

Mark Scheme (Results)

March 2011

GCSE

GCSE Mathematics (Modular) – 5MB1F
Paper 01

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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If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.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 as 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

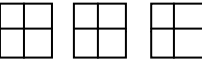
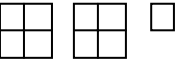
Unless allowed by the mark scheme, the marks allocated to one part of the question CANNOT be awarded in another.

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

5MB1F_01				
Question	Working	Answer	Mark	Notes
1 (a)		40	1	B1 cao
(b)		28	1	B1 cao
(c)(i)	$24 \div 8 = 3$		2	B1 cao
(ii)	$18 \div 8 = 2\frac{1}{4}$			B1 cao
2 (a)	$10 + 60 + 5$	75	1	B1 (accept 1 hour 15 minutes or 1.25 hours or $1\frac{1}{4}$ hours with units)
(b)(i)		3.25 pm	2	B1 for 3.25 pm oe [accept 3.25 only and 03.25 pm but do not accept 3.25 am or 03.25]
(b)(ii)		21 15		B1 for 21 15 (ignore am or pm written)
(c)	$10.45 - 10.25$ OR $10.25 + 5 + 10 + 5$	20	2	M1 for an attempt to find the time difference between 10.25 and 10.45 A1 cao
3 (a)		Climbing	1	B1 cao
(b)	$7 + 4 + 3 + 6$	20	2	M1 for adding at least 2 correct readings (eg. $7 + 6$, or $7 + 6 + 3$; however answers alone of 13 or 16 get no marks) A1 cao
(c)		Bar of height 7	1	B1 for a bar of height 7, shaded or un-shaded on either side of the boys bar

5MB1F_01				
Question	Working	Answer	Mark	Notes
4 (a)		4	1	B1 cao
(b)		Mark and Lori	1	B1 cao (accept M and L)
(c)		$\frac{2}{6}$	2	M1 for $\frac{2}{n}$ where $2 < n \leq 6$ or $\frac{n}{6}$ where $n < 6$ A1 for $\frac{2}{6}$ oe (condone incorrect cancelling) [SC: B1 for 2 out of 6 or 2 : 6 or 2 in 6 or 1 out of 3, etc. if M0 scored]
5 (a)		\times at $\frac{1}{2}$	1	B1 for \times marked at $\frac{1}{2}$ cao (allow the \times above or below the line)
(b)		\times at $\frac{1}{4}$	1	B1 for \times marked at $\frac{1}{4}$ (allow the \times above or below the line) [Tolerance: the \times must be between the '1' in the word 'probability' above and the 'a' in the word 'scale' above]
(c)		\times at 0	1	B1 for \times marked at 0 cao (allow the \times above or below the line)

5MB1F_01				
Question	Working	Answer	Mark	Notes
6 (a)		3, 7, 5, 3, 2	2	M1 for at least 1 correct frequency or 1 correct tally cell A1 all frequencies correct (with or without the tally column completed or incorrectly completed)
(b)		2	1	B1 for 2 or ft from (a)
(c)	$20 + 18 + 23 + 17 + 15 + 21$ $114 \div 6$	19	2	M1 for “(20 + 18 + 23 + 17 + 15 + 21)” [=114] $\div 6$ A1 cao [SC: B1 for an answer of 96.5 if M0 scored]

5MB1F_01				
Question	Working	Answer	Mark	Notes
7	$\frac{25}{100} \times 200 = 50$ $\frac{1}{5} \times 200 = 40$ $200 - 50 - 40$ <p>OR</p> $25 + 20 = 45$ $100 - 45 = 55$ $\frac{55}{100} \times 200$ <p>OR</p> $\frac{1}{4} + \frac{1}{5} = \frac{5}{20} + \frac{4}{20} = \frac{9}{20}$ $\frac{11}{20} \times 200$	110	3	<p>M1 for $\frac{25}{100} \times 200$ or $200 \div 4 (= 50)$ or $\frac{1}{5} \times 200$ or $200 \div 5 (= 40)$ M1 (dep) for $200 - '50' - '40'$</p> <p>OR</p> <p>M1 for $25 + "20" (= 45)$ or $100 - "45"$ or $\frac{"45"}{100} \times 200 (= 90)$ M1 (dep) for $\frac{"55"}{100} \times 200$ or $200 - \frac{"45"}{100} \times 200$</p> <p>OR</p> <p>M1 for $\frac{1}{4} + \frac{1}{5}$ or $\frac{"9"}{20}$ or $\frac{"9"}{20} \times 200 (= 90)$ M1 (dep) for $\frac{"11"}{20} \times 200$ or $200 - \frac{"9"}{20} \times 200$</p> <p>A1 cao</p>
8		C1, C2, C3, C4 A1, A2, A3, A4 T1, T2, T3, T4	2	<p>B2 for all 12 correct pairs (in any order, eg C1 or 1C) with no incorrect combinations. (B1 for at least 8 different correct pairs, ignoring any extra incorrect combinations) Note: Ignore any repeats</p>

5MB1F_01				
Question	Working	Answer	Mark	Notes
9 (a)		48	1	B1 for an answer in the range 47.5 to 48.2
(b)		25	1	B1 cao
(c)	32×5 16×10 100×1.6	155 to 165	2	M1 for complete method reading from graph then multiplying by a suitable scale factor. Eg 1.6×100 , 8×20 , 16×10 , 32×5 , 40×4 , $48 \times 3\frac{1}{3}$ or valid use of answer to (a) or (b) A1 for answer in the range 155 to 165 or ft on their answers to either (a) or (b)
10 (a)		27	1	B1 cao
(b)	$(27 + 1)/2 = 14$ so 14th is median value	23	1	B1 cao
(c)	$53 - 8$	45	2	M1 for 53-8 A1 cao [SC: B1 for 8 to 53 or 8 - 53 oe or 8 and 53 identified if M0 A0 awarded]

5MB1F_01					
Question	Working	Answer	Mark	Notes	
11	(a)	15 matches = 150° 1 match = 10° $120 \div 10 = 12$	12	2	M1 for $150 \div 15 (=10)$ or $120 \div 10$ [Note: 10 seen on the answer line with no working gets no marks] A1 cao
	(b)		Not enough information ticked and reason given	1	B1 for "Not enough information" ticked (or not and not contradicted) and correct explanation eg Explains that we don't know actual number of matches hockey team won. OR explains we don't know number of matches. OR explains that pie charts only show the proportions (eg. "cannot compare sizes of angles only") [B0 for any contradictory responses]

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Question	Working	Answer	Mark	Notes																				
12	$30 - 17 = 13$ $5 - 3 = 2$ $13 - 2 - 7 = 4$ $4 + 4$ 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 border="1" data-bbox="398 903 804 1114"> <thead> <tr> <th></th> <th>B</th> <th>G</th> <th>Total</th> </tr> </thead> <tbody> <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> </tbody> </table>		B	G	Total	Packed	4			School lunch		7		Home	3		5	Total	17		30	8	4	<p>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 "$13 - 2 - 7 (= 4)$"</p> <p>M1 for $17 - 4 - 3 (= 10)$ M1 for "10" + $7 (= 17)$ M1 for $30 - 5 - 17$</p> <p>M1 for $17 - 4 + 7 (= 20)$ M1 for "20" + $(5 - 3)$ M1 for $30 - 22$</p> <p>A1 cao</p> <p>[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</p> <p>[Note: for the award of the final A1, the 8 in any diagram must be highlighted, in some way, to be the required answer]</p>
	B	G	Total																					
Packed	4																							
School lunch		7																						
Home	3		5																					
Total	17		30																					

5MB1F_01				
Question	Working	Answer	Mark	Notes
13		0.06 or 6%	2	<p>M1 for $1 - (0.09 + 0.18 + 0.16 + 0.21 + 0.30)$ oe OR M1 for $100 - (9 + 18 + 16 + 21 + 30)$ oe OR M1 for $1 - \left(\frac{9}{100} + \frac{18}{100} + \frac{16}{100} + \frac{21}{100} + \frac{30}{100}\right)$ A1 for 0.06 or 6% (6 only gets A0) or $\frac{6}{100}$ oe [SC; B1 for 6 on the answer line without working, if M0 scored]</p>
14	$6.50 \times 36 = 234$ $234 + 320 = 554$ $36 \div 4 = 9$ $26.50 \times 9 = 238.50$ $36 \times 7.50 = 270$ $270 + 238.5 = 508.5$ OR $320 \div 36 = 8.88(9)$ $8.88(9) + 6.50 = 15.38(9)$ $26.50 \div 4 = 6.62(3)$ $6.62(3) + 7.50 = 14.12(3)$ $14.12(3) \times 36 = 508.50$	£508.50	5	<p>M1 for using $36 \times$ correct entrance price, 36×7.50 or 36×6.50 M1 for using correct travel cost, 320 or “$36 \div 4$” $\times 26.50$ (238.50) [condone 320 for concert and “$36 \div 4$” $\times 26.50$ (238.50) for theme park] A1 for 554 cao A1 for 508.5 cao C1 ft for identifying, in words, the cheaper venue from 2 calculated amounts. One amount must be for the theme park and one amount must be for the concert [Note: the 2 calculated amounts must each be of ticket plus travel costs] OR M1 for $320 \div 36 [= 8.88(9)]$ or $26.50 \div 4 [= 6.62(3)]$ A1 for 15.38(9) or 14.12(3) M1 for “14.12(3)” $\times 36$ A1 for 508.5 C1 ft for identifying, in words, “the cheaper cost per student gives the least total cost”.</p>

5MB1F_01				
Question	Working	Answer	Mark	Notes
15	(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
16	(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]

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