GCSE

Mathematics C (Graduated Assessment)

General Certificate of Secondary Education

Unit **B273:** Module M3 (Sections A&B)

Mark Scheme for June 2011

Subject-Specific Marking Instructions

1.   **M** marks are for <u>using a correct method</u> and are not lost for purely numerical errors.
      A marks are for an <u>accurate</u> answer and depend on preceding **M** (method) marks. Therefore **M0 A1** cannot be awarded.
      W marks are <u>workless</u> 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 <u>special cases</u> 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 <u>not from wrong working</u> **full marks** should be awarded.

      Do <u>not</u> award the marks if the answer was obtained from an incorrect method, ie incorrect working is seen <u>and</u> 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 × (*their* '37' + 16), or FT 300 − √(*their* '5^2 + 7^2'). Answers to part questions which are being followed through are indicated by eg FT 3 × *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)**		24	**1**		
	(b)		F(eb) and D(ec)	**1**	Need both	Be liberal with month spellings etc. – condone i.e. March iff Feb and Dec are both also given Accept values i.e, 20 and 17
	(c)		June, July, August, September	**1**	Need all 4	Condone "4" NAMBI

2	**(a)**	**(i)**	10	**2**	Clearly as an answer
					M1 for (£)10 seen
					     or 0.2 seen
					     or "number" ÷ 5 seen
					     or (£)40 given as answer	

		(ii)	300	**3**	**M1** for £100 seen **M1** for "100" × (£)3 seen or figs 3 **M1** for recognition that 1litre is 1000ml	May be implied by (3) x 1000 seen

	(b)	**(i)**	21.20	**3**	**M2** for digits "212" or 42.4(0) seen
					or both 14.975 and 6.225 seen
					
					M1 for 29.95 + 12.45
					     or "number" ÷ 2
					     or figs 424 seen
					     or either 14.975 or 6.225 seen
					M1 for a clear attempt to halve both
					     prices and then sum	

		(ii)	25	**2**	**M1** for 10:15 or 10:20 or 10:45 seen	Allow all common time formats

Question			Answer	Marks	Part marks and guidance	
	(c)		50 to 100 cm or 0.5 to 1 m	2	**1** for number **1** for unit (independent)	Allow 2 feet to 3 feet / 24" to 36"/1 yard Effectively 1 for any length unit restricted to cm, m, inches, feet, yards
	(d)		C B E D A	3	**W2** for 4 correct or **W1** for 2 or 3 correct	
	(e)		83 to 89	2	**M1** figs 83 to 89	
	(f)		All correct	3	**M2** for correct body and all four wheels in correct position **M1** for just correct body **M1** for at least two correct wheel sizes	(i.e. wheels of correct width but incorrect height) Not necessarily in correct position Mark for intent – ruler drawn straight lines not absolutely necessary
3			All correct 	2	**W1** for 2 correct	Extras count as errors Judge from the left to right

Section A Total: 25

Section B

Question			Answer	Marks	Part marks and guidance	
4	(a)	(i)	35.5 to 37	1		
		(ii)	55±1 (mph) clearly written on any part of answer line(s)	2	M1 for 55±1 seen in working This may be indicated as line(s) on graph (i.e. actual digits not required)	Covers both conversion and decision
			_____ ALTERNATIVE _____	_____	_____	_____
			25 (ms^{-1}) clearly written on first part of answer line	1	Mark is dependent on further work (i.e. just "25" and no other working anywhere scores zero).	Must be a clear attempt at a relevant conversion to gain the mark (otherwise could be a lucky guess)
			because ……. 20±1 (ms^{-1} = 45 mph) or 55±1 (mph = 25ms^{-1})	1	May be seen anywhere in working	
	(b)	(i)	10 or Storm	1		
		(ii)	11.5	3	**M2** for 10 × 1.15 or better seen or **M1** for 10 (knots) seen or figs 115 excluding 1.15 or **SC1** for "3" or "7 to 10" seen	Allow full credit for 10.5 × 1.15 = 12.075
	(c)	(i)	4.4	3	**M2** for 26.4 ÷ 6 seen or **M1** "their total" ÷ 6 **A1** "their correct answer" or **M1** for figs 264 or 132/5 or clear indication to sum seen or "number" ÷ 6	**M2** for 24.4 seen (misuse of calculator) "Number" must be larger than 10

Question			Answer	Marks	Part marks and guidance	
		(ii)	4.8	**1**		Accept 24/5
		(iii)	Yes + there are three (results) above (four knots)	**1**	The "yes" may be implied	Or equivalent statement involving "3". The three may be implied by stating the actual values
5	**(a)**		278	**1**		
	(b)		29 356.8 / 29 356 / 29 357	**2**	**M1** for sight of 1112 × 2.2 or 7339.2 / 7339 / 7340 or 12 x 2.2 or 12 x 1112	⇒ 2446.4 / 2446 seen or 12232/5 seen Misreading and calculating with June's rainfall ⇒ 26.4 / 26 seen or 132/5 seen ⇒ 13344 seen
6	**(a)**		6	**1**		Only allow fully embedded answers e.g. 2 x 6 = 12 (not just x6 or 6x etc.)
	(b)		8	**1**		Only allow fully embedded answers (see above)
	(c)		10	**1**		Only allow fully embedded answers (see above)
7	**(a)**		80	**2**	**M1** for 20 or 60 seen	
	(b)		111	**1**		
	(c)		2209	**1**		

Question			Answer	Marks	Part marks and guidance
8	(a)		…. because there is only one £1000 envelope o.e.	1	The mark is for the reason. If correct reason given ignore subsequent incorrect probabilities. There are more 1p envelopes / less £1000 envelopes. One or more of the correct probabilities e.g. $\frac{4}{5}$ or $\frac{1}{5}$ As a minimum allow "more likely to pick 1p" but do not allow "less likely to pick £1000".
	(b)	(i)	A on 4th tick $\pm$ 2 mm	1	If both arrows are unlabelled but positioned correctly award 0 for part (i) and 1 for (ii) below. If only one arrow drawn and this is unlabelled award zero for both parts (i) and (ii).
		(ii)	B on zero $\pm$ 2 mm	1	If both arrows are unlabelled but positioned correctly award 0 for part (i) and 1 for (ii) below. If only one arrow drawn and this is unlabelled award zero for both parts (i) and (ii).

Section B Total: 25

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