

Mark Scheme (Results)

November 2014

Pearson Edexcel GCSE
In Mathematics B (2MB01)
Higher (Calculator) Unit 1

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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.
- 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. Note that in some cases a correct answer alone will not score marks unless supported by working; these situations are made clear in the mark scheme. Examiners should 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 award marks for the quality of written communication (QWC).
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 labelling 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If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.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.

Partial answers shown (usually indicated in the ms by brackets) can be awarded the method mark associated with it (implied).

Any case of suspected misread loses A (and B) marks on that part, but can gain the M marks; transcription errors may also gain some credit. Send any such responses to review for the Team Leader to consider.

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 cancelling 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.

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 (embedded answers).

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)

14 The detailed notes in the mark scheme, and in practice/training material for examiners, should be taken as precedents over the above notes.

Guidance on the use of codes within this mark scheme

M1 – method mark for appropriate method in the context of the question
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

Paper_5MB1H_01					
Question	Working	Answer		Mark	Notes
1.		12	3 5 9	3	B2 for a fully correct ordered diagram (B1 for correct unordered diagram or ordered with at most two errors) B1 for correct key eg 12 3 means 123 (cm)
		13	0 3 3 5 7 8		
		14	7 7 8 9		
		15	0 1		
2. (a)		2 different reasons		2	B1 for a reason relating to: Bias – due to gender or due to railway station location Size of sample too small B1 for one other reason
(b)		Question and response boxes		2	B1 for a suitable question with time period and units in question or response boxes B1 for at least 3 non-overlapping and exhaustive response boxes
3.		$\frac{x + x + 5 + 2x}{3}$		2	M1 for intention to add x , $x + 5$, $2x$ or $4x + 5$ seen or ambiguous answer eg “ $4x+5$ ” $\div 3$ A1 for $\frac{x + x + 5 + 2x}{3}$ oe

Paper_5MB1H_01				
Question	Working	Answer	Mark	Notes
4. (a)		Frequency polygon	2	B2 for fully correct frequency polygon - points plotted at the midpoint (B1 for all points plotted accurately but not joined with straight line segments) or all points plotted accurately and joined with last joined to first to make a polygon or all points at the correct heights and consistently within or at the ends of the intervals and joined (can include joining last to first to make a polygon) NB: ignore parts of graph drawn to the left of the 1 st point or the right of the last point
(b)		$160 < h \leq 180$	1	B1 for $160 < h \leq 180$ (could be ft from diagram)
5. (a)		0.05	3	M1 for correct method using sum of probabilities = 1 eg $1 - 0.6 - 0.25 (=0.15)$ or $0.6 + 0.25 + 2x + x = 1$ M1 (dep) for correct method to use $P(\text{blue}) = 2 \times (\text{Green})$ Eg " 0.15 " $\div 3$ A1 cao
(b)		30	2	M1 for 0.6×50 oe A1 cao

Paper_5MB1H_01				
Question	Working	Answer	Mark	Notes
6.		15.42	4	<p>M1 for method to find litres needed for either car A (eg $450 \div 10.3 (= 43.69)$) or car B (eg $450 \div 14.6 (= 30.82)$)</p> <p>M1 for method to find cost of fuel for either car A (eg $1.39 \times 43.69 (=60.73)$) or car B (eg $1.47 \times 30.82 (=45.31)$)</p> <p>M1 (dep M2) or method to find difference in fuel costs for car A and B</p> <p>A1 cao</p> <p>Or</p> <p>M1 for method to find cost per mile for car A (eg $1.39 \div 10.3 (=0.135)$) or for car B (eg $1.47 \div 14.6 (=0.101)$)</p> <p>M1 for method to find total cost of fuel for either car A (eg $450 \times 0.135 (=60.73)$) or for car B (eg $450 \times 0.101 (=54.31)$)</p> <p>M1 (dep M2) for method to find difference in fuel costs for car A and B</p> <p>A1 for £15.42</p> <p>NB: Working throughout may be in £ or pence.</p>
7.		28	5	<p>M1 for method to find $\frac{1}{5}$ of children eg $60 \div 5 (=12)$</p> <p>M1 for method to find number of boys or girls eg "$12 \times 2 (=24)$" or "$12 \times 3 (=36)$"</p> <p>M1 for method to find total number going in the morning</p> <p>eg $\frac{3}{4} \times 60 (= 45)$</p> <p>M1 for complete method to find number of girls going in the morning eg $45 - (24 - 7)$</p> <p>A1 cao</p>
8.		0.7, 0.3 0.9, 0.1, 0.9, 0.1	2	<p>B1 for 0.7, 0.3 in correct position</p> <p>B1 for 0.9, 0.1, 0.9, 0.1 in correct position</p>

Paper 5MB1H 01				
Question	Working	Answer	Mark	Notes
9. (a)		Point at (47, 34)	1	B1 point plotted
(b)		Positive	1	Positive (correlation)
(c)		48 to 51 inclusive	2	M1 for a single straight line segment with positive gradient that could be used as a line of best fit or a horizontal line from 35 or point marked at (n,35). A1 for given answer in the range 48 – 51
10.		1615.34	3	M1 for correct method to find value of investment after 1 year eg 1500×0.025 or 37.5 or 1500×1.025 or 1537.5 oe) M1 for a complete compound interest method to find value of investment after 3 years eg 1500×1.025^3 A1 cao
*11		Justification	4	M1 for method to find total mileage eg $55 \times 5 + 50 (= 325)$ M1 for method to find mean eg $325 \div 6$ A1 for 54.1 – 54.2 C1 (dep on at least M1) for justification comparing means. OR M1 for method to find total mileage for Andy's mean $52.5 \times 6 (= 315)$ M1 for method to find correct total mileage $55 \times 5 + 50 (= 325)$ A1 for 315 and 325 C1 (dep on at least M1) for justification comparing correct totals

Paper_5MB1H_01				
Question	Working	Answer	Mark	Notes
12. (a)		40	1	B1 cao
(b)		22-24	3	M1 for reading graph up from 43 and across [36-38] A1 for 22 or 23 or 24
(c)		Correct box plot	3	B3 for fully correct box plot (allow ft for median from (a)) (B2 for at least 3 correct values plotted including box and tails or 5 correct values indicated) (B1 for at least 2 correct values plotted including box or tails or 3 or 4 correct values plotted) Min LQ Median UQ Max 17 32 "40" 46 50
13.		223	3	B1 for using 4.5, 4. 4 9 , 0.0045 or 0.0044 9 M1 for 1000 or 1 kg divided by 4.5, 4. 4 9 , 0.0045 or 0.0044 9 (=222.72) or 222 seen A1 cao
14. (a)		Correct explanation	1	B1 for groups in the sample are in the same proportion as they are in the population.
(b)		33	2	M1 for $\frac{494}{1786} \times 120$ oe A1 cao

Paper_5MB1H_01				
Question	Working	Answer	Mark	Notes
15.	(50,10) (10,50) (20,20) (20,50) (50,20)	$\frac{12}{30}$	4	<p>M1 for method to identify all correct pairs eg sample space or tree diagram (may be implied by correct products)</p> <p>M1 for all correct products</p> $\frac{1}{6} \times \frac{3}{5}, \frac{3}{6} \times \frac{1}{5}, \frac{2}{6} \times \frac{1}{5}, \frac{1}{6} \times \frac{2}{5}, \frac{2}{6} \times \frac{1}{5}$ <p>M1 for finding sum of correct products</p> $\frac{1}{6} \times \frac{3}{5} + \frac{3}{6} \times \frac{1}{5} + \frac{2}{6} \times \frac{1}{5} + \frac{1}{6} \times \frac{2}{5} + \frac{2}{6} \times \frac{1}{5}$ <p>A1 for $\frac{12}{30}$ oe</p> <p>OR</p> <p>M1 for method to identify all correct pairs < 40p eg sample space or tree diagram (may be implied by correct products)</p> <p>M1 for all correct products</p> $\frac{3}{6} \times \frac{2}{5}, \frac{3}{6} \times \frac{2}{5}, \frac{2}{6} \times \frac{3}{5}$ <p>M1 for completing working</p> $1 - \left(\frac{3}{6} \times \frac{2}{5} + \frac{3}{6} \times \frac{2}{5} + \frac{2}{6} \times \frac{3}{5} \right)$ <p>A1 for $\frac{12}{30}$ oe</p>

Paper_5MB1H_01				
Question	Working	Answer	Mark	Notes
16. (a)		Correct histogram	3	B3 fully correct histogram with vertical axis correctly scaled. (B2 for 4 correct blocks or 5 correct blocks with incorrect or no scale) (B1 for 2 correct blocks of different widths or any 3 correct blocks or correct FD values for at least 3 frequencies) eg fd of 1.2, 2.1, 2.2, 1.6, 0.4
(b)		38	2	M1 for $\frac{1}{3} \times 33 + 21 + 6$ A1 cao OR M1 for vertical line at m= 20 or showing one third of $15 < m \leq 30$ bar. A1 cao

Modifications to the mark scheme for Modified Large Print (MLP) papers.

Only mark scheme amendments are shown where the enlargement or modification of the paper requires a change in the mark scheme.

The following tolerances should be accepted on marking MLP papers, unless otherwise stated below:

Angles: $\pm 5^\circ$

Measurements of length: ± 5 mm

PAPER: 5MB1H_01		
Question	Modification	Notes
1	Size x 1½. 4th horizontal line drawn in.	
4	Grid: 2 cm squares both axes, right axes labelled. Horizontal axis – heavier lines at 120, 140, 160, 180, and 200 Vertical axis heavier lines at 5, 10 and 15	
8	Braille (i) to (vi) given on diagram and candidates asked to write values for each.	
9	2 cm grid. Crosses changed to filled in circles. Right axis labelled	
12	Graph line changed – Curve goes through (15,1) (30, 15) (40, 30) (45, 45) (50, 60)	
	(c) 17 changed to 15 – will mean five points are 15, 30, 40, 45 and 50	
16	Table: 21 changed to 20 Top line 84 changed to 83 Grid: 2 cm	

