

Mark Scheme (Results)

November 2016

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If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.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

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		$\begin{array}{r l} 4 & 788 \\ 5 & 0013578 \\ 6 & 124669 \\ 7 & 358 \end{array}$ <p>4 7 represents 47 grams</p>	3	B2 for fully correct ordered diagram (B1 for correct unordered diagram or ordered with at most 2 errors) B1 for correct key, eg 4 7 represents 47 (grams)
2	(a)	120	2	M1 for $\frac{2}{3} \times 180$ oe A1 cao
	(b)	75	2	M1 for $1000 \div 400 \times 30$ or $30 + 30 + 15$ oe A1 cao OR M1 for $3 \times 25 : 40 \times 25$ oe or $75 : 1000$ A1 cao
3	(a)	The greater the hand = length the greater the foot length	1	B1 for the greater the hand = length the greater the foot length oe (accept positive correlation)
	(b)	24 – 25	2	M1 for a single straight line segment with positive gradient that could be used as a line of best fit or an indication on the diagram from 18.5 on the x -axis A1 for answer in range 24 – 25
4	(a)	Suitable question	2	B1 for a suitable question including time period (may appear with response boxes) B1 for at least 3 non-overlapping boxes which are exhaustive for their question
	(b)	Suitable reason	1	B1 for suitable reason, eg sample not representative

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Question	Working	Answer	Mark	Notes
5		$\frac{2x + 9 + 4x - 7}{2}$	2	M1 for $2x + 9 + 4x - 7$ oe A1 for $\frac{2x+9+4x-7}{2}$ oe
*6		No from a correct method	5	M1 for method to find cost of room after discount eg $(1 - 0.15) \times 168$ oe (= 142.8) M1 for method to find income or method to find total expenditure eg 48×9.5 (= 456) eg $50 + 25 + 15 + 225 + '142.8'$ (= 457.8) M1 (dep on M2) for complete method to work out if Freya has enough money eg '457.8' and '456' (or 1.8) eg $'457.8' \div 48$ (= 9.53 – 9.54) eg $'456' - 90 - 225$ (= 141) A1 for correct values for comparison eg 457.8 and 456 eg 9.53 – 9.54 eg 141 and 142.8 C1 (dep on M1) for No or ft their values, with no incorrect statement.
7 (a)		$10 < a \leq 15$	1	B1 cao
(b)		12.5	4	M1 for finding 4 products fx consistently within interval (including end points) M1 (dep) for use of at least 4 correct mid points M1 (dep on first M1) for $\sum fx \div \sum f$ A1 cao

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Question	Working				Answer	Mark	Notes	
8		Co	Ju	Wa	Total	34	4	M1 for a two-way table with clear labelling showing at least 3 values of the given information correctly placed M1 for 54 or 20 M1 for 9 or 12 A1 cao OR M1 for $37 - 17$ (=20) M1 for $45 - ('20' + 16)$ (= 9) M1 for $25 + '9'$ (=34) A1 cao OR M1 for $99 - 45$ (=54) M1 for $54 - (17 + 25)$ (=12) M1 for $99 - (37 + 12 + 16)$ (=34) A1 cao
	B	25		17				
	G		16		45			
	Total			37	99			
9	(a)				1.4	2	M1 for distance \div time, eg $14 \div 10$ A1 for 1.3 – 1.5	
	(b)				Lorry travels 1.4 kilometres each minute	1	B1 for (lorry travels) 1.4 kilometres each minute oe	
10					8.625	3	M1 for 50×8.4 (=420) or 30×8.25 (=247.5) M1 for $(50 \times 8.4 - 30 \times 8.25) \div 20$ A1 cao	

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Question	Working	Answer	Mark	Notes
11		Correct method for obtaining random sample	1	B1 for a correct method for obtaining random sample, eg number each television and use random numbers to select the numbers (televisions)
12	(a)	50 – 60		M1 for '340' or reading graph at 72 A1 for 50 – 60
	(b)	Box plot	3	B3 for a fully correct box plot (B2 for a box plot with at least 3 correctly values including box and whiskers/tails B1 for a box plot with at least 2 correctly values including box and whiskers/tails or 5 correct values plotted and no box or whiskers/tails)
	* (c)	Two comparisons	2	C2 ft for two relevant comparisons in context, one for median and one for IQR or range (C1 ft for one relevant comparison)
13	(a)	$\frac{2}{5}, \frac{3}{5}, \frac{2}{5}, \frac{3}{5}, \frac{2}{5}$	2	B1 for $\frac{2}{5}$ on first branch B1 for $\frac{3}{5}, \frac{2}{5}$ and $\frac{3}{5}, \frac{2}{5}$ on other branches
	(b)	$\frac{6}{25}$	2	M1 f.t. for $\frac{3}{5} \times \frac{2}{5}$ A1 f.t. for $\frac{6}{25}$ oe

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Question	Working	Answer	Mark	Notes
14		2	2	M1 for $\frac{17}{176} \times 20$ or 1.93...seen A1 cao
15	e.g. $(0.8 + 0.8 + 0.8) + (3.6 + 3.6)$ $+ 7.2 + (4.4 + 4.4) = 25.6 \text{ cm}^2$ $= 320 \text{ lizards}$ So, $1 \text{ cm}^2 = 12.5 \text{ lizards}$ $7.2 + 4.4 + 4.4 = 16$ $16 \times 12.5 = 200$	200	3	M1 for equating area to frequency, eg $1 \text{ cm}^2 = 12.5 \text{ lizards}$ M1 for $(7.2 + 4.4 + 4.4) \times '12.5'$ A1 cao OR M2 for $\frac{16}{25.6} \times 320$ oe A1 cao
16	(a)	0.000125	2	M1 for $(1 - 0.95)^3$ A1 cao (accept $\frac{1}{8000}$)
	(b)	0.135375	3	M1 for $0.95 \times 0.95 \times (1 - 0.95)$ M1 for $3 \times 0.95 \times 0.95 \times (1 - 0.95)$ A1 for 0.135 – 0.136
17	(a)	750	2	M1 for $\frac{30}{N} = \frac{2}{50}$ oe A1 cao
	(b)	assumption	1	B1 for correct assumption eg random selection (of beads)

