

Mathematics A

General Certificate of Secondary Education

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

Mark Scheme for November 2010

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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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Marking Instructions & Abbreviations**Marking instructions**

1. Mark strictly to the mark scheme.
2. Make no deductions for wrong work after an acceptable answer unless the mark scheme says otherwise.
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.
B marks are independent of **M** (method) marks and are awarded for a correct final answer or a correct intermediate stage.
5. Two additional situations may appear in the mark scheme allowing the award of **A** marks or independent (**B**) marks:
 - i. Correct answer with no working
 - ii. Follows correctly from a previous answer whether correct or not (“FT” on mark scheme).
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. 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.
8. If the correct answer is seen in the body and the answer given in the answer space is a clear transcription error allow full marks unless the mark scheme says ‘mark final answer’ or cao. If the answer is missing, but the correct answer is seen in the body allow full marks. If the correct answer is seen in working but a completely different answer is seen in the answer space, then accuracy marks for the answer are lost. Method marks would normally be given.
9. For methods not provided for in the mark scheme give as far as possible equivalent marks for equivalent work.

10. For answers scoring no marks, you must either award NR (no response) or 0, as follows:

Award NR (no response) if:

- Nothing is written at all in the answer space
- There is any 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.)

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.

11. Where a follow through 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.
12. Unless the question asks for an answer to a specific degree of accuracy, always mark at the greatest number of significant figures seen. E.g. answer on 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.
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.
14. Ranges of answers given in the mark scheme are always inclusive.
15. Annotating scripts. The following annotations are available:

✓ and ✗

BOD - Benefit of doubt

FT - Follow through

ISW - Ignore subsequent working

M0, M1, M2 - Method mark awarded 0, 1, 2

A1 - Accuracy mark awarded

B1, B2 - Workless mark awarded 1, 2

MR - Misread

SC - Special case

^ - Omission sign

These should be used whenever appropriate during your marking.

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 **isw** in the mark scheme it means **ignore subsequent working** (after correct answer obtained), provided the method has been completed.
- 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 the answer line, even if it is not in the method leading to the final answer.
- Figs: for example **figs 237** means any answer with just these digits with leading or trailing zeros disregarding any decimal point. E.g. 237000, 2.37, 2.370, 0.00237 but not 23070 or 2374.

1	(a)	2149 4798 4890 5199	1	Accept names of mountains in correct order: Zulia, Emin, Speke, Kenya	Accept clear identification
	(b)	2741	2	M1 for 4890 and 2149 identified as the relevant heights	
	(c)	4800	1		
	(d)	5000	1		
	(e)	3002	1		
2	(a)	(3, 1) plotted	1	Tolerance 1 mm; condone unlabelled if no plot seen condone C close to point	
	(b)	(0, 4)	1		If answer space blank check diagram for complete correct answer
	(c)	(-2, 3)	1		If answer space blank check diagram for complete correct answer
3	(a)	(i) Grams or g	1		Condone misspellings etc throughout if intention clear
		(ii) Metres or m	1		
		(iii) Centimetres or cm	1		
	(b)	340 soi 1 litre = 1000 ml soi Yes, <i>their</i> 660 > 600 or <i>their</i> 940 < 1000 or <i>their</i> 330 > 300 oe	B1 M1 A1	660 implies B1 M1	

4	(a)	10 dots, 1 in each square and 4 stars at intersections of squares	1	Mark the intent	
	(b)	4 5 10 12	1	Ignore extra columns	
	(c)	9	1		
	(d)	20	1	SC1 for reversed answers in (c) & (d)	
	(e)	2 more lavenders and 1 more rose needed oe	1		3 plants is insufficient
5	(a)	(i) Bars of consistent width and spacing Correct heights	1 1	Condone freehand Condone one error in heights	Vertical line graph and frequency polygon can only score 2 nd mark
		(ii) Shilpa	1		
	(b)	(i) 39 www	3	M1 for sum of $48 + 54 + \dots + 36 [= 351]$ Condone up to 2 errors or omissions M1 for division of <i>their</i> 351 by 9 If M0 then SC2 for answer of 319	SC2 answer from forgetting to press = before division by 9
		(ii) 28 www	2	M1 for 54 and 26 only	
	(c)	The 2009 meetings were longer <u>on average</u> oe OR The lengths of the meetings were [slightly] <u>more varied</u> in 2008 oe	1	Accept 'not much difference in the spread of the times'	

6	(a)	Two of 63, 65, 67	1		
	(b)	63 or 7×9	1		
	(c)	64 or 8^2	1		
7		67° angle drawn at A, AC drawn 4.8 cm and completion to triangle	2	Tolerance 2° for angle, 2mm for line M1 for angle or line within tolerance If M0 then SC1 for complete 'correct' triangle with A and B interchanged	
8		1.4 × figs 85 [= 119(p) or (£)1.19] 1.2 × figs 125 [= 150(p) or (£)1.5(0)] 10 – (their1.19 + their1.50) or their1.19 + their1.50 + 6.99 or 10 – 6.99 – (their1.19 + their1.50) £7.31 or £9.68 or £0.32 or 32p AND Yes	M1 M1 M1 A1	soi by correct answer	
9	(a)	$(6 + 2) \times 4 = 32$	1		
	(b)	$6 + 2 \times (4 - 1) = 12$	1	Accept superfluous pairs of brackets in all 3 parts e.g. accept $6 + (2 \times (4 - 1)) = 12$ here	Brackets must be in pairs 0 for e.g. $6 + 2 \times (4 - 1 = 12$
	(c)	$6 + (2 \times 4)^2 = 70$	1		
10		First box joined to 6a box Second box joined to $2c + 9d$ box Third box joined to $3a + 6$ box	1 1 1	In each case treat incorrect extra lines as choice	

11	(a)	(i) 62	1											
		(ii) 38	2	M1 for either 37 or 39 seen, or for mention of or identification of 12[th] or 13 or 12.5 (could be on the diagram)										
	(b)	<table border="1"> <tr> <td>80</td> <td></td> <td></td> </tr> <tr> <td></td> <td>25</td> <td>66</td> </tr> <tr> <td>121</td> <td></td> <td></td> </tr> </table>	80				25	66	121			2	M1 for two entries correct	
80														
	25	66												
121														
12	(a)	(i) 221 to 224	1											
		<p>(ii) At least one side of AB, BC, CA measured accurately (11 cm, 9 cm, 8 cm with tolerance ± 1 mm)</p> <p>Total distance found e.g. 28 cm on map or 700 000 cm soi</p> <p>100 cm = 1 m and 1000 m = 1 km or 4 cm to 1 km soi</p> <p>7 [km] and appropriate comment</p>	<p>M1 May be implied by conversion to actual distances in cm, m or km (e.g. figs 275, 225, 2)</p> <p>M1 FT <i>their</i> measurements; may be done after conversion</p> <p>M1 May be earned earlier; need not be explicit M0 for e.g. 10 000 m = 1 km stated</p> <p>B1 Accept 6.9 to 7.1 km and ‘so OK’, ‘no, paths may be not straight so they have to go further’ etc</p>	<p>Often seen by diagram; may be implied by 28 e.g. 2.75 [km] seen by diagram earns first and third M1s If only 8 seen must be clearly identified as AC</p> <p>Figs 7 imply this second M1</p> <p>May be implied by correct answer</p> <p>E.g. if measurements or 28 not seen, may earn M0 M1 M1 B1</p>										

	(b)	<p>1.41(4...)</p> <p>Suitable comment e.g. '1.4 would be more accurate' or 'not too far out for a rough guide' or '1.5 is near and is easier for an estimate' or 'they have rounded wrongly it should be 1.4 not 1.5'</p>	<p>2 M1 for $1^2 + 1^2$ or $\sqrt{2}$ oe soi Allow A1 for 1.4 if M1 earned</p> <p>Allow SC1 for $1.5^2 - 1^2 = 1.25$ followed by $\sqrt{1.25} = 1.1(18\dots)$ rot [can also earn comment mark following this]</p> <p>1 Dependent on answer 1.4 to 1.42 or Pythagoras attempted</p>	<p>Condone trigonometry used if correct answer obtained</p> <p>M0 for just $1 + 1 [= 2]$ with no evidence of squaring or square root</p> <p>Mark equivalently for other squares used e.g. M1 for $2^2 + 2^2$ and A1 for 2.82(8...) and B1 for comparison with 3</p>
13		<p>$\frac{8}{5}$ or 1.6 oe</p>	<p>3 M2 for $5x = 8$ Or M1 for one side of equation correct AND M1 for final answer FT from <i>their</i> $ax = b$, provided $a \neq \pm 1$</p> <p>Allow B3 for correct answer given embedded as final answer</p>	<p>Allow M1 for e.g. $3x = 8 - 2x$</p> <p>E.g. $3 \times 1.6 + 7 = 15 - 2 \times 1.6$</p>

APPENDIX 1

Exemplar responses for question 12b

Response	Mark awarded
The magazine's estimate is 7% too high	1
They are only 100m out so quite good / they are 100 m out so wrong	1
Accuracy good as roughly right (after correct calculation)	1
"So not correct " after correct calculation	1
Magazine not accurate – rounds to 1.4 not 1.5	1
It should be 1.4 [or FT if M1 earned]	1
The magazine's information is fairly accurate [because they are only 4mm out] [Ignore justification]	1

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