

GCSE

Mathematics A

Unit **A502/01**: Mathematics B (Foundation Tier)

General Certificate of Secondary Education

Mark Scheme for November 2014

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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.

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Annotations used in the detailed Mark Scheme.

Annotation	Meaning
	Correct
	Incorrect
	Benefit of doubt
	Follow through
	Ignore subsequent working (after correct answer obtained), provided method has been completed
	Method mark awarded 0
	Method mark awarded 1
	Method mark awarded 2
	Accuracy mark awarded 1
	Independent mark awarded 1
	Independent mark awarded 2
	Misread
	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 $180 \times (\textit{their '37'} + 16)$, or FT $300 - \sqrt{(\textit{their '5^2 + 7^2'})}$. Answers to part questions which are being followed through are indicated by eg FT $3 \times \textit{their (a)}$.

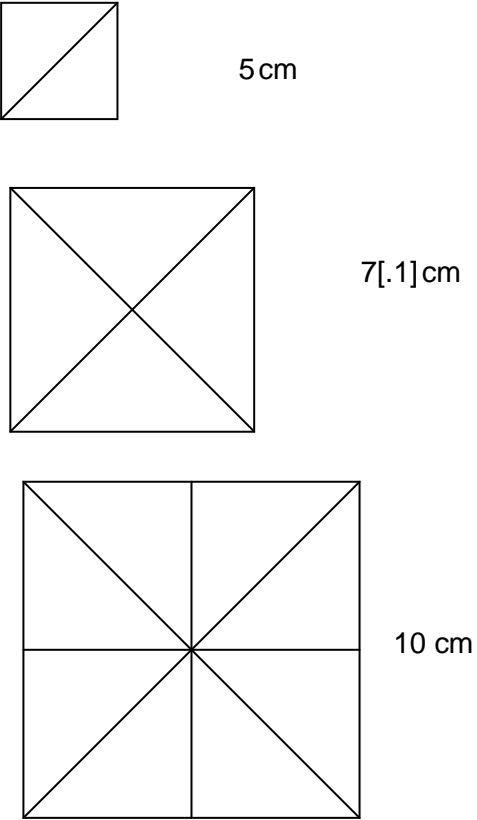
For questions with FT available you must ensure that you refer back to the relevant previous answer. You may find it easier to mark these questions candidate by candidate rather than question by question.

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)		Correct order	2	B1 for reversed order or 3 in correct order	Correct order 81 101 899 952 2014
	(b)	(i)	50[%]	1		
		(ii)	$\frac{3}{4}$ oe	1	Condone 9 as answer	Accept any correct fraction equivalent but not a decimal or percentage
	(c)	(i)	6[.00] isw	2	M1 for 10% = [£]3 or 30 × 0.2 oe	Do not accept [£]3 as final answer Ignore working once 20% found if the increased value is clearly attempted
2	(a)	(i)	Hexagon	1		Ignore regular
		(ii)	Diameter drawn	1	One line intended straight through centre of circle and extending to circumference	Condone more diagonals
		(iii)	Chord	1		
		(iv)	Line of symmetry	1	One line intended straight If multiple lines mark the worst	Condone more lines of symmetry

Question	Answer	Marks	Part Marks and Guidance	
(b)		4	<p>B1 for first correct square</p> <p>B1 for length of side associated with correct square</p> <p>AND</p> <p>B1 for second correct square</p> <p>B1 for length of side associated with correct square</p> <p>If 0, then SC2 for two of 5 cm, 7[.1] cm or 10 cm and no squares Or SC1 for one of 5, 7 or 10 seen</p>	<p>Condone poor drawing, gaps and missing interior lines throughout</p> <p>Condone poor drawing</p> <p>If multiple squares drawn mark the two best</p>
3	(a) 120	2	M1 for 1.2×100	
	(b) <i>Their 75</i>	2FT	M1 for <i>their</i> $120 - 45$	
	(c) 30	2	M1 for $36 \div 1.2$	Method implied by multiples of 1.2 eg $1.2 \times 10 = 12$ $1.2 \times 20 = 24$ etc
4	(a) 12	1	Condone 12[.00]	

Question		Answer		Marks	Part Marks and Guidance																				
	(b)	<table border="1"> <tr> <td>Fish tank</td> <td>£12.40</td> <td>12</td> </tr> <tr> <td>Water pump</td> <td>£4.90</td> <td>5</td> </tr> <tr> <td>Gravel</td> <td>80p</td> <td>1</td> </tr> <tr> <td>Plastic castle</td> <td>£6.80</td> <td>7</td> </tr> <tr> <td>Ceramic skull</td> <td>£3.20</td> <td>3</td> </tr> <tr> <td colspan="2">Total</td> <td>28</td> </tr> </table>		Fish tank	£12.40	12	Water pump	£4.90	5	Gravel	80p	1	Plastic castle	£6.80	7	Ceramic skull	£3.20	3	Total		28	2	<p>B2 for 5 correct (FT <i>their</i> £12.48 or correct) Or B1 for 3 correct</p>	Allow 12.00 or 12.0 for 12 etc	
Fish tank	£12.40	12																							
Water pump	£4.90	5																							
Gravel	80p	1																							
Plastic castle	£6.80	7																							
Ceramic skull	£3.20	3																							
Total		28																							
			1	<p>1 FT for <i>their</i> total correct</p> <p>If 0, then SC2 for total 28 and no rounded prices or SC1 for total 28.1[0] and no rounded prices</p>																					
5	(a)	55[.00]		1																					
	(b)	10[.00]		1																					
	(c) (i)	40[.00]		2	M1 for 5 × 8																				
	(ii)	8 (16) 24 32 40 48 56 64		1	Condone 1 error in addition of 8	Eg 8, 16, 23 , 31, 39, 47, 55, 63 scores 1 mark																			
	(iii)	Ruled straight line from (8pm, 0) through (1am, 40) and on to (4am, 64)		2	<p>B1 plotting 6 of <i>their</i> points</p> <p>B1 for ruled straight line from (8pm, 0) to at least (3am, 56) or for ruled straight line through at least 6 points</p>	<p>Condone from (9pm, £8) for points and line</p> <p>Points implied by line</p> <p>Half square tolerance throughout</p> <p>Use overlay</p>																			

Question			Answer	Marks	Answer
5	(c)	(iv)	<p>A correct comparison of costs with no clearly incorrect statements for employing both girls including all of,</p> <ul style="list-style-type: none"> Recognise Alba is [usually or for a time period] cheaper than Katy oe Recognise Katy is cheaper than Alba either from 8pm to 11:45pm or midnight or 1:00am oe Two costs or a difference at the same time A time and cost read from any sloping line or two further costs or a difference 	4	<p>FT <i>their</i> lines but still look for four elements correct. EG, if Alba always below Katy, B1 for “Always cheaper” and then B2 . Condone references to earning rather than cost so “Alba is cheaper” becomes “Alba earns less” Condone correct time equivalents throughout and “up to” or “at” for 8pm to</p> <p>Condone use of graph as step function and read end points Key times are Same at 1:00am oe Same at 11:45pm Alba more between 11:45pm and 1:00am</p>
			<p>A correct comparison of costs (ignore incorrect statements) for employing both girls including 3 of</p> <ul style="list-style-type: none"> Recognise Alba is [usually or for a time period] cheaper than Katy oe Recognise Katy is cheaper than Alba either from 8pm to 11:45pm or midnight or 1:00am oe Two costs or a difference at the same time A time and cost read from any sloping line or two further costs or a difference 	3–2	<p>A correct comparison of costs (ignore incorrect statements) for employing both girls including 2 of</p> <ul style="list-style-type: none"> Recognise Alba is [usually or for a time period] cheaper than Katy oe Recognise Katy is cheaper than Alba either from 8pm to 11:45pm or midnight or 1:00am oe Two costs or a difference at the same time A time and cost read from any sloping line or two further costs or a difference
			<p>A correct comparison of costs (ignore incorrect statements) for employing both girls including 1 of</p> <ul style="list-style-type: none"> Recognise Alba is [usually or for a time period] cheaper than Katy oe Recognise Katy is cheaper than Alba either from 8pm to 11:45pm or midnight or 1:00am oe Two costs or a difference at the same time A time and cost read from any sloping line or two further costs or a difference 	1–0	Nothing of any worth.

Question		Answer	Marks	Part Marks and Guidance	
6 C	(a)	Ruled line of best fit	1	Within limits of overlay	
	(b)	11 or 12 only	1		
	(c)	Positive	1	Ignore "Strong" etc	
7	(a)	Division indicated only	1		
	(b)	$b = g - 5$	2	Condone $g - 5 = b$ B1 for $g - 5$ seen or B1 for $b + 5 = g$ or $g - b = 5$ or $g - b - 5 = 0$	NOT $5 - g$ or $b - 5$ etc For B1 accept equivalent forms without b as subject
	(c)	$x > 6$	1		
	(d)	$a + b$	1		
	(a)	5 points correct	2	B1 for at least 2 points correct	± 1 whole square Ignore any connecting lines
8 C	(b) (i)	1146 to 1159	1		
	(b) (ii)	106 to 119	1		

Question		Answer	Marks	Part Marks and Guidance	
9	(a)	[0].4[0...]	2	M1 for $2 \div 5$ or $\frac{2}{5} \times \frac{2(0)}{2(0)}$ seen isw	Condone 0s after 4
	(b)	$\frac{79}{100}$	1		
	(c) (i)	$\frac{4}{3}$ only indicated	1		
	(ii)	Dot or The decimal will not end oe	1	Do not accept "recurs" oe	Allow 0.33[3...] as explanation
10 C	(a)	Translation $\begin{pmatrix} -2 \\ 4 \end{pmatrix}$	1 2	B1 for one component correct or $\begin{pmatrix} 2 \\ -4 \end{pmatrix}$ or $\begin{pmatrix} 4 \\ -2 \end{pmatrix}$ or $x-2, y+4$	Allow 2 left, 4 up for B2 Condone other unconventional notations that imply the correct vector eg -2,4 for B1
	(b)	Correct reflection	2	B1 for reflection in $y = 1$ or reflection in any vertical line	Overlays available Condone freehand
	(c)	Correct shape	3	B2 if wrong centre used or correct intention for 2 points Or B1 if wrong SF used	Overlay available Condone freehand

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