



OXFORD CAMBRIDGE AND RSA EXAMINATIONS
General Certificate of Secondary Education

MATHEMATICS B

J567/02

Paper 2 (Foundation Tier)

Additional Specimen Mark Scheme

The maximum mark for this paper is **100**.

This document consists of **9** printed pages and **1** blank page.

Marking Instructions

1. Mark strictly to the mark scheme.
2. Make no deduction for omission of units except as indicated on the mark scheme.
3. Work crossed out but not replaced should be marked.
4. M (method) marks are not lost for purely numerical errors.
A (accuracy) marks depend on preceding M (method) marks. Therefore M0 A1 cannot be awarded.
B (independent) marks are independent of M (method) marks and are awarded for a correct final answer or a correct intermediate stage.
5. Subject to 4, two situations may be indicated on the mark scheme conditioning the award of A marks or independent marks:
 - Correct answer obtained without wrong working
 - Follows correctly from a previous answer whether correct or not (“ft”).
6. As a general principle, if two or more methods are offered, mark only the method that leads to the answer on the answer line. If two (or more) answers are offered, mark the poorer (poorest).
7. Always mark the greatest number of significant figures seen, even if this is then rounded or truncated on the answer line, unless the question asks for a specific degree of accuracy.
8. If the correct answer is seen in the body and the answer given in the answer space is a clear transcription error allow full marks unless the mark scheme says ‘mark final answer’ or ‘cao’. If the answer is missing but the correct answer is seen in the body allow full marks. If the correct answer is seen in the working but a completely different answer is seen in the answer space then accuracy marks for the answer are lost. Method marks would normally be given.
9. Where there is clear evidence of a misread, and this does not affect the nature or difficulty of the question, a penalty of 1 mark is generally appropriate. This may be achieved by awarding M marks but not an A mark, or awarding one mark less than the maximum.
10. For methods not provided for in the mark scheme give as far as possible equivalent marks for equivalent work.
11. For answers scoring no marks, you must either award NR (no response) or 0, as follows:

Award NR if:

- Nothing is written at all in the answer space
- There is any comment which does not in any way relate to the question being asked (“can’t do”, “don’t know”, etc.)
- There is any sort of mark that is not an attempt at the question (a dash, a question mark, etc.)

Award 0 if:

- There is any attempt that earns no credit. This could, for example, include the candidate copying all or some of the question, or any working that does not earn any marks, whether crossed out or not.
12. Where a follow through (ft) mark is indicated on the mark scheme for a particular part question, you must ensure that you refer back to the answer of the previous part question.
 13. Anything in the mark scheme which is in square brackets [...] is not required for the mark to be earned, but if present it must be correct.

Abbreviations

The following abbreviations are commonly found in GCSE Mathematics mark schemes.

- Where you see **oe** in the mark scheme it means **or equivalent**.
- Where you see **isw** in the mark scheme it means **ignore subsequent working**.
- Where you see **www** in the mark scheme it means **without wrong working**.
- Where you see **cao** in the mark scheme it means **correct answer only**.
- Where you see **soi** in the mark scheme it means **seen or implied**.
- Where you see **rot** in the mark scheme it means **rounded or truncated**.
- Where you see **seen** in the mark scheme it means that you should award the mark if that number/expression is seen anywhere in the answer space, including on the answer line, even if it is not in the method leading to the final answer.
- Where you see **figs 237**, for example, this means any answer with only these digits. You should ignore leading or trailing zeros and any decimal point e.g. 237000, 2·37, 2·370, 0·00237 would be acceptable but 23070 or 2374 would not

1	(a)	Labels on horizontal axis Lines numbered on the vertical axis to form a linear scale Correct bar heights	1 1 2	Allow labels on the bars Condone a minimum of two numbers providing it forms the correct linear scale Or B1 for 3 correct heights Mark intent and condone different bar widths
	(b)	One correct comment eg the most popular animal is the dog	1	Allow any correct comment, eg there are 24 students in the class
2	(a)	6800	2	B1 for 6807·98
	(b)	420	2	M1 for 84 or 3360 seen
3	(a)	Radius Chord	1 1	
	(b)	[regular] hexagon	1	
4	(a)	22	1	
	(b)	Add 4	1	Or 'goes up by 4' etc but must have direction as well as 4
	(c)	42	1	
	(d)	All terms are even and 399 is odd	1	Mark for identifying it is an odd number
5	(a)	$7a$	1	
	(b)	$8x - 4y$	2	B1 for $8x$ or $-4y$
6	(a)	189	1	
	(b)	7·75	2	M1 for 7·745(9...)
7	(a)	(i) 9	1	
		(ii) 16	2	M1 for a valid method, eg look up 12 (to get 8) even if they fail to double it
	(b)	(i) 32	1	
		(ii) 46	3	M1 for adding up the numbers (368) M1 for ' <i>their</i> 368' ÷ ' <i>their</i> 8'

8	$2x - 6 = 9$ $2x = 15$ $x = 7.5$ In this order only	B1 B1 B1	<u>Alternative method:</u> B2 for $x - 3 = 4.5$ B1 for $x = 7.5$ In this order only For each wrong step, deduct one from the marks for the question, to a minimum of 0 marks
9	(a) $(x =) 33$ <u>and</u> angles on a straight LINE add to 180 $(y =) 134$ <u>and</u> angles at a POINT add to 360 $(z =) 63$ <u>and</u> angles at the base of an ISOSCELES triangle are equal	2 2 2	1 for angle and 1 for reason in each CAPS terms must be present in reason
	(b) No <u>and</u> angles in a quadrilateral add to 360 (or not 380)	1	"Quad" <u>and</u> "360" <u>or</u> "not 380" must be present
10	47 38 1.17 2.34 2.6	5	B1 for each answer
11	(a) 2 5 10 25 and no extras	2	Condone any number appearing more than once 1 for two or three correct
	(b) 36	1	
	(c) (i) $\frac{1}{12}$	1	
	(ii) $\frac{4}{12}$ oe	2	B1 for 4 or for 2 of 25, 36 or 100
	(iii) $\frac{6}{12}$ oe	2	B1 for 6 or for 3 of 2, 3, 5, 7, 11, 17

12	(a) (i) 6	1	
	(ii) 16	2	M1 for clear attempt at $9000 \div 575$ or $15 \cdot 6(5\dots)$ seen
	(b) (i) 190	2	M1 for $(0) \cdot 125 \times 1400 + 15$ or 175 seen
	(ii) 1160	3	M2 for a correct method eg $160 - 15$ then divide by $(0) \cdot 125$ Or M1 for a correct 'trial' with cost eg 1200 and £165 (trial cannot be 1400 cubes)
13	(a) 50	1	
	(b) (i) <i>makes 72 (not required)</i> 1000 400 500 12	4	1 for each correct answer (allow 1 litre for water if units stated) If 0 scored, M1 for $\times 4$ soi Or SC2 for 333, 133, 166(7) and 4 Or SC1 for 2 of the above
	(ii) No <u>and</u> $1000 < 1200$ oe	2	M1 for $300 \times 4 (= 1200)$ Accept any correct statement with correct evidence that they do not have enough cream
14	19·04 www	4	M3 for $4 \cdot 2 \times 3 \cdot 4 + 2 \cdot 8 \times (5 \cdot 1 - 3 \cdot 4)$ oe or $5 \cdot 1 \times 2 \cdot 8 + 3 \cdot 4 \times (4 \cdot 2 - 2 \cdot 8)$ oe or $5 \cdot 1 \times 4 \cdot 2 - (5 \cdot 1 - 3 \cdot 4) \times (4 \cdot 2 - 2 \cdot 8)$ oe OR M1 for $3 \cdot 4 \times 4 \cdot 2 [= 14 \cdot 28]$ M1 for $2 \cdot 8 \times 1 \cdot 7 [= 4 \cdot 76]$ M1 for attempt to add <i>their</i> two areas <u>Alternative method:</u> M1 for $5 \cdot 1 \times 2 \cdot 8 [= 14 \cdot 28]$ M1 for $3 \cdot 4 \times 1 \cdot 4 [= 4 \cdot 76]$ M1 for attempt to add <i>their</i> two areas <u>Alternative method:</u> M1 for $5 \cdot 1 \times 4 \cdot 2 [= 21 \cdot 42]$ M1 for $1 \cdot 4 \times 1 \cdot 7 [= 2 \cdot 38]$ M1 for attempt to subtract <i>their</i> two areas

15	<p>More young males prefer the gym or the older the males the less they prefer the gym <u>and</u> Middle aged women like the cinema less than the other age groups <u>and</u> Older people prefer the cinema to the other two</p>	3	<p>Accept each correct statement for 1 mark to a maximum of 3 Allow two statements about each strata eg allow two statements about Males</p>																												
16	(a) Δ with vertices at (1, 0), (-3, 0) and (1, 2)	3	<p>M2 for rotation about (2, 0) through 90° clockwise or M1 for rotation through 90° anticlockwise about wrong centre</p>																												
	(b) Yes, same shape and size	1	<p>Or "exactly the same, just rotated"</p>																												
17	<p>(a) <table style="display: inline-table; border-collapse: collapse; vertical-align: middle;"> <tr><td style="border-right: 1px solid black; padding: 0 5px;">2</td><td style="padding: 0 5px;">3</td><td style="padding: 0 5px;">5</td><td style="padding: 0 5px;">7</td><td style="padding: 0 5px;">8</td><td style="padding: 0 5px;"></td><td style="padding: 0 5px;"></td></tr> <tr><td style="border-right: 1px solid black; padding: 0 5px;">3</td><td style="padding: 0 5px;">0</td><td style="padding: 0 5px;">1</td><td style="padding: 0 5px;">2</td><td style="padding: 0 5px;">5</td><td style="padding: 0 5px;">6</td><td style="padding: 0 5px;">7</td></tr> <tr><td style="border-right: 1px solid black; padding: 0 5px;">4</td><td style="padding: 0 5px;">0</td><td style="padding: 0 5px;">1</td><td style="padding: 0 5px;">2</td><td style="padding: 0 5px;">4</td><td style="padding: 0 5px;">8</td><td style="padding: 0 5px;"></td></tr> <tr><td style="border-right: 1px solid black; padding: 0 5px;">5</td><td style="padding: 0 5px;">1</td><td style="padding: 0 5px;">2</td><td style="padding: 0 5px;">2</td><td style="padding: 0 5px;">3</td><td style="padding: 0 5px;">6</td><td style="padding: 0 5px;"></td></tr> </table></p>	2	3	5	7	8			3	0	1	2	5	6	7	4	0	1	2	4	8		5	1	2	2	3	6		3	<p>M2 if correct except for one error or omission Or M1 for unordered leaves with at most one error or omission</p>
2	3	5	7	8																											
3	0	1	2	5	6	7																									
4	0	1	2	4	8																										
5	1	2	2	3	6																										
	(b) 33	1																													
	(c) 38.5	2	<p>M1 for at least one of 37 and 40 identified</p>																												
18	(a) 11.5 to 11.6	3	<p>M2 for 1150 to 1160 Or M1 for $3 \text{ cm} \times (180 \text{ to } 183)$ M1 for correct conversion of their growth to metres and adding 6.1</p>																												
	(b) 13.5	1																													
	(c) 5457 or 5460	3	<p>M2 for 5100×1.07 Or M1 for 5100×0.07 M1 for $5100 + \text{their } 7\% \text{ of } 5100$ Allow A1 for 5500 only if correct method seen</p>																												

19	(a) 2 : 15	2	M1 for 6 : 45 or 10 : 75 or $2/15 : 1$ or $1 : 7.5$ or for 2 ml : 15 ml
	(b) 360	2	M1 for 120 seen or for $240 \times \frac{3}{2}$ oe
	<p>(c) Yes with correct and clearly expressed supporting method showing volume of tea in pot and volume required for 4 mugs</p> <p>Volume of tea in pot found and volume required for 4 mugs but decision not clear</p> <p>SC: allow 4 marks for complete solution of problem with 8.4 used instead of 7.4 [volume of 1 mug = 323 to 324 ml, and of 4 mugs = 1292 to 1296 ml]</p> <p>Volume of 1 mug or volume of pot</p> <p>Incorrect answer with no relevant content</p>	<p>5</p> <p>4-3</p> <p>2-1</p> <p>0</p>	<p>Including clearly stated units</p> <p>For lower mark - Volume of pot = $11 \times 11 \times 12 = 1452$ ml <u>and</u> volume of one mug = $\pi \times 3.5^2 \times 7.4 = 284$ to 285 ml or for volume of 4 mugs = 1132 to 1140 [ml] but not volume of pot</p> <p>For lower mark – correct method for volume of pot or correct method for volume of mug</p>

Paper Total: 100

Assessment Objectives and Functional Elements Grid

GCSE MATHEMATICS B

J567/02 - Paper 2 (Foundation Tier)

	Topic	Context	Ref	AO1	AO2	AO3	Functional
1	Bar chart	Favourite animals	FIS4		5		
2	Rounding; fraction of a quantity		FIN1 FIN4 FIN5	4			
3	Recognising shapes		FSG3 FIG4	3			
4	Sequences		FIA1 FBA1	4			
5	Simplification		FBA3	3			
6	Using a calculator; significant figures		FIN11 FBN3 FBN2	3			
7	Conversion graph; averages	£ and \$	FIS3 FIA5	5	2		2
8	Equations		FBA4	3			
9	Angles		FIG3 FBG1 FBG2	7			
10	Number operations	Shopping bill	FIN9			5	5
11	Factors and multiples; probability		FBN1 FBS1	8			
12	Formulae	Ordering cubes	FIA2 FBA2 FSA2		8		8
13	Proportion	Profiteroles	FIG1 FBN9		5	2	7
14	Area of a compound shape		FSG4	4			
15	Comparing distributions		FIS5 FBS3 FSS3			3	3
16	Rotation; congruence		FSG6	4			
17	Stem and leaf	Car speeds	FSS3	3	3		
18	Length/time problem; lower bounds; percentage change	Whales	FSN6 FGG1 FGN4	1	3	3	
19	Ratio; volume of cuboid and cylinders	Cups, teapots and mugs	FSN5 FGG5	2	2	5	7
TOTALS				54	28	18	32

Paper Total: 100 marks

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