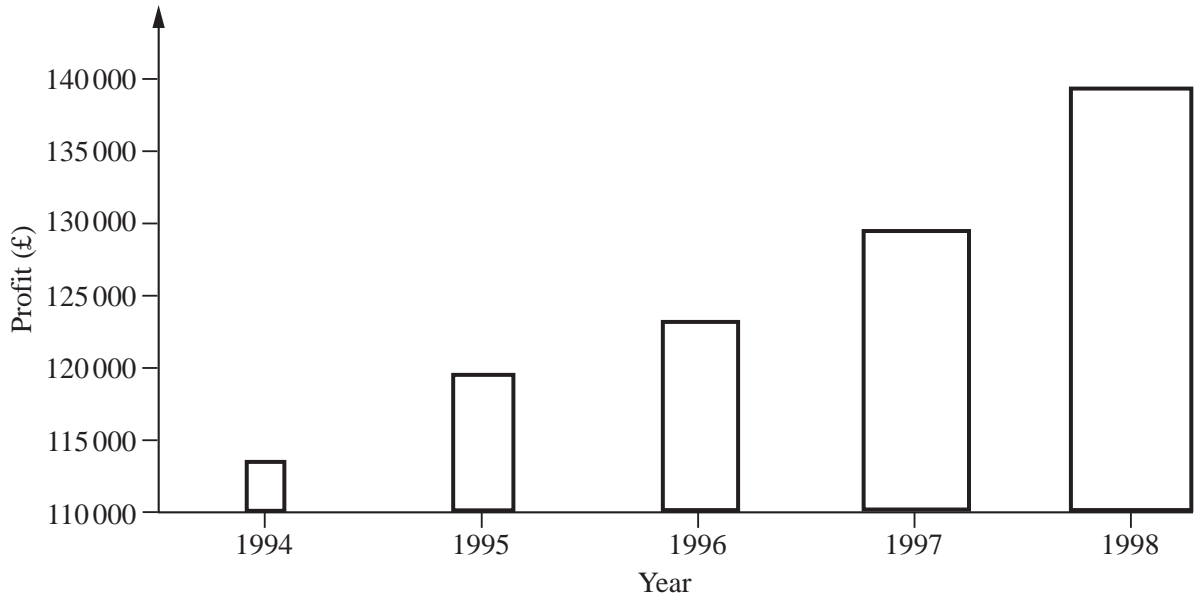
- (b) Describe fully the **single** transformation that maps shape A onto shape B.

_____ [3]

- (c) Draw the enlargement of shape A with centre $(0, 0)$ and scale factor 3.
Label this shape D. [3]

7

5 For this diagram, give two reasons why it may be misleading.



1 _____

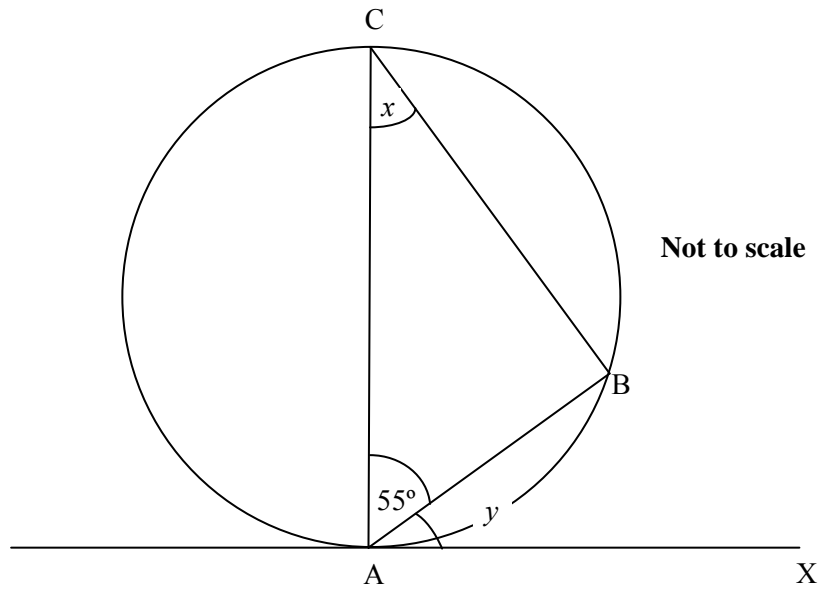
[1]

2 _____

[1]

2

6



In the diagram, O is the centre of circle ABC.
AX is a tangent to the circle at A.

(a) Work out angle x .

(a) _____ [2]

(b) Explain why $y = 35^\circ$.

_____ [1]

3

7 In this question, $a = 5$, $b = -4$, $c = -3$.

Work out the values of

(a) $3a + 2b$,

(a) _____ [2]

(b) $\frac{3a^2 + c^2}{b + c}$.

(b) _____ [2]

4

- 8 (a) A machine produces pieces of wood.

The length of each piece of wood measures 34 mm, correct to the nearest millimetre.

Between what limits does the actual length lie?

- (a) The length is between _____ mm and _____ mm [2]

- (b) Three of these pieces of wood are put together to form a triangle.

What is the greatest possible perimeter of the triangle?

- (b) _____ mm [1]

3

- 9 (a) Multiply out and simplify

$$3(2x + 1) - 2(x - 1).$$

- (a) _____ [2]

- (b) Rearrange the formula

$$A = 2\pi rh + \pi r^2$$

to make h the subject.

- (b) $h =$ _____ [2]

4

10 The total rainfall figures, in millimetres, for the past 7 years in Egypt are shown below.

27 24 31 30 28 15 29

Find the five yearly moving averages.

_____ [3]

3

11 There are two sets of traffic lights on Barry's journey home.

The probability that he is stopped at the first set is 0.4.

The probability that he is stopped at the second set is 0.3.

These probabilities may be assumed to be independent.

What is the probability that Barry is stopped at only one set of lights?

_____ [4]

4

12 (a) Factorise $x^2y + 4xy$.

(a) _____ [1]

(b) Simplify $\frac{4a^4b^3}{6ab^2}$.

(b) _____ [2]

(c) Solve the equation $x^2 + 7x + 12 = 0$.

(c) $x =$ _____ [3]

6

Oxford Cambridge and RSA Examinations

General Certificate of Secondary Education

Mathematics C (Graduated Assessment) 1966/2342B (I)
INTERMEDIATE TIER TERMINAL PAPER – SECTION B

Specimen Paper 2003

Candidates answer on the question paper.

Additional materials:

- Tracing paper (optional)
- Geometrical instruments
- Scientific or Graphical Calculator
- Pie chart scale

TIME 1 hour

Candidate Name	Centre Number	Candidate Number												
	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 15%; height: 20px;"></td> <td style="width: 15%;"></td> <td style="width: 15%;"></td> <td style="width: 15%;"></td> <td style="width: 15%;"></td> <td style="width: 15%;"></td> </tr> </table>							<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 15%; height: 20px;"></td> <td style="width: 15%;"></td> <td style="width: 15%;"></td> <td style="width: 15%;"></td> <td style="width: 15%;"></td> <td style="width: 15%;"></td> </tr> </table>						

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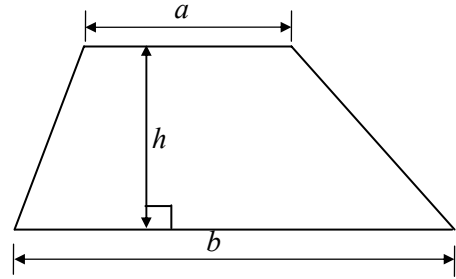
INFORMATION FOR CANDIDATES

- You are expected to use a calculator in Section B of this paper.
- The number of marks is given in brackets [] at the end of each question or part question.
- The total mark available for this Section is 50.

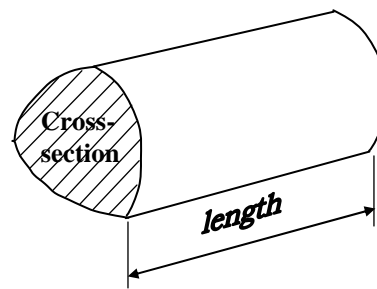
For Examiners' Use	
Section B	

FORMULA SHEET: INTERMEDIATE TIER

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



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



13 Mr and Mrs Walker went on holiday to Denmark.

The rate of exchange between pounds and kroner was $\text{£}1 = 11.70$ kroner.

(a) Before they went, Mr Walker changed $\text{£}225$ into kroner.

How many kroner did he get?

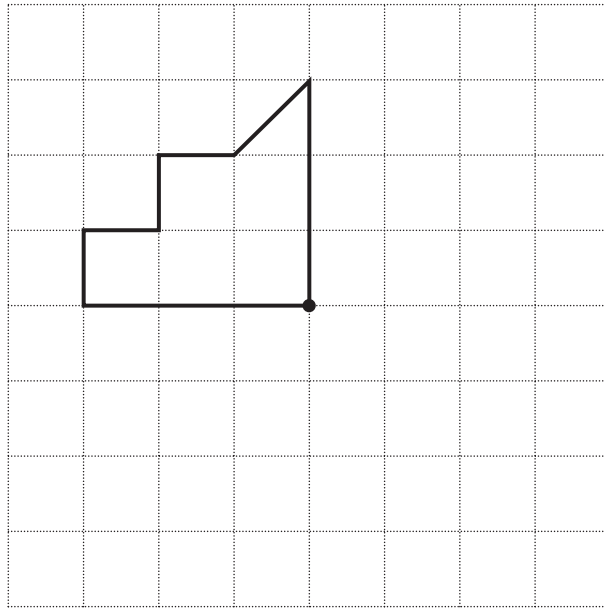
(a) _____ kroner [2]

(b) Mrs Walker bought a ring for 680 kroner in Denmark.

How much did the ring cost in pounds?
Give your answer to the nearest penny.

(b) £ _____ [3]

5



Complete the pattern so it has a rotational symmetry of order 4.

[3]

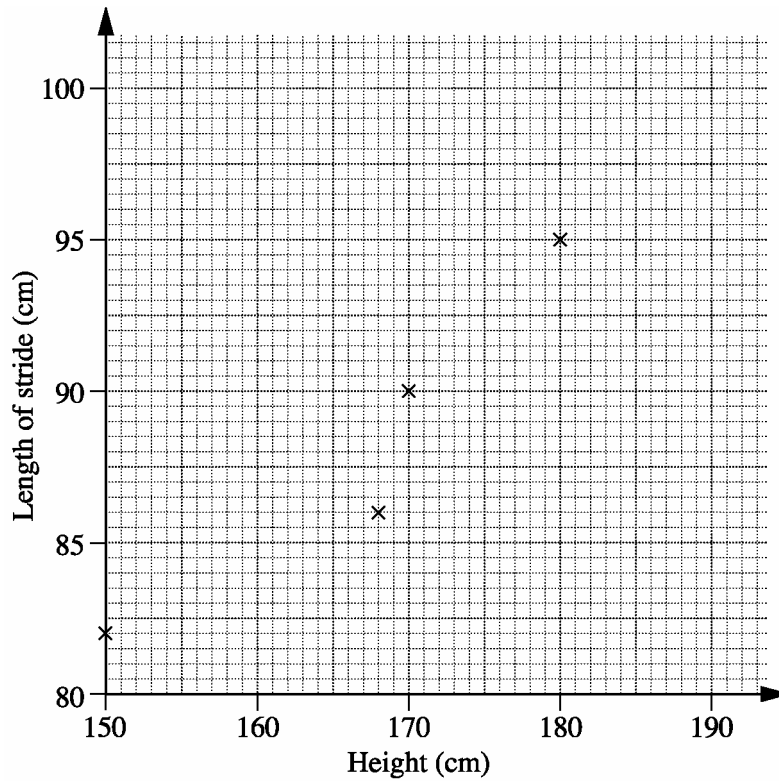
3	
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- 15 Jackie recorded the heights and the lengths of the strides of 10 boys in her form. These are the results.

Height (cm)	170	180	168	150	164	172	167	176	182	190
Length of stride (cm)	90	95	86	82	87	89	93	92	94	96

- (a) Complete this scatter diagram to show these results. The first four points have been plotted.

[2]

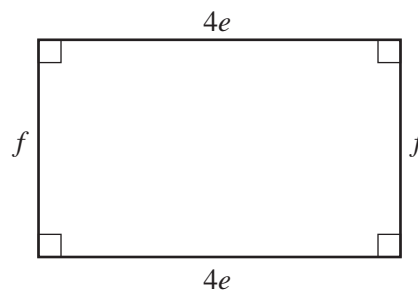
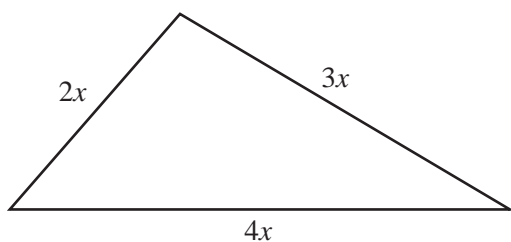


- (b) Comment on the relationship between the height and the length of stride of the ten boys.

[1]

3

16 (a) Look at these shapes.



Write as simply as possible an expression for the perimeter of

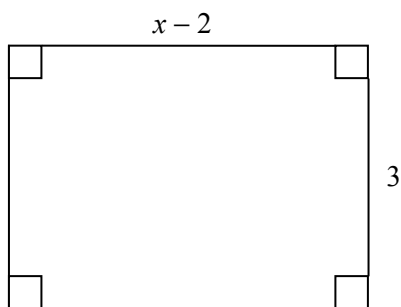
(i) the triangle,

(a)(i) _____ [1]

(ii) the rectangle.

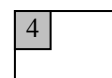
(ii) _____ [2]

(b) Look at this rectangle.



Write, without brackets, an expression for the area of this rectangle.

(b) _____ [1]



17 Each year Brentwood School hold a sponsored swim.
The money raised is shared between two charities, A and B, in the ratio 5 : 1.

(a) In 1999 a total of £1800 was raised.

How much was given to charity A?

(a) £ _____ [2]

(b) In 2000 charity A was given £1850.

How much was given to charity B?

(b) £ _____ [2]

4

18 A circular picture frame has a piece of glass in the front with radius 11 cm.

Work out the area of the glass.

Give your answer to a suitable degree of accuracy.

_____ cm² [3]

3

19 The equation $x^3 - 2x - 1 = 0$ has a solution between 1 and 2.

Use trial and improvement to find the solution correct to two decimal places.

You must show your trials.

$$x = \underline{\hspace{2cm}} \quad [4]$$

4

20 The mean weight of the 14 girls in a class is 54.2 kg.

(a) Calculate the total weight of the 14 girls.

(a) kg [1]

(b) The mean weight of the 11 boys in the class is 59.2 kg.

Calculate the mean weight of the 25 pupils in the class.

(b) kg [2]

3

21 (a) Calculate

(i) $12 \cdot 9 - 4 \cdot 4 \times 7 \cdot 8 + 1 \cdot 2$,

(a)(i) _____ [1]

(ii) $100 - \sqrt{5 \times 5 \cdot 12 - 9 \cdot 6}$.

(ii) _____ [1]

(b) Calculate the following.

The sum of the cube of $12 \cdot 5$ and the square of $4 \cdot 5$,
divided by the difference between $25 \cdot 4$ and the
reciprocal of $2 \cdot 5$

(b) _____ [1]

3

22 Solve these simultaneous equations algebraically.
Show your working.

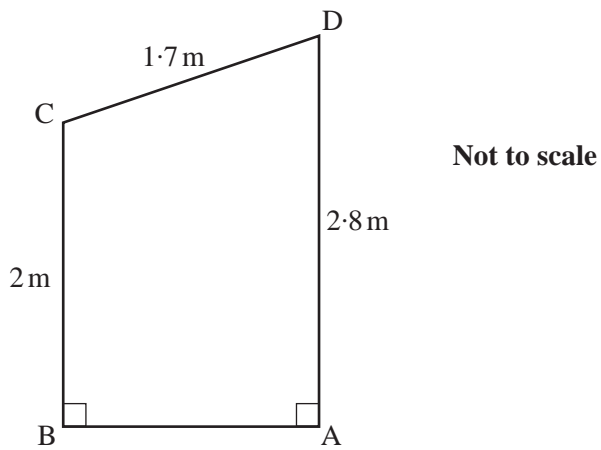
$$\begin{aligned} 2x - y &= 6 \\ 4x + 3y &= 7 \end{aligned}$$

$x =$ _____

$y =$ _____ [3]

3

- 23 The diagram shows the end, ABCD, of a shed.
The shed is standing on horizontal ground.



- (a) Calculate the area of ABCD.

(a) _____ m² [6]

- (b) Calculate the angle CD makes with the horizontal.

(b) _____ ° [3]

9

- 24 (a)** Ten years ago the population of Japan was 1.5×10^8 .
The population is now 1.1983×10^8 .

Calculate the percentage increase in the population.

(a) _____ % [2]

- (b)** The table shows the populations of three countries.

Country	Population
France	6.12×10^7
Finland	7.24×10^6
U.S.A.	2.16×10^8

- (i)** Calculate the total population of the three countries.
Give your answer to a reasonable degree of accuracy.

(b)(i) _____ [2]

- (iii)** The area of France is 213 000 square miles.

Calculate the average number of people per square mile in France.

(ii) _____ [2]

6	
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Mathematics C (Graduated Assessment)
INTERMEDIATE TIER TERMINAL PAPER

1966/2343(I)

MARK SCHEME

Specimen Paper 2003

SECTION A

1		1400 175.50×36 6318 7718	W1 M1 Long multiplication with at most 2 errors A2 Answer only W3 A1 [5]
<hr/>			
2	(a) 3 (b) $5x - 3x = 9 + 2$ 5.5	W1 M1 A1 Answer only W2 [3]	
<hr/>			
3	(a) 35000 and 50 seen $35000 \div 50$ 700 (b) $132 \div 1.5$ 88	W1 M1 A1 M2 M1 for $132 \div 1$ hour 32 mins A1 Answer only W3 [6]	
<hr/>			
4	(a) Correct reflection (b) Rotation or turn Clockwise 90° About (0, 0) (c) Correct enlargement	W1 M1 A1 A1 W3 W2 for the correct centre but the wrong size or W1 for the correct size in the wrong place or W1 for 2 correct sides in the correct place [7]	
<hr/>			
5	The scale does not start from zero The width of the bars are not the same	W1 W1 [2]	
<hr/>			
6	(a) $180 - (90 + 55)$ 35 (b) Angle between tangent and radius $= 90^\circ$	M1 A1 Answer only W2 W1 [3]	

7	(a)	7	W2	W1 for 15 or -8 seen
	(b)	-12	W2	W1 for 84 seen
[4]				
8	(a)	33.5	W1	
		34.5	W1	Accept 14.499...
	(b)	103.497 to 103.5	W1	
[3]				
9	(a)	$6x + 3 - 2x + 2$	M1	
		$4x + 5$	A1	Answer only W2
	(b)	$A - \pi r^2 = 2\pi r h$	M1	
		$h = \frac{A - \pi r^2}{2\pi r}$	A1	Answer only W2
[4]				
10		28, 25.6, 26.6	W3	Allow M1 for $\frac{27+24+31+30+28}{5}$
[3]				
11		0.6, 0.7 seen	W1	
		$0.4 \times 0.7 + 0.6 \times 0.3$	M2	
		0.46	A1	Answer only W3
[4]				
12	(a)	$xy(x + 4)$	W1	
	(b)	$\frac{2a^3b}{3}$	W2	W1 for a correct first step
	(c)	$(x + 3)(x + 4)$	M2	M1 for $(x \pm 3)(x \pm 4)$
-3 and -4		A1	Answer only W3	
[6]				

Section A total: 50

SECTION B

13	(a)	225 × 11.7 2632.5	M1 A1 Answer only W2
	(b)	680 ÷ 11.70 58.12	M1 A2 A1 for 58.11... Answer only W3 for 58.12 W2 for 58.11...
			[5]
14		Correct diagram	W3 W2 for 2 correct sectors W1 for 1 correct sector
			[3]
15	(a)	6 points plotted	W2 W1 for 4 or 5 correct
	(b)	Positive correlation or 'greater the height the greater the stride length'	W1
			[3]
16	(a)(i)	9x	W1
	(ii)	8e + 2f	W2 W1 for 4e + 4e + f + f
	(b)	3x - 6	W1
			[4]
17	(a)	1800 × $\frac{5}{6}$ 1500	M1 A1 Answer only W2
	(b)	1850 × $\frac{1}{5}$ 370	M1 A1 Answer only W2
			[4]
18		380	W3 M1 for $\pi \times 11 \times 11$
			[3]
19		One value between 1 and 2 correctly substituted An improved value correctly substituted Correct substitution of a number between 1.6 and 1.7 1.62	W1 Accept to the nearest integer or better W1 Accept to 1d.p. or better W1 Accept to 1d.p. or better W1 Dep on at least 2 other marks
			[4]
20	(a)	758.8	W1
	(b)	(14 × 54.2 + 11 × 59.2) ÷ 25	M1

56.4

A1 f.t. from (a), answer only W2

[3]

21	(a)	-20.22	W1
	(b)	96	W1
	(c)	78.935	W1

[3]

22	Multiplication of equation (1) by 3 or Multiplication of equation (1) by 2 Adding or subtracting equations	M1 M1	At least two terms correct or $y = 2x - 6$ substituted in second equation. At least two terms correct or brackets removed if substitution method used.
	$x = 2.5$ $y = -1$	A1	Answer only W1

[3]

23	(a)	0.8 seen or used	W1
		$\sqrt{(1.7^2 - 0.8^2)}$ or complete trig method	M2 Answer only W2
		$\frac{1.5}{2 + 2.8} \times 1.5$	W1 M1 for $1.7^2 - 0.8^2$ or $\sin = \frac{0.8}{1.7}$ or $\cos = \frac{0.8}{1.7}$
		3.6	A1 Answer only W4
	(b)	$\tan = \frac{0.8}{1.5}$	M2 Accept correct equivalents
		28 to 28.1	A1 Answer only W3

[10]

24	(a)	$\frac{1.1983 + 10^8 - 1.15 \times 10^8}{1.15 \times 10^8} (\times 100)$	M1	
		4.2	A1 Answer only W2	
	(b)	$6.12 \times 10^7 + 7.24 \times 10^6 + 2.16 \times 10^8$ 2.8×10^8 or 2.84×10^8	M1 A1	Intention to divide Answer only W2
	(c)	$6.12 \times 10^7 \div 213000$ 287	M1 A1	Answer only W2

[6]**Section B total: 50****Total mark available: 100**

Paper 1966 Specimen Intermediate Terminal

Question	Topic	Syll ref	Mod ref	Number	Manip Alg	Other Alg	Shape	Data	UA1	UA2	UA3	Multistep	Accuracy	Units	Eff calc	Grade E	Grade D	Grade C	Grade B	Common to H	Common to F
1	Hire purchase	H2/1a, 3c, 4a	N5.4	5					4			5				5					5
2	Simple equations	H2/5f	A5.1		3											1	2				3
3	Estimation & averages	H2/3h, H2/4a, H3/4a	N5.1, S6.8	6												3	3				6
4	Transformations	H3/1d, 3b, 3c	S4.4, S6.6, S5.7				7			3						1	6				
5	Misleading diagrams	H4/1c, 1d, 5b	D4.2					2			2						2				2
6	Circles	H3/2h	S7.1				3				1							3			
7	Substitution	H2/3a	A7.1			4										2		2			
8	Limits	H3/4a	S8.1				3											3		3	
9	Simplification and subject of formula	H2/5b, H2/5g	A8.2, A7.3		4													4		4	
10	Moving average	H4/4f	D8.4					3											3		
11	Probabilities	H4/4h	D8.1					4											4		
12	Factorising and solving equations	H2/5d, H2/5k	A8.2		6														6	5	
			Section A total	11	13	4	13	9	4	3	3	5				12	13	12	13	12	16
13	Rates of exchange	H2/4a	N5.4	5												5					
14	Symmetry	H3/3a	S5.7				3									3					3
15	Scatter diagram	H4/4a, 4c	D6.2					3									3				3
16	Expressions	H2/5b	A5.2		4						1					3	1				3
17	Ratios	H2/3d, 4a	N6.3	4													4				4
18	Area of circle	H3/4d	S6.2				3						1				2				2
19	Trial and improvement	H2/5m	A8.6			4												4		4	
20	Means	H4/1a	D5.2					3	1			2				1	2				
21	Use of calc	H2/3d	N7.1	3											3	1		2		2	
22	Simultaneous equations	H2/5l	A8.3		3														3		
23	Area, Pythagoras & trigonometry	H3/4d, H3/2f, H3/1a, H3/2g	S6.4, S7.2, S8.5				9		5			7		1				7	3	9	
24	Standard form	H2/2b, H2/3h, H2/1g	N8.5	6						1									6	6	
			Section B total	18	7	4	15	6	6	1	1	9	1	1						21	15
			Total	29	20	8	28	15	10	4	4	14	1	1	3	13	12	13	12	33	31