

# **Mathematics C (Graduated Assessment)**

General Certificate of Secondary Education

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

## **Mark Scheme for June 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.

OCR will not enter into any discussion or correspondence in connection with this mark scheme.

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Any enquiries about publications should be addressed to:

OCR Publications  
PO Box 5050  
Annesley  
NOTTINGHAM  
NG15 0DL

Telephone: 0870 770 6622  
Facsimile: 01223 552610  
E-mail: [publications@ocr.org.uk](mailto:publications@ocr.org.uk)

**Subject-Specific Marking Instructions**

1. **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.  
**W** marks are workless marks, which are independent of **M** (method) marks and are awarded for a correct final answer or a correct intermediate stage.  
**SC** marks are for special cases that are worthy of some credit.
2. 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.

3. 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.

4. 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.
5. The following abbreviations are commonly found in GCSE Mathematics mark schemes.
  - **cao** means **correct answer only**.
  - **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).
  - **nfww** 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**.
6. 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'.
  7. 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).
  8. 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.
  9. 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.
  10. 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'. 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.
  11. Ranges of answers given in the mark scheme are always inclusive.
  12. 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.
  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.

## Section A

Question		Answer	Marks	Part marks and guidance																															
1	(a)	50 000	1																																
	(b)	3500	1	Condone 3500.00																															
	(c)	29000 or 30 000 or 20 580 000 or 600 000 or 638000 or 660 000	<b>M1</b> <b>A1</b>	for at least one of these used Allow <b>W1</b> for a correct answer with no correct estimates seen																															
2	(a)	(i) 5/8 and 15/24	2	<b>M1</b> for at least two correct conversions seen	eg $\frac{3}{4} = \frac{6}{8}$ or $\frac{18}{24}$ or $\frac{30}{40}$ Accept circled as indicators																														
		(ii) $1\frac{3}{7}$	2	<b>M1</b> for $\frac{10}{7}$																															
	(b)	81	2	<b>M1</b> for $3 \times 3 \times 3 \times 3$ soi																															
3	(a)	-2	1																																
	(b)	1.5 or $1\frac{1}{2}$ or $\frac{6}{4}$	2	<b>M1</b> for $4x = 9 - 3$ or better or for answer FT from <i>their</i> $4x = a$	eg $12 = 4x$ then $[x = ] 3$ earns <b>M1</b>																														
4	(a)	<table border="1" style="margin-left: auto; margin-right: auto;"> <tbody> <tr><td></td><td></td><td></td><td></td><td>7</td><td>8</td></tr> <tr><td></td><td></td><td></td><td></td><td>8</td><td>9</td></tr> <tr><td></td><td></td><td></td><td></td><td>9</td><td>10</td></tr> <tr><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td><td>11</td></tr> <tr><td>7</td><td>8</td><td>9</td><td>10</td><td>11</td><td>12</td></tr> </tbody> </table>					7	8					8	9					9	10	6	7	8	9	10	11	7	8	9	10	11	12	1		
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				9	10																														
6	7	8	9	10	11																														
7	8	9	10	11	12																														

Question		Answer	Marks	Part marks and guidance	
	(b)	6/36 o.e.	2	FT for <i>their</i> 6/36 isw M1 for 6 out of 36 o.e.	Accept 0.17 or 17% or better
5	(a)	Allington	1		Accept clear indication
	(b) (i)	4794	1		
	(b) (ii)	8 to 11	1		
	(c)	155 to 159	1		
6		Correct equilateral triangle constructed with arcs	2	M1 for one side 6.3 to 6.7 cm with arcs or correct triangle with no arcs	
7	(a)	-5, -2, 10	1		
	(b)	<i>their</i> points plotted ruled line through correct points	1FT 1	Within 2mm of correct position no FT for line; must extend from $x = -1$ to 4	Must plot six points

Section A Total: 25

## Section B

Question		Answer	Marks	Part marks and guidance	
8	(a)	136	1		
	(b)	152.7 or 153	3	M1 for sum attempted (=1527) M1dep for <i>their</i> sum $\div 10$ [answer of 1452.3 implies M2]	
	(c)	(i) 'No because Ruth's mean is bigger' oe	1FT	Must FT from (b) Accept 'You can't tell because it is only a small sample'	Allow FT 'Yes because Ruth's mean was less oe if their (b) < 145. Condone average for mean or use of total. Do not accept any reference to range.
		(ii) 'Yes because Ruth's range is smaller' oe	1	Must FT from (a)	Allow FT 'No because Ruth's range was larger' oe if <i>their</i> (a) > 160. Do not accept any reference to mean.
9	(a)	8.5	2	M1 for $2B = 5.4$ soi	
	(b)	(i) $c$	1	Condone $1c$	
		(ii) $7x - 2$	2	Mark final answer Condone $7x + -2$ M1 for one term correct	
10	(a)	2 by 3 rectangle added in suitable position  5 by 3 rectangle added in suitable position	1  1	If 0 allow W1 for one 2 by 3 AND one 3 by 5 rectangles added but in wrong position for net	NB various nets possible
	(b)	30	2	M1 for '5 by 3 by 2' identified	

Question		Answer	Marks	Part marks and guidance	
11	(a)	$20/100 \times 120$ o.e. [= 24] 96 <i>their</i> $96 \times 2/3$ 64	<b>M1</b> <b>M1</b> <b>M1</b> <b>A1</b>	or $80/100 \times 120$ o.e $120 - \textit{their} 24$ or <i>their</i> $96 - \textit{their} 96 \times 1/3$	96 implies M2
	(b)	54  $108^\circ$ or 30% and $36^\circ$ or 10% mentioned	<b>1</b>  <b>1</b>	or 'angle is 3 times as big' or '2° represents 1 person'	
12	(a)	(i)	<b>1</b>	o.e. giving no lines of symmetry but rotational symmetry order 2	Shading need not be whole quadrants of rhombus
		(ii)	<b>1</b>	o.e. giving no lines of symmetry but rotational symmetry order 1	shading need not be whole quadrants of rhombus
	(b)	False False True False	<b>2</b>	<b>M1</b> for two correct	Any non-ambiguous indication, eg F, F, T, F or $\times \times \checkmark \times$ but do not accept blanks for false.

Section B Total: 25



**OCR (Oxford Cambridge and RSA Examinations)**  
**1 Hills Road**  
**Cambridge**  
**CB1 2EU**

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**14 – 19 Qualifications (General)**

Telephone: 01223 553998

Facsimile: 01223 552627

Email: [general.qualifications@ocr.org.uk](mailto:general.qualifications@ocr.org.uk)

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Facsimile: 01223 552553