

GCSE

Mathematics A

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

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.

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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 $180 \times (\text{their '37'} + 16)$, 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.
 - **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.

MARK SCHEME

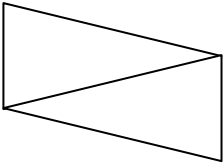
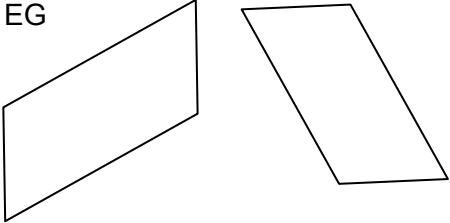
Question			Answer	Marks	Part Marks and Guidance	
1	a		4.8[0]	1		Condone poor money notation throughout Q1 EG [£]4.8p
	b		1.28	1		
	c		4.14	3	M2 for $10 - \text{their}(2.4 + 2.56 + 0.9)$ oe s Or M1 for $2.4 + 2.56 + 0.9$ soi	Soi by 5.86
	d		2	3	M2 for $(10 - \text{their}(2.4 + 2 \times 2.56)) \div 0.9$ oe Or M1 for $10 - \text{their}(2.4 + 2 \times 2.56)$ Or for <i>their</i> $2.48 \div 0.9$	Soi by $2.48 \div 0.9$ Division may be by summing 90p or seeing one of 8.42 or 9.32 or 10.22 Soi by 7.52
2	a	(i)	45 and 90	1	Must have both and no extras	In any order
		(ii)	Isosceles	1	Clear indication	EG ringed, ticked, others crossed out

Question			Answer	Mark	Answer
2	b		<p>Complete and correct response using correct geometric terms including</p> <ul style="list-style-type: none"> Angles in triangle [at mid points] oe 45 [degrees] All angles in shape are 90 [degrees] or the same All triangles are the same [size] All sides of the shape are the same [length] <p>Poorly expressed response but containing two from</p> <ul style="list-style-type: none"> Angles in triangle [at mid points] oe 45 [degrees] All angles in shape are 90 [degrees] or the same All triangles are the same [size] All sides of the shape are the same [length] <p>Unsupported statements not demonstrating the required evidence</p>	<p>3</p> <p>2 - 1</p> <p>0</p>	<p>Accept alternative, correct wording for each statement so long as meaning is clear and terms used correctly May say congruent Must not say or imply sides = angles for this mark</p> <p>One from</p> <ul style="list-style-type: none"> Angles in triangle [at mid points] oe 45 [degrees] All angles in shape are 90 [degrees] or the same All triangles are the same [size] All sides of the shape are the same [length] <p>If sides = angles stated or implied then score only 1 of these marks</p>

Question			Answer	Marks	Part Marks and Guidance	
2	c		$\frac{1}{2}$ oe	1	Accept "[A] half"	Accept fraction equivalent to $\frac{1}{2}$
	d		12	2	M1 for $360 \div 30$ or $330 \div 30$ seen	$330 \div 30$ implied by 11 seen
3	a		3, 5	1		
	b		5	1	Condone (-3, 5)	
	c		3, 1 or -3, 1	1	Accept both pairs if both pairs correct	One right pair and one wrong pair scores 0

Question			Answer	Marks	Part Marks and Guidance	
4	a			2	B1 for shading giving only one line of symmetry but more than 2 squares shaded	Alternative
	b			2	B1 for more than 2 lines giving rotational symmetry order 2	
	c			1		

Question			Answer	Marks	Part Marks and Guidance	
5	a		25	1		
	b		[+] 9	1		Condone -9 but not $9 \times 9 = 81$
	c		8	1		
	d		3^2 final answer	2	Accept “3 squared” for 2 marks B1 for 3×3 or 9 as answer to calculation. Or M1 for $81 \div 9$ seen	May be from cancelling
6	a	(i)	An expression	1		Condone poor copying If not in answer space, may be clearly indicated in list
		(ii)	12	2	M1 for $50 \div 4$ soi	Soi by 12.5 or 13
	b	(i)	$x > 4$	1		
		(ii)	$y < 5$	1	If 0 scored in (i) and (i), SC1 for $[x =] 4$ and $[y =] 5$	
7	a		2 points correctly plotted	1		Within one small square
			Final 3 points joined	1	Straight by eye	Mark intention and ignore wobbles or kinks
	b		4 oe	1	Accept 4 to 5 but not 5	EG 4 th or “When she burned from (351 to 300) or (49)”
	c		170 to 190	1		

Question			Answer	Marks	Part Marks and Guidance	
8	a		Pay [in] £	1	Must have word for “pay” and £	Accept alternatives for “Pay” such as “Earnings” but must have £ or “pounds”. Do not accept y.
	b		560	1		
	c		0.01	2	M1 for $\frac{\text{rise}}{\text{tread}}$	Must relate to triangle soi on grid (eg from marks) and use values
9	a		Obtuse	1		Condone poor spelling
	b	(i)		1	In any orientation	Condone missing diagonal and accept possible parallelogram but not a rhombus. EG 

Question			Answer	Mark	Answer
9	b	(ii)	Complete and correct response using correct geometric terms including <ul style="list-style-type: none"> • Parallelogram • Opposite [pairs of] sides same length • $180 - 75 - 75$ oe • [Angles in a] triangle [add up] to 180 • 30 • $30 + 75 = 105^\circ$ 	4	
			Poorly expressed response but containing first bullet point and then three from <ul style="list-style-type: none"> • Parallelogram • Opposite [pairs of] sides same length • $180 - 75 - 75$ oe • [Angles in a] triangle [add up] to 180 • 30 • $30 + 75 = 105^\circ$ 	3 - 2	Two from <ul style="list-style-type: none"> • Parallelogram • Opposite [pairs of] sides same length • $180 - 75 - 75$ oe • [Angles in a] triangle [add up] to 180 • 30 • $30 + 75 = 105^\circ$
			One from <ul style="list-style-type: none"> • Parallelogram • Opposite [pairs of] sides same length • $180 - 75 - 75$ oe • [Angles in a] triangle [add up] to 180 • 30 • $30 + 75 = 105^\circ$ Or Correct mathematical name for <i>their</i> quadrilateral in part (i)	1 - 0	Unsupported statements not demonstrating the required evidence

Question			Answer	Mark	Answer	
10	a		£5, £5, £1, £1, £2, 50p, 50p, 20p, 20p, 5p Or £10, £5, 20p, 5p, 5p, 5p, 5p, 2p 2p, 1p Or £5, £5, £1, £1, £1, £1, £1, 20p, 20p, 5p	2	B1 for other selection that adds to £15.45	
	b		10.97	3	M2 for 15.45 – [1.99 – 2.49] oe Or M1 for 1.99 + 2.49 soi 4.48	Could be counting on
	c		[15 or 15.50 or 16] – 2 – [2 or 2.50 or 3] oe or [15 or 15.50 or 16] - [4 or 4.50 or 5] oe Their answer correct.	M1 A1		
11	a		5 correct points plotted	2	B1 for 2 or more points correctly plotted	Within one small square
	b		Weak Positive	1 1	Or B1 for 'no correlation' Condone a description of positive if it covers both 'ends'	If 'no correlation' ignore any statements regarding strength eg "As the hours of sunshine rise then so do the temperatures and as they fall the temperatures fall"
	c		Yes as there is a correlation Or No with sensible reason relating to weak	1	Must be consistent with <i>their</i> answer in (b)	EG (b) = No correlation then (c) Yes as some correlation scores 0 in (c) eg No as the correlation is weak

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