

Mathematics C (Graduated Assessment)

General Certificate of Secondary Education

Unit **B275**: Module M5 (Sections A&B)

Mark Scheme for January 2012

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This mark scheme is published as an aid to teachers and students, to indicate the requirements of the examination. It shows the basis on which marks were awarded by examiners. It does not indicate the details of the discussions which took place at an examiners' meeting before marking commenced.

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)	Correct triangle	2	Allow $\pm 2\text{mm}$ for the length and $\pm 2^\circ$ for the angle M1 for either the angle(52°) or line length (7 cm) correct	Measure with the ruler and compass
	(b)	6.7 - 7.2	1ft	If 0 or 1 scored in (a) then strict ft from <i>their</i> triangle $\pm 2\text{mm}$	
2	(a)	6	1	Condone fully embedded solutions	
	(b)	15	1	Condone fully embedded solutions	
	(c)	9	2	Condone fully embedded solutions M1 for $2x = 17 + 1$ or better or correct answer from <i>their</i> $ax=b$ (a not 1)	
3	(a)	370	1		
	(b)	365.26	1		
	(c)	400	1	Condone extra correct zeros	
4	(a)	W(est)	1		
	(b)	225	2	B1 for South-West (SW), 135 seen	
5	(a)	$\frac{3}{5}$	1		
	(b)	$\frac{3}{20}$ oe	1		
	(c)	3^4	1		

Question		Answer	Marks	Part marks and guidance	
	(d)	64	1		
	(e)	$\frac{1}{4}$ oe	1	It must be a fraction	
6	(a)	2	1		
	(b)	-1	1		
	(c)	-10	1		
	(d)	-6	1		
7	(a)	Yes <u>and</u> Bob has a higher median	1	Condone average for median	
	(b)	Jesse <u>and</u> he has a lower range	1		
	(c)	Jesse's longest jump could be only 8.27 at most so he could not have won	1	Comment on Jesse only; ignore any references to Bob	

Question		Answer	Marks	Part marks and guidance	
8	(a)	103	2	M1 for attempt at $5 \times (17.4 + 3.2)$ or for 20.6 seen	
	(b)	30	2	M1 for 78 or 48 seen	
	(c)	$9m + 12n$	2	B1 for $9m$ or $+ 12n$ seen	
9		Correct diagram	2	B1 for one of the three 'flags' correct	The overlay will give the positions of the points required
10	(a)	[3] [5] 7 9 [11]	1		
	(b)	Correct ruled line	2	It must be from $x = 0$ to $x = 4$ B1 for three points correctly plotted, FT their table	The overlay will give the position of the line, fix the lowest point on (0,3)
11		rhombus square kite	2	No extras B1 for two of these and no extras or all three and one extra	
12		1574(-4) or 1570 or 1600	2	M1 for $16.4 \times 8 \times 12$	
13		Correct pie chart	4	Each sector correctly labelled with the name B3 for 2 correct sectors labelled or 3 correct unlabelled or B2 for 1 correct labelled or 2 correct unlabelled or correct angles seen (45, 81, 126, 108) or percentages (12.5, 22.5, 35, 30) or B1 two correct angles seen or correct fractions oe or $\frac{360}{40}$	For 4 marks we need just three sectors within tolerance and allow $\pm 3^\circ$ for each of these sectors (all four sectors labelled with name) If wrongly labelled treat as unlabelled

Question			Answer	Marks	Part marks and guidance
14			0.92	2	B1 for $1 - 0.08$ seen
15			1024	4	M1 for $12\ 800 \times 0.40$ oe A1 for 5120 soi M1 for <i>their</i> '5120' $\div 5$ oe or M1 for <i>their</i> $1280 \div 5$ oe A1 for 2560 soi M1 for 2560×0.40 oe or B2 for either 5120 or 2560 seen even if given as the answer

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