

**GENERAL CERTIFICATE OF SECONDARY EDUCATION
MATHEMATICS B**

J567/01

Paper 1 (Foundation Tier)

Candidates answer on the Question Paper

OCR Supplied Materials:

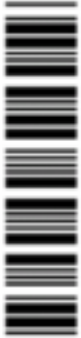
None

Other Materials Required:

- Geometrical instruments
- Tracing paper (optional)

SPECIMEN

Duration: 1 hour 30 minutes



Candidate Forename		Candidate Surname	
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Centre Number						Candidate Number				
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INSTRUCTIONS TO CANDIDATES

- Write your name clearly in capital letters, your Centre Number and Candidate Number in the boxes above.
- Use black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully and make sure that you know what you have to do before starting your answer.
- Your answers should be supported with appropriate working. Marks may be given for a correct method even if the answer is incorrect.
- Answer **all** the questions.
- Do **not** write in the bar codes.
- Write your answer to each question in the space provided.

INFORMATION FOR CANDIDATES

- The number of marks is given in brackets [] at the end of each question or part question.
- Your Quality of Written Communication is assessed in questions marked with an asterisk (*).
- The total number of marks for this paper is **100**.
- This document consists of **24** pages. Any blank pages are indicated.

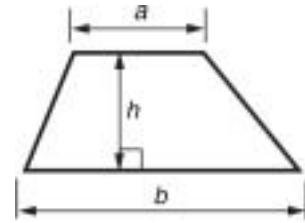
WARNING

You are **NOT** permitted to use a calculator for this paper.

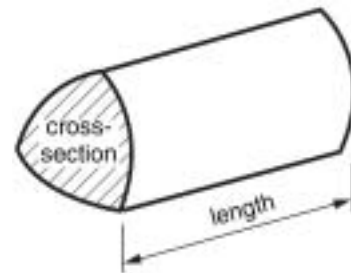


Formulae Sheet: Foundation Tier

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

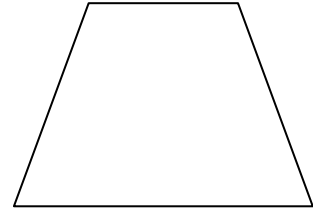
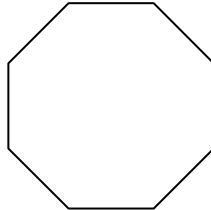
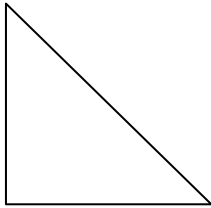
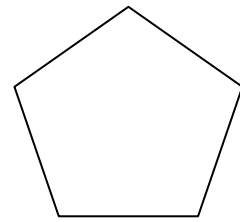
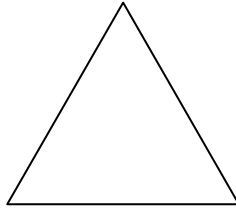
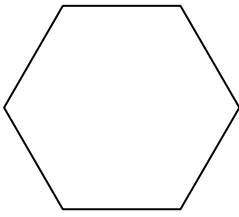


Volume of prism = (area of cross-section) \times length



PLEASE DO NOT WRITE ON THIS PAGE

1 (a) Here are six shapes.



(i) Write P inside the pentagon.

[1]

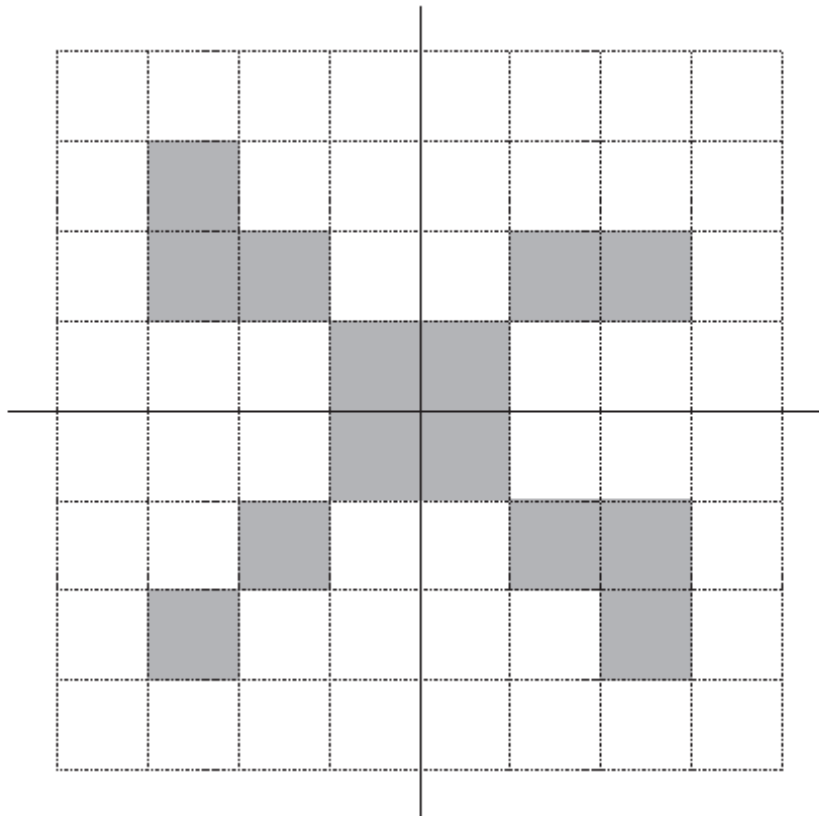
(ii) Write O inside the octagon.

[1]

(iii) Put a tick (✓) inside the shape that has rotation symmetry of order 3.

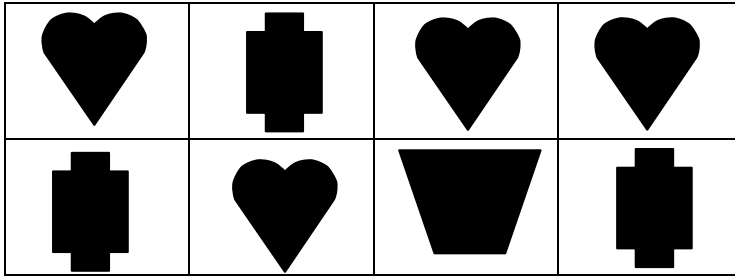
[1]

(b) Shade **two** more squares so that the shape below has two lines of reflection symmetry.



[2]

2 (a) Kezia has some cards with pictures on them.



Kezia chooses a card without looking.

Use a word from this list to complete the sentences.




certain unlikely evens likely impossible


(i) It is _____ she chooses  . [1]

(ii) It is _____ she chooses  . [1]

(iii) It is _____ she chooses  . [1]

- (b) Kezia asked a group of children what their favourite card game is.
This pictogram shows their answers.

Old Maid	
Happy Families	
Snap	
Go Fish	

Key	 = 2 children
-----	--

- (i) Ten children chose Snap.

Show this on the pictogram.

[1]

- (ii) How many children chose Go Fish?

(b)(ii) _____ [1]

3 (a) Work out.

(i) 63×100

(a)(i) _____ [1]

(ii) 137×10

(ii) _____ [1]

(iii) $95\,000 \div 10$

(iii) _____ [1]

(iv) $750 \div 100$

(iv) _____ [1]

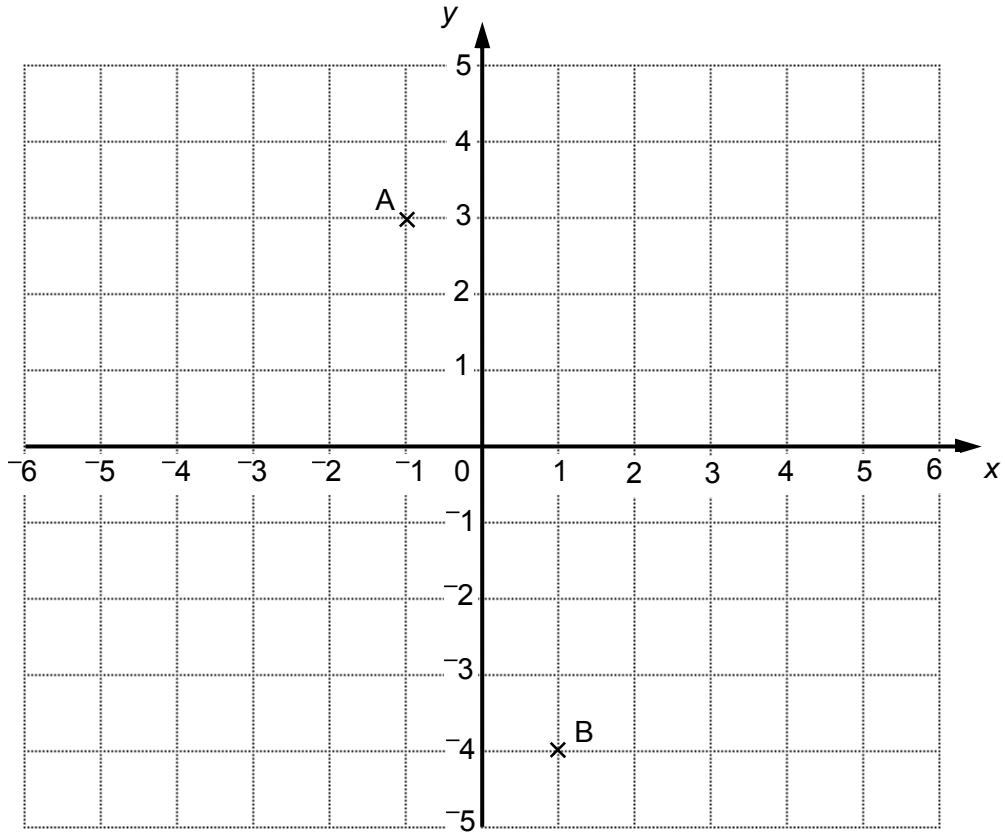
(b) (i) Write 4836 correct to the nearest 100.

(b)(i) _____ [1]

(ii) Write 2981 correct to the nearest 10.

(ii) _____ [1]

4 Here is a coordinate grid.



- (a) Plot the point $(-3, -4)$.
Label it C.

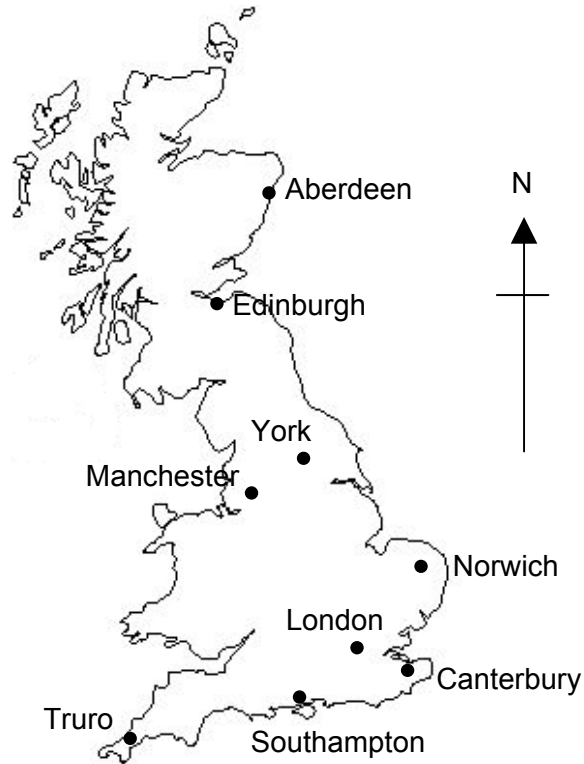
[1]

- (b) Join ABC to make a triangle.

What type of triangle is this?

(b) _____ [1]

5 (a) This is a map of Great Britain.

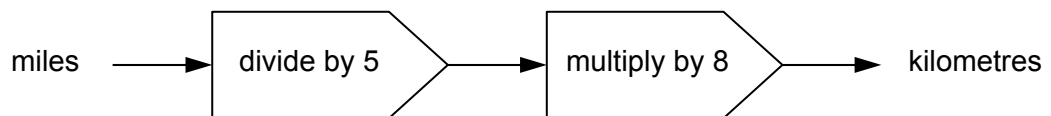


Use information from the map to complete these sentences.

(i) _____ is North East of London. [1]

(ii) Manchester is _____ of Edinburgh. [1]

(b) This formula is used to change miles into kilometres.



Janet drives 75 miles from Southampton to London.

Use the formula to work out how many kilometres she drives.

(b) _____ km [2]

(c) This table shows the distances, in miles, between some British cities.

	Southampton	Birmingham	London	Cardiff
Oxford	69	68	63	106
Manchester	226	86	201	189
Cambridge	130	98	64	200
Norwich	201	159	118	272

(i) How many miles is it from Oxford to Birmingham?

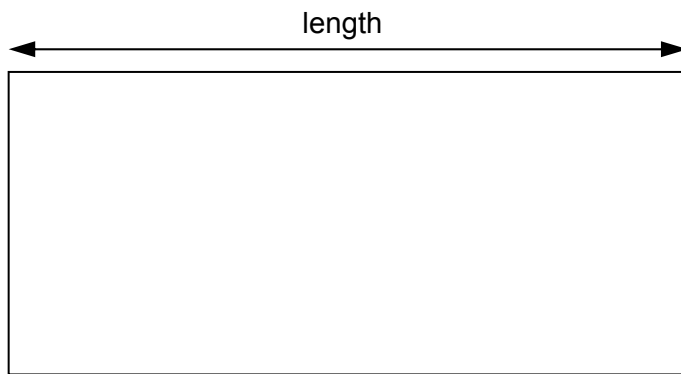
(c)(i) _____ [1]

(ii) Eddie drives from Cambridge to Birmingham and then from Birmingham to Norwich.

How many miles does he drive altogether?

(ii) _____ miles [3]

- 6 (a)** Mr Morgan and his family go on a camping holiday. This is a scale drawing of the pitch for their tent.

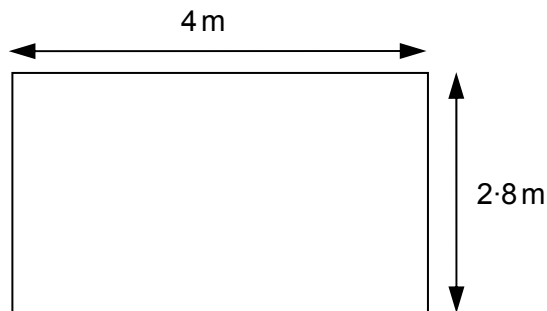


Scale: 1 cm to 1.5 m

Find the real length of the pitch.

_____ m [2]

- (b)** This is the base of Mr Morgan's tent.

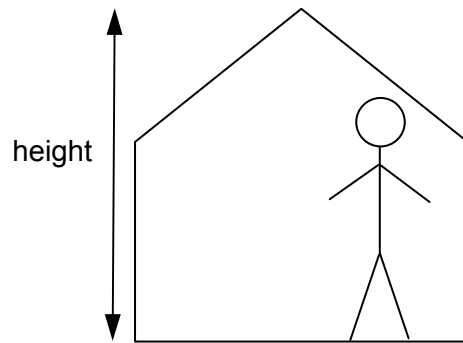


Not to scale

What is the area of the base?

(b) _____ m² [2]

(c) Mr Morgan is in his tent.



Estimate the height of the tent.

(c) _____ m [1]

(d) Mr Morgan has a bottle of water.
The bottle contained 1.5 litres of water when it was full.
He has used 850 ml.

How many millilitres of water are left in the bottle?

(d) _____ ml [2]

7 Work out.

(a) $(6 + 2) \times (12 - 3)$

(a) _____ [2]

(b) 267×28

(b) _____ [3]

(c) $5^2 - 2^3$

(c) _____ [2]

8 Here are the first five terms in a sequence of numbers.

7 11 15 19 23

- (a) What is the next term in the sequence?
Explain how you worked it out.

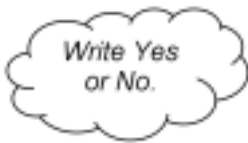
_____ because _____
_____ [2]

- (b) The 100th term in the sequence is 403.
What is the 98th term in the sequence?

(b) _____ [1]

- (c) Sahib thinks that the 50th term is 202.

Is he correct?
Explain your answer.

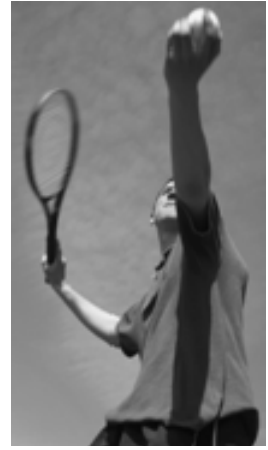


_____ because _____
_____ [1]

9 Two tennis players, Novak and Rafael, are playing a match.

- (a) During the first set Novak wins 60% of his serves.
He serves 35 times.

Work out how many serves Novak wins in the first set.



(a) _____ [2]

- (b) During the second set Rafael wins $\frac{4}{5}$ of his serves.

What percentage of his serves does Rafael win?

(b) _____ % [2]

10 (a) Gurbir records the outside temperature on four days in January.

-4 3 -5 2

Work out the median temperature.

(a) _____ [2]

(b) Ellie has a set of six cards.

She has written the temperatures Gurbir recorded on four of the cards.

-4	3	-5	2		
------	-----	------	-----	--	--

Fill in Ellie's two blank cards so that

- three of the six numbers are negative, and
- the mode of the six numbers is negative.

[2]

(c) Mtisunge has a set of five number cards.

The median of Mtisunge's five numbers is smaller than the mode.

Write down a possible set of numbers for Mtisunge's cards.

--	--	--	--	--

[2]

11 (a) *Katherine's Cars* charges a flat fee of £2.50 as well as £1.25 per mile for a taxi journey.

(i) Write a formula for the total cost, £ C , of a journey of m miles.

(a)(i) _____ [2]

(ii) Calculate the cost of a journey of 4 miles.

(ii) £ _____ [2]

(b) Another company, *Luxury Taxis*, uses the following formula to work out the charge.

$$P = 3x + 7$$

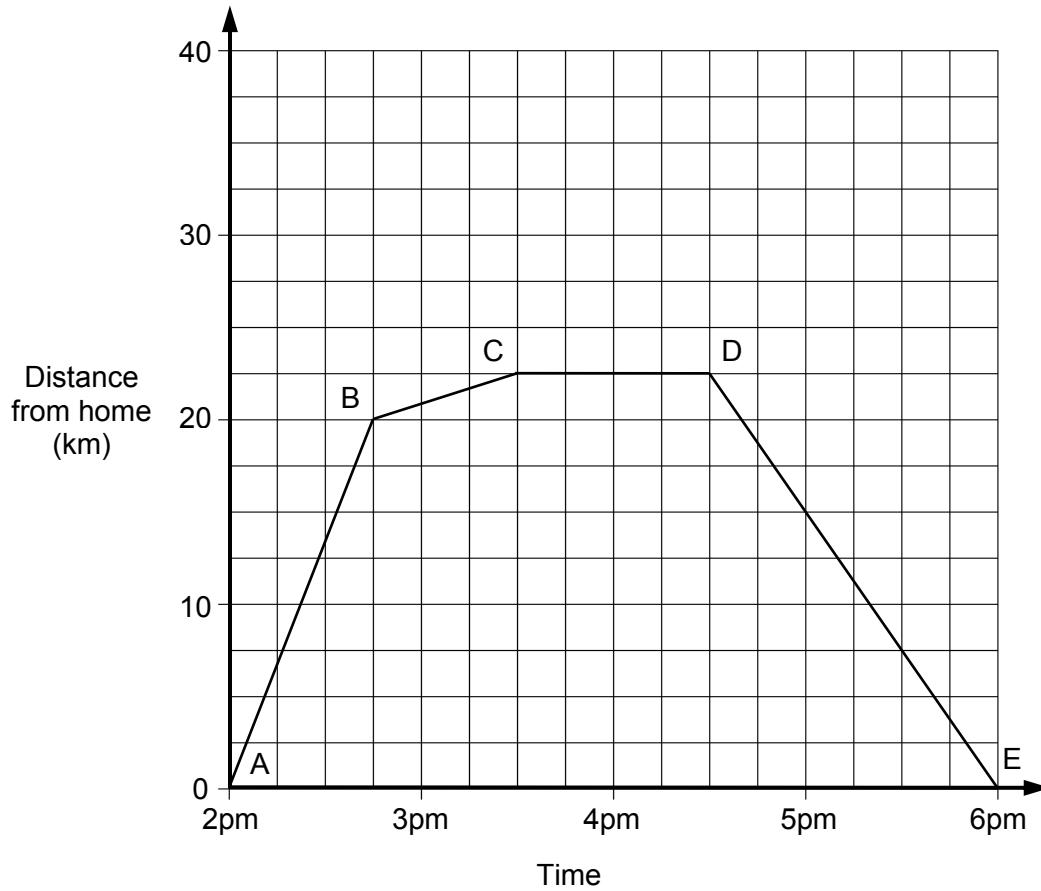
P is the cost in pounds.

x is the distance in miles.

Work out the distance, x , when $P = 25$.

(b) _____ [2]

- 12 Chung drives to a 'paint-balling' event.
Here is the distance/time graph for this journey.



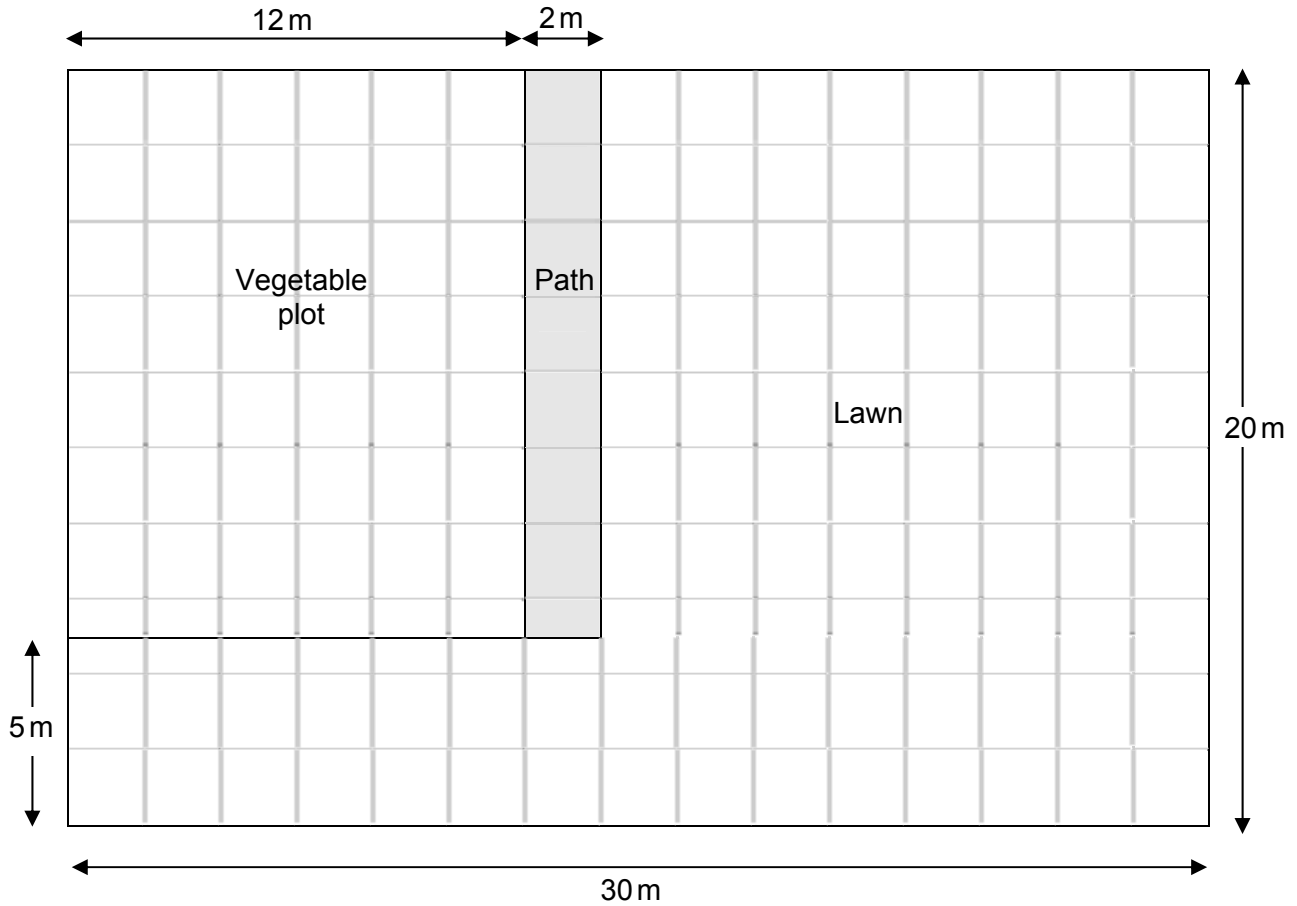
- (a) Which section of the graph shows when Chung is at the 'paint-balling' event?

(a) _____ to _____ [1]

- (b) In which section of the graph is the car travelling fastest?

(b) _____ to _____ [1]

13 Chris made this scale drawing of his garden.



(a) What scale did he use for the drawing?

(a) 1 cm to _____ [1]

(b) Work out the area of the real vegetable plot

(b) _____ m² [2]

(c) What percentage of the whole garden is used for the vegetable plot?

(c) _____ % [3]

14*

$$1 \text{ litre} = 1\frac{3}{4} \text{ pints}$$



2 pints
£0.70



4 pints
£1.40



6 pints
£2.10

Sunidra estimates that she needs $1\frac{1}{2}$ litres of milk each day.

Milk is sold in 2, 4 and 6 pint bottles, as shown above.

Sunidra wants to buy enough milk to last for a week.

Advise Sunidra which bottles of milk she should buy for the whole week.

[6]

- 15 Dave the cat meows every 6 minutes.
Poppy the cat meows every 8 minutes.
At 8:45, they both meow together.

At what time will they next meow together?

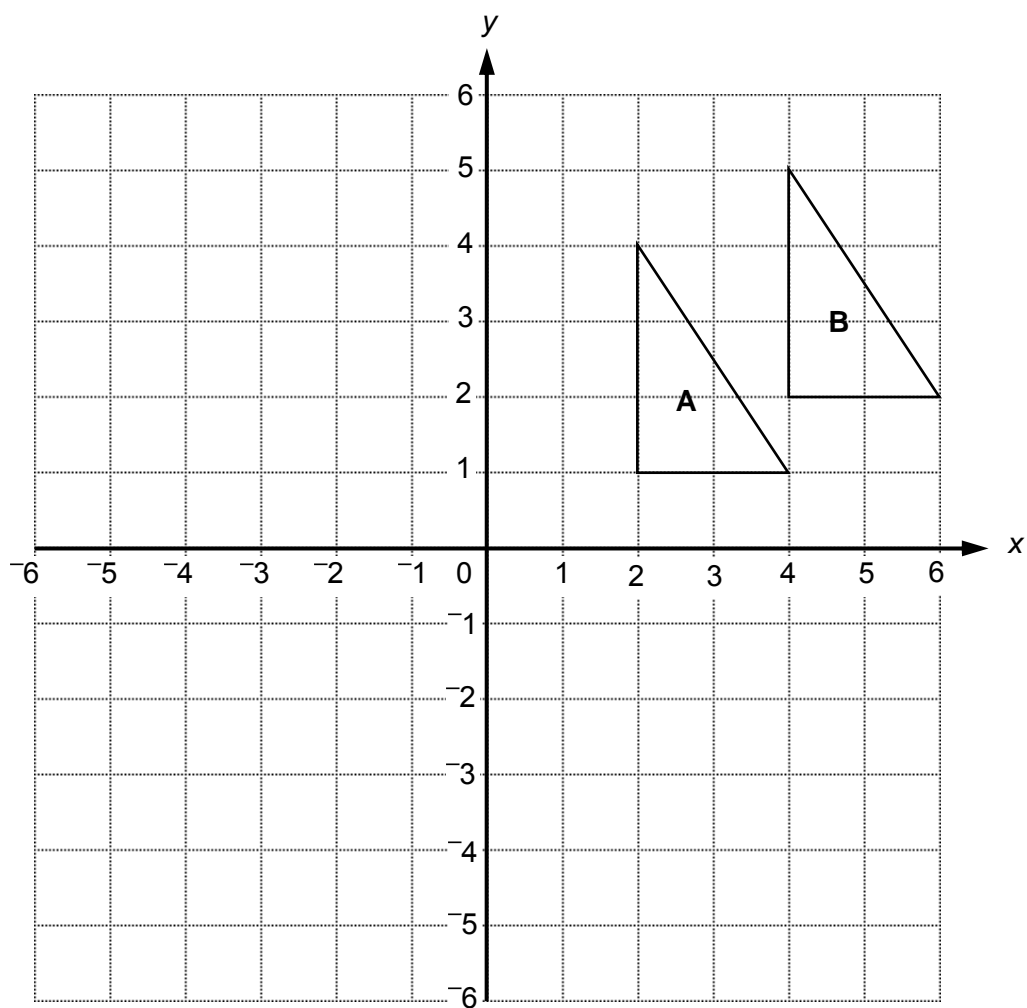
[4]

16 Estimate the answer to this calculation.

$$\frac{17.5 \times 3.8}{0.483}$$

 [2]

17



(a) Rotate triangle A by 90° clockwise about the origin.
Label the image C.

[3]

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

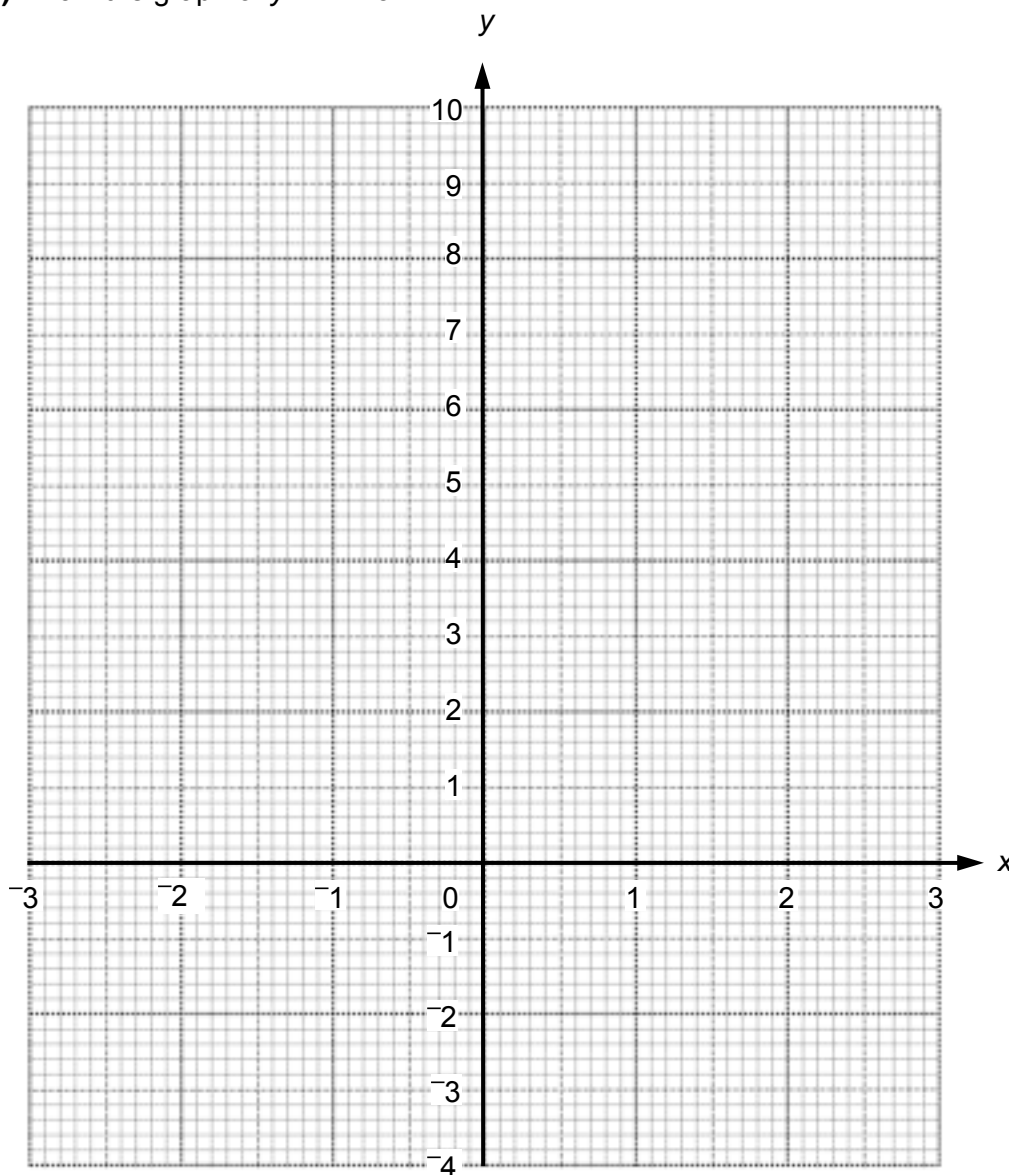
 [2]

18 (a) Complete this table for the graph of $y = x^2 - 3$.

x	-3	-2	-1	0	1	2	3
y	6	1			-2	1	6

[2]

(b) Draw the graph of $y = x^2 - 3$.



[2]

(c) Use your graph to estimate both solutions to $x^2 - 3 = 0$, correct to one decimal place.

(c) _____ [2]

19 Rearrange this formula to make h the subject.

$$P = 3h - 5$$

_____ [2]

20 Alvita has a new job in Ayrton.
Her children will go to school in Benton.

She wants to live:

- nearer to Benton than Ayrton
- less than 12 miles from Ayrton

Using a ruler and a pair of compasses, construct and shade the region where Alvita wants to live.

Scale: 1 cm represents 2 miles

Ayrton •

• Benton

[4]

TURN OVER FOR QUESTION 21

- 21** Abbie is making a lottery machine for her school. It contains five balls, numbered from 1 to 5. It has to work so that each ball has an equal probability of being selected. She tests the machine by using it 50 times. Here are her results.

Number	Relative Frequency
1	0.12
2	0.28
3	0.20
4	0.24
5	0.16

- (a)** If Abbie repeated this test, would she get the same results? Explain your answer.

[1]

- (b)** Make two comments about the results of Abbie's test.

1 _____

2 _____

[2]

Copyright Acknowledgements:

Q9 Image of male tennis player © www.istockphoto.com

Q15 Pints of milk © www.istockphoto.com

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Oxford Cambridge and RSA Examinations
General Certificate of Secondary Education

MATHEMATICS B

J567/01

Paper 1 (Foundation tier)

Specimen Mark Scheme

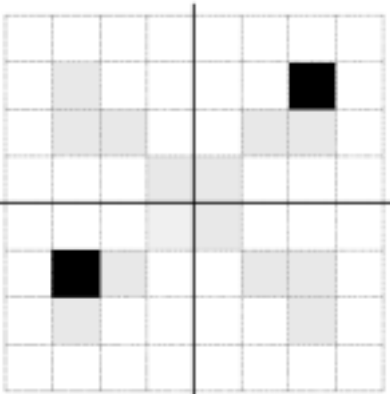
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This document consists of **7** printed pages and **1** blank page.

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1	(a)(i) Pentagon indicated	1	
	(ii) Octagon indicated	1	
	(iii) Equilateral triangle ticked	1	
	(b)	2	cao B1 for one correct with only one error or omission
			
2	(a)(i) Evens	1	
	(ii) Impossible	1	
	(ii) Unlikely	1	
	(b)(i) 5 symbols drawn	1	Clear intention
	(ii) 3	1	
3	(a)(i) 6300	1	cao
	(ii) 1370	1	cao
	(iii) 9500	1	cao
	(iv) 7.5	1	Accept 7.50
	(b)(i) 4800	1	cao
	(ii) 2980	1	cao
4	(a) C plotted	1	cao
	(b) Isosceles [triangle]	1	
5	(a)(i) Norwich	1	
	(ii) South	1	Accept S
	(b) 120	2	M1 attempt at $75 \div 5$ soi by 15
	(c)(i) 68	1	cao
	(ii) 257	3	B2 for $98 + 159$ B1 for <i>their</i> $98 + \text{their } 159$

6	(a) 13.5 oe	2	M1 for <i>their</i> 9×1.5 OR B1 fig 9 seen																						
	(b) 11.2	2	M1 attempt to multiply 4 by 2.8																						
	(c) 2 to 2.4 inclusive	1	Accept in centimetres																						
	(d) 650	2	M1 650 or 1500 seen OR SC1 0.65																						
7	(a) 72	2	B1 8 and 9 seen																						
	(b) Complete correct method which, without errors, would lead to the correct answer.	M1	The three most common methods are below: <u>Grid method:</u> <table border="1" style="margin-left: 40px;"> <tbody> <tr> <td>4000</td> <td>1200</td> <td>140</td> </tr> <tr> <td>1600</td> <td>480</td> <td>56</td> </tr> </tbody> </table> <u>Lattice/Gelosia method:</u> <table border="1" style="margin-left: 40px; text-align: center;"> <tbody> <tr> <td>0</td> <td>1</td> <td>1</td> </tr> <tr> <td>4</td> <td>2</td> <td>4</td> </tr> <tr> <td>1</td> <td>4</td> <td>5</td> </tr> <tr> <td>6</td> <td>8</td> <td>6</td> </tr> </tbody> </table> <div style="margin-left: 40px;"> <table style="border: none;"> <tr> <td style="padding: 0 10px;">7</td> <td style="padding: 0 10px;">4</td> <td style="padding: 0 10px;">7</td> <td style="padding: 0 10px;">6</td> </tr> </table> </div> <u>Long Multiplication method:</u> $\begin{array}{r} 267 \\ \underline{28} \times \\ 2136 \\ \underline{5340} \\ 7476 \end{array}$	4000	1200	140	1600	480	56	0	1	1	4	2	4	1	4	5	6	8	6	7	4	7	6
4000	1200	140																							
1600	480	56																							
0	1	1																							
4	2	4																							
1	4	5																							
6	8	6																							
7	4	7	6																						
	2136, 5340, 196, 1680 or 5600 seen, or 4 correct values from 4000, 1200, 140, 1600, 480, 56 seen, or 4 correct boxes in grid method, or 4 correct boxes in lattice/Gelosia method and attempt to add. 7476	B1																							
		A1	SC1 7476 without working																						
	(c) 17 without wrong working	2	B1 25 or 8 seen																						

8	(a) 27 Add 4 [to previous term] oe	1 1	Or correct formula for n th term $(4n + 3)$
	(b) 395	1	
	(c) No because (eg) terms are all odd numbers	1	
9	(a) 21	2	M1 for correct working seen, eg finds 10% [soi by 3·5] and attempt to multiply <i>their</i> 3·5 by 6
	(b) 80	2	B1 for $\frac{8}{10}$ or $\frac{80}{100}$ seen
10	(a) $\bar{1}$	2	M1 Attempt to find mean of $\bar{4}$ and 2
	(b) $\bar{5}$ or $\bar{4}$ and a non-negative number $\neq 2$ or 3	2	B1 if only one condition met
	(c) Any correct answer	2	B1 if one error
11	(a) $C = 2\cdot5[0] + 1\cdot25m$	2	B1 C omitted
	(b) 7·50 www	2	B1 $4 \times 1\cdot25$ or £5 seen
	(c) 6 www	2	B1 $3x = 21 - 3$ or better
12	(a) C to D	1	
	(b) A to B	1	
13	(a) 2m	1	
	(b) 180	2	M1 $12 \times \textit{their} 15$
	(c) 30	3	M1 $(\textit{their} 180) \div (\textit{their} 20 \times 30)$ M1 $\frac{30}{100}$

<p>14 *</p>	<p>Complete correct calculation to find $18\frac{3}{8}$ pints required, and rounds up to 20. Indicates with correct and clear language that as the bottles have the same unit cost it does not matter which combination is chosen, and gives at least one combination for 20 pints.</p> <p>Correct method but incomplete or containing a minor error - but if followed without errors, would lead to $\frac{147}{8}$ or $18\frac{3}{8}$. Provides a brief comment saying that it does not matter which combination is chosen but without a clear reason. Gives a combination for <i>their</i> answer.</p> <p>Correctly converts both mixed numbers to improper fractions, or correctly multiplies one of the mixed numbers by 7 and attempts to multiply the result by the other fraction. Weak comment concerning the price of the bottles.</p> <p>No relevant calculations or comments.</p>	<p>6-5</p> <p>4-3</p> <p>2-1</p> <p>0</p>	<p>For the lower mark, there may be one minor slip in the arithmetic at any stage, or weaker explanation.</p> <p><u>Examples of combinations:</u></p> <p>6, 6, 6, 2 6, 6, 4, 4 6, 6, 2, 2, 2, 2 6, 4, 4, 4, 2 6, 4, 4, 2, 2, 2 6, 2, 2, 2, 2, 2, 2 4, 4, 2, 2, 2, 2, 2 2, 2, 2, 2, 2, 2, 2, 2, 2</p> <p><u>Example of working:</u></p> $1\frac{1}{2} = \frac{3}{2} \text{ and } 1\frac{3}{4} = \frac{7}{4}$ $\frac{3}{2} \times \frac{7}{4} = \frac{21}{8}$ $\frac{21}{8} \times 7 \text{ (days)} = \frac{147}{8}$ $18\frac{3}{8}$ <p>For the lower mark, more than one error is present in the working, or comment is missing or has several errors in spelling, punctuation and grammar, or no combination for <i>their</i> answer.</p> <p>For the lower mark, as 2 but with errors in the conversion or in the multiplication, or limited comment which may have poor spelling, punctuation and grammar.</p>
<p>15</p>	<p>9:09 www</p>	<p>4</p>	<p>B2 24 identified (as LCM) OR B1 Multiples of 6 and 8 (or prime factors) seen AND M1 8:45 + <i>their</i> 24 minutes</p>
<p>16</p>	$\frac{20 \times 4}{0.5} = 160$	<p>2</p>	<p>M1 Two of the three numbers correctly rounded to 1sf</p>

17	(a) Correct rotation to triangle with vertices $(1, -2), (4, -2), (1, -4)$	3	B2 for rotation 90° anticlockwise about origin OR B1 for rotation 90° clockwise about incorrect centre
	(b) Translation $\begin{bmatrix} 2 \\ 1 \end{bmatrix}$	1 1	Accept "2 right 1 up"
18	(a) $-2, -3$	2	B1 each
	(b) All points plotted accurately and joined with a smooth curve	2	M1 five points plotted accurately Allow ± 1 mm accuracy ft <i>their</i> table for 2 marks
	(c) $1.6 - 1.8$ and $-1.6 - -1.8$	2	B1 each ft <i>their</i> smooth curve (± 0.1)
19	$h = \frac{P+5}{3}$ oe	2	M1 $h = \frac{P-5}{3}$ or $h = \frac{P}{3} - 5$
20	Correct perpendicular bisector of AB with correct construction arcs and part circle radius 6 cm, centre A and correct region shaded	4	Allow tolerance of ± 2 mm in measurements and allow circle to be sufficiently drawn to intersect the perpendicular bisector of AB twice. M1 for perpendicular bisector of AB with correct construction arcs AND M2 part circle radius 6 cm centre A OR M1 12 miles = 6 cm soi OR SC1 part circle radius 12 cm centre A
21	(a) She is [extremely] unlikely to get the same result [because of a large number of combinations]	1	Accept any correct statement including 'she will not get the same results'
	(b) Not very close together, or not close to 0.2, or '2' occurs twice more than '1' Too few trials to be sure, or she needs to do more trials oe	1 1	Accept any correct statement Accept any correct statement 'More numbered balls' is not enough

Paper Total : 100 marks

Assessment Objectives and Functional Elements Grid

GCSE MATHEMATICS B

J567/01

Mathematics B Paper 1 (Foundation Tier)

	Topic	Context	Ref	AO1	AO2	AO3	Functional
1	Recognising shapes, symmetry		FIG4, FBG7, FIG7	5			
2	Probability vocabulary, pictogram	Cards	FIS1, FIS4	5			
3	Powers of 10		FIN3, FIN1	6			
4	Coordinates		FIA4	2			
5	Maps, function machines, two-way tables	British cities	FIG6, FIA3, FIS5	3	5		3
6	Units, estimating, area	Camping	FIG1, FIG2, FIG5, FBG6		7		5
7	Brackets, multiplication, index notation		FIN11, FIN4, FBN3	7			
8	Sequences		FBA1	3		1	
9	Percentages and fractions	Tennis	FIN7, FBN6		4		4
10	Using averages		FBS2	2		4	
11	Formulae and equations	Taxi	FBA2, FBA4		6		6
12	Interpret distance-time graph	Paintballing	FBA.5		2		
13	Scale drawing, area, percentage	Plan of garden	FBG6, FSN2	3	3		3
14	Calculations with mixed numbers	Milk	FGN2			6	6
15	LCM	Cats	FGN6, FIN10			4	
16	Estimate answer to calculation		FGN5	2			
17	Transformations		FSG6	5			
18	Quadratic graph		FGA6	6			
19	Change subject of formula		FGA3	2			
20	Construction of locus	Finding where to live	FGG6		4		4
21	Relative frequency	Lottery machine	FGS1		3		
	TOTALS			51	34	15	31

Paper Total: 100 marks

