

Mathematics C (Graduated Assessment)

General Certificate of Secondary Education

Unit **B276**: Module M6 (Sections A&B)

Mark Scheme for March 2011

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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 for examiners (March 2011)**GCSE Mathematics C (Graduated Assessment) – J517
Units B272 to B280**

1. Mark strictly to the mark scheme.
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.

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.)

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. 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

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.

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 e.g. 237000, 2·37, 2·370, 0·00237 would be acceptable but 23070 or 2374 would not.

Section A

1	(a)	0.09	1		
	(b)	Final answer $\frac{7}{10}$ oe	2	W1 for $\frac{4}{10}$ as an attempt at conversion of $\frac{2}{5}$	If tenths not used, allow attempt at converting both fractions. A correct common denominator and one correct numerator must be seen.
	(c)	$\frac{3}{14}$ cao	2	W1 for $\frac{6}{28}$ oe www	
	(d)	(0).625 cao	2	W1 for 0.63 without working M1 for $5 \div 8$ attempted, working shown	Do not allow if $8 \div 5$ also, without indication of which is their choice of method.
2	(a)	3.5 oe	2	M1 for $4x = 20 - 6$ or better	Equivalentents include $3\frac{1}{2}$ or $\frac{14}{4}$ isw if incorrect cancelling after 3.5 oe as answer accept embedded if final answer.
	(b)	$10x - 10$ or $(-)$ 10 circled	1		Condone $10x - 10 = 30$ all circled. Do not allow more than one line circled
		Explanation referring to incomplete multiplication of brackets	1		

3	0.28 oe	2	<p>W1 for 0.72 or M1 for $1 - (0.6 + 0.12)$ SC1 for 0.82 as their answer</p>
4	Regular pentagon with all vertices on circumference. All interior angles $108^\circ \pm 2^\circ$ lines must be ruled	3	<p>Clear intention to plot vertices on circumference</p> <p>W2 for 5 points plotted correctly on circle but not joined or for pentagon with 3 interior angles of $108^\circ \pm 2^\circ$, vertices on circumference. or for fully correct but lines not ruled or for a ruled regular pentagon with interior angles $108^\circ \pm 2^\circ$, but vertices not on circumference.</p> <p>or M1 for $\frac{360}{5}$ or $\frac{540}{5}$ implied by 72 or 108 www</p> <p>or W1 for any pentagon with vertices on the circumference or for pentagon with 2 interior angles of $108^\circ \pm 2^\circ$ and not all vertices on circumference</p>

5	£9.47 www	4 W3 figs 947 www ----- or W2 for figs 1053 www or M2 for complete attempt at multiplication of 3.9 and 2.7 with no more than one arithmetic error. or W1 for figs 243, 81(0), 273 or 78(0). or If grid method used 3 correct boxes AND M1 for attempt at subtraction from 20, may be implied by answer.	Must be a fully correct method, which without arithmetic error would lead to the correct answer. <i>Their</i> multiplication could be repeated addition. Do not count boxes with just 0 or 0 0 see appendix Must see where <i>their</i> 10.53 is from. It must be an attempt to find a total, not just $20 - 3.9$ or $20 - 2.7$ or $20 - 6.6$ or $20 - 7.8$
6	(a) Correct rotation (2,3) (2,4) (4,4) (4,2)	3 W2 for rotation of 90° anticlockwise about (0,0) or W1 for trapezium correct size and orientation	Condone freehand if points clear and missing label if only one trapezium drawn
	(b) Translation 5 right 6 down	1 1	With no other transformation named. If more than one transformation named or implied both marks are lost. E.g. rotate and move Accept vector but not coordinates. Condone missing brackets from vector. Ignore fraction line

Section A Total: 25

Section B

7	(a)	0.04	1		
	(b)	18.1 cao	2	W1 for 18.09(....) SC1 for 18.0	
8		3 : 4, or 1 : 1.33, or 0.75 : 1	2	W1 for 42 : 56 or simpler After 0 SC1 for answer reversed e.g. 4 : 3	W1 for any equivalent simpler form of 42 : 56. But award 0 for e.g. 84 : 112 Any ratio must include colon to score.
9	(a)	4	1		
	(b)	3.6	3	W2 for $\frac{108}{30}$ or SC2 for 80.9(3..) or W1 for 0, 4, 4, 3, 24, 15, 30, 28 seen. Implied by 108 or 113 and M1 for <i>their</i> $108 \div 30$	Allow 2 errors M0 for $30 \div 30$
10	(a)	-8, -3, (2), 7	1		
	(b)	Ruled line from (-1, -8) to (2, 7) cao	2	If 2 not earned, W1 f.t the 4 points in <i>their</i> table	If line correct ignore any other points plotted Incorrect line scores a max of 1 mark Accept clear intention for plotting of points, but do not ft any points off given graph paper.

	(c)	$1.4 \pm 1\text{mm}$	1	or f.t their ruled straight line if 2 marks not given in (b)	If no ruled line in (b) no f.t. If no ruled line only accept 1.4
11	(a)	13	2	W1 for 28 from $7x$ or ~ 15 from $3y$	Do not accept $28x$ or $\sim 15y$
	(b)	$3(2x - 3)$ cao	1		condone missing final bracket
12		60 Alternate angles	1 1	dep on 60. Condone z angles	
13	(a)	5 points correctly plotted	2	W1 for 3 or 4 correct points plotted	
	(b)	There is correlation	1		Do not accept negative
14	(a)	Ruled chord drawn	1		Condone chord extended beyond circumference of circle Accept diameter
	(b)	$10.173 - 10.179$ or 10.17 or $10.18(0..)$ or 10.2 www m^2	2 1	M1 for $1.8^2 \times \pi$ soi	If their final answer is within the acceptable range, allow correct rounding or truncation on answer line

Section B Total: 25

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