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Mark Scheme (Results)

Summer 2014

Pearson Edexcel GCSE
In Mathematics B (2MB01)
Unit 1: 5MB1H_01 (Higher)

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If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.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

Guidance on the use of codes within this mark scheme
M1 – method mark for correct method 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			2 reasons	2	B2 for 2 aspects from: Bias or leading question; No time frame; Vague response boxes (B1 for 1 aspect)
2	(a)		Point plotted	1	B1 for point plotted at (6,35)
	(b)			1	B1 for description of dynamic relationship or negative correlation
	(c)			1	B1 for single straight line of best fit which could be used to take readings
	(d)		21 - 26	1	B1 for answer in the range 21 - 26 or ft from single straight line segment (if previous B0)
3			56	3	M1 for correct method to find 20% of 120 (=24) or $\frac{1}{3}$ of 120 (= 40) M1 (dep) for 120 − "24" − "40" A1 cao OR M1 for $1 - \frac{20}{100} - \frac{1}{3}$ $(= \frac{7}{15})$ oe or $\left\{\frac{20}{100} + \frac{1}{3}\right\} \times 120$ (= 64) oe M1 (dep) for "$\frac{7}{15}$" × 120 oe or 120 − "64" A1 cao (if M0, then SCB1 for 64)

Paper_5MB1H_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
*4			4	4	M1 for 200 ÷ (1 + 9) (= 20) M1 for 750 ÷ 20 (= 37.5) A1 for 3.7(3….) or $3\frac{11}{15}$ or 37.5 **and** 150 C1 ft (dep on M1) for clear statement of 4 bottles with working shown **OR** M1 for 750 × 10 (= 7500) M1 for 200 × 140 (= 28 000) A1 for 3.7(3….) or $3\frac{11}{15}$ or 28000 **and** 30000 C1 ft (dep on M1) for clear statement of 4 bottles with working shown **OR** M1 for 200 × 140 (= 28 000) M1 for 28 000 ÷ (9 + 1) (= 2800) A1 for 3.7(3….) or $3\frac{11}{15}$ or 2800 **and** 3000 C1 ft (dep on M1) for clear statement of 4 bottles with working shown **OR** M1 for 200 ÷ (1 + 9) (= 20) M1 for 140 × "20" = 2800 A1 for 3.7(3….) or $3\frac{11}{15}$ or 2800 **and** 3000 C1 ft (dep on M1) for clear statement of 4 bottles with working shown

Paper_5MB1H_01

Question		Working	Answer	Mark	Notes
5			$\frac{20-x}{20}$	2	M1 for writing $20 - x$ or for 20 as any denominator below an algebraic expression in x or $20 - x \div 20$ A1 for $\frac{20-x}{20}$ or $1 - \frac{x}{20}$ oe
6			2.55	3	B1 for max as 42.5 or 42.4$\dot{9}$ M1 for max × 60 or 2550 A1 for 2.55 (accept 2.54$\dot{9}$)
7	(a)		1 | 0 3 4 5 6 8 2 | 0 3 3 | 2 6 4 | 2 3 5 5 6 5 | 4	3	B2 for a fully ordered diagram (B1 for a correct unordered diagram or ordered with at most two errors) B1 for a correct key
	*(b)	<table><tr><td></td><td>Gym</td><td></td><td>Pool</td></tr><tr><td>HV</td><td>45</td><td><</td><td>54</td></tr><tr><td>LV</td><td>18</td><td>></td><td>10</td></tr><tr><td>Mean</td><td>32</td><td>></td><td>29.5</td></tr><tr><td>Median</td><td>34</td><td>></td><td>27.5</td></tr><tr><td>Range</td><td>27</td><td><</td><td>44</td></tr></table> 1 | 8 9 2 | 0 1 7 9 3 | 2 4 5 6 9 9 4 | 2 4 5	Compares: medians/means + Spread	3	A maximum of two B marks from: B1 for a correct mean or median for either the gym ages or the pool ages. B1 for a correct range for either the gym ages or the pool ages. B1 for a correct stem and leaf diagram drawn for the gym ages (no need for a key) C1 for any correct comparison which relates to the context of the gym ages and pool ages, of either medians means or ranges from correct figures, or from stem & leaf diagrams

Paper_ 5MB1H_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
8			154	3	M1 for $\frac{56}{200}$ or $\frac{550}{200}$ M1 for $\frac{56}{200} \times 550$ A1 cao
9	(a)		48	1	B1 cao
	(b)		12	1	B1 cao
	(c)		20	2	M1 for 80 ÷ 4 A1 cao
10	(a)	5 × 5 = 25 11 × 20 = 220 23 × 40 = 920 13 × 65 = 845 8 × 90 = 720 2730 ÷ 60	45.5	4	M1 for *fx* with *x* consistent within intervals (including the end points) allow one error M1 (dep) for use of all correct mid-interval values M1 (dep on first M1) for Σ f*x* ÷ 60 A1 cao
	(b)		5, 16, 39, 52, 60	1	B1 cao
	(c)		Cumulative frequency graph	2	M1 ft for at least 4 of 5 points from their cf table (values must be cumulative) plotted consistently within each interval A1 for a fully correct cf graph
	(d)		15, 16 or 17	2	M1 for method shown to read off from *x* = 60 on their cf graph or linear interpolation from the table A1 ft from their cf graph

Paper_ 5MB1H_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
11			68	3	M1 for 30 × 60 (= 1800) or 20 × 56 (= 1120) M1 for ("1800" – "1120") ÷ 10 A1 cao Or M1 for (60 − 56) × 20 or 4 × 20 (=80) M1 for "80" ÷ 10 = 8 A1 cao
12		$\frac{11264}{27500}$ (= 0.4096) $0.8^n = 0.4096$	4	2	$\frac{11264}{27500}$ (= 0.4096) M1 for 0.8^n evaluated for n = 2 OR attempt to evaluate 27500×0.8^n for at least one value of n (not equal to 1) OR finding at least 2 deductions, ie 2 of 5500, 4400, 3520 A1 for 4 cao
13	(a) (b)		14 1.20	1 2	B1 cao M1 for attempt to find the gradient oe of the line eg drawing a right angled triangle with base & height shown, or $\frac{y_2 - y_1}{x_2 - x_1}$, values shown A1 for 1.20 (accept 1.2)
14			17	2	M1 for $\frac{117}{1034} \times 150$ or 16.9(729…..) A1 for 17

Paper_ 5MB1H_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
15			$\frac{54}{90} = \frac{3}{5}$	4	M1 for use of 9 as denominator of second probability M1 for a correct method to find the probability of at least one possible combination, $\frac{1}{10}\times\frac{6}{9}$ or $\frac{6}{10}\times\frac{1}{9}$ or $\frac{3}{10}\times\frac{1}{9}$ or $\frac{1}{10}\times\frac{3}{9}$ or $\frac{6}{10}\times\frac{3}{9}$ or $\frac{3}{10}\times\frac{6}{9}$ or $\frac{1}{10}\times\frac{9}{9}$, $\frac{6}{10}\times\frac{4}{9}$ or $\frac{3}{10}\times\frac{7}{9}$ M1 for complete and correct method shown eg $2\times(\frac{1}{10}\times\frac{6}{9}+\frac{6}{10}\times\frac{3}{9}+\frac{3}{10}\times\frac{1}{9})$ or $1-(\frac{6}{10}\times\frac{5}{9}+\frac{3}{10}\times\frac{2}{9})$ A1 for $\frac{54}{90}$ oe **Alternative scheme for replacement** M1 for $\frac{6}{10}\times\frac{6}{10}$ or $\frac{3}{10}\times\frac{3}{10}$ or $\frac{1}{10}\times\frac{1}{10}$ M1 for $1-(\frac{6}{10}\times\frac{6}{10}+\frac{3}{10}\times\frac{3}{10}+\frac{1}{10}\times\frac{1}{10})$ OR M1 for $\frac{1}{10}\times\frac{6}{10}$ or $\frac{6}{10}\times\frac{3}{10}$ or $\frac{3}{10}\times\frac{1}{10}$ M1 for $2\times(\frac{1}{10}\times\frac{6}{10}+\frac{6}{10}\times\frac{3}{10}+\frac{3}{10}\times\frac{1}{10})$ OR B2 for $\frac{54}{100}$ oe

Paper_ 5MB1H_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
16	(a)	16 ÷ 20 = 0.8 27 ÷10 = 2.7 36 ÷ 15 = 2.4 6 ÷ 5 = 1.2	Correct histogram	3	M1 for recognising and showing evidence of using frequency density, eg at least 2 correct frequency densities or a key . A1 for all bars in correct proportions OR for one error with bars and correct labelling and scaling of axes A1 for fully correct histogram including axes labelled and scaled.
	(b)		$\frac{18}{85}$	3	M1 for using 40 cm on horizontal scale and using a correct method to convert area of bar to the right of 40 cm to frequency, eg 2.4 × 5. M1 (dep) for '12' + 6 A1 for $\frac{18}{85}$ oe OR M1 for $\frac{36}{3}$ M1 (dep) for '12' + 6 A1 for $\frac{18}{85}$ oe

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: ±5º
Measurements of length: ±5 mm

PAPER: 5MB1H_01			
Question		**Modification**	**Notes**
Q02		2cm grid crosses, cha nged to solid circles. Right axis labeled	
Q07 Q09		Box for key put top left Box plot: median changed to 47.5, upper quartile changed to 52.5	
Q09	(C)	52kg changed to 52.5 kg	
Q10	(C)	Frequencies changed: 5, 20, 15, 15, 5 grid x axis – 2 cm for 10, y axis 2cm for 5	
Q13		2 cm grid, line moved parallel to original graph line to go through (0,20) (50, 80) (75, 110)	
Q16		Frequency column: 27 changed to 28 2 cm grid Number of weather stations changed from 85 to 86	

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