

Mathematics C (Graduated Assessment)

General Certificate of Secondary Education

Unit **B273/01**: Module M3 (Sections A&B)

Mark Scheme for January 2012

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All examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

Mark schemes should be read in conjunction with the published question papers and the report on the examination.

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Annotations

Annotation	Meaning
✓	Correct
✗	Incorrect
BOD	Benefit of doubt
FT	Follow through
ISW	Ignore subsequent working (after correct answer obtained), provided method has been completed
M0	Method mark awarded 0
M1	Method mark awarded 1
M2	Method mark awarded 2
A1	Accuracy mark awarded 1
B1	Independent mark awarded 1
B2	Independent mark awarded 2
MR	Misread
SC	Special case
^	Omission sign

These should be used whenever appropriate during your marking.

The **M**, **A**, **B** etc annotations must be used on your standardisation scripts for responses that are not awarded either 0 or full marks.

It is vital that you annotate these scripts to show how the marks have been awarded.

It is not mandatory to use annotations for any other marking, though you may wish to use them in some circumstances.

Subject-specific Marking Instructions

- i. **M** marks are for using a correct method and are not lost for purely numerical errors.
A marks are for an accurate answer and depend on preceding **M** (method) marks. Therefore **M0 A1** cannot be awarded.
B marks are independent of **M** (method) marks and are for a correct final answer, a partially correct answer, or a correct intermediate stage.
SC marks are for special cases that are worthy of some credit.
- ii. Unless the answer and marks columns of the mark scheme specify **M** and **A** marks etc, or the mark scheme is 'banded', then if the correct answer is clearly given and is not from wrong working **full marks** should be awarded.

Do not award the marks if the answer was obtained from an incorrect method, ie incorrect working is seen and the correct answer clearly follows from it.

- iii. Where follow through (**FT**) is indicated in the mark scheme, marks can be awarded where the candidate's work follows correctly from a previous answer whether or not it was correct.


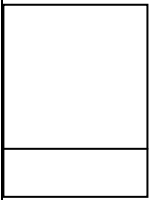
Figures or expressions that are being followed through are sometimes encompassed by single quotation marks after the word *their* for clarity, eg FT $180 \times (\textit{their} '37' + 16)$, or FT $300 - \sqrt{(\textit{their} '5^2 + 7^2)}$. Answers to part questions which are being followed through are indicated by eg FT $3 \times \textit{their} (a)$.

For questions with FT available you must ensure that you refer back to the relevant previous answer. You may find it easier to mark these questions candidate by candidate rather than question by question.

- iv. Where dependent (**dep**) marks are indicated in the mark scheme, you must check that the candidate has met all the criteria specified for the mark to be awarded.
- v. The following abbreviations are commonly found in GCSE Mathematics mark schemes.
- **figs 237**, for example, means any answer with only these digits. You should ignore leading or trailing zeros and any decimal point eg 237000, 2.37, 2.370, 0.00237 would be acceptable but 23070 or 2374 would not.
 - **isw** means **ignore subsequent working** (after correct answer obtained).
 - **nfw** means **not from wrong working**.
 - **oe** means **or equivalent**.
 - **rot** means **rounded or truncated**.
 - **seen** means that you should award the mark if that number/expression is seen anywhere in the answer space, including the answer line, even if it is not in the method leading to the final answer.
 - **soi** means **seen or implied**.
- vi. Make no deductions for wrong work after an acceptable answer unless the mark scheme says otherwise, indicated for example by the instruction 'mark final answer'.
- vii. 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).
- viii. When the data of a question is consistently misread in such a way as not to alter the nature or difficulty of the question, please follow the candidate's work and allow follow through for **A** and **B** marks. Deduct 1 mark from any **A** or **B** marks earned and record this by using the **MR** annotation. **M** marks are not deducted for misreads.

- ix. Unless the question asks for an answer to a specific degree of accuracy, always mark at the greatest number of significant figures even if this is rounded or truncated on the answer line. For example, an answer in the mark scheme is 15.75, which is seen in the working. The candidate then rounds or truncates this to 15.8, 15 or 16 on the answer line. Allow full marks for the 15.75.
- x. 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'. Place the annotation ✓ next to the correct answer.
- If the answer space is blank but the correct answer is seen in the body allow full marks. Place the annotation ✓ next to the correct answer.
- 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 still be awarded. Use the M0, M1, M2 annotations as appropriate and place the annotation ✗ next to the wrong answer.
- xi. Ranges of answers given in the mark scheme are always inclusive.
- xii. For methods not provided for in the mark scheme give as far as possible equivalent marks for equivalent work. If in doubt, consult your Team Leader.
- xiii. 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.

Question		Answer	Marks	Part marks and guidance	
1	(a)	85	1		
	(b)	42.5(0)	1		
	(c)	(0, 0) (10, 8.5) (50, 42.5) (100, 85) plotted Straight line from (0, 0) to (100, 85)	1FT 1FT	Two points plotted correctly FT straight line only	FT their table
	(d)	80 to 84	1		
2	(a)	3.2	1		
	(b)	14	1		
3		(50% is) 16 (5% is) 1.6 (55% is) 17.6	1 1FT 1FT	<i>Their</i> 16 ÷ 10 correct <i>Their</i> 16 + <i>their</i> 1.6 correct	
4	(a)	130	2	M1 for 40 × 2.5 or 100 seen or “x minutes” + 30 Allow B1 for 80 or 20 seen If 0, SC1 for 2h 10min	x ≠ 44 or 22 or 25 Not 2.10
	(b)	10:30	3FT	M1 for <i>their</i> 130 + 20 (150) M1 for <i>their</i> 150 in hours and minutes (2 hours 30 minutes) or clear attempt to “count back” from 1 o'clock. A1 for <i>their</i> 10:30 without further error	Hrs and min intended eg 2:30. 2.30

Question		Answer	Marks	Part marks and guidance	
5	(a)		1	All three lines drawn. Condone missing line (shown dotted) but if any other wrong lines, score 0 .	Condone un-ruled and mark intent
	(b)		2	B1 for complete rectangle 3cm by 4cm B1 for horizontal line 1cm from lowest line of outline	Condone un-ruled and mark intent
	(c) (i)	300	2	Accept 0.3(00) litres M1 for 15×20 oe or figs 3 as answer	If 0.3 must state <u>litres</u> . $0.02(0) \times 15$
	(ii)	200	1FT	FT 500 – <i>their</i> 300	
	(d)	26	1		
6	(a)	$\frac{8}{16}$ oe	1	Do not accept ratio form eg 16 : 8	Accept percentage (50%) or decimal (0.5) For Q. 6 penalise once only first use of words such as “out of” or “in”
	(b)	Right, correct or yes and Bag B or A: $P(\text{red}) = \frac{4}{8}$ oe [These are] both the same or both = $\frac{1}{2}$ or 50% or “evens” or 0.5	1 1	Mark the reason if “right” oe is seen If 0 , allow B1 for $\frac{1}{2}$ or “a half” or 50% or 50-50 (words) or “evens” or 0.5 seen	

Question		Answer	Marks	Part marks and guidance	
7	(a)	9 [.00]	1	Accept 900p or nine	0 for 900
	(b)	7.6	2	M1 for figs 38 seen or $1.9(0) \times 4$ or $19 \div 5 \times 2$	
8		22 to 28	1		
9	(a)	21	1		
	(b)	9	1		
10	(a)	Square	1		
	(b)	49	1		
	(c)	12	1		
	(d)	(i) 56	1		
		(ii) 552.25	1		
11	(a)	7	2	M1 for figs 7(14.....) seen	
	(b)	(i) 3 / / /	2 1FT	M1 for 46 – 22 – 4 – 7 – 4 – 6 oe FT dashes = <i>their</i> frequency	Mark frequency first Any matching frequency and tally scores a minimum of 1 mark.
		(ii) No There are no 3s in the answers oe	1 1 dep	Mark judgement first Anything implying frequency = 3 is automatically 0	Does not need supporting evidence for first mark.

Question		Answer	Marks	Part marks and guidance	
12	(a)	One horizontal line 3 cm	1		Vertices within circles of overlay and lines intended straight.
		Diagonal line closing shape and no other changes to the diagram	1		
	(b)	68 to 76	2	B1 for 3.4 to 3.8 (cm) Or M1 for $\times 20$ seen	
13	(a)	2.25 or $2\frac{1}{4}$ oe	2	B1 for 27 seen Or M1 for <i>their</i> $27 \div 12$ soi	
	(b)	6	1		

APPENDIX

Exemplar responses for Q.11(b)(ii)

Response	Mark
She is likely to get a 3 as she hasn't got any yet.	0 + 0
NO 3 is the lowest number	1 + 0
NO She only has 1 three on the spinner	1 + 0
NO There is nothing in the tally for 3	1 + 1
NO She hasn't got a three yet so she might not get one	1 + 1

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