

Mark Scheme (Results)

November 2012

GCSE Mathematics (2MB01) Foundation
5MB1F (Calculator) Paper 01

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Publications Code UG033830

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If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.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

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Question		Working	Answer	Mark	Notes															
1	(a)		white	1	B1 cao															
	(b)		medium	1	B1 cao															
	(c)		43	1	B1 cao															
2	(a)		24	1	B1 for 24															
	(b)		6	1	B1 for 6															
	(c)	Wed = 12 Thurs = 12 + 6 = 18 or 6 more = 3 extra circles		2	M1 for identifies 6 bunches as 3 circles or '12' + 6 or gives an answer of 9 circles A1 for 9 circles in two clusters of 4 and an additional circle															
3	(a)(i)		7 30	3	B1 for (0)7 30 or 19 30 or half past 7 oe (ignore am or pm)															
	(ii)	9.26 – 7.30 or 7 30 to 8 30 min 8 to 9 1 hour 9 to 9 26 <u>26 min</u>	1 hour 56 minutes		M1 for a valid attempt to work out the difference between '7 30' and 9 26 eg. from 9.26 – '7.30' or by splitting the interval and adding A1ft for 1 hour 56 minutes or 116 minutes or 1h 56 m or 1 h 56 or 116 m or 1:56 SC B1 for 1.56															
	(b)		8.6	1	B1 for 8.6 oe															
4		<table><tr><th>Colour</th><th>Tally</th><th>Frequency</th></tr><tr><td>red</td><td></td><td></td></tr><tr><td>black</td><td></td><td></td></tr><tr><td>white</td><td></td><td></td></tr><tr><td>silver</td><td></td><td></td></tr></table>	Colour	Tally	Frequency	red			black			white			silver			Data collection sheet	3	B3 for a correct data collection sheet that has at least 3 colours: the tally column and frequency column must have headings (B2 for any 2 of these aspects) (B1 for any 1 of these aspects)
Colour	Tally	Frequency																		
red																				
black																				
white																				
silver																				

5MB1F_01					
Question		Working	Answer	Mark	Notes
5		$30 \div 3.85 = 7.7922\dots$	7	2	M1 for $30 \div 3.85$ oe or 7.79(22...) seen or 26.95 seen or 30.8(0) seen A1 cao
6	(a)		cross	1	B1 for cross placed less than 1 cm from 0
	(b)		cross	1	B1 for cross placed between 1 cm and 4 cm from 1
7*		Girls: $8 - 2 = 6$ Boys: $6 - 1 = 5$	correct with explanation	3	M1 for girls' range = $8 - 2$ or boys' range = $6 - 1$ or comparison of largest and smallest scores A1 for girls' range = 6 and boys' range = 5 C1 (dep on M1) ft for correct interpretation from candidate's working and where the two ranges have been correctly linked with girls and boys
8		(S, L), (S, B), (S, C), (P, L), (P, B), (P, C)	List all 6 choices	2	B2 for all 6 with no extras or repeats (B1 for at least 3 correct)
9	(a)		13	1	B1 cao
	(b)		12	2	M1 for ordering at least 16 of the original values and identifying the middle of the ordered list or indicating at least one of the middle two numbers for $n = 16$ or 18 and the middle number for $n = 17$ A1 cao
10	(a)	$(6+8+6+4+5+5+6+7+4+6) \div 10 = 57 \div 10$	5.7	2	M1 for adding all the numbers and dividing by 10 A1 cao
	(b)	$(3 \times 1) + (1 \times 2) + (4 \times 3) + (0 \times 4) + (2 \times 5) = 3 + 2 + 12 + 0 + 10$	27	2	M1 for $(3 \times 1) + (1 \times 2) + (4 \times 3) + (0 \times 4) + (2 \times 5)$ allow 1 error A1 cao

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Question		Working		Answer	Mark	Notes																	
11	(a)	(a) ÷ 6 × 64 or Read from graph and ×		10	1	B1 cao																	
	(b)			15	1	B1 14.8 - 15.2																	
	(c)			103 to 110	2	M1 for valid method eg Read from £8 and × answer by 8 <table><tr><td>£</td><td>£</td><td>Calc</td><td>CHF</td></tr><tr><td>8</td><td></td><td>8 × 13</td><td>(104)</td></tr><tr><td>6</td><td>4</td><td>6 × 16.5 + 6.5</td><td>(104.5)</td></tr><tr><td>16</td><td></td><td>4 × 26.5</td><td>(106)</td></tr><tr><td>20</td><td>4</td><td>3 × 33 + 6.5</td><td>(105.5)</td></tr></table> A1for 103 - 110	£	£	Calc	CHF	8		8 × 13	(104)	6	4	6 × 16.5 + 6.5	(104.5)	16		4 × 26.5	(106)	20
£	£	Calc	CHF																				
8		8 × 13	(104)																				
6	4	6 × 16.5 + 6.5	(104.5)																				
16		4 × 26.5	(106)																				
20	4	3 × 33 + 6.5	(105.5)																				
12		<table><tr><td></td><td>H</td><td>T</td><td>F</td><td>G</td></tr><tr><td>M</td><td>3</td><td>8</td><td>15</td><td>9</td></tr><tr><td>W</td><td>6</td><td>14</td><td>7</td><td>1</td></tr></table>			H	T	F	G	M	3	8	15	9	W	6	14	7	1	Diagram or chart	4	B1 for a key or suitable labels to identify the men and women. The key may be ignored if unclear provided the graph is clear, ie if different colours are used to shade in the graph. Give benefit to candidate. B1 for a diagram(s) or chart(s) set up for comparison, showing data for at least 3 sports e.g. dual bar chart, composite bar charts, etc (or frequency polygons) B1 for correct heights for men or women or totals C1 for a fully correct diagram or chart to include ‘frequency’ oe		
	H	T	F	G																			
M	3	8	15	9																			
W	6	14	7	1																			

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Question		Working	Answer	Mark	Notes
13			10 10 (3) 23 (18) 4 (9) (31) 28 (14) 12(54)	3	B3 for all 6 correct (B2 for 4 or 5 correct) (B1 for 1 or 2 or 3 correct)
14			$\frac{3}{12}$	2	B2 for $\frac{3}{12}$ or $\frac{1}{4}$ or 0.25, or 25% (B1 for $\frac{x}{12}$, $x < 12$, $x \neq 3$ or $\frac{3}{x}$, $x > 3$)
15	(a)		positive	1	B1 Accept with ‘positive’ valid extra words eg strong positive
	(b)		46 – 54	2	B2 46 – 54 Or M1 for a single line segment with positive gradient that could be used as a line of best fit or a vertical line from 44 A1 for given answer in the range 46 – 54

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Question		Working	Answer	Mark	Notes																								
16			<div>18 9 9</div> <div>19 0 3 5 8</div> <div>20 0 5 6 7 7</div> <div>21 1 2 8</div> <div>22 3</div> <div>Key</div>	3	<div>B2 for a correct ordered diagram (B1 for an unordered diagram with at most1 error or omission OR for an ordered diagram with 1 or 2 errors or omissions Note: 1 error can look like 2 in the diagram when 1 value is misplaced</div> <div>B1 (indep) for a correct key eg Key: 18 7 represents 187 (g)</div> <div>NB for an ordered diagram of the form</div> <table><tr><td>1</td><td> </td><td>89</td><td>89</td><td>90</td><td>93</td><td>95</td><td>98</td><td></td><td></td><td></td><td></td></tr><tr><td>2</td><td> </td><td>00</td><td>05</td><td>06</td><td>07</td><td>07</td><td>11</td><td>12</td><td>18</td><td>23</td><td></td></tr></table> <div>award a maximum of B1 for an ordered diagram with 1 or 2 errors or omissions The B1 for a key can still be earned.</div>	1		89	89	90	93	95	98					2		00	05	06	07	07	11	12	18	23	
1		89	89	90	93	95	98																						
2		00	05	06	07	07	11	12	18	23																			
17			2 statements	2	<div>B1 for overlapping numbers oe</div> <div>B1 for not exhaustive oe</div>																								
18	(a)		Yes with valid reason	1	<div>C1 for Yes with it can be cancelled to 1 in 6 oe, eg 15 out of 90 is the same as 1 out of 6 or $90 \div 6 = 15$ or No with as this survey <u>only</u> has 90 cats oe or Can't tell with we do not know how many cats in the survey</div>																								
	(b)	<div>Top Cat = $35 \times 4 = 140^\circ$ Katkins = $30 \times 4 = 120^\circ$ Coolkat = $15 \times 4 = 60^\circ$</div>	Pie chart	3	<div>M1 for $360 \div 90$ or 4 seen or one angle (TC or Ka or Co) correct in pie chart $\pm 2^\circ$ ignore labels, or one correct angle calculated A1 for any two angles (TC or Ka or Co) correct in pie chart. $\pm 2^\circ$ ignore labels A1 for fully correct and labelled pie chart. All angles $\pm 2^\circ$</div>																								

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Question		Working		Answer	Mark	Notes																											
19*		$A = (78 + 52 + 165) \times 2 + 236$ $= 295 \times 2 + 236 = 590 + 236$ $= 826$ $826 \times 0.95 = 784.70$ $B = (68 + 48 + 160) \times 2 + 242$ $= 276 \times 2 + 242 = 552 + 242$ $= 794$ $794 \times 0.97 = 770.18$ <table><tr><th>Shop</th><th>A</th><th>B</th></tr><tr><td>Skis</td><td>156</td><td>136</td></tr><tr><td>Boots</td><td>104</td><td>96</td></tr><tr><td>S & B</td><td>260</td><td>232</td></tr><tr><td>Lift(Ch)</td><td>330</td><td>320</td></tr><tr><td>Lift (Ad)</td><td>236</td><td>242</td></tr><tr><td>Lift total</td><td>566</td><td>562</td></tr><tr><td>Total</td><td>826</td><td>794</td></tr><tr><td>%age off</td><td>41.3</td><td>23.82</td></tr></table>		Shop	A	B	Skis	156	136	Boots	104	96	S & B	260	232	Lift(Ch)	330	320	Lift (Ad)	236	242	Lift total	566	562	Total	826	794	%age off	41.3	23.82	Shop B	5	<p>M1 for finding the total cost for 1adult and 2 children for lift passes for 6 days in either shop A or shop B e.g $236 + 2 \times 165$ or $242 + 2$ or 2×160 or $236 + \text{“330”}$ or $242 + \text{“320”}$ or 566 seen or 562 seen or the total cost of 2 children only for ski hire and boot hire for 6 days in either shop A or shop B e.g. $2 \times 78 + 2 \times 52$ or $2 \times 68 + 2 \times 48$ or “156” + “104” or “136” + “96” or 260 seen or 232 seen</p> <p>M1 for a complete calculation of cost for shop A or shop B Eg $(78 + 52 + 165) \times 2 + 236$ or $(68 + 48 + 160) \times 2 + 242$ or “295” $\times 2 + 236$ or “276” $\times 2 + 242$ or 826 or 794 seen</p> <p>M1 for a correct method to find the reduced cost for shop A or for shop B e.g. “826” $\times 0.95$ or “794” $\times 0.97$ A1 for (€)784(.70) or (€)785 and (€)770(.18) C1 (dep on M1 scored) ft for ‘cheaper shop’ identified</p>
Shop	A	B																															
Skis	156	136																															
Boots	104	96																															
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Order Code UG033830 November 2012

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Welsh Assembly Government

