

GCSE

Mathematics A

Unit **A503/01**: Mathematics C (Foundation Tier) Paper 1

General Certificate of Secondary Education

Mark Scheme for June 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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1. These are the annotations, (including abbreviations), including those used in scoris, which are used when marking

Annotation	Meaning
	Blank Page – this annotation must be used on all blank pages within an answer booklet (structured or unstructured) and on each page of an additional object where there is no candidate response.
	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

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)		2 6	1		
	(b)		6	1		
	(c)		5	1		
	(d)		5	1		
	(e)		3 and 5 and 6 or 3 and 6 and 5 or 1 and 2 and 5 or 1 and 5 and 2	2	B1 for a correct multiplication shown in working eg $5 \times 2 = 10$	Allow B1 for a correct answer using <i>their</i> cards
2	(a)	(i)	18 45 or 6 45 pm	1		Condone 18 45 pm Quarter to seven in the evening
		(ii)	20 35 or 8 35 pm	1FT	FT <i>their</i> (a) + 1 hr 50 mins	Condone 20 35 pm Twenty five to 9 in the evening
	(b)		5.10	3	B2 for 31.1[0] shown in working or M2 for $(2 \times 8.2 + 3 \times 4.9) - 26$ or M1 for $2 \times 8.2 + 3 \times 4.9$	5.1 as answer scores B2
3	(a)	(i)	C	1		Throughout (a), accept indication on probability line e.g. flavour written next to correct letter, ignore any probabilities given
		(ii)	A	1		
		(iii)	D	1		

Question			Answer	Marks	Part Marks and Guidance	
	(b)		5 tuna and cheese and one other flavour totalling 5 where the number of cheese is 3, 2 or 1 and is greater than the number of chicken	3	B1 for 5 tuna B1 for number of cheese is greater than the number of chicken and the cheese is either 3, 2 or 1	Condone e.g. Tuna 5/10, Cheese 3/10, chicken 2/10 for 3 marks or B marks eg For 2 marks 5 tuna 3 cheese 1 chicken eg For 1 mark 3 tuna 3 cheese 4 ham
4	(a)	(i)	30.06	1		Do not accept 1503/50
		(ii)	8.1	1		Do not accept 81/10
	(b)		4.40	1		Do not accept 4.4
5	(a)		5 m only indicated	1		
	(b)	(i)	96	1		
		(ii)	250	2	M1 for evidence of $\times 5$ then $\div 8$	
6	(a)		(-5, 1)	1		
	(b)		Plots point at (3, -4)	1	Condone no label	Condone P marked in correct place with no point plotted
	(c)		[0]45	1	43 to 47	
	(d)		Plots point at $(-1, k)$ where $-1.5 < k < 5$ Gives coordinate of <i>their</i> plot for S	1 1FT	Condone no label FT dep on S due south of shop or a point closer to the church than the post office	Allow $(-1, k)$ where $-1.5 < k < 5$ if no plot
7	(a)		20	1		

Question			Answer	Marks	Part Marks and Guidance	
	(b)		120	1FT	FT <i>their</i> (a) $\times 6$	
	(c)		15	1		
	(d)	(i)	9	2FT	FT $24 - \text{their (c)}$ M1 for identifying cuboid as $3 \times 4 \times 2$	eg M1 for 24 shown in working
		(ii)	49	2FT	FT $64 - \text{their (c)}$ M1 for identifying cube as $4 \times 4 \times 4$	eg M1 for 64 shown in working
8	(a)		35	1		
	(b)		4.0	1		
	(c)		120	1		
9	(a)	(i)	63y	1	Mark final answer	Throughout part (a) penalise the first occurrence only of poor notation e.g. $63 \times y$
		(ii)	5	1	Mark final answer	
		(iii)	$8b - 3a$	2	Mark final answer B1 for $kb - 3a +$ or $8b - ka$ as answer or $8b - 3a$ seen then spoilt	Allow any k Allow $8b - 3a$ with no signs B1
	(b)	(i)	180	1		Accept $\frac{180}{6} = 30$ as answer
		(ii)	2.5 oe	2	M1 for $6x = 16 - 1$ or better	Allow $15/6$ isw for 2 marks Accept $6 \times 2.5 + 1 = 16$ as answer for 2 marks

Question			Answer	Marks	Part Marks and Guidance	
	(c)		$12x + 20$	1	Mark final answer	
10	(a)	(i)	5600	1		
		(ii)	3.2	1		Accept 3.20
	(b)		900	3	M2 for $1500 - 4 \times 30 \times 5$ oe or B2 for 600 [ml] or 0.6 / or B1 for 1500 or [0].03 or [0].12 or 120 shown After 0 scored SC1 for answer 1380	
11	(a)	(i)	65	2	M1 for $90 \times 0.6 + 5 \times 2.20$	For M1 allow if in pence
		(ii)	164	3	M2 for $(133.6 - 16 \times 2.2)/0.6$ or B1 for 98.4 shown or SC1 for answer with figs 164	
	(b)	(i)	1875	2	M1 for $22\,500 \div 12$	
		(ii)	900	2	M1 for $4/100 \times 22\,500$ oe	M1 not spoiled if added to 22500 i.e. answer 23400 gets M1
12	(a)	(i)	0.9 oe	1		
		(ii)	78	2	M1 for 780×0.1 oe	

Question			Answer	Marks	Part Marks and Guidance	
	(b)		Willingboro Academy by 2	3FT	FT difference between <i>their</i> (a)(ii) and 76 with a correct choice of school M2 for the difference between <i>their</i> (a)(ii) and $912 \times \frac{1}{12}$ oe and chooses the correct school or M1 for $912 \times \frac{1}{12}$ oe	If 1/12 pa to give e.g. 75.7 then M2 maximum Accept 0.083[..] for 1/12 for method
13	(a)	(i)	$\frac{3}{20}$ oe	1	oe fraction	
		(ii)	$\frac{2}{21}$ oe	1	oe fraction	
	(b)		$\frac{5}{15} - \frac{3}{15}$ $\frac{2}{15}$	M1 A1	 Dep on M1	
14			612	5	M4 for $4 \times 6 \times 21.75 + (4 + 6 + 4 + 6) \times 4.5[0]$ or M3 for $4 \times 6 \times 21.75 [= 522]$ soi and $(4 + 6 + 4 + 6) \times 4.5[0] [= 90]$ soi or M2 for $4 \times 6 \times 21.75 [=522]$ soi or $(4 + 6 + 4 + 6) \times 4.5[0] [= 90]$ soi or M1 for 4×6 or $4 + 6 + 4 + 6$ shown	

Question			Answer	Marks	Part Marks and Guidance	
15			Line from (0, 0) to (4, 80) Line from (4, 80) to (7, 125) Line from (7, 125) to (9, 125) Line from (9, 125) to (14, 0)	1 1FT 1FT 1FT	Ruled straight lines (n, m) to ($n + 3, m + 45$) (x, y) to ($x + 2, y$) Correct gradient down to ($p, 0$) <u>After 0</u> SC2 for 4 correct vertices or SC1 for 2 correct vertices	Condone freehand straight Points correct 'by eye' Correct gradient 'by eye'
16	(a)		Shouldn't multiply 7 by 2 oe Should be $14 + 2$ oe Should be $12 \div 6$ oe	1 1 1	Multiplied 7 by 2 (which is wrong) He did $14 - 2$ (which is wrong) He did $6 \div 12$ (which is wrong)	Any order. Any correct statement, no contradiction.
	(b)		Sub $\frac{1}{2}$ in correct LHS of equation and get 1	1	oe	
17	(a)	(i)	0.41 0.29 0.18 0.12	3	B1 for 200 soi M1 for use of $\frac{\text{frequency}}{\text{their total}}$	At least once
		(ii)	Large sample size	1		
	(b)		$0.3[0]$ oe	2	-1 for poor notation M1 for $\text{their}(0.18) + \text{their}(0.12)$ or $(36+24)/(82+58+36+24)$ oe	e.g. $0.3/1$, 3 in 10 etc
	(c)		1312	2	M1 for $\text{their}(0.41) \times 3200$ or for $82 \div (82 + 58 + 36 + 24) \times 3200$ oe	Ignore rounding after correct answer
18	(a)		$150 + \frac{1}{2} \times 80$ oe	1	May be in words, but must mention 150 and 40 (or $\frac{1}{2}$ of 80)	Nothing incorrect

Question		Answer	Mark	Answer
18	(b)*	Answer 1160 with commentary	7	eg Vertical strips – $5 \times 150 = 750$) Horizontal strips – $2 \times 80 = 160$) 1030 Radii – $3 \times 40 = 120$) Semi-circle – $\frac{1}{2} \times \pi \times 80 = 125.6$ to 126 Total = 1155.6 to 1156 -----
		Answer 1160 but no commentary <u>OR</u> 1155.6 to 1156 seen with commentary	6-5	1155.6 to 1156 seen but with no commentary <u>OR</u> Correct method soi for straight total <u>AND</u> semi-circle length with commentary
		Correct method soi for straight total <u>AND</u> semi-circle length but with no commentary	4-3	Correct method soi for semi-circle length <u>AND</u> horizontal total or vertical total or radii total <u>OR</u> Correct method for straight total <u>AND</u> $\pi \times 80$ [251 to 252] soi
		Correct method soi for straight total <u>OR</u> semi-circle length	2-1	Correct method soi for horizontal total <u>OR</u> vertical total <u>OR</u> radii total <u>OR</u> $\pi \times 80$ seen soi
		No relevant work	0	

OCR (Oxford Cambridge and RSA Examinations)
1 Hills Road
Cambridge
CB1 2EU

OCR Customer Contact Centre

Education and Learning

Telephone: 01223 553998

Facsimile: 01223 552627

Email: general.qualifications@ocr.org.uk

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Head office
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Facsimile: 01223 552553

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