GCSE

Mathematics C (Graduated Assessment)

General Certificate of Secondary Education **B279**

Module M9 (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)	tree diagram completed; Saturday 0.4, 0.6 oe Sunday 0.3, 0.7, 0.3, 0.7 oe	1	
	(b)	0.46 oe ignore subsequent cancelling from fraction answer	3	**M2** for 0.4 × 0.7 + 0.6 × 0.3 FT *their* tree Or **M1** for 0.28 or 0.18 or correct pairs identified ft *their* tree if **0**, **SC2** for 0.58 (from 0.46 + 0.12)
2	(a)	1 www	2	**M1** for 5^0 or $5^2 \times \dfrac{1}{5^2}$ oe Or **W1** for $k^0 = 1$
	(b)	25 www	2	**M1** for 5^4 or 625 seen in working or answer Or **W1** for answer 5^2
3	(a)	C = 5r² oe	2	**M1** for C = kr² or (k=)5
	(b)	245	1	
4		$\dfrac{1}{2} \times \dfrac{1}{10}$ or $\dfrac{1}{20}$ or 0.05 oe	**M2**	Or **M1** for $\dfrac{3\times10^6}{6\times10^7}$ or $\dfrac{2.9\times10^6}{5.8\times10^7}$ or $\dfrac{5.8\times10^7}{2.9\times10^6}$ or $\dfrac{6\times10^7}{3\times10^6}$ oe or $\dfrac{29}{580}$ or $\dfrac{30}{600}$ or $\dfrac{580}{29}$ or $\dfrac{600}{30}$
		5% www	**A1**	

5	(a)	$6x^2 - x - 2$	2	**M1** for $6x^2 - 4x + 3x - 2$ (3 out of 4 terms correct; may be in grid) or 2 out of 3 terms correct
	(b)	(i) $6x^2 - x - 2 = 33$ cao	1	
		(ii) $(2x - 5)(3x + 7)$	**M2**	**M1** for $(2x \pm 5)(3x \pm 7)$ or for factors, using integers excluding 0, giving two terms correct when expanded;
		5/2, -7/3 isw	**A1**	ft *their* factors, dep on M1 if **0**, **W1** for 5/2, −7/3
		(iii) length 6, width 5.5	1	condone reversed answers or ft *their x* substituted in $2x + 1$ and $3x - 2$ leading to positive length and width
6	(a)	gradient 8/2 = 4	1	accept gradient 4 with 8 (or 11 − 3) and 2 (or 2 − 0) seen accept 'diff in *y*'/'diff in *x*' = 4
		intercept (0, 3)	1	accept 'crosses *y* axis at 3' accept 'intercept is 3' condone '*c* = 3'
	(b)	$(y =) -0.25x + 3$	2	**M1** for (gradient) −0.25 oe seen

Section A Total: 25

Section B

7		$m = \dfrac{3p + 35}{8}$ oe	3	**M1** for $2m + 3p = 5(2m - 7)$ or better **M1** for $8m = 3p + 35$ ft 1st step to Am = Bp + k **M1** for $m = \dfrac{Bp + k}{A}$ ft 2nd step (providing neither A or B = 0)
8		41.78 to 41.79 accept 41.8 if **M1** earned	2	**M1** for 4.25, 3.45, 2.85
9	(a)	4.8... www	3	**M2** for 6.4 sin 49 (or cos (90 – 49)) Or **M1** for sin 49 = BD/6.4
	(b)	59.5 to 59.9	3	**M1** for tan BCD = *their* BD/2.8 **M1** for inverse trig function used correctly or correct statement ft *their* trig function accept answer of 60 if **M2** earned; if **M1** scored <u>and</u> answer of 60 then second **M1** can be implied
10		x = 146° angle at <u>centre</u> double angle at <u>circumference</u> (or vice versa) y = 34 tangent meets radius at 90º sum of angles of quadrilateral (is 360) or, using ΔBCE, accept (using symmetry) either radii equal or tangents equal or, using ΔBCD and ΔEBD, accept using isosceles triangle <u>or</u> radii equal	1 1 1 **M1** **A1**	 or ft 360 − 180 − *their x* (providing x ≠107)

11	(a)	correct histogram	3	**W2** for correct heights; 2.6, 3, 2.5, 3.26, 2.85, 1.8, 0.32 Or **W1** for 3 correct heights (or 3 correct frequency densities) in table) AND **W1** for all widths correct
	(b)	(i) 15 + 28 + 31 + 66 + 48 + 26 + 5 (= 219)	2	condone omission of × 1000 **M1** for 3 × 5 + 2.8 × 10 + 3.1 × 10 + 4.4 × 15 + 2.4 × 20 + 1.3 × 20 + 0.2 × 25; condone 2 errors Or **W1** for 4 frequencies from 15, 28, 31, 66, 48, 26, 5
		(ii) correct statement, eg 'more older people in Bexley'	1	do not allow simple comparison of one interval allow correct comparison of two or more adjacent intervals combined, eg 'more under 25s in Haringey' or 'more over 60s in Bexley' allow 'on average people are older in Bexley' allow 'Bexley is a flatter distribution'
12		2048 www	3	**M2** for 1.6^3 seen Or **M1** for 1.6 or 32/20 **A1** for 2050

Section B Total: 25

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

OCR Customer Contact Centre

14 – 19 Qualifications (General)
Telephone: 01223 553998
Facsimile: 01223 552627
Email: general.qualifications@ocr.org.uk

www.ocr.org.uk

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