

Mark Scheme (Results)

Summer 2015

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

Edexcel and BTEC Qualifications

Edexcel and BTEC qualifications are awarded by Pearson, the UK's largest awarding body. We provide a wide range of qualifications including academic, vocational, occupational and specific programmes for employers. For further information visit our qualifications websites at www.edexcel.com or www.btec.co.uk. Alternatively, you can get in touch with us using the details on our contact us page at www.edexcel.com/contactus.

Pearson: helping people progress, everywhere

Pearson aspires to be the world's leading learning company. Our aim is to help everyone progress in their lives through education. We believe in every kind of learning, for all kinds of people, wherever they are in the world. We've been involved in education for over 150 years, and by working across 70 countries, in 100 languages, we have built an international reputation for our commitment to high standards and raising achievement through innovation in education. Find out more about how we can help you and your students at: www.pearson.com/uk

Summer 2015

Publications Code UG042109

All the material in this publication is copyright

© Pearson Education Ltd 2015

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

5MB1H/01 June 2015

Question		Working	Answer	Mark	Notes
1	(a)		0.8	1	B1 0.8 oe
	(b)		40	2	M1 for 200×0.2 oe A1 cao
2	(a)		Description	1	B1 description eg Taller trees are older. Accept positive correlation.
	(b)		20	1	B1 19 – 21
	(c)		2	2	M1 for evidence of taking readings at two points from Sandy line, or increase excluding start eg $24 \div 10$, $14 \div 5$ A1 for answer 1.8 to 2.2
	(d)		Comparison	2	B2 for a complete explanation e.g. Trees grow at approximately <u>twice the rate</u> on sandy soil (B1 for a partial explanation e.g. Trees grow faster on sandy soil)
3	(a)		Reason	1	B1 e.g. people coming from the market are more likely to have used it.
	(b)		Reason	1	B1 e.g. it's a leading question, “cheap” not defined, etc.
	(c)		Question with response boxes	2	B1 for a suitable question e.g. How far have you travelled to get to the market? B1 for a set of at least 3 exhaustive, non-overlapping boxes with units, with no inequality symbols.
4	(a)		53.5	1	B1 cao
	(b)		54.5	1	B1 for 54.5 (accept 54.49)

5MB1H/01 June 2015

Question	Working	Answer	Mark	Notes
5		32.35	3	<p>M1 for $109 \times \frac{15}{100}$ (=16.35) or 0.85 oe</p> <p>M1 (dep M1) for $109 - "16.35"$ or $109 \times \frac{85}{100}$ (=92.65) or $125 - "92.65"$</p> <p>A1 cao</p>
6 (a)		0 8 9 1 4 7 8 8 2 0 1 1 2 2 5 6 3 0 3	3	<p>B2 for a fully correct ordered stem and leaf diagram</p> <p>[B1 for a complete unordered diagram or for an ordered diagram with at most 2 errors]</p> <p>B1 (indep) key</p>
(b)		20	2	<p>M1 for $36 \div (5 + 4)$ (=4)</p> <p>A1 cao</p>
7 (a)		1	1	B1 cao
(b)		2.4	3	<p>M1 for $\Sigma(\text{number of books} \times \text{frequency})$ (=60)</p> <p>M1 for $"60" \div "25"$</p> <p>A1 cao</p> <p>SC B2 for an answer of 2.48</p>
(c)		3.15	3	<p>M1 for 15×4.4 (=66)</p> <p>M1 for a complete method eg $("60" + "66") \div (15 + "25")$</p> <p>A1 cao</p>

5MB1H/01 June 2015

Question	Working	Answer	Mark	Notes
*8	BS Bank I: 2436 2550 Tot: 42436 42550 %: 1.0609 1.06375	Correct decision with evidence	4	M1 for $40000 \times \frac{3}{100}$ oe (=1200) or 41200 M1 for evidence of a compound interest method eg '41200' $\times \left(\frac{103}{100}\right)$ or $\left(\frac{103}{100}\right)^2 \times 40000$ A1 for 2436 or 42436 C1 (dep at least M1) for correct decision ft for either Bank or Building Society OR M1 for 1.03 M1 for 1.03^2 (= 1.0609) and $\frac{2550}{40000}$ oe A1 for 1.0609 and 1.06375 C1 (dep at least M1) for correct decision ft for either Bank or Building Society
9 (a)		43	1	B1 42 – 44
(b)		90	2	M1 for evidence of reading in the range 48 - 52 A1 88 – 92
* (c)	Medians B 50 G 43 Q ₁ B 40 G 22 Q ₃ B 30 G 56 IQRs B 30 G 34 Allow ± 1 in figs.	Comparison	4	B1 for boys' median = 50 B1 for boys' IQR = 30 or girls' IQR = 34 C1 for comparison of medians or quartiles or IQR (only if stated) C1 for comparison of medians and IQR with all values correct and with context

5MB1H/01 June 2015

Question	Working	Answer	Mark	Notes
10 (a)		Explanation	1	B1 eg One where the proportions of the strata in the sample are the same as in the population
(b)		20	2	M1 for $\frac{73}{45+78+73+25} \times 60$ or $\frac{73}{221} \times 60$ oe (=19.819...) A1 cao
11		A: $y = 2^x$ B: $y = 10 - 2x$ C: $y = 8x - 2x^2$	3	B1cao B1cao B1cao

5MB1H/01 June 2015

Question	Working	Answer	Mark	Notes
12 (a)		Probability tree	3	B1 for $\frac{2}{8}$ in the correct place B1 for $\frac{5}{7}, \frac{2}{7}; \frac{6}{7}, \frac{1}{7}$ in the correct place on a probability tree B1 complete probability tree with labelling eg A, B etc.
(b)		$\frac{30}{56}$	2	M1 $\frac{6}{8} \times \frac{5}{7}$ A1 oe eg 0.5357.... or $\frac{15}{28}$
(c)		$\frac{54}{56}$	3	M1 for $\frac{6}{8} \times \frac{5}{7}$ or $\frac{6}{8} \times \frac{2}{7}$ or $\frac{2}{8} \times \frac{6}{7}$ oe eg 0.5357... or 0.214... M1 for $\frac{6}{8} \times \frac{5}{7} + \frac{6}{8} \times \frac{2}{7} + \frac{2}{8} \times \frac{6}{7}$ or $1 - \left(\frac{2}{8} \times \frac{1}{7} \right)$ A1 oe eg 0.964.... or $\frac{27}{28}$
13	F 90 126 144 120 60 54	345	5	M1 for use of F = FD $\times$ Int width A1 for any 3 Fs correct M1 for $\frac{60}{100} \times (90 + 126 + 144 + 120)$ (= 288) or $\frac{60}{100} \times 480$ (=288) M1 $\frac{1}{2} \times "(60 + 54)"$ (= 57) or $\frac{1}{2} \times 114$ (=57) 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
Q2	(a)	2 graphs provided, one for ‘sandy soil’ and one for ‘clay soil’. Sandy soil graph line goes through (10, 25) and (20, 45) Clay soil graph line goes through (15, 20) and (25, 30) Points are moved to fit in with the new graph lines. Parts (b) and (c) have been reversed and relabelled.	B1 description eg Taller trees are older. Accept positive correlation.
Q2	(b)	2 graphs provided, one for ‘sandy soil’ and one for ‘clay soil’. Sandy soil graph line goes through (10, 25) and (20, 45) Clay soil graph line goes through (15, 20) and (25, 30) Points are moved to fit in with the new graph lines. Parts (b) and (c) have been reversed and relabelled.	B1 19 – 21
Q2	(c)	2 graphs provided, one for ‘sandy soil’ and one for ‘clay soil’. Sandy soil graph line goes through (10, 25) and (20, 45) Clay soil graph line goes through (15, 20) and (25, 30) Points are moved to fit in with the new graph lines. Parts (b) and (c) have been reversed and relabelled. 18 years has been changed to 15 years.	M1 for evidence of taking readings at two points from Sandy line, or increase excluding start eg $24 \div 10$, $14 \div 5$ A1 for answer 1.8 to 2.2 within given tolerance and adjusted appropriately.

PAPER: 5MB1H_01			
Question		Modification	Notes
Q2	(d)	2 graphs provided, one for 'sandy soil' and one for 'clay soil'. Sandy soil graph line goes through (10, 25) and (20, 45) Clay soil graph line goes through (15, 20) and (25, 30) Points are moved to fit in with the new graph lines. Parts (b) and (c) have been reversed and relabelled.	B2 for a complete explanation e.g. Trees grow at approximately <u>twice the rate</u> on sandy soil (B1 for a partial explanation e.g. Trees grow faster on sandy soil)
Q3	(a)	Question for questionnaire moved to the Diagram Book.	B1 e.g. people coming from the market are more likely to have used it.
Q3	(b)	Question for questionnaire moved to the Diagram Book.	B1 e.g. it's a leading question, "cheap" not defined, etc.
Q3	(c)	Question for questionnaire moved to the Diagram Book.	B1 for a suitable question e.g. How far have you travelled to get to the market? B1 for a set of at least 3 exhaustive, non-overlapping boxes with units, with no inequality symbols.
Q6	(a)	Bottom line has been drawn on the stem and leaf diagram.	B2 for a fully correct ordered stem and leaf diagram [B1 for a complete unordered diagram or for an ordered diagram with at most 2 errors] B1 (indep) key
Q6	(b)	Bottom line has been drawn on the stem and leaf diagram.	M1 for $36 \div (5 + 4)$ (=4) A1 cao

PAPER: 5MB1H_01			
Question		Modification	Notes
Q7	(a)	Frequency column on the table has been extended to allow room for working.	B1 cao
Q7	(b)	Frequency column on the table has been extended to allow room for working.	M1 for $\Sigma(\text{number of books} \times \text{frequency})$ (=60) M1 for "60" $\div$ "25" A1 cao SC B2 for an answer of 2.48
Q7	(c)	Frequency column on the table has been extended to allow room for working.	M1 for 15×4.4 (=66) M1 for a complete method eg ("60" + "66") $\div$ (15 + "25") A1 cao

