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Mark Scheme (Results)

March 2011

GCSE

GCSE Mathematics (Modular) – 5MB1H
Paper 01

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Publications Code UG026934

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NOTES ON MARKING PRINCIPLES

1 All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.

2 Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.

3 All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e if the answer matches the mark scheme. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.

4 Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.

5 Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.

6 Mark schemes will indicate within the table where, and which strands of QWC, are being assessed. The strands are as follows:

i) *ensure that text is legible and that spelling, punctuation and grammar are accurate so that meaning is clear*
Comprehension and meaning is clear by using correct notation and labeling conventions.

ii*) select and use a form and style of writing appropriate to purpose and to complex subject matter*
Reasoning, explanation or argument is correct and appropriately structured to convey mathematical reasoning.

iii) *organise information clearly and coherently, using specialist vocabulary when appropriate*.
The mathematical methods and processes used are coherently and clearly organised and the appropriate mathematical vocabulary used.

7 With working

If there is a wrong answer indicated on the answer line always check the working in the body of the script (and on any diagrams), and award any marks appropriate from the mark scheme.
If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.
If it is clear from the working that the "correct" answer has been obtained from incorrect working, award 0 marks. Send the response to review, and discuss each of these situations with your Team Leader.
If there is no answer on the answer line then check the working for an obvious answer.
Any case of suspected misread loses A (and B) marks on that part, but can gain the M marks. Discuss each of these situations with your Team Leader.
If there is a choice of methods shown, then no marks should be awarded, unless the answer on the answer line makes clear the method that has been used.

8 Follow through marks

Follow through marks which involve a single stage calculation can be awarded without working since you can check the answer yourself, but if ambiguous do not award.
Follow through marks which involve more than one stage of calculation can only be awarded on sight of the relevant working, even if it appears obvious that there is only one way you could get the answer given.

9 Ignoring subsequent work

It is appropriate to ignore subsequent work when the additional work does not change the answer in a way that is inappropriate for the question: e.g. incorrect canceling of a fraction that would otherwise be correct
It is not appropriate to ignore subsequent work when the additional work essentially makes the answer incorrect e.g. algebra.
Transcription errors occur when candidates present a correct answer in working, and write it incorrectly on the answer line; mark the correct answer.

10 Probability

Probability answers must be given a fractions, percentages or decimals. If a candidate gives a decimal equivalent to a probability, this should be written to at least 2 decimal places (unless tenths).
Incorrect notation should lose the accuracy marks, but be awarded any implied method marks.
If a probability answer is given on the answer line using both incorrect and correct notation, award the marks.
If a probability fraction is given then cancelled incorrectly, ignore the incorrectly cancelled answer.

11 Linear equations

Full marks can be gained if the solution alone is given on the answer line, or otherwise unambiguously indicated in working (without contradiction elsewhere). Where the correct solution only is shown substituted, but not identified as the solution, the accuracy mark is lost but any method marks can be awarded.

12 Parts of questions

Unless allowed by the mark scheme, the marks allocated to one part of the question CANNOT be awarded in another.

13 Range of answers

Unless otherwise stated, when an answer is given as a range (e.g 3.5 – 4.2) then this is inclusive of the end points (e.g 3.5, 4.2) and includes all numbers within the range (e.g 4, 4.1)

Guidance on the use of codes within this mark scheme
M1 – method mark A1 – accuracy mark B1 – Working mark C1 – communication mark QWC – quality of written communication oe – or equivalent cao – correct answer only ft – follow through sc – special case dep – dependent (on a previous mark or conclusion) indep – independent isw – ignore subsequent working

5MB1H_01				
Question	**Working**	**Answer**	**Mark**	**Notes**
1 (a)		Reason	2	B2 for 2 acceptable reasons relating to the types below [B1 for 1 acceptable reason] Bias relating to age. Bias relating to gender Bias relating to PE students Size of sample too small Sampling method is not random
(b)		Question and response boxes	2	B2 for a suitable question with at least 3 non-overlapping response boxes (must include a time period and units) [B1 for a suitable question with time period or at least 3 non-overlapping response boxes with units]
2 (a)		Point at (11.5, 73)	1	B1 Point plotted $\pm\frac{1}{2}$ small square
(b)			1	B1 for description of dynamic relationship eg "the more hours of sunshine, the more ice creams sold" or positive correlation]Note: 'sunnier' implies 'more hours of sunshine']
(c)		62 - 70	2	B2 for answer in the range 62-70 OR M1 for a single straight line of best fit with positive gradient, passing between (6.5, 45), (6.5, 59) and (12, 70), (12, 80) or a vertical line drawn from 10 A1 for answer in range 62-70 or ft from single straight "line of best fit" with positive gradient

5MB1H_01				
Question	**Working**	**Answer**	**Mark**	**Notes**
3 *(a)	140 × 5 ÷ 7 140 × 2 ÷ 7	100 40	3	M1 for 140 × 5 ÷ 7 or 140 × 2 ÷7 or 140 ÷ ("2 + 5") × 2 or 140 ÷ ("2 + 5") × 5 A1 for 100 and 40 cao C1 for linking "cooker(s)" and "freezer(s)" correctly to final answers.
(b)	$145 \times \frac{20}{100}$	29	2	M1 for 145 × 0.2 or $145 \times \frac{20}{100}$ or 14.5 × 2 or 145 ÷ 10 × 2 A1 for 29 SCB1 for 116 if no other marks have been awarded.

<table>
<tr><th colspan="5">5MB1H_01</th></tr>
<tr><th>Question</th><th>Working</th><th>Answer</th><th>Mark</th><th>Notes</th></tr>
<tr>
<td>4</td>
<td>30 - 17 = 13
5 - 3 = 2
13 -2 - 7 = 4
4 + 4

OR
17 – 4 – 3 = 10
10 + 7 = 17
30 – 5 – 17

OR
17 – 4 = 13
13 + 7 = 20
20 + (5-3) = 22
30 - 22

<table>
<tr><td></td><td>B</td><td>G</td><td>Total</td></tr>
<tr><td>Packed</td><td>4</td><td></td><td></td></tr>
<tr><td>School lunch</td><td></td><td>7</td><td></td></tr>
<tr><td>Home</td><td>3</td><td></td><td>5</td></tr>
<tr><td>Total</td><td>17</td><td></td><td>30</td></tr>
</table>
</td>
<td>8</td>
<td>4</td>
<td>M1 for calculation of total girls 30 - 17 (= 13)
M1 for calculation of girls going home 5 - 3 (= 2)
M1 for calculation of girls having packed lunch
"13" - "2" - 7 (= 4)

M1 for 17 – 4 – 3 (= 10)
M1 for “10”+ 7 (= 17)
M1 for 30 – 5 – “17”

M1 for 17 – 4 + 7 (= 20)
M1 for “20” + (5 – 3)
M1 for 30 – “22”

A1 cao

[Interim answers may appear in a 2-way table or Venn diagram]
M1 for a 2-way table or diagram, with clear labeling, showing at least 3 pieces of the given information correctly placed
A1 for 13 (girls) or 10 (boys, school lunch)
A1 for 2 (girls, home) or 17 (total school lunch)
A1 cao
[Note: for the award of the final A1, the 8 in any diagram must be highlighted, in some way, to be the required answer]</td>
</tr>
</table>

5MB1H_01				
Question	**Working**	**Answer**	**Mark**	**Notes**
5	0.85 × 800	680	2	M1 for 0.85 × 800 A1 cao
6	15 × 9 = 135 (7 × 2) + (8 × 3) + (9 × 3) + (10 × 4) + (11 × 2) = 127 135 - 127	8	3	M1 for 15 × 9 or 135 seen M1 (7 × 2) + (8 × 3)+(9 × 3) + (10 × 4) + (11 × 2) or 127 seen A1 8 cao
7 (a)	48 ÷ 4	12	2	M1 48 ÷ 4 or 49 ÷ 4 or 48 – 36 A1 for 12
(b)		Box plot drawn	2	B2 fully correct box plot (B1 for the box plot drawn with one plotting error)
(c)		On Tuesday: Median higher (IQ) Range higher.	2	B1 for median higher on Tuesday or journeys took longer on Tuesday B1 for (IQ) range higher on Tuesday or more variation in journey length on Tuesday. (NB: For B2 at least one comparison must be in context)

5MB1H_01				
Question	**Working**	**Answer**	**Mark**	**Notes**
*8	3 × 2 × 74.25 + 3 × 2 × 31 3 × 2 × 59.75 + 4 × 2 × 31.75	631.50, 612.50 so November cheapest with reason given	5	M1 for at least one correct dinner cost calculation 3 × 2 ×31 or 4 × 2× 31.75 M1 for at least one correct room cost calculation 3 ×2 × 74.25 or 3 × 2 × 59.75 OR M2 for at least one combined room and dinner calculation 2 × 3 × (31 + 74.25) or 2(3 × 59.75 + 4 × 31.75) AND A1 for 631.5(0) A1 for 612.5(0) C1 ft holiday identified QWC: Decision must be stated and total costs must be attributable from both calculations consistent for 2 people. **Alternative** M1 for at least one correct dinner cost calculation 3 × 31 or 4 × 31.75 M1 for at least one correct room cost calculation 3 × 74.25 or 3 × 59.75 OR M2 for at least one combined room and dinner calculation 3 × (31 + 74.25) or (3 × 59.75 + 4 × 31.75) AND A1 for 315.75 A1 for 306.25 C1 ft holiday identified QWC: Decision must be stated and total costs must be attributable from both calculations consistent for 1 person.

5MB1H_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
9	(a)	1 - (0.3 + 0.21 + 0.16 + 0.09) 0.24 ÷ 4	0.06	3	M1 for 1 - (0.3 + 0.21 + 0.16 + 0.09) or 1-0.76 or 0.24 M1 dep for "0.24" ÷ 4 A1 cao
	(b)	0.3 × 0.16 + 0.16 × 0.3 + 0.21 × 0.21	0.1401	3	M1 for one correct product or 3 correct pairs identified by scores or probabilities. Ignore 4+4 repeated with no other errors. M1 for all correct products with intention to add A1 for 0.1401
10	(a)	15×0=0 40 × 14 = 560 55 × 16 = 880 65 × 21 = 1365 85 × 9 = 765 3570 ÷ 60	59.5	4	M1 for finding at least 4 products *fx* consistently within interval (including end points) M1 (dep) for use of at least 4 correct midpoints M1 (dep on first M) for "Σ*fx*″ ÷ 60 A1 for 59.5
	(b)		14,30,51,60	1	B1 all 4 correct
	(c)			2	M1 for at least 4 of "5 points" plotted consistently within each interval, ± 0.5 full square, and joined by curve or line segments providing no gradient is negative. A1 for a fully correct cf graph.
	(d)			2	B2 for answer in the range 21 - 25 (B1 for answer in the range 35 - 39) **OR** M1 (dep on graph being cf) for using w = 63 A1 ft (± 0.5 square)

5MB1H_01				
Question	**Working**	**Answer**	**Mark**	**Notes**
11 (a)		0.2 0.4, 0.6, 0.4	2	B1 for Martin correct B1 for Luke correct
(b)		0.08	2	M1 for "0.2" × "0.4" ft values from tree diagram if both < 1 A1 cao
12	$\frac{34}{182} \times 50 = 9.34$	9	2	M1 for $\frac{34}{182} \times 50$ (= 9.3..) A1 cao
13		4	2	M1 for an attempt to evaluate 2500 x 1.03^n for at least one value of n (not equal to 1) Or $\frac{2813.77}{2500}$ (=1.1255...) and 1.03^n evaluated, $n \geq 2$ Or finding at least two correct interest payments. ie 75 and 77.25 A1 for 4 cao
14 (a)		5 15	2	B1 cao B1 cao
(b)		fd = 2 (ht 4cm) fd = 2.5 (ht 5cm)	2	B2 for 2 correct bars B1 for 1 correct bar If B0 is scored then you can award M1 at least one correct frequency density calculated for the missing bars Or 1 sq = 2.5 plants oe

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March 2011
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