GCSE

Mathematics A

General Certificate of Secondary Education

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

Mark Scheme for November 2012

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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

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 for a correct final answer, a partially correct 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 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 for example 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. 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).

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 **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.

10. 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.

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)**		(0)7:26	1	Allow (0)726 (am), 26 minutes past 7	
	(b)		47	1FT	Strict FT from (a): 0646 → 53, 0716 → 55, 0746 → 50, 0816 → 45	
2	**(a)**		Mon(day)	1		
	(b)		5	1	Allow ⁻5	
	(c)		⁻11	1		
3			g ml cm m	4	**B1** each Condone g for ml	
4			35.70, 47.98, 31.90, 15.98, 7.50 143.76	3 1FT	**B2** for 5 correct but missing zero(s) or 4 correct Or **B1** for 4 correct but missing zero(s) or 3 correct FT from *their* 5 costs + 4.70	
5	**(a)**		20 dots in 4 rows, 5 columns	1		
	(b)		30 Valid reason eg 6 by 5 or 'each time you add on an extra row and an extra column' or 'you need to add 10 dots' or $n \times (n + 1)$	1 1		

Question			Answer	Marks	Part Marks and Guidance	
	(c)		9	1		
6			48 × 250 = 12000 soi Use of 1000 ml = 1 litre Correct comparison of 12 litres and 11.7 litres and sensible conclusion	M1 A1 B1 A1	May convert first: **B1** for 250 ml = 0.25 litres soi **M1** for 48 × *their* 0.25 soi by 12 **A1** for 12 [litres] [FT *their* 0.25 for 12 with wrong dp] Accept 'not enough' 'only a little bit short' etc; which values are being compared must be clear	<u>Alternative 1</u> **B1** for 11.7 litres = 11 700 ml soi **M1** for (figs 117) ÷ 48 soi by (243.75) or (figs 117) ÷ 250 soi by 46.8 **A1** for figs 243(.75) or figs 46 to 47 **A1** for correct comparison of 243(.75) with 250 or 46 to 47 with 48 and sensible conclusion <u>Alternative 2</u> **B1** for 4 cups in a litre soi **M1** FT for 9 × *their* 4 or 36 cups in urn **M1** FT for 2.7 × *their* 4 or 10(...) cups in kettle **A1** for 46-47 and sensible conclusion
7	**(a)**		South or S North West or NW	2	**B1** each Ignore distances	
	(b)		20 to 35 inclusive	2	**M1** for 4 to 7 or for use of 1 cm = 5 km	
	(c)		115 to 120	1	Ignore embellishments	
8			Correct triangle with compass arcs, tolerance 2 mm	2	**B1** for correct triangle without compass arcs or for compass arcs for AC or BC correct	C might be below AB

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Question			Answer	Marks	Part Marks and Guidance	
9	(a)		$2m + 7t + 11$	3	**B2** for two terms correct in final answer or for correct version seen and then wrongly 'simplified' Or **B1** for one term correct in final answer	
	(b)	(i)	$[x =] \ ^{-}8$	1		
		(ii)	$[y =] \ \dfrac{8}{5}$ oe	2	**M1** for $5y = 8$ or $y - 1.4 = 0.2$ oe or for correct answer FT *their ay = b a ≠ 0, 1 or b and b ≠ 0* Or **B1** for correct embedded final answer	$\dfrac{5y}{5}$ is not an acceptable equivalent
	(c)		$\left[x =\right]\dfrac{y-6}{4}$ or $\dfrac{y}{4}-1.5$ oe	2	**M1** for a correct constructive first step, or for answer correct except for a sign error	eg **M1** for $\dfrac{6-y}{4}$ (sign error in denominator)
10	(a)		500	1	Accept answer in words	
	(b)		77 000	1	Accept answer in words	
	(c)		$90 \div 8$ or $80 \div 8$ or $1 \div 8$

Their $(90 \div 8$ or $80 \div 8$ or $1 \div 8) \times 5$

Their $((90 \div 8) \times 5) -$ *their* $((80 \div 8) \times 5)$ or *their* $(1 \div 8 \times 5) \times (90 - 80)$

6.25 or 6.3 or 6.2 | M1

M1

M1

B1 | 11.25 or 10 or 0.125 implies **M1**

56.25 or 50 or 0.625 implies **M2** | <u>Alternative method</u> **M1** for $90 - 80$ soi **M1** for *their* $(90 - 80) \div 8$ **M1** for *their* $((90 - 80) \div 8) \times 5$ **B1** for 6.25 or 6.3 or 6.2 |
| 11 | (a) | (i) | 5(th) | 1 | Accept eg Friday if identified as day 5 on diagram | |

PMT

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Question			Answer	Marks	Part Marks and Guidance	
		(ii)	21	2	**M1** for 28 and/or 7	Could be on diagram
		(iii)	39	2	**M1** for 32 and/or 7	Could be on diagram
	(b)	**(i)**	(table: 21 / 37 / 77, 53)	3	**B2** for two correct entries Or **B1** for one correct entry	If a space is blank, accept clear evidence in working space eg Joe White = 21
		(ii)	8 : 7	1	Accept 1 : 0.875 or 1.14[…] : 1	
	(c)		12	3	nfww **M2** for $\frac{60}{\text{their }(7+5+3)} \times 3$ oe Or **M1** for 60 ÷ *their* (7 + 5 + 3) oe or for 4	
12	**(a)**		There are overlaps eg 5 comes in two boxes	1	Or needs responses with no overlaps eg 0-4, 5-9 etc	See exemplars
			There is no box for over 20 CDs (accept a numerical example eg 30)	1	Or needs responses covering all eventualities eg extra box for "21 or more" or extra box for "other"	

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Question			Answer	Marks	Part Marks and Guidance	
	(b)		260	4	nfww **M1** for midpoints 50, 150, 250 etc (at least 3 correct) soi **M1** for *their* 'midpoints' × freq attempted soi by 10400 or 10420 or at least 3 products seen FT *their* 'midpoints' **M1** for *their* sum of *f* × *x* ÷ *their* sum of *f* Or **SC3** for final answer 260.5 Or **SC2** for final answer 210 or 310	eg may be seen by table Condone 50.5, 150.5 etc eg at least 3 of 100, 1500, 3750, 3150, 1350, 550 or total 10400 Working may be by table If correct: 10400 ÷ 40 eg allow 2nd and 3rd **M1**s for use of endpoints not midpoints First two **M1**s may be earned for correct work seen even if not then used in the final answer

APPENDIX 1

Exemplar responses for question **12a**

Response	Mark awarded
She has included the last number from the previous category.	1
She has one same option in each of the boxes.	1
It is not suitable for all possible responses.	0
Not a true representation of population, age groups stop at 20 years old.	0
How many CDs a person has is too specific – needs a more general question to be asked.	0

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