

Mathematics A

General Certificate of Secondary Education

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

Mark Scheme for November 2013

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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 $180 \times (\text{their '37' + 16})$, or FT $300 - \sqrt{(\text{their '5^2 + 7^2'})}$. Answers to part questions which are being followed through are indicated by eg FT $3 \times \text{their (a)}$.

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.
 - **nfw** 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)		2006, 116	2	B1 each	
	(b)		25	2	M1 for 86 and/or 61	
	(c)		Bar height 23 drawn for 2011	1	Must attempt to go between 22 and 24 lines	
2	(a)	(i)	North	1	Accept N etc	0 for North West etc
		(ii)	3.5 to 4	2	M1 for 7 to 8 cm	
	(b)		6.15	2	M1 for 174 or 1.74	
	(c)		5	1	Accept 4 to 6	
	(d)	(i)	100 400	1		
		(ii)	100 000	1		
3	(a)		Squares 4 5	1		
			Circles 14 16	1		
			Pattern 4: Squares 6 Circles 18	1		
	(b)		30	1		
			It goes up 2 each time oe	1		See appendix for examples No MR for 12 (squares) instead of 30 circles
4	(a)	(i)	28	1		
		(ii)	26	1		

Question			Answer	Marks	Part Marks and Guidance															
		(iii)	29	1																
	(b)		125	1	Condone 5 on answer line if $25 \times 5 = 125$ seen in body of script															
	(c)	(i)	34	1																
		(ii)	-4	1	0 for 6 but allow 1 for '-4 or 6'															
5	(a)	(i)	278	1																
		(ii)	24	2	M1 for <i>their</i> $278 \div 11.6$ or for 23.9...															
	(b)	(i)	12.26 10 to 60 and leaving time FT <i>their</i> arrival time FT <i>their</i> leaving time + 1h 11m	1 1 + 1 1		Condone incomplete time notation if meaning is clear eg in (b)(ii) accept notation such as 2.25														
		(ii)	Leaving time one of the bus times after <i>their</i> arrival in Sheringham Arrival time correct for that bus	1 1	<table border="1"><tr><td>1425</td><td>1455</td><td>1525</td><td>1555</td></tr><tr><td>1446</td><td>1516</td><td>1546</td><td>1616</td></tr></table> <table border="1"><tr><td>1625</td><td>1655</td><td>1755</td></tr><tr><td>1646</td><td>1716</td><td>1814</td></tr></table>	1425	1455	1525	1555	1446	1516	1546	1616	1625	1655	1755	1646	1716	1814	
1425	1455	1525	1555																	
1446	1516	1546	1616																	
1625	1655	1755																		
1646	1716	1814																		
6	(a)		$4c$ or $c + c + c + c$ or $4 \times c$ oe	1	Need not be simplified	1 for tc (total cost) = $4c$ oe 1 for $4b = 4c$ with b described as choc bar 0 for $4c = 20p$ oe 0 for 4^c														
	(b)	(i)	$15ab$	1	Must be simplified	Not $15 \times a \times b$														

Question			Answer	Marks	Part Marks and Guidance	
		(ii)	$5a + 3b$	2	B1 for $5a$ or for $3b$	Condone $a5$, $5 \times a$, $5A$ etc
7	(a)		300 450 3 540 6 720	3	B3 for all correct Or B2 for 4 correct Or B1 for 2 correct	
	(b)		470	3	nfw M1 for 435×4 or 1740 M1 for $450 + 480 + 340$ or 1270 or for subtracting 450, 480 and 340 from <i>their</i> 435×4	Allow 470 from trials if correct answer found Allow M1 for $450 + 480 + 340 +$ anything else
8	(a)		Triangle correct, with compass arcs	2	M1 for $BC = 8.4$ cm or $AC = 4.3$ cm or an arc with one of these radii drawn; tolerance 2 mm	Use overlay Allow a MR for $AC = 8.4$ cm, $BC = 4.3$ cm
	(b)		20 to 25 from correct triangle with or without arcs or FT <i>their</i> triangle tolerance 2 degrees	1		
	(c)		Obtuse	1	Must be correct and FT <i>their</i> triangle	
9	(a)		8	2	M1 for 12 or for evidence of $\div 6$ then $- 4$	
	(b)	(i)	$6n + 4$	1	Need not be simplified	eg 1 for $n6 + 4$ or $6 \times n + 4$ 0 for other letters used but condone N used

Question			Answer	Marks	Part Marks and Guidance	
		(ii)	7	3	nfw SC2 for embedded answer $6 \times 7 + 4 = 7 + 39$ OR M1 for collecting n 's M1 for collecting numbers FT <i>their</i> $an + b = n + 39$, $a \neq 1$ or 0 and $b \neq 39$ or 0	Allow 7 from trials if correct answer found; otherwise M0 eg M2 for $5n = 35$ after correct equation
10			Pie chart with all sectors correct: J 60°, A 120°, V 96°, S 84°, tolerance 2° and correct labels	3	M2 for a 4-sector chart with 2 sectors within tolerance Or M1 for 60, 120, 96 and 84 seen or for a pie chart with 1 correct angle (even if not 4 sectors) Accept abbreviations for labels	Use the scoris protractor to check the angles: for unruled lines, check the angle where a line crosses/ would cross the circumference Condone 5, 10, 8, 7 for labels
11	(a)		567.5 to 567.6 or 568 or 570	3	nfw M2 for $\sqrt{466^2 + 324^2}$ oe or equivalent complete method using trig (condone poor notation) Or M1 for $466^2 \pm 324^2$ or for 322 132 or any attempt at Pythagoras (eg 217 156 + 104 976)	570 from scale drawing scores 0
	(b)		More than 90 since diagonal should be less than 572 oe	1FT	FT only if at least M1 gained in (a)	

APPENDIX 1

Exemplar responses for question 3(b)

Response	Mark
Add 2 each time	1
Keep adding 2	1
It is double the number of squares and 6 more for the ends	1
You double the pattern number and add 10	1
The rule is $2n + 10$	1
Pattern 5 would have 20. $5 \times 2 = 10$ which is the difference between 5 and 10. $20 + 10 = 30$	1
Each pattern you add one square and two circles so the answer will be 30	1
Add 2	0
The number of circles goes up 2 times	0
You add one square and two circles so the answer will be 30	0

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