OCR
RECOGNISING ACHIEVEMENT

GCSE

Mathematics B (Linear)

General Certificate of Secondary Education

Component **J567/01:** Mathematics Paper 1 (Foundation)

Mark Scheme for June 2013

Oxford Cambridge and RSA Examinations

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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.

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 – $\sqrt{}$(*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.

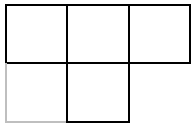
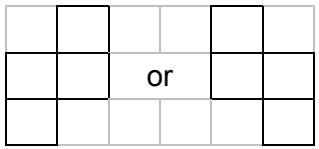
12. Ranges of answers given in the mark scheme are always inclusive.

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)		37.1[0]	1		
	(b)		21	1		
	(c)		24	1		
	(d)		7	1		
2			346	4	**M1** for 19 × 3 **or** 117 × 2 or 57 or 234 **seen** **M1** for 191 – (19 + 117) or 55 **seen** **M1** for *their* 55 + *their* 234 + *their* 57 **Or SC3** for answer of 537	For second M1 must see a subtraction **from** 191 For third M1 *their* 55 must come from the number of single lambs being specified or some attempt at subtraction using 191
3	(a)	(i)	kilometre(s) or km(s)	1		
		(ii)	gram(s) or gm(s) or g(s)	1	**SC1** for miles in (i) and ounces in (ii) Or for miles in (i) and kg(s) or mg(s) in (ii)	
	(b)	(i)	170	1		
		(ii)	2500	1		
4	(a)		20 2 bundles + 2 sticks	1 1		bundles must be correct
	(b)		Bars of height 20, 3 and 7	2	**B1** for 2 correct **FT** from *their* 20	
	(c)		48	1	**FT** *their* 20 + 28	

Question			Answer	Marks	Guidance
5*			Full clear correct annotated method shown with correct conclusion of Cheaper by Train **and** Taxi by £2	5	Minimum calculations shown for 5 marks 30 × 160 = 4800 = £48 or 0.3(0) × 160 = £48 or 160 × 30p = £48 **and** 38 + 2 + 6 = £46
			4a Correct conclusion of Cheaper by Train and Taxi by £2, with some method shown as evidence 4b Correct fares of £48 and £46 found with a supporting method but no, incomplete or incorrect conclusion 4c Full, clear correct method with a small slip and a conclusion that correctly follows on from this 4d Misinterprets taxi costs as no fixed charge and £3 per quarter mile. Shows a full clear correct method and comes to a conclusion of cheaper by car journey by £8	4-3	For the lower mark 3a £48 or £46 found with a clear method and some attempt at a correct method to find the cost of the other journey 3b Correct conclusion of Cheaper by Train and Taxi by £2, with no method shown as evidence 3c Shows full correct methods for both journeys with some errors but comes to a conclusion that is sensible 3d Misinterprets taxi costs as no fixed charge and £3 per quarter mile with no or incomplete conclusion or full, clear correct method with a small arithmetic slip and a conclusion that correctly follows on from this
			2a £48(car) **or** £46(train and taxi) **or** £8(taxi) found with a full method 2b £46 or £8 or £6 with little or no method **and** 160 × 30 or 160 × 0.3 or **figs** 48 **seen**	2-1	For the lower mark 1a £48 **or** £46 or £8 or £6 **seen** with little or no method 1b 160 × 30 or 160 × 0.3 or **figs** 48 **seen** 1c 1½ ÷ ¼ **soi** 1d 38 + 2 + attempt at 1½ ÷ ¼
			No correct method shown	0	

Question			Answer	Marks	Part Marks and Guidance	
6	(a)	(i)	Shape A 3, Shape B 0, none, Shape C 1	2	**B1** for **1** correct	
		(ii)	Shape A 3, Shape B 2, Shape C 1, 0, none or no rotation symmetry	2	**B1** for **2** correct	
		(iii)	6	1		
	(b)	(i)		1	Any orientation	
		(ii)		1	Any orientation After 0 marks in (b)(i) and (ii) then **SC1** for shapes (which don't have to join edge to edge) in (b)(i) **and** b(ii) that have an area of $4cm^2$ and satisfy the conditions	
		(iii)	8	1		
		(iv)	10	1		
7			$\frac{12}{25}$	4	**isw** **M3** for Areas of $[5\times5] = 25[cm^2]$ **and** $[3\times2] = 6[cm^2]$ **seen**. or $5\times5[=25]$ **and** $3\times2[=6]$ Or **M2** for Areas of $[5\times5] = 25[cm^2]$ **or** $[3\times2] = 6[cm^2]$ **or** $[3\times3]=9[cm^2]$ **or** $[2\times2] = 4[cm^2]$ **seen** **or** 5×5 **or** 3×2 **or** 3×3 **or** 2×2 Or **M1** for 2cm **seen** or 2 seen in correct position on diagram or $5 - 3 = 2$ or $3 + 2 + 3 + 2$ **seen**	Shaded [area] = $12[cm^2]$ implies $6[cm^2]$ Areas 6, 9 and 4 can be seen in appropriate places on the diagram

Question			Answer	Marks	Part Marks and Guidance	
8	(a)	(i)	18	1		
		(ii)	300	1		
	(b)	(i)	11 subtracting 4 or decreasing by 4 **oe**	1 1	Accept : I took 4 from 15 etc (The pattern is) -4	Condone going down by -4 Do not accept goes up by 4 Ignore extra comments
		(ii)	-37	1	**FT** -33 – *their* 4 (not strict FT)	
		(iii)	-157	1	**FT** -165 + 2 × *their* 4 (not strict FT)	
9	(a)		3.9 to 4.1 m 2.6 to 2.9 m on answer line	3	**B2** one correct Or **M1** for sight of 8(cm) (7.8 to 8.2) **and** 5.6(cm) (5.4 to 5.8)	Measurements may be on the diagram
	(b)		**No** **because** the gap (old cooker) is only **70 to 90 cm** wide **or** the gap needs to be **1.9 cm** on the scale drawing	1	**Must have a reason** that includes a length, either 70 to 90cm or 1.9cm	Measurement may be on the diagram
10	(a)	(i)	2.2	2	**M1** for putting data in order of size	
		(ii)	0.8	1		
		(iii)	2.3	1		
	(b)		1.8, 2.1, 2.1, 2.4, 2.4, 2.6 (in any order)	2	**M1** for 6 numbers on the answer line with **either** greatest height 2.6 **or** 2.1, 2.1, 2.4, 2.4 (two only of each)	

Question			Answer	Marks	Part Marks and Guidance	
11	(a)		10 (more) correct pairs	2	**B1** for 8 or 9 (more) correct, ignore repeats or extras	Condone repeat of one combination only for 2 marks, otherwise maximum score of B1 if there are repeats, omissions or extras.
	(b)		$\frac{1}{12}$ **oe** or 0.083[3…] or 8.3[3…]%	1	**FT** from *their* table (not strict FT)	Do not accept a ratio Accept on the answer line 1/12 with unlikely or 1/12 with 1 in (out of) 12
	(c)	(i)	$\frac{1}{4}$ or $\frac{3}{12}$ **oe** or 0.25 or 25%	1	**FT** from *their* table providing numerator is greater than 1 (not strict FT) **SC1** for 1 in (out of) 12 in (b) and 3 in (out of) 12 **oe** in (c)(i)	Do not accept a ratio Accept on the answer line 3/12 **oe** with unlikely or 3/12 **oe** with 3 in (out of) 12 **oe**
		(ii)	0 or $\frac{0}{12}$ or $\frac{0}{\textit{their}12}$ or 0 in (out of) *their* 12	1	**FT** from *their* denominator in (b) (only with a numerator of zero) (not strict FT)	Accept 0 etc with impossible or none on the answer line Accept 0%
12	(a)		3	1		
	(b)	(i)	$^{-}2$	1		
		(ii)	28	1		
13	(a)	(i)	51.38	1		
		(ii)	50	1	Do not accept 50.0…	

Question			Answer	Marks	Part Marks and Guidance	
	(b)		70×4 or 72×4 or 75×4 **only** = 280 = 288 =300	M1 A1	Method **must be shown** for 2 marks **SC1** for answers in range 273 to 300	For 2 marks if 280 or 288 or 300 seen as answer, method must lead to this. Accept £280.00 etc for A1 Accept 400×70 = 28000 £280 etc
14	**(a)**		$\frac{1}{2}$ or 0.5	2	**M1** for $\frac{2}{3}$ written as $\frac{4}{6}$ or $\frac{12}{18}$ **and** $\frac{3}{18}$ **oe seen** or $\frac{3}{6}$ **oe** as answer	**nfww**
	(b)		$1\frac{3}{20}$	3	**M2** for $\frac{23}{20}$ **oe** or 1.15 Or **M1** for $\frac{15}{20}+\frac{8}{20}$ **oe** or 0.75 + 0.4	

Question			Answer	Marks	Part Marks and Guidance	
15	(a)		$x + 10$ or $10 + x$	1	Accept written as a formula (l = , w = etc)	Ignore any units Do not accept $x = x + 10$
	(b)		$4x + 20$ or $4(x + 5)$ or $2(2x + 10)$	2	Mark final answer only Accept written as a formula **B1** for $x + x + (x + 10) + (x + 10)$ **seen** or $4x$ [+…] on answer line After no marks in (a) and (b) **SC1** for (a) $10x$ (b) $22x$ or $10x + 10x + x + x$ **seen**	Ignore any units
16	(a)		Translation $\begin{bmatrix} 3 \\ -1 \end{bmatrix}$ or 3 right, 1 down	1 1	After 0 marks **SC1** for: 3 across 1 down Correct vector with fraction line $(3, {}^{-}1)$	
	(b)		**C** in correct position (see overlay (Red)) *Their* **C** reflected in the ***x*-axis**	3 1FT	**M2** for a rotation of 90° clockwise about O or for a rotation of 90° anticlockwise Or **M1** for a rotation of 90° clockwise **Strict FT**	Accept freehand Use overlay: Red gets 3 marks Blue gets 2 marks Translation of Red gets 2 marks Translation of Blue gets 1 mark
17	(a)		4 points correctly plotted	2	**B1** for at least 2 points correctly plotted	Use overlay to check Tolerance up to half square horizontally and vertically Ignore extra points

Question			Answer	Marks	Part Marks and Guidance	
	(b)	**(i)**	Ruled line of best fit	1	Line must pass through or between (5, 23) and (5, 31) AND (26, 76) and (26, 84)	Use overlay Line must be at least as long as limits of overlay and be on or inside lines of overlay
		(ii)	62 - 66	1	Or **FT** *their* straight line tolerance ±1 goal	Condone non-integer values
18	**(a)**	**(i)**	10	1		
		(ii)	28	2	**M1** for 16 **seen** or $^-12$ from $3x$ **soi** or for $(^-4)^2 - 3 \times {}^-4$	
	(b)		$y^2 + 5y$ final answer	1		Must be y^2 not $y \times y$ Condone $y \times 5$ or $y5$ for $5y$ [not y^5]
	(c)		$4p(p - 2)$ final answer	2	**M1** for $4p(p...)$ or $4(p^2 - 2p)$ or $p(4p - 8)$ or $2p(2p - 4)$ **seen**	Condone missing final bracket Condone $(4p + 0)(p - 2)$
19			Perpendicular bisector of AB with two correct pairs of arcs Arc centre B, radius 7cm ± 2mm Correct region shaded	2 1 1	**B1** for bisector without correct arcs or for two pairs of correct arcs crossing with no line drawn **FT** *their* bisector and arc	Use overlay and mark intention Condone solid/dashed lines for both arc and bisector Allow any length bisector and arc if intention clear Their bisector must be a straight line and intersect arc twice and their arc intention centre B Clear intention of correct region indicated

Question			Answer	Marks	Part Marks and Guidance	
20	(a)		[£]16.90	3	**M2** for 8.45 or 3.90 **seen** or **figs** 169 **seen** or for complete attempt at 130% of (2 × 6.5) OR **M1** for attempt at 30% of 6.50 or attempt at 30% of (2 × 6.5) **seen** OR **B1** for 0.65 or 65p or 1.3[0] or 130 **seen** or for **figs** 845 or 39 **seen**	M2 only for answer 16.9 Condone 845 or 390 if clearly working in pence Eg for 0.3 × 6.50 or 0.3 × 13 or [£]1.95 **seen** 13 × 30% is not sufficient for M1
	(b)		15 [boys] 25 [girls]	2	Both correct **M1** for 40 ÷ (3 + 5) or 40 ÷ 8 **seen** or for 15 or 25 **seen**	
21			48	4	**M1** for $\frac{2}{8}+\frac{5}{8}$ **oe soi** AND **M1** for 1 – *their* $\frac{7}{8}$ **soi** AND **M1** *their* $\frac{1}{8}$ (total) = 6 **soi** After **M0**, **SC1** for attempt to use diagram to find fraction for accounts	Adding showing use of common denominator Calculating fraction for accounts Equating fraction with accounts hours $\frac{1}{8}$ = 6 hours seen implies M3

APPENDIX

Mark scheme for question 6(a)(iii) Braille transcript

Response	Mark awarded
12	**1**

Mark scheme for question 6(b)(iii) Braille transcript

Response	Mark awarded
16	**1**

Mark scheme for question 6(b)(iv) Braille transcript

Response	Mark awarded
20	**1**

Mark scheme for question 9(b) Braille transcript

Response	Part Marks and Guidance	Mark awarded
No **because** the gap (old cooker) is only **70 to 90 cm** wide **or** the gap needs to be **9.5 cm** on the scale drawing	**Must have a reason** that includes a length, either 70 to 90cm or 9.5cm Measurement may be on the diagram	**1**

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