RECOGNISING ACHIEVEMENT

GCSE

Mathematics A

General Certificate of Secondary Education

Unit **A503/01:** Mathematics C (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.

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
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 × (*their* '37' + 16), or FT 300 – √(*their* '$5^2 + 7^2$'). Answers to part questions which are being followed through are indicated by eg FT 3 × *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.

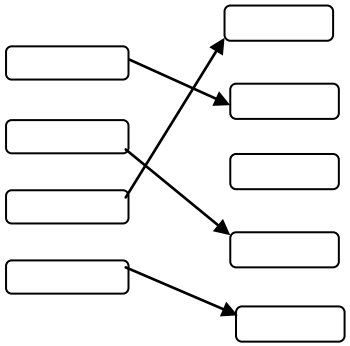
12. Ranges of answers given in the mark scheme are always inclusive.

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)		66 8 $\frac{1}{10}$ oe	3	**B1** for each correct response	
	(b)		$\frac{3}{5}$	2	**B1** for $\frac{6}{10}$	
	(c)	(i)	9.95	1		
		(ii)	29	1		
2			Area = 12 and Perimeter = 20	2	**B1** for each correct	
3	(a)	(i)	0.4[0]	1		
		(ii)	1350	1		
	(b)		61.4 cm or 614 mm	2	**M1** for 700 – 86 or 70 – 8.6 oe or answer with figs 614	For **2** marks accept 0.614 m or 0.000614 km
	(c)		85	3	Allow **B2** for answer 85.7… or 86 Or **M2** for 12000 ÷ 140 oe soi by 11900 or 11.9 Or **M1** for 12000 or 0.140 or figs 85 or figs 857.. or figs 86 seen After **0** scored, **SC1** for 1000 ml = 1 litre or for answer 84	Accept any indication

Question			Answer	Marks	Part Marks and Guidance	
4			Order on line C D B E	4	**B1** for each correct box	
5	**(a)**		A and I	1		
	(b)		[Triangular] Prism	1		
	(c)		[Edges =] 9 and [Faces =] 5	2	**B1** for either correct	
6	**(a)**		($^-$3, 2)	1		
	(b)		Plots the point (5, 2)	1		Do not allow if labelled C
	(c)		Plots the point (1, k) where $^-5 \leq k \leq 5$ and $k \neq 2$ or for (5, $^-$6) or ($^-$3, $^-$6) Gives coordinates of *their* plotted point	1 1FT	 Strict FT	
7	**(a)**		Moscow	1		Accept $^-$22
	(b)		8	1		Accept $^-$8
	(c)		Moscow then London	1	In that order	
	(d)		Winnipeg and 3	2	**B1** for Winnipeg	Accept $^-$3

Question			Answer	Marks	Part Marks and Guidance	
8	(a)			4	**B1** for each correct match	
	(b)		40	1		

Question			Answer	Marks	Part Marks and Guidance	
9*			Perfect solution Chooses Dream Carriers and shows [Flyaway =] 190 + 190 = [£]380 [Budget Lines =] 150 + 150 + 70 + 15 = [£]385 (condone [£]400) and [Dream Carriers =] 230 + 115 + 10 = [£]355 (condone [£]365)	5	Condone omission of '+' signs if values shown with total	Condone [£]400 for Budget Lines and [£]365 for Dream Carriers (if credit card charge calculated for each flight)
			Chooses Dream Carriers but without full working showing the total prices of [£]380, [£]385 (condone [£]400) and [£]355 (condone [£]365) **Or** shows full correct working but makes wrong choice of airline **Or** shows full correct working but makes one arithmetic error and then follows through to give correct choice	4-3	Dream Carriers cost shown as [£]355 (condone [£]365) **and** Budget Lines cost shown as [£]385 (condone [£]400) **Or** omits credit card charge on Budget airlines **or** Dream Carriers but all other totals are correct and makes correct decision **Or** gets cost correct for Dream Carriers and Flyaway but omits one bag from Budget Lines but otherwise correct and makes correct decision	
			Shows Budget Lines costs as [£]385 (condone [£]400) **or** Dream Carriers cost shown as [£]355 (condone [£]365)	2-1	Shows 150 × 2 + 35 × 2 [+ 15] **or** 230 + 115 [+10] **Or** Flyaway total cost as [£]380	
			No relevant comment	0		

Question			Answer	Marks	Part Marks and Guidance	
10	**(a)**		3.5 oe	1		Allow correct embedded solution in original equation as final answer to score full marks in (a), (b) and (c)
	(b)		42	1		
	(c)		3.75 oe	2	**M1** for $4x = 17 - 2$ or FT *their* $ax = b$ with $a \neq 0$ or 1 or b and $b \neq 0$	Allow FT at division step isw – does not need to be evaluated If division step not shown, accept answer correct to 2 sf or better
11			1.25	2	**M1** for $2.5 \div 2$	
12	**(a)**		26	1		
	(b)		6	1		
	(c)		10	1		
	(d)		Horizontal line from (11 20, 26) to (12 20, 26) Line or curve from (n, 26) to (n + 30, 0)	1 1FT	For first mark, condone horizontal line omitted provided return journey starts at 12 20 FT *their n*	Allow freehand
13			197.5[0]	5	**M4** for 227.5 – 30 oe OR **B3** for area = 15.8 isw rounding Or **M2** for any complete method shown to find the area of the wall Or **M1** for correct method for area of one relevant rectangle AND **M1indep** for *their* area × 12.5	Ignore units throughout for **M** and **B** marks eg soi by 18.2, 2.4, 1.8, 10.5, 3.3, 7.8, 6, 6.3 Allow for 'a number' × 12.5 Can be clearly implied

Question			Answer	Marks	Part Marks and Guidance	
14	**(a)**		26.3[0]	3	**M2** for 160 × 0.09 + 70 × 0.17 Or **M1** for 160 × 0.09 or 70 × 0.17 (14.4[0] or 11.9[0])	Allow method marks for both parts in pence
	(b)		176	3	**M2** for (38.79 – 135 × 0.17) ÷ 0.09 oe Or **M1** for 38.79 – 135 × 0.17 oe or 15.84 or 1584 or for a value less than 38.79 divided by 0.09 oe or for answer 17 or 17.6 texts	Other methods must be complete
15	**(a)**		HH HT TH TT	2	**B1** for 3 correct (ignore repeats)	
	(b)	**(i)**	$\frac{1}{4}$ oe isw	1FT	FT *their* list dep on at least **B1**	Not from $\frac{2}{8}$
		(ii)	$\frac{2}{4}$ oe isw	1FT	FT *their* list dep on at least **B1**	Not from $\frac{4}{8}$
16			$\frac{45}{90}$	4	nfww **B3** for 45 Or **B2** for 27 seen or 18 seen Or **M1** for 36 ÷ 4 × 3 oe or 54 ÷ 3 oe Correct answer of $\frac{1}{2}$ alone with no working gets **B1** only	For **4** marks, accept equivalents provided 45 is seen Allow if seen in a fraction

Question			Answer	Marks	Part Marks and Guidance	
17	(a)		$2x$	1		
	(b)		12 and 2	1 + 1		
18	(a)		- - - 9 - 7 9 11 7 9 11 13 9 11 13 15	2	**B1** for 6 correct entries	
	(b)		Certain Unlikely	1 1		
	(c)		$\frac{1}{4}$	2	**B1** for $\frac{4}{n}$ or $\frac{n}{16}$	
	(d)		$\frac{3}{16}$ or 0.1875 or 18.75%	1		
19	(a)		84	2	**M1** for $7 \times 3 \times 4$	
	(b)		Correct isometric drawing	3	For **3** marks condone hidden edges shown as dotty lines Or **B2** for correct isometric drawing but with hidden edges shown solid or incorrect Or **B1** for one correct face	Allow freehand if intention clear – ie just misses dot Ignore any non-edge lines
20	(a)		48.69 to 48.71	2	**M1** for $\pi \times 15.5$ oe	

Question			Answer	Marks	Part Marks and Guidance	
	(b)		1.8 or $\frac{9}{5}$ or $1\frac{4}{5}$ 1.8[0…] or $\frac{9}{5}$ or $1\frac{4}{5}$	2 1FT	**M1** for 27.9 ÷ 15.5 or (87.65 to 87.7) ÷ (48.69 to 48.71) FT *their* scale factor	
21			- - 5 - $\frac{1}{30}$ - $\frac{3}{8}$ or $\frac{6}{16}$ - $\frac{15}{8}$ or $\frac{30}{16}$ or $1\frac{7}{8}$	1 1 1, 1FT	For $\frac{1}{30}$ accept 0.033 or better For $\frac{3}{8}$ accept 0.375 For $\frac{15}{8}$ accept 1.875. FT *their* values	Condone $\frac{5}{1}$
22			0.16 oe	3	**M2** for (1 – 0.15 – 0.37) ÷ 3 oe soi Or **M1** for 1 – 0.15 – 0.37 soi by 0.48	**M2** implied by an answer figs 16

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