OCR
Oxford Cambridge and RSA

GCSE

Mathematics A

Unit **A501/01:** Mathematics A (Foundation Tier) Paper 1

General Certificate of Secondary Education

Mark Scheme for November 2015

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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.

OCR will not enter into any discussion or correspondence in connection with this mark scheme.

12. 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 – √(*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)		20	1		
	(b)		13	1		
	(c)		2 ½ symbols drawn for orange juice	1	mark intent	
2	(a)		28	1		
	(b)		54	1		
	(c)		38 and 52	1		
	(d)		17	1		
3	(a)		cross in correct position	1	condone on correct edge of road	not **in** road
	(b)		Denzil [Road]	1	condone spelling error if meaning is clear	
	(c)		right, left, right	1	accept r, l, r	
4	(a)	(i)	2.8	1		
		(ii)	arrow pointing to −1.5	1	accept anywhere in gap between −1.4 and−1.6	
		(iii)	−4.6	1		
	(b)	(i)	650	2	**B1** for 1000 ml = 1 litre soi	

Question			Answer	Marks	Part Marks and Guidance	
		(ii)	8	4	nfww **M1** for 250 or their 350 − 100 and **M1** (indep) for ÷ 30 or for at least four repeated subtractions of 30 oe **A1** for 8.3(...) SC: after 650 used instead of 350 allow **SC3** for 18 or **SC2** for 18.3(3...) oe	condone their 350 ÷ 30 oe for **M1** after their (i) = 150 allow second **M1** for final ans of 1 allow **M2** for at least four repeated additions of 30 to 100
5	**(a)**		72 to 74	1		
	(b)		8.6 to 8.8	1		
	(c)		E or AED or DEA	1		
6			1.978 or 1.98	4	**M1** for 60 years used and **M1** (indep) for 2.3 × their 60 [allow for digits 138 seen or used] and **M1** for 1 m = 1000 mm oe seen or used, implied by 0.138 [m] if M0, allow **SC1** for correct statement such as 2.3 cm in 10 years	may be two-stage conversion m to cm then cm to m **not** implied by 13.8 cm

Question			Answer	Marks	Part Marks and Guidance	
7	(a)		13	3	nfww **M1** for attempt to add the ten scores [= 130 if correct] and **M1** for ÷ 10 after M0, **SC2** for ans of 120.1	
	(b)		9.5	2	**M1** for one or both of 15th and 16th values identified (9 and 10)	may be in table
8	(a)		$6f - 2g$	2	**B1** for one term correct Or for $6f + -2g$	
	(b)	(i)	80	1		
		(ii)	-1	1		
	(c)		2.5	2	**M1** for $2x = 5$ oe or for their answer FT *their* $ax = b$, with one of a and b correct	no FT for $a = 1$ or $b = 0$
9	(a)	(i)	1250 and 6250	2	**B1** for one correct or for their second 5 × their first	condone wrong order
		(ii)	No with valid reason	2	**M1** for strategy such as finding next 2 terms, dep on attempt to multiply successive terms by 5	eg M1 for 31 250, 156 250 found or for repeated division of 600 000 by 5 see exemplars
	(b)		$3n + 1$	2	oe; need not be simplified **M1** for $3n$ oe **SC1** for $3x + 1$ oe using other letters	accept $n \times 3$. $n3$ etc; [Common with Higher]

<table>
<tr><th colspan="3">Question</th><th>Answer</th><th>Marks</th><th>Part Marks and Guidance</th><th></th></tr>
<tr><td>10</td><td>(a)</td><td></td><td>bearing of 150 drawn</td><td>1</td><td>tol 2°</td><td>overlay to assist examiners</td></tr>
<tr><td></td><td></td><td></td><td>first section 6 cm long</td><td>1</td><td>tol 2mm</td><td></td></tr>
<tr><td></td><td></td><td></td><td>line 3.6 cm due East from end of their first section</td><td>1</td><td></td><td></td></tr>
<tr><td></td><td>(b)</td><td></td><td>306 to 310 or FT their (a)</td><td>2</td><td>M1 for evidence on diagram that they know which angle the bearing is
or for one relevant angle correctly measured on their diagram, tol 2°</td><td>eg arc clockwise round from N at their ‘end’ to return line</td></tr>
<tr><td>11</td><td></td><td></td><td><table><tr><td>Gold</td><td>Silver</td><td>Bronze</td><td>Total</td></tr><tr><td>13</td><td>11</td><td>9</td><td>33</td></tr><tr><td>11</td><td>5</td><td>10</td><td>26</td></tr><tr><td>10</td><td>10</td><td>5</td><td>25</td></tr><tr><td>34</td><td>26</td><td>24</td><td>84</td></tr></table></td><td>3</td><td>B3 for all 5 entries correct;
B2 for 3 or 4 entries correct;
B1 for 2 entries correct</td><td>[Common with Higher]

B0 just one entry correct</td></tr>
<tr><td>12</td><td>(a)</td><td>(i)</td><td>9</td><td>2</td><td>B1 for 8 shares seen or used eg 24 ÷ 8 [= 3]
or B1 for 3 × 3</td><td>B0 for just 3 seen

[Common with Higher]</td></tr>
<tr><td></td><td></td><td>(ii)</td><td>10</td><td>2</td><td>B1 for 5 × 2 or other clear evidence of attempt to double the ratio</td><td>[Common with Higher]</td></tr>
<tr><td></td><td>(b)</td><td></td><td>2:20 pm or 14:20</td><td>3</td><td>B2 for 80 or 1h 20m or 2:20
or M1 for prime factor decomposition of 16 and/or 20 found
$16 = 2^4$, $20 = 2^2 \times 5$ but need not be expressed as product
or M1 for 16, 32, 48 and 20, 40, 60 seen (oe in counting on from 1 pm)
or M1 for $16 = 4 \times 4$ and $20 = 4 \times 5$</td><td>eg correct factor tree or division list

[Common with Higher]</td></tr>
</table>

Question			Answer	Marks	Part Marks and Guidance	
13	(a)		Jenny has divided by the smaller number	1	oe condone 'by smaller decimal'	see appendix for examples [Common with Higher]
	(b)		multiplying by a number less than 1 makes the answer smaller	1	oe condone decimal or fraction instead of number less than one	[Common with Higher]

APPENDIX 1

Exemplar responses for question 9(a)(ii)

Response	**Mark**
No, it goes 31 250, 156 250, 781 250 so misses out 600 000.	2
No because 600 000 ÷ 5 = 120 000 ÷ 5 = 24 000 ÷ 5 = 4800 and we have gone past that already	2
No because after 10 they all end in 50 or 250	2
No because 3 is a factor of 600 000 and each term is the sequence is 2 times a power of 5.	2

Exemplar responses for Q.13a) [common with Higher]

Response	Mark
The larger the number you divide by, the smaller your answer will be	1
Dividing by a number less than 1 makes the answer larger	0 not sufft

Exemplar responses for Q.13(b) [common with Higher]

Response	Mark
The answer should be smaller than 12	1
Multiplying by a number less than 1 makes the answer smaller not bigger	1

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