OCR
Oxford Cambridge and RSA

GCSE

Mathematics B (Linear)

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

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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Annotations used in the detailed Mark Scheme.

Annotation	Meaning
BP	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
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.

MARK SCHEME

Question			Answer	Marks	Part marks and guidance	
1	(a)		190 g	1		
	(b)		450 cm	1		
	(c)		5 ml	1		
2			Correct reflection (±2 mm)	2	**B1** for 2 vertices correct	excluding those on the mirror line see overlay condone freehand
3	(a)		11 correct rows no repeats	2	**B1** for 6 or more additional correct rows, condone repeats	accept 1, 2, 3 and 4 used if intention is clear for **B1**
	(b)	(i)	78 610	1		
		(ii)	79 000	1		
4	(a)	(i)	931	1		
		(ii)	4700	1		
		(iii)	2.4 **oe**	2	**M1** for attempt to divide Or figs 24 as answer	
		(iv)	28	2	**M1** attempt at complete method allow 1 arithmetic error ft their first percentage **SC1** 52 as final answer	
	(b)	(i)	$\frac{75}{100}$ **oe isw**	1		must be fraction

Question			Answer	Marks	Part marks and guidance	
		(ii)	0.6	2	**M1** for 3 ÷ 5 **oe**	
5	(a)	(i)	29	1		
		(ii)	+ 6	1		need direction and quantity, $6n - 1$ Maybe on diagram
	(b)		37	2	**M1** for 10 × 4 **soi** by 40	
6			4.02, 4.024, 4.042, 4.2, 4.202	2	**B1** for 1 not in correct order **SC1** order reversed	
7	(a)		6	1		
	(b)		Jelly	1	**FT** toffee ≥13	Condone Jelly with 13
	(c)		Linear scale for frequencies starting from 0 Fully correct bar chart 7, 13 ,6, 2, 12	1 2FT	 **FT** *their* value for toffee in the table **B1** for *their* 4 correct heights or bars of equal widths and gaps	0 need not be marked if no scale **FT** implied consistent linear scale Do not condone extensions to grid. Heights must be in correct half of square. Do not follow through incorrect scale for heights Condone freehand
8	(a)	(i)	$(^{-}4, ^{-}1)$	1		
		(ii)	Point plotted at $(^{-}4, 3)$	1		

Question			Answer	Marks	Part marks and guidance	
		(iii)	Correct name of their triangle in (a)(ii)	1FT	**Strict FT** from *their* (⁻4, 3)	
	(b)		Radius drawn	1		Allow within 1mm of the circumference and/or centre by eye Allow freehand
9	(a)	(i)	$3a$	1		
		(ii)	$5c - 7d$	2	**B1** for $5c$ or $-7d$	
		(iii)	b^8	1		
	(b)	(i)	12	1		
		(ii)	$\frac{9}{6}$ **oe**	2	**M1** for a correct step eg $13 - 4 = 6x$ or $x = b/a$ after $ax = b$ ($a \neq 1$, $b \neq 0$) from *their* equation	
	(c)		$P = 6h$	2	**M1** for $6h$ oe or $h = \frac{p}{6}$ or $\frac{p}{h} = 6$	Accept 6 × h, h6, h+h+h+h+h+h oe

Question	Answer	Marks	Answer
10(a)*	Group ticket, 2 children and 2 over 60's and cost of £104 selected after showing values of [£111], £109, £106 and £104 with complete working to show how these prices have been obtained. ie 8 individual tickets at £109 **and** 2 group tickets at £106 **and** 1 group ticket and 2 over 60s and 2 children at £104 [and 1 group ticket and 2 adults and 2 children at £111]	**5**	
	Values of [£111], £109, £106 and £104 with complete working to show how these prices have been obtained. ie 8 individual tickets at £109 **and** 2 group tickets at £106 **and** 1 group ticket and 2 over 60s and 2 children at £104 [and 1 group ticket and 2 adults and 2 children at £111] with no or incorrect conclusion.	**4 – 3**	Showing three costs of entry for 8 people with working (condone 1 arithmetic error) or two fully correct costs of entry for 8 people with working and correct conclusion for their calculations
	Showing two costs of entry for 8 people with working (condone 1 arithmetic error per combination) or one fully correct cost of entry for 8 people with working	**2 – 1**	Showing one cost of entry for 8 people with working (condone 1 arithmetic error)
	No worthwhile work attempted	**0**	
			NB Group of 8 people must contain 4 children

Question			Answer	Marks	Part marks and guidance	
10	(b)	(i)	55	1		
		(ii)	27	2	**M1** for ordered list of 8 values or 23 and 31 identified	List could be seen in earlier part of the question, unless alternative method leads to an incorrect answer
	(c)		6.04	1		
	(d)	(i)	36	2	**M1** for 11 + 11 + 7 + 7 or better	Ignore extra units given
		(ii)	77 m^2	2 1	**M1** for 11 × 7	
	(e)		8	1		
	(f)		1635 or 4:35pm	1		Do not accept 4:35 am or 0435 condone 4:35 or 1635pm

Question			Answer	Marks	Part marks and guidance	
11			400 **nfww**	4	**M1** for 10 × 20 × 5 **soi** by 1000 **M1** for 200 × 50 × 40 **soi** by 400000 **M1** for attempt at division of *their* '200 × 50 × 40' ÷ *their* '10 × 20 × 5' ---------- or **M3** for 10 × 5 × 8 or **M2** for 10 and 5 and 8 or **M1** for 10 or 5 or 8 clearly linked to 200(2m) or 50 or 40	accept equivalent numbers being divided must be volumes and division must be seen Check diagram for numbers Accept alternative orientations of the small cuboids
12	(a)		$\frac{6}{11}$	1		Penalise incorrect form once
	(b)		$\frac{5}{11}$	1	**FT** 1 − *their* (a)	
	(c)		0	1		Accept $\frac{0}{11}$ or words zero, nil or nought only
13	(a)		$\frac{3}{4}$	2	**B1** for $\frac{9}{12}$ **oe**	Must be fraction
	(b)		$\frac{7}{8}$ **oe**	2	**M1** correct common denominator with 2 numerators	Condone 1 error in numerators

Question			Answer	Marks	Part marks and guidance	
	(c)		$3\frac{5}{6}$	1		
	(d)		$\frac{13}{8}$	1		
	(e)		$3\frac{13}{30}$ or $\frac{103}{30}$ or any equivalent fraction isw	3	**M2** for $\frac{13}{30}$ **oe** from a subtraction or $\frac{18}{30}$ and $\frac{5}{30}$ **oe** or $\frac{168}{30}$ and $\frac{65}{30}$ **oe** allow an error in one of the two numerators with a correct common denominator or **M1** for any correct attempt to get a common denominator or $\frac{28}{5}$ and $\frac{13}{6}$ **oe**	eg $\frac{36}{60}$ and $\frac{11}{60}$ scores **M2** eg two fractions with common denominators of a multiple of 6×5
14			48	2	**M1** for 60 ÷ (1 + 4) or 12	answer of 12:48 or 48:12 implies **M1** note: 48 out of 60 scores 2 48/60 scores M1
15			Correct octagon with all vertices on circumference	2	**M1** for 360 ÷ 8 or 45 **SC1** for any octagon with at least 5 vertices on circle	

Question			Answer	Marks	Part marks and guidance	
16	(a)		4 points correctly plotted (±1 mm)	2	**B1** for any two points correctly plotted	
	(b)		negative	1		Ignore any extra statements such as 'strong'
	(c)		ruled line of best fit between 1.60 and 2.10	1	tolerance on 1.60: 45 – 55 and on 2.10: 20 – 30	use overlay and ignore any lines joining up the points
	(d)		(1.81, 15) indicated on graph	1		
	(e)		Strict follow through from *their* line of best fit tolerance ± 2 for answer **nfww**	2FT	**M1FT** for a correct reading from their single ruled line	allow tolerance ±1 on number sold no **FT** from a zig-zag line
17			7.5 or 7 ½ **oe**	4	**M1** for 3 +x + 5 or 2x + x + 5 soi **nfww** **M1** for 4x + 13 [= 43] or better or *their* linear expression = 43 **M1** for correct first step from *their* linear *equation*, eg 4x = 43 − 13 or better **M1** for $x = b/a$ after $ax = b$ ($a \neq 1$, $b \neq 0$) from *their equation* to a maximum of 3 marks	4x + 13 [=43] implies the first **M1** Their linear expression may not be simplified if you see trial-and-improvement then award **M1** for each correct attempt, with input and output clearly linked, up to a maximum of **3** marks on the function 4x + 13 eg trial of 6 result 37 scores **M1**

Question			Answer	Marks	Part marks and guidance	
18			bisector of angle A (± 2°)	1	must be ruled, condone dotted	on or within the two lines on the overlay
			two pairs of correct supporting arcs	1	intersection arcs on AB and AD could be short lines or a single arc	
			arc of circle, centre C, radius 4 cm (±2 mm)	1	not freehand, condone dotted and arc must meet their bisector and the line BC, if no bisector where it should have been	meets bisector 'near A' and use the ruler to check tolerance
			their region indicated	1FT	**FT dep** on any ruled line through A and an arc, centre C, intersecting with their line and BC	whole region must be within park for 4 marks the bisector through A has to intersect BC
19	(a)		$\bar{3}$ 1 3	1		
	(b)		correct ruled line from x = −2 to x = 4	2	**B1** for 4 points correctly plotted **FT** their table for points only	For points and line tolerance is ½ small square horizontally

Question			Answer	Marks	Part marks and guidance	
20			62	**4**	**M1** for 60 ÷ 40 or 1.5 **oe** seen **M1** for 184 − 60 or 124 or 3.5 − 1.5 or 2 seen **M1** for *their* '124' ÷ *their* '2'	equivalents include 1[h] 30 [m] **oe** allow h or hr or hour[s] and 1.30 etc not 1.3 for distance ÷ time, *their* 2 has to be a time eg 2, 2.45, 120 *their* 2 cannot be 3.5 or 210 and *their* 124 cannot be 184

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