GCSE

Mathematics C (Graduated Assessment)

General Certificate of Secondary Education **B274**

Module M4 (Sections A&B)

Mark Scheme for June 2010

Any enquiries about publications should be addressed to:

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*. <u>All suspected malpractice should be flagged using exceptions</u>.

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

Section A

1	(a)	14 cao	1	
	(b)	9 cao	1	
	(c)	5 cao	1	
2	(a)	0·075, 0·507, 0·57	1	
	(b)	57/100 oe fraction	1	
	(c)	40	1	
3	(a)	triangle with vertices at (4, 1)(5, 1) and (5, 3)	2	**SC1** for a reflection in other $x = k$ or reflection in $y = 3$
	(b)	(i) (−2, 1) plotted	1	
		(ii) (3, 1) or (−7, 1) plotted or ft *their* R to make parallelogram	1	
		(iii) (3, 1) or (−7, 1) or coordinates of *their* S	1	
4	(a)	20x	1	condone $x \times 20$, $20 \times x$ or $x20$
	(b)	$y + 4$ or $4 + y$	1	
5	(a)	comparison of 1/2 and 1/6 eg 'it isn't as much as 50-50 since there are 6 faces and only one gives a six'	1	must refer to 6 faces or numbers and 1 eg 1/6, 1 out of 6 oe or identifies one 6 or one of each number or five other numbers or not three sixes see exemplars
	(b)	probabilities should be fractions / decimals / %	1	just one of these is sufficient eg it should be ½ oe not 1 out of 2 see exemplars

6	(a)	(i) 71·64	2	**M1** for valid strategy seen eg long multiplication attempted or 36 × £2 − 36p or repeated addition
		(ii) 16	3	**M2** for a correct strategy used, eg short division or chunking or repeated addition or multiples – must be using correct numbers in 'chunks' etc to earn M2 Or **M1** for 288 ÷ 18 seen OR **M1** for 288/18 = 144/9 **M1** for partially correct attempt at division of 144 by 9
	(b)	(i) 110	1	
		(ii) toast	1	
		(iii) 30	1	
		(iv) 140	2	**M1** for at least one of 130 and 270 soi allow **SC1** for 180 (using 2008 figures)

Section A Total: 25

Exemplar responses for 5(a)

Response	Mark
Because there is 5 other numbers to roll	1
Because there is only 2/12 chance of getting a six	1
Because it's 1 out of 6	1
The dice has 5 other possibilities to land on.	1
Because there are 5 other numbers on the dice and it is 1 out of 6 chance	1
Because the dice has only 1 side that has a six on it	1
Because the chance of getting a six is 1/6 so 50-50 is wrong	1
Because there is only 1 six	1
Because there are not 3 sixes on a dice	1
Because it is a six sided dice and there is one six	1
Because there is only one side with six dots on it	1
'cos it wood be 1 in 6 chance that he wood get 6	1
Getting a six and not getting a six are not equally likely	1
Because it's very unlikely you can get a six on a six sided dice.	0
Because there is six numbers on the dice not two	0
There are six sides not two	0
There is not an even number to get a 50-50 chance.	0
Because there are 1 to 6 numbers and he thinks there is just 1 number	0
Because there are more than one number	0
Because on a dice there are 6 numbers	0
Because if it were 50-50 there would be half one number and the other half another but there is six numbers on a dice	0
Because the dice is six sided not two-sided	0
Because 50-50 means half a chance and there is 6 numbers so it can't be 50-50	0

Exemplar responses for 5(b)

Response	Mark
Is 1 out of 2 but she could have said half	1
Because the chance of getting an even number is 50%	1
It should be 3/6	1
It is not written as a fraction	1
You write it as a fraction 1/3	1
It is not written as a fraction	1
She could have made it more sense e.g. 50%	1
There is 3 even numbers and it's out of 6 so the chance would be 3/6	1
He should say 3 out of 6	0
There are 3 even numbers out of 6	0
There are more than two even numbers	0
There is 3 even and 3 odd numbers	0
She should have said 50-50	0
There are 3 even numbers on the dice so it would be 1/3	0
There is the same amount of even numbers as odd numbers	0
The probability is 3 out of 6 chances	0
There is 6 chances not 2	0
As there's not 2 numbers- it is a 50-50 chance	0
It wouldn't be 1 out of 2. it would be written as 1:2	0
Because the probability on a die would be 3 out of 6	0
It is 3 in 6 chance	0
Not enough information	0

Section B

7	(a)	10 50 250	2	**W1** if one error, ft from *their* error
	(b)	30 5 rows and 6 columns	1 1	or nos. of rows and cols go up by one each time or you add on an extra 2 more each time or + 4 + 6 + 8 + 10 condone 5 × 6
8	(a)	(i) 95 - 97	1	
		(ii) 1 ¼ or 1.25 or 75 mins or 1h 15m	1	allow 1:15 but **0** for 1:25 or 1.15 or other confusion with decimal hours and minutes
		(iii) B to C because steepest oe	1	
	(b)	42	2	**M1** for 126 ÷ 3
	(c)	6·5 www	3	**M1** for 39 or addition of correct 6 numbers **M1** for *their* sum ÷ 6 OR **SC2** for 32·3(3…) [from 3 + 8 + …+ 8 ÷ 6]
	(d)	8 to 10 inclusive	1	
	(e)	7 × 80 [= 560] 1050 − *their* 560 490	**M1** **M1** **A1**	 **W3** for 490 www
9		22·4 cm²	2 1	**M1** for 3·5 × 6·4 or 35 x 64 or figs 224 or 112/5 condone 'square centimetres' or 'cm sq' etc
10		124 73	1 2	**M1** for 360 – (210 + 77) oe
11		correct trial 19 × 24 = 456	**M2**	or for two correct trials in the range 11-25 with second one closer to 456 OR **M1** for correct trial of 11 - 18 inclusive **M1** for a trial of 20 - 25 inclusive
		19	**W1**	if answer line blank, allow indicated in table eg as last trial

Section B Total: 25

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