GCSE

Mathematics C (Graduated Assessment)

General Certificate of Secondary Education **B275**

Module M5 (Sections A&B)

Mark Scheme for June 2010

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

Section A

1	(a)	200 cao	1	
	(b)	300 or 310 × *their* 200 60 000 – 62 000	1 1	if **0** scored, **SC1** for (200 or 190 or 194) × (300 or 310 or 307)
2	(a)	(i) $\dfrac{1}{4} = \dfrac{3}{12}$ or $\dfrac{1}{3} = \dfrac{4}{12}$	1	either pairing correct
		(ii) $\dfrac{1}{5}$ cao	1	
	(b)	£3(.00) isw	2	**M1** for (£)1.5(0) OR 150p seen or $\dfrac{15}{100} \times 20$ oe after £3, ignore further attempt to add (or subtract from) £15 If 0 scored, SC1 for 18 only
3	(a)	20	1	
	(b)	No <u>and</u> statement referring to number of words on line (and not frequency)	1	see exemplars **W0** for answer starting with Yes
	(c)	one statement comparing modes	1ft	see exemplars not simply restating values may use V's mode = 6, even if refuted in (b), or *their* mode stated in (b)
		one statement comparing ranges	1	if one statement is the converse of the other, mark only one eg D has smaller writing V has bigger writing **W0** for contradictory statements (even given as two separate parts)
4	(a)	(i) $a + b$	1	no extras
		(ii) $4b - a$ oe	2	no extras **W1** for $4b$ or $-a$ oe seen condone extras only for maximum **W1**
	(b)	15	2	**W1** for $24 - 9$ seen

5	(a)	Complete triangle joined to ends of line (±2 mm) with arcs shown	2	**M1** for at least one arc of radius 8 cm (±2mm) from end of given line
	(b)	(i) the angles are not 90°	1	the angles in a triangle are 60° so some are 60° and some are 120° the angles of the quadrilateral are not all the same size see exemplars
		(ii) rhombus cao	1	
		(iii) 2 cao	1	
6	(a)	(SA) AS, SH, HS, AH, HA.	2	**W1** for 3 correct (even if repeats or errors also shown)
	(b)	$\dfrac{1}{6}$	1ft	ft $\dfrac{1}{their6}$
	(c)	$\dfrac{4}{6}$ or $\dfrac{2}{3}$	1ft	strict follow from (a) $\dfrac{their4}{their6}$ **W0** if $\dfrac{6}{9}$ seen

Section A Total: 25

Exemplar responses for 3(a)

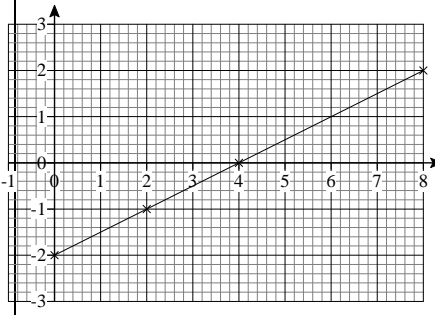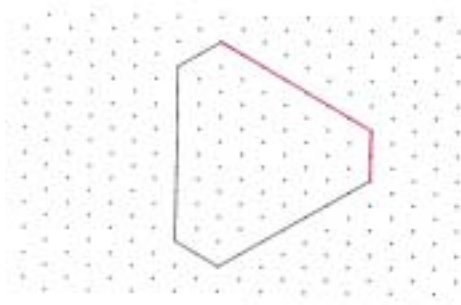| Response	Mark	
No and there never was even 6 words on a line.	1	*Mentions words on line*
No and the mode would be 12	1	*Give correct answer (for words on line)*
No and 6 doesn't occur	1	*Since 6 words on line does not appear assume reference to words on line.*
No and 6 isn't one of the numbers on a line	1	*References words on line*
No and That is the frequency	1	
No there was only 1, 6 and that was the frequency	1	*Distinguishes from frequency*
No and mode is the number most frequently used.	0	*Defines mode*
No and number 6 isn't common number in the results table	0	*Implies frequency*
No and 6 doesn't occur the most.	0	*Implies frequency*
No and Most of them aren't 6	0	*Implies frequencies considered*
No and 6 is no the most number that occurs – 2 is	0	*Implies frequencies considered*
Yes and anything	0	

Exemplar responses for 3(a)

Response *[Deepika or she, Vipin or he in statements]*	Mark
Deepika has a smaller range	1
D's range is 1 less	1
D's writing is more consistent	1
Vipin has a larger range	1
Their ranges are very close (similar)	1
The ranges are similar	1
Deepika has smaller writing (than Vipin)	1
Deepika has a bigger mode (than Vipin)	1
Deepika gets more words on a line (than Vipin)	1
Deepika wrote more words.	1
She has much smaller writing than Vipin's	1
The mode of Deepika is bigger/larger than Vipin's mode by 10. (ft from mode = 6, even if they have said 6 is wrong in part b)	1
Vipin has bigger writing (than Deepika)	1
Vipin gets fewer (less) words on a line (than Deepika)	1
She writes more words on a line compared to him.	1
Hers may be smaller writing	1
She had more words on the lines.	1
The range of Vipin's results are bigger than Deepika because it is 6-1=5 for Vipin and only 4 for Deepika (Calculation for range from frequencies)	0
Her mode is better	0
D's writing was bigger than V's because her mode is bigger. (contradictory?)	0
D writes longer sentences than V	0
She also has written more lines.	0
The size or their writing were different	0
The amount of words on their lines were different.	0
The range is around the same so the number of words must have been simler to Vipins.	0
Deepika's range is 4 and Vipin's (his) is 5	0
Deepika's mode is 16 and Vipin's is 12	0
Wrote more words (Does not say who)	0
Higher frequency	0

Exemplar responses for 5(b)(i)

Comment	Mark
A square has 4 lines of symmetry, this only has 2	1
a square has 4 90 degree angle also know as right angles. (implies "this has not")	1
She is wrong because a square has 4 lines of symmetry not 2.	1
Because a square has more lines of symmetry. (implies "than 2")	1
This cannot be a square because there is know right angles	1
It is not a square because the angles are not all the same size.	1
The angles are different (Just about!!)	1
A square has 4 angles of 90° and this only has 2 (contradiction)	0
She is wrong because it isn't at a 90 degree angle like a square. (Implies tilted)	0

Section B

7	(a)	−1, 2	1	
	(b)		**1ft** **1dep**	*their* 3 points plotted correctly ±½ square Correct line at least from 2 ≤ *x* ≤ 8 ±½ square
8	(a)	80	1	
	(b)	4	2	**M1** for 12 = 3*x* or reverse flow chart correct 11 → +1 → ÷ 3
9		25.7 to 34.6 inclusive	2	**W1** for 2·3 to 3·2 or 4.6 to 6.4 in working (as lengths)
10	(a)	Spinnaker	1	
	(b)	168 000	2	**M1** for 800 000 × 0·21 or $\frac{800\,000}{100} \times 21$ oe or $\frac{800\,000}{360}$ × (73° to 77°) or figs 168
11	(a)		2	**W1** for any figure with order 3 using other than 2 additional lines or if one line extends beyond half way to next dot or correct shape with 1, 2 or 3 axes of symmetry included If **0** scored, **SC1** for correct shape but with vertices up to half a line space to next dot.
	(b)	60° cao	1	

12	(a)	(i) 125	1	
		(ii) 3.2	2	**W1** for 3.1(6…..…) seen or answer 3.20(000000)
	(b)	(i) 125	1	
		(ii) 55	3ft	**W2** for 180 seen Or **W1** for 6, 5 and 6 seen **M1** 180 – *their* (b)(i) Alternative method (adding layers) **W1** for 30 seen **W1** for 25 seen **M1 for** *their* 30 + *their* 25 If **0** scored, **SC1** for 50 or 60 as answer
13	(a)	(i) 4507	1	
		(ii) −18	1	
	(b)	$\dfrac{2}{3}$	2	condone $\dfrac{2}{3}$ and $\dfrac{4}{6}$ on answer line **W1** for $\dfrac{4}{6}$ isw **SC1** for $\dfrac{3}{2}$

Section B Total: 25