OCR
RECOGNISING ACHIEVEMENT

GCSE

Mathematics A

General Certificate of Secondary Education

Unit **A501/01:** Mathematics A (Foundation Tier)

Mark Scheme for June 2013

Oxford Cambridge and RSA Examinations

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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.

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Annotations used in the detailed Mark Scheme.

Annotation	Meaning
	Correct
	Incorrect
BOD	Benefit of doubt
FT	Follow through
ISW	Ignore subsequent working (after correct answer obtained), provided method has been completed
M0	Method mark awarded 0
M1	Method mark awarded 1
M2	Method mark awarded 2
A1	Accuracy mark awarded 1
B1	Independent mark awarded 1
B2	Independent mark awarded 2
MR	Misread
SC	Special case
^	Omission sign

These should be used whenever appropriate during your marking.

The **M**, **A, B**, etc 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.

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.
   B marks are independent of **M** (method) marks and are for a correct final answer, a partially correct 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 × (*their* '37' + 16), or FT 300 – $\sqrt{}$(*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.

   - **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 and applies as a default.
   - **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. In questions with no final answer line, make no deductions for wrong work after an acceptable answer (ie **isw**) unless the mark scheme says otherwise, indicated by the instruction 'mark final answer'.

7. In questions with a final answer line following working space,

   (i) if the correct answer is seen in the body of working and the answer given on the answer line is a clear transcription error allow full marks unless the mark scheme says 'mark final answer'. Place the annotation ✓ next to the correct answer.

   (ii) if the correct answer is seen in the body of working but the answer line is blank, allow full marks. Place the annotation ✓ next to the correct answer.

   (iii) if the correct answer is seen in the body of working but a completely different answer is seen on the answer line, then accuracy marks for the answer are lost. Method marks could still be awarded. Use the M0, M1, M2 annotations as appropriate and place the annotation × next to the wrong answer.

8. In questions with a final answer line:

   (i) If one answer is provided on the answer line, mark the method that leads to that answer.

   (ii) If more than one answer is provided on the answer line and there is a single method provided, award method marks only.

   (iii) If more than one answer is provided on the answer line and there is more than one method provided, award zero marks for the question unless the candidate has clearly indicated which method is to be marked.

9. In questions with no final answer line:

   (i) If a single response is provided, mark as usual.

   (ii) If more than one response is provided, award zero marks for the question unless the candidate has clearly indicated which response is to be marked.

10. 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 **B** marks. Deduct 1 mark from any **A** or **B** marks earned and record this by using the MR annotation. **M** marks are not deducted for misreads.

11. 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.

12. Ranges of answers given in the mark scheme are always inclusive.

13. 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.

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.

Question			Answer	Marks	Part Marks and Guidance	
1	(a)		1409	2	**M1** for 2013 – 604 or for 1410 or for 3 digits of 1409 correct	eg **M1** for 1408
	(b)		811 000	1		
	(c)		Integer between 22 950 and 23 080 incl.	2	**B1** for answer of 25 000 or figs (2295 to 2308) Or **M1** for division by 52 or for (÷ 365 and × 7)	For **M1** condone 48 used (or 12 × 4) instead of 52 or condone 360 or 366 used with 7
	(d)		Metres	1		Not just m
	(e)		330 to 400	1		
2	(a)		Rectangle 4 squares by 2 squares Rectangle 2 squares by 1 square Rectangle 2.8 squares by 1.2 squares All sides ruled All rectangles in suitable positions	1 1 1 1 1	Tolerance 1 mm Tolerance 1 mm Accept $2.5 < l < 3$ and $1 < w < 1.5$ Dep on at least 1 rectangle Dep on 2 rectangles of acceptable size	Ignore labels Any restart must be to same scale as given diagram "Suitable positions" means • at least half a square between any two rectangles • access to all of one long side of 'chest' and 'cot' • access to at least half the long side of the 'bed' • must not overlap or block the door
	(b)	(i)	107 to 109	1		

Question			Answer	Marks	Part Marks and Guidance	
		(ii)	6.2 to 6.4 or 62 to 64 cm or mm as appropriate	1 1	 Accept mm with answer > 20; accept cm with answer < 10	Answer of 6 cm (2 to 4) mm scores both marks
3			1045 oe	4	nfww **M1** for 5 × 25 or 125 **M1** for correct conversion of *their* 125 or *their* 125 + 10 (over 60) to hours and minutes **M1** for subtracting *their* 125 + 10 from 1 pm soi	
4	**(a)**		7.7	2	**M1** for 7.6[8....]	
	(b)	**(i)**	22	1	Accept eg by machine if nothing on answer line	
		(ii)	20	2	**M1** for 30 seen	
5	**(a)**		Multiples of 3 or 3 times table	1	Accept × for 'times'	
	(b)		9	1	Or other square number divisible by 9 eg 36 or 81	
	(c)		Yes, odd + even [= odd]	1	Accept yes, adding 4 to an odd number [gives odd]	See appendix for examples
	(d)		17 or 7 or 2	1		
	(e)		$^{-}3$	1		

Question			Answer	Marks	Part Marks and Guidance	
6			Sum of resident's car lengths attempted (= 19.7)	M1	Condone working in cm throughout Allow with 1.2s added (condone 5 or 6 lots of 1.2)	Alternative method **M1** for repeated subtraction of car lengths from 24
			4 × 1.2 or 4.8 added soi	M2	**M1** for 5 × 1.2 or 6 × 1.2 added soi	**M2** for 4 × 1.2 or 4.8 subtracted Or **M1** for 5 × 1.2 or 6 × 1.2 subtracted soi OR **M1** for dividing remaining gap by 1.2 or 4 And **M1** for answer compared with 4 or 1.2 Or **M1** for dividing remaining gap by 5 or 6
			[Total length needed =] 24.5 and so no	A1	Units must be sensible and consistent	**A1** for $^{-}0.5$ (after subtraction) or for 3.[…] or 1.0[…] (after division) and so no
7	(a)		$8a - 1$	2	Mark final answer **B1** for one term correct in final answer, eg $8a + {}^{-}1$ Or **M1** for $8a - 1$ seen then spoilt	
	(b)	(i)	9	1		
		(ii)	7	2	**M1** for $3x = 21$ or for *their* answer FT *their* $ax = b$ with $a \neq 1$ and $b \neq 0$ Or **B1** for correct embedded final answer	
	(c)		$^{-}6$	2	**M1** for 9 or $^{-}15$ seen	

Question			Answer	Marks	Part Marks and Guidance	
8			7.2 or 7 m 20 cm	4	**B3** for 4.8 or 4 m 80 cm as final answer Or **M2** for $\frac{2}{2.5} \times 6$ oe Or **M1** for $\frac{2}{2.5}$ or $\frac{2.5}{2}$ oe AND **M1** for 12 – *their* hedge cut, dependent on at least M1 gained, can be implied by their answer If **0**, allow **SC1** for a correct proportional step such as 4 m uses 5 bags, or for an estimated answer in range 7.1 to 7.4 with no correct method seen	eg **M1** for 0.8 [metres per bag] or 1.25 [bags per metre]
9	(a)	(i)	16	1		
		(ii)	15	2	**M1** for 22 or 7 seen	
	(b)		At least 3 response boxes covering all eventualities from at least 1 m to 20 m	1	For this mark they must mention appropriate units Condone heights implicitly to nearest metre or better as having no gaps eg 0-2 m, 3-5 m etc	Condone < 20 m as upper limit; condone omission of 'no trees in garden' or 'no garden' category; top category must start from 3 m or more
			No overlaps between categories (must have at least 3 categories; categories must not be more than 1 m apart)	1	After **0** for question allow **SC1** if clear intent to cover all eventualities (as for first mark) but poor notation (eg of inequality signs) has meant they earned 0	**0** for eg ...10-15 then 15-20 etc but bod intent with ...10-14 then 15-20 then 20+ or with ...10-14 then 15-19 then 20+ Condone no boxes if clear categories

Question			Answer	Marks	Part Marks and Guidance	
	(c)	(i)	Plots at midpoints of groups	1	At 2, 7, 12, 17; condone one error within the correct interval	Use overlay
			Heights correct	1	Tolerance 1 mm	As well as correct, allow heights mark for bars or for plots not at midpoints but elsewhere in correct interval
			Joins with ruled straight lines	1	Within 1 mm of points; ignore joins to axes from endpoints, but **0** if endpoints are joined	Ignore bars if a frequency polygon also seen; otherwise bars can earn the mark for heights correct
		(ii)	7.6	4	nfww **M1** for midpoints 2, 7, 12, 17 seen or used	At least three of them seen
					M1 for *their* midpoints × frequency (14, 70, 72, 34; total 190)	At least 3 correct or for total 190 nfww
					M1 for (*their* sum of midpoints × frequency) ÷ *their* 25; FT *their* (7 + 10 + 6 + 2)	Allow first two **M1**s if seen even if not used for answer on answer line
					A1 for 7.6 Accept 8 for **A1** if M3 earned and no errors seen	Second and third **M**s are available for '*their* midpoints' being an attempt using other points in interval, or endpoints (at least 3 seen) Answers of 5.6 or 9.6 imply second and third **M1**s

Question			Answer	Marks	Part Marks and Guidance	
10			Perpendicular bisector of AB drawn with correct arcs (two pairs)	2	**M1** for perpendicular bisector of AB with no/wrong arcs or correct arcs and too short or for the perpendicular bisector of another side with correct arcs	Use overlay; their line must pass between parallel lines on overlay and be at least as long; condone touching these lines but not crossing them
			Circle centre D radius 4 cm drawn	1	At least the relevant part of the arc	Tolerance 2 mm
			Correct region shaded	1	Garden to left of perpendicular bisector and outside circle; dependent on circle centre D attempted and reasonable attempt at perpendicular bisector of AB (a line passing through somewhere near the middle of AB and approaching an angle of 90° with it)	Allow correct region indicated by label not shading Ignore other constructions if correct ones are there

APPENDIX 1

Exemplar responses for Q5(c)

Response (all include "yes")	**Mark**
It starts at an odd number and then + 4 which gives an odd number every time	1
You're adding even numbers to odd and it goes up in 4	1
It starts from 3 and goes up in 4s so it would always be odd	1
They are going up in 4s which is an equal number and the sequence started on an odd number	1
Adding 4 every time to an odd number means it can never add up to an even	1
It started with an odd and is increasing with an even	1
Because they start with a odd number and add 4 each time	1
They are plussing 4 each time which **keeps** the pattern odd	1 bod
If you keep on adding 4 you will **still** get on an odd number	1 bod
The pattern has intervals of 4 missing 2 even and an odd number with every jump which means it **always** lands on an odd number	1 bod
You add 4 to the numbers and it **stays** odd	1 bod
They are going up 4 every time which land on an odd number **every** time	1 bod
You are adding 4 each time giving you an odd number	0
The pattern of the first 5 terms repeats the units	0
The number will either end in 3, 7, 1, 5 or 9	0
It is $4n - 1$ and 3, 7, 1, 5, 9 are all odd	0
They are going up an even amount of times	0

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

OCR Customer Contact Centre

Education and Learning
Telephone: 01223 553998
Facsimile: 01223 552627
Email: general.qualifications@ocr.org.uk

www.ocr.org.uk

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Head office
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Facsimile: 01223 552553

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