OCR
RECOGNISING ACHIEVEMENT

GCSE

Mathematics A

General Certificate of Secondary Education

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

Mark Scheme for June 2012

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 <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.
     B marks are <u>independent</u> 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.

     -    **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 **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.

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 of working

    i.   and the answer given in the answer space 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.   but the answer space is blank, allow full marks. Place the annotation ✓ next to the correct answer.

    iii.   but a completely different answer is seen in the answer space, 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.

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.

Question			Answer	Marks	Part Marks and Guidance	
1	(a)		80	1		Only these answers are acceptable throughout
	(b)		36 and 24	1		
	(c)		8 or 24	1		
	(d)		36	1		
	(e)		23	1		
2	(a)		484 545	2	**M1** for $532\,417 - 47\,872$ soi	Ignore dots, commas, etc., between digits
	(b)		Forty seven thousand eight hundred (and) seventy two	1		Condone poor spelling if meaning is clear; ignore 'and', hyphens, '&'
	(c)		47 900	1		Ignore dots, commas, etc., between digits
3	(a)		(⁻2, 4)	1		
	(b)		(0, 1)	1		
	(c)	(i)	(3, 5) plotted and labelled C	1		For both (i) and (ii), condone missing labels, if no plots then condone correct labels covering correct points. In either part, if more than one plot then correct plot must be labelled
		(ii)	(⁻4, ⁻1) plotted and labelled D	1		
4	(a)	(i)	260	1		

Question			Answer	Marks	Part Marks and Guidance	
		(ii)	1240 + g or 1.24(0) + kg or 1 kg 240 g	1+1	Or FT from (i)	Allow wrong spellings of kilograms etc Allow 1 for g with wrong answer in range (1000, 1500) Allow 1 for kg with wrong answer in range (1, 1.5)
	(b)		09:05 oe	2	1 each for minutes and hours correct	Ignore am etc; accept intent for notation eg 9.05, 5 past 9, but not 9.5
5	(a)		2.29	1		
	(b)		1.92 or 1920 g	3	nfww **M1** for attempt at total soi by 12.24 to 15.36 **M1** for ÷ 8 **M2** is implied by answer of 12.77 or 1920	Allow 12 240 to 15 360 (from using g rather than kg) Independent 12.77 comes from forgetting to press = before ÷ 8
6	(a)		6*a*	1		Accept 6*A*, but not 6×*a* or *a*6
	(b)		65	2	**M1** for 75 or 3 × 25 or for −10 soi	eg by answer of −85
7	(a)		Angles <u>all</u> within 2° tolerance with ruled radii	2	**M1** for two angles in tolerance provided only four sectors	The overlay can be used whether the pie chart is drawn clockwise or anti-clockwise, but assumes same order as in the table
			Sectors labelled correctly	1	Must have exactly four sectors with largest by eye labelled Surrey County Council and smallest by eye labelled Parish Councils	Accept abbreviations, eg SCC, etc. or shading with a key Accept freehand

Question			Answer	Marks	Part Marks and Guidance	
	(b)		79.1	1	Condone 79 100 000	
8			327h 36min	4	**B4** for answers of 328h 39m and 329h 42m Or **M3** for 6 × 52 × (63/60 or 1.05) soi by final answer of 327h 6m or 327.6 Or **M2** for 6 × 52 × (1h 3m or 63m) soi by 312(h) 936(m) or 19 656(m) Or **M1** for 6 × 52 × … soi by 312 or 321.36 or 321h 36m or 405.6 or 405h 6m or for ÷ 60 soi	eg implied by 1.05 or 6.3 or 54.6
9	(a)	(i)	42	1		
		(ii)	14	2	**M1** for at least one of 51 and 37	May be seen on the bar chart
		(iii)	28	2	**M1** for at least one of 11 and 17	May be seen on the bar chart
	(b)		58	1	Condone ⁻58	
	(c)		8000 to 9000	2	**M1** for 1 metre = 3 to 3.3 ft soi or for 1 ft = 0.3 to 0.31 m soi	1 ft = 30 cm is not enough
	(d)		6528 or 6530	2	**M1** for 544 × 12	eg 544 + … + 544 (must be 12 544s)

Question			Answer	Marks	Part Marks and Guidance	
10	(a)		[*C* =] 0.3*n* + 120 oe	2	Accept 0.3 × *n, n*0.3 etc Ignore £ or p **M1** for 0.3*n* seen If **0** scored then **SC1** for [*C* =] 30*n* + 120 or 30*n* + 12 000 oe	Condone *m* or *x* etc, except *c*, used instead of *n*
	(b)	(i)	75	3	nfww **M1** for 110 = 0.4*n* + 80 **M1** for 30 = 0.4*n* If 75 found, allow full marks for greater answer including eg journey from bus depot	First **M1** for substitution (may be earned after rearrangement) Second **M1** for one correct constructive step in solution or initial rearrangement eg *B* − 80 = 0.4*n*) Just 30 = 0.4*n* seen implies both **M1**s If no algebra allow: **M1** for 110 − 80 or 30 seen, but not 30p **M1** for 30/0.4 or (110 − 80)/0.4 or for 0.4 × 75 = 30 Allow **B3** for correct solution arrived at after trial and improvement

Question			Answer	Marks	Part Marks and Guidance	
		(ii)	Leading [question] oe	1	Or biased or 'it needs response categories'	Accept eg 'it's too vague – I don't know what good means' **0** for 'it can only be answered Yes or No'
			'Do you think that your bus hire was good value for money' or Suitable version with responses eg 'Yes/No' boxes or at least 3 'non-overlapping' categories covering all eventualities	1	Accept other 'Do you think that...' also trying to improve on other aspects of wording **0** for any 'Don't you think that...'	Condone improved question if additional question eg 'Why?' See appendix for exemplars

Question			Answer	Marks	Part Marks and Guidance	
11			5.39	5	nfww **B4** for other rot versions of 5.38516... nfww to at least 2dp OR **M1** for 5 and 2 used or seen in right-angled triangle **M1** for an attempt at Pythagoras **M1** for square root of (*their* 5^2 ± *their* 2^2) (may be implied by answer) Allow **A1** for 5.3 or 5.4 (dep on **M3**) Following attempt at Pythagoras, allow **B1** for *their* answer correctly rounded to 2dp if answer with more dp seen	NB **0** for 5.4 without correct method seen – no marks for measuring eg 2 and 5 in relevant places on diagram or ½ × 5 × 2 or 5 + 2 = 7 or 5 across, 2 up seen eg *their* 5^2 and *their* 2^2 seen; second and third **M1**s may be earned for an attempt at Pythag with a wrong triangle (possibly not right-angled)

Question	Answer	Marks	Part Marks and Guidance	
12	Circle centre R radius 3 cm	1	Or arc of this circle extending through at least 3 of the six circles for this arc on the overlay Condone arc hand-drawn only if in tolerance for three consecutive circles on overlay	Use overlay; tolerances 2 mm; if in doubt, use ruler For all boundaries, allow marks whether they are dashed or full
	Ruled line parallel to AB and 3 cm from it	1	Extending through at least 2 of the three circles for this line on the overlay	
	Perpendicular bisector of TW attempted	M1	**M0** for arcs/circles centres T and W with no line	Allow **M1** for line through midpoint of TW but at 80 to 100° to TW eg **M0** for line through centre of TW parallel to wall of house
	Accurately drawn bisector with correct compass arcs	A1	Line must extend at least between the circles on the overlay	Allow **A1** for touching circles and common tangent drawn if accurate
	Correct region shaded	1	Dependent on circle and two lines attempted for the above loci	Region must be bounded by the house wall, another two lines and the arc for the distance from R; ignore any shaded/non-shaded region to left of circle if FT from wrong bisector

APPENDIX 1

Exemplar responses for question 10(b)(ii)

Response	Mark awarded
They may not know what amount bus hire usually is.	1
'Don't you think' makes it seems as if there is only one answer.	1
It isn't well-worded. 'Don't you think' makes it hard to answer.	1
It is a rhetorical question.	0
It's asking the customer if they agree.	1
Would you pay that much for a bus?	1
It starts off with 'Don't'.	1
Do you think that your bus hire was good value for money?	1
Very general; not giving specific answers, only Yes or No. You can't improve from answer given.	0
Compared to other bus hires, was your hire with us of a good price?	1
The person receiving the questionnaire might get confused because of the double negative if the answer is No.	1
Do you think that your bus hire was good value for money?	1
It could not be good value for money because other people may have different thoughts.	0
Do you think the service we provided was up to the standards we supply?	1
The customer can only answer yes or no.	0
Do you think ...... Why?	1 (condone two questions)
Good value for money is too open a question.	1
Do you think your bus hire was too expensive?	1
You can't put the results in a graph or table.	0
On a scale of 1 to 10, how good was the value for money?	1
It is biased as it's only allowing a positive response.	1
What do you think about the cost of your bus hire?	1

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