

GCSE

Mathematics A

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

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.

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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)	(i)	30	1		
		(ii)	8	1		
		(iii)	30 and 16	1	Accept in either order	
		(iv)	13	1		
	(b)		3.2	2	M1 for other rot versions of 3.162... to 1 dp or more	
2	(a)	(i)	20 ± 2	1		
		(ii)	5.2 to 5.4 and cm	2	Or 52 to 54 and mm Allow B1 for 5.2 to 5.4 or 52 to 54 and no units or wrong units Or for cm with 4.5 to 6 or for mm with 45 to 60	
	(b)		Angle 126 to 130 drawn at A	1	Tolerance 2 mm from A Accept line extended and 128° drawn to right, provided labelled clearly	Use angle measurer, with the line drawn on the paper as one of the arms
3	(a)		2, 1	1		
	(b)		-1, 2	2	B1 each If B0 , allow M1 for coordinates reversed or for midpoint clearly marked at (-1, 2)	
	(c)		(1, -4) plotted	1	Tolerance 2 mm	

Question			Answer	Marks	Part Marks and Guidance	
4	(a)	(i)	3	1		
		(ii)	32 or -32	2	M1 for at least one of 26 and -6	
		(iii)	12	1		
5	(b)	(i)	0	1	Accept 'none' etc	
		(ii)	Feb[ruary]	1	Condone misspelling if intent is clear	0 for 25 cm
	(a)		77.5	1		
	(b)		19	1		
	(c)		Two hundred [and] five thousand	1	Condone misspelling if intent is clear	
	(d)		2460	2	M1 for $6 \times 342 + 2 \times 204$ oe, condoning one error If M0, allow SC1 for 2118 or 2802 or 2256 or 2664	eg M1 for $5 \times 342 + 2 \times 204$ oe
	(e)		200 to 230	2	M1 for $5/8 \times 340$ oe	
	(a)		3	2	M1 for 15 or 300	
6	(b)		Bath 9 squares by 4 squares	B1		
			In suitable position, FT	B1	Allow FT if <i>their</i> bath 8 to 10 squares by 3 to 5 squares; if on wall marked 'length, there must be at least 2 squares between toilet and bath	

Question			Answer	Marks	Part Marks and Guidance	
7	(a)	(i)	71	3	nfw M1 for attempt at sum [= 426 if correct] M1 for $\div 6$ Or SC2 for answer of 364	[Answer from forgetting to press = before dividing]
		(ii)	11.9	2	M1 for 78.2 and 66.3 identified	
	(b)		No + the girls' range is smaller oe	2 FT	Strict FT from (a)(ii) M1 for comparison of ranges	
8			Suitable strategy eg cost of 9 haircuts or attempt at savings per haircut and taking 9 th haircut into consideration LH offer [for 8 or 9] = $41 \times 8 = 328$ RH offer [for 9] = $37.5(0) \times 9 = 337.5[0]$ So LH offer cheaper ISW wrong difference found	M1 M1 M1 A1	Must attempt to consider effect of free haircut in left-hand offer <u>Alternative method for 2nd and 3rd M1s</u> Or savings on RH offer [for 8] = $8 \times (41 - 37.5(0)) = 28$ Or comparison of savings with cost of 9 th haircut 37.5(0) eg $328 \div 9 = 36.44(\dots)$ or 36.40 nfw	Do not allow a mix of marks from different methods May see a greater number of haircuts considered. Allow full marks if a multiple of 9.
9			0.31(25)	2	nfw M1 for [C] $\frac{50}{40}$ or 1.25 or for [D] $\frac{50}{32}$ or 1.5625	Common

Question			Answer	Marks	Part Marks and Guidance	
10			$57^2 + 35^2$ or 4474 $\sqrt{57^2 + 35^2}$ 66.8 to 66.9	M1 M1 A1	Allow B3 for 66.8 to 66.9 nfw Allow A1 for 67 only if evidence of correct method	
11	(a)		48	1		Common
	(b)		$4(n + 2)$ or $4n + 8$	2	M1 for $4 \times n$ oe soi	Condone poor notation such as n^4 etc or $n = 4n + 8$ Common
12	(a)		$10m - 4r + 3$	3	B2 for final answer with 2 correct terms or for 3 correct terms not collected correctly B1 for final answer with 1 correct term or for 2 correct terms not collected correctly	Condone $+4r$ instead of $-4r$
	(b)		5.5 or $5\frac{1}{2}$	3	nfw M2 for $2x = 11$ or $[x =] 11/2$ Or M1 for one side of this correct AND M1 for answer FT <i>their</i> $ax = b$ or <i>their</i> $ax + b = 0$ for $a \neq 1$ or 0, $b \neq 0$	Common FT dependent on at least M1 already earned

Question			Answer	Marks	Part Marks and Guidance	
13			Perpendicular bisector of AB attempted	M1	M0 for arcs/circles centres A and B with no line	Allow M1 for line through midpoint of AB but at 80 to 100° to AB
			Accurately drawn bisector with correct compass arcs	A1	Line must extend at least between the circles on the overlay	
			Circle centre C rad 5 cm	M1	Or arc of this circle extending through at least 3 of the seven circles for this arc on the overlay Condone arc hand drawn only if in tolerance for three consecutive circles on overlay	Tolerances 2 mm; if in doubt, use ruler Common
			Section of bisector inside circle clearly indicated	B1	FT <i>their</i> circle and line	

APPENDIX

Exemplar responses for Q7(b)

Response [All after answer of 11.9 in Q7(a)]	Mark
No, because they could have got smaller times but they were wider spread out than the girls [“they” are clearly “boys” here]	2
No, their range is much larger than the girls	2
No, the girls had a better range showing that the girls were faster	1
wrong because the gap between the fastest and the lowest was shorter	0 must make clear for girls
No, the scores are different in genders and can't be compared. Each set of scores show own results. Neither is more consistent	0
Yes, the boys had a lower mean time [irrelevant] and a higher range	0 because of the yes

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