

Mathematics C (Graduated Assessment)

General Certificate of Secondary Education **B276**

Module M6 (Sections A&B)

Mark Scheme for June 2010

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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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Marking instructions

1. Mark strictly to the mark scheme. If in doubt, consult your team leader using the messaging system within *scoris*, e-mail, or by telephone.
2. Make no deduction for omission of units except as indicated on the mark scheme (although if this leads to a later error this will of course be penalised).
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.
W (workless) 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:
 - i. Correct answer correctly obtained (no symbol)
 - ii. Follows correctly from a previous answer whether correct or not (“ft” on mark scheme and on the annotations tool).
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.
 - i. Allow full marks if the correct answer is seen in the body and the answer given in the answer space is a clear transcription error, unless the mark scheme says ‘mark final answer’ or ‘cao’.
 - ii. Allow full marks if the answer is missing but the correct answer is seen in the body.
 - iii. Accuracy marks for an answer are lost if the correct answer is seen in the working but a completely different answer is seen in the answer space. Method marks would normally be given.
9. 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 **W** marks. Deduct 1 mark from any **A** or **W** marks earned and record this by using the **MR** annotation. **M** marks are not deducted for misreads.
10. 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.
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 a 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.)

The hash key [#] on your keyboard will enter NR.

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 if this is not shown within the image zone. You may find it easier to mark follow through questions candidate-by-candidate rather than question-by-question.
13. In cases where there is clear evidence that a calculator has been used in section A, mark the script as normal then raise an exception (malpractice) in *scoris*. All suspected malpractice should be flagged using exceptions.
14. 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.
15. Holding the F2 key on your keyboard displays the annotations toolbar next to your cursor. The following annotations are available:

✓ and ✗



Highlighter
BOD Benefit of doubt
FT Follows through
ISW Ignore subsequent working (after correct answer obtained)
M0, M1, M2 Method mark awarded 0, 1, 2
A1 Accuracy mark awarded 1
W1, W2 Workless mark awarded 1, 2
SC Special case
^ Omission
MR Misread

These should be used whenever appropriate during your marking. **The A, M and W 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.

16. The comments box will be used by the Principal Examiner to explain his or her marking of the practice scripts for your information. Please refer to these comments when checking your practice scripts. **Please do not type in the comments box yourself.** Any questions or comments you have for your team leader should be communicated using the *scoris* messaging system, e-mail, or by telephone.
17. As far as possible you should mark roughly equal numbers of RIGs from sections A and B. It is helpful to mark some in each section as you go, rather than marking all RIGs in one section, then all RIGs from the other.

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 **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 **www** in the mark scheme it means **without wrong working**.
- 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 eg 237000, 2·37, 2·370, 0·00237 would be acceptable but 23070 or 2374 would not.

Section A

1	(a)	correct reflection	1	points at (2, -1), (5, -1) and (2, -5) allow ± 2 mm but mark intention
	(b)	correct rotation	3	points at (-1, 2), (-1, 5) and (-5, 2) W2 for 'correct' rotation except in the wrong direction ie (1, -2), (1, -5), (5, -2) Or W1 for correct rotation using the wrong centre
2	(a)	(0)·875	2	M1 for the division $7 \div 8$ or (0)·125 seen or figs 875 seen
	(b)	1/10	2	M1 for $\frac{2}{20}$ oe or $\frac{2 \times 1}{5 \times 4}$ or for <i>their</i> proper fraction correctly and fully simplified
3	(a)	-10	1	
	(b)	15 www	2	M1 for $16 - 1$ seen or 11 coming from use of $2^3 = 6$ eg $2 \times 2^3 - 1 = 12 - 1 = 11$ W1 for 8 seen
4	(a)	$\frac{3}{5}$ oe	1	
	(b)	0·15	2	M1 for 1 - 0·3 - 0·1 - 0·45 soi or figs 15, 85 or an answer of 0·51
5	(a)	Colin (or 10) <u>and</u> you multiply (or times) first	1	allow the correct working eg $2 \times 3 = 6$ and $6 + 4$ or just $4 + 6$
	(b)	72	2	M1 for 8 or 9 seen

6	(a)	$\frac{30}{4}$ oe www isw	2	M1 for $4x = 27 + 3$ or better or $x = \frac{b}{4}$ from $4x = b$ or if correct answer not seen award W1 for 7·2
	(b)	7 www	3	If 7 not found, award a maximum of 2 <u>marks from the following:</u> M1 for $5x - 3x + h = k$ or better M1 for $kx = hx + 25 - 11$ or better W1 for $x = \frac{b}{a}$ from $ax = b$
7		15 www	3	M1 for $48 \div (5 + 1)$ or better soi A1 for 40

Section A Total: 25

Section B

8		$\angle A$ (75°) correct, line AC (6 cm) correct and Δ complete with all lines ruled	2	M1 for either the angle or the line correct allow $\pm 2^\circ$ for angle and $\pm 2\text{mm}$ for line; condone freehand line or incomplete triangle
9	(a)	as the Maths marks increase the Science marks increase	1	allow equivalent statements eg positive (correlation)
	(b)	correct line	1	line must be ruled and between $20 \leq x \leq 55$ where $x = 20$, $8 \leq y \leq 22.5$ where $x = 55$, $50 \leq y \leq 65$
	(c)	35 – 45	1	or ft <i>their</i> ruled line tolerance ± 1
10	(a)	(i) 17	1	
		(ii) 43	1	
	(b)	7B <u>and</u> the mean (average) is greater	1	any statement including 29.5 and 26 implies the selection of the mean and choice of 7B implies that 29.5 is greater do not award the mark if there is any statement showing confusion with mode or median
11	(a)	correct ruled line from (0, 2) to (4, 10)	3	M2 for three correct points identified by any means (table, coordinates or plotted points) or the correct line but short Or M1 for two correct points identified by any means (table, coordinates or plotted points)
	(b)	1.5	1	or ft <i>their</i> ruled line
12	(a)	1.56	2	M1 for 1.55(647.....), 1.6, 39.69 or 25.5 seen
	(b)	5 hours 24 minutes	1	
13	(a)	51.45, 51.46 or 51.5 and cm^2	3	M1 for $1/2 \times 8.3 \times 12.4$ A1 for 51.45, 51.46 or 51.5 W1 for cm^2
	(b)	40.19 - 40.22 or 40 www	2	M1 for $\pi \times 12.8$
14	(a)	$4x+8$	1	
	(b)	$3(2x+5)$	1	

15	(a)	60	2	M1 for $360 \div 6$ or $180 - 120$
	(b)	120 is a factor of 360 or all sides (lengths, lines) are equal	1	Allow equivalent or correct statements eg <ul style="list-style-type: none">• they fit together without gaps• they fit together at the corners• they fit together to make 360°• interior angles fit together perfectly

Section B Total: 25

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