

Mark Scheme (Results)

Summer 2015

Pearson Edexcel GCSE
In Mathematics B (2MB01)
Foundation (Non-Calculator) Unit 2

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If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.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

5MB2F/01 June 2015				
Question	Working	Answer	Mark	Notes
1 (a)		43	1	B1 cao
(b)		15	1	B1 cao
(c)		$\frac{3}{10}$	1	B1 for $\frac{3}{10}$ or 3 tenths oe
2 (a)		3	1	B1 cao
(b)(i)		5	2	B1 cao
(b)(ii)		9		B1 cao

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Question		Working	Answer	Mark	Notes
3	(a)		$\frac{3}{4}$ shaded	1	B1 for 6 sectors shaded
	*(b)		$\frac{1}{3}$ + correct reason	2	M1 for $1 \div 3 (=0.33\dots)$ C1 for correct statement and $0.33\dots$ OR M1 for $\frac{3 \times 3}{10 \times 3}$ and $\frac{1 \times 10}{3 \times 10}$ C1 for correct statement and $\frac{9}{30}$ and $\frac{10}{30}$ OR M1 for $\frac{1 \times 3}{3 \times 3}$ C1 for correct statement and $\frac{3}{9}$ and $\frac{3}{10}$ OR M1 for e.g. $\frac{1}{3} \times 30 (=10)$ and $0.3 \times 30 (=9)$ C1 for correct statement and e.g. 10 and 9
4			7	2	M1 for $40 \div 6 (=6.66\dots)$ OR $6 \times 6 (=36)$ oe or $6 \times 7 (=42)$ oe OR 40, 34, 28... oe A1 cao
5	(a)		8	1	B1 cao
	(b)		rectangle drawn	2	M1 for drawing a rectangle (accept square) A1 for correct area

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Question	Working	Answer	Mark	Notes
*6		No with working	3	<p>M1 for $15 \times 25 (=375)$ A1 for 375 (cm) or 75 (cm short) C1 (dep on M1) for No oe with working or ft '375' or '75'</p> <p>OR</p> <p>M1 for $300 \div 15 (=20)$ A1 for 20 (parcels) or 5 (parcels short) C1 (dep on M1) for No oe with working or ft '20' or '5'</p> <p>OR</p> <p>M1 for $300 \div 25 (=12)$ A1 for 12 (cm) or 3 (cm short) C1 (dep on M1) for No oe with working or ft '12' or '3'</p>
7	(a)	diameter	1	B1 cao
	(b)	tangent	1	B1 cao
	(c)	sector drawn	1	B1 cao
8	(a)	trapezium	1	B1 cao
	(b)	line of symmetry drawn	1	B1 cao
	(c)	(3, 4) marked	1	B1 cao

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Question	Working	Answer	Mark	Notes
9		11(am)	4	M1 for $2 \div 0.5$ oe (=4) or 80 (minutes) M1 for $'4' \times 20 + 10$ oe (=90 minutes) M1 for 12 30 – '90 (minutes)' oe A1 for 11(am) oe SC B2 for 10 30(am)
10		80, 75 reason	2	B1 cao B1 for correct reason, e.g. take 5 (each time)
11	(a)	18	2	M1 for 0.3×60 or $6 + 6 + 6$ oe A1 cao
	(b)	5	1	B1 for 5 or +5
	(c)	25	1	B1 cao
12	(a)	ab	1	B1 for ab oe
	(b)	$3x^2$	1	B1 for $3x^2$ oe
	(c)	$4x - 5y$	2	M1 for $3x + x$ (=4x) or $-2y - 3y$ (= -5y) A1 cao
13		3	2	M1 for $120 \div (5 \times 8)$ oe A1 cao

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Question	Working	Answer	Mark	Notes
14	eg 5m = 16.5ft (50m \Rightarrow) 10×16.5 =165ft $360 - 165 = 195$ ft OR eg 20ft = 6m (360ft \Rightarrow) 18×6 =108m $108 - 50 = 58$ m	185 – 210 feet or 55 – 63 metres	3	M1 for converting ft to m or m to ft M1 (dep) for difference in heights in consistent units A1 for 185 – 210 feet or 55 – 63 metres

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Question	Working	Answer	Mark	Notes
*15		$x = 120$ with correct reasons	4	<p>M1 for (CED=) 35 M1 for (EBD=) $180 - (50 + 35 + 35) (=60)$ A1 for $x = 120$ oe C1 (dep on M1) for two of</p> <ol style="list-style-type: none"> 1. base <u>angles</u> of <u>isosceles</u> triangle <u>equal</u> 2. <u>angles</u> in <u>triangle</u> add to <u>180</u> 3. <u>angles</u> on <u>straight line</u> add to <u>180</u> <p>OR</p> <p>M1 for (CED=) 35 or (ECD=) 110 M1 for (EBD=) $110 - 50 (=60)$ A1 for $x = 120$ oe C1 (dep on M1) for two of</p> <ol style="list-style-type: none"> 1. base <u>angles</u> of <u>isosceles</u> triangle are <u>equal</u> 2. <u>exterior angle</u> of triangle equals <u>sum</u> of <u>interior opposite angles</u> 3. <u>angles</u> on <u>straight line</u> add to <u>180</u> <p>OR</p> <p>M1 for (CED=) 35 M1 for (ECA=) $35 + 35 (=70)$ or $50 + \text{'ECD'}$ A1 for $x = 120$ oe C1 (dep on M1) for both of</p> <ol style="list-style-type: none"> 1. <u>exterior angle</u> of triangle equals <u>sum</u> of <u>interior opposite angles</u> 2. base <u>angles</u> of <u>isosceles</u> triangle are <u>equal</u>

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Question	Working	Answer	Mark	Notes
*16	(Cost per paperclip) $40 \div 50 = 0.8$ $90 \div 120 = 0.75$ OR (Paperclip per penny) $50 \div 40 = 1.25$ $120 \div 90 = 1.33(3)$ OR e.g. (number of paperclip for £3.60) $9 \times 50 (=450)$ $4 \times 120 (=480)$	large with correct figures	3	M1 for $40 \div 50 (= 0.8)$ or $90 \div 120 (= 0.75)$ OR $50 \div 40 (=1.25)$ or $120 \div 90 (= 1.33\dots)$ OR appropriate calculation that could lead to a comparative figure, e.g. $9 \times 50 (=450)$ or $4 \times 120 (=480)$ M1 for method to compare figures for both boxes, e.g. $40 \div 50 (= 0.8)$ and $90 \div 120 (= 0.75)$ C1 for correct comparative figures for both boxes leading to a correct comparison, e.g. 0.8 and 0.75 and large (box) or 120 paperclip (box) or 90p (box)
17	(a)	$6xy(1 + 3y)$	2	M1 for correct expression with at least one factor extracted or $6xy$ (linear expression in y) A1 cao
	(b)	w^3	1	B1 cao
	(c)	a^{20}	1	B1 cao

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Question	Working	Answer	Mark	Notes
18		270	3	<p>M1 for $9 \div 0.1 (=90)$ or $4.5 \div 1.5 (=3)$ oe M1 for '3'× '90' oe (=270) A1 cao</p> <p>OR</p> <p>M1 for $4.5 \div 0.1 (=45)$ or $9 \div 1.5 (=6)$ oe M1 for '6'× '45' oe (=270) A1 cao</p> <p>OR</p> <p>M1 for $9 \times 4.5 (=40.5)$ or $1.5 \times 0.1(=0.15)$ oe M1 for '40.5' ÷ '0.15' (=270) A1 cao</p>
19	$3000 \div 20 = 150$ $150 \div (14+1) = 10$ $10 \div 0.5 = 20$ 20×3.99	79.80	4	<p>M1 for $3000 \div 20 (=150)$ M1 (dep) for correct use of ratio M1(dep on M1, M1) for total cost of bottles A1 for 79.8(0)</p>

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: 5MB2F_01			
Question		Modification	Notes
Q2	(a)	Triangle has been enlarged.	B1 cao
Q2	(b)(ii)	Model provided for all candidates. Also a diagram provided for MLP. Diagram has been enlarged.	B1 cao
Q2	(b)(ii)	Model provided for all candidates. Also a diagram provided for MLP. Diagram has been enlarged.	B1 cao

PAPER: 5MB2F_01

Question		Modification	Notes
Q3	(a)	Diagram has been enlarged.	B1 for 6 sectors shaded
Q3	(b)	Diagram has been enlarged.	M1 for $1 \div 3 (=0.33\dots)$ C1 for correct statement and $0.33(\dots)$ OR M1 for $\frac{3 \times 3}{10 \times 3}$ and $\frac{1 \times 10}{3 \times 10}$ C1 for correct statement and $\frac{9}{30}$ and $\frac{10}{30}$ OR M1 for $\frac{1 \times 3}{3 \times 3}$ C1 for correct statement and $\frac{3}{9}$ and $\frac{3}{10}$ OR M1 for e.g. $\frac{1}{3} \times 30 (=10)$ and $0.3 \times 30 (=9)$ C1 for correct statement and e.g. 10 and 9
Q5	(a)	Grid has been enlarged. Wording is added: “Each square represents a one centimetre square”.	B1 cao
Q5	(b)	Grid has been enlarged. Wording is added: “Each square represents a one centimetre square”.	M1 for drawing a rectangle (accept square) A1 for correct area
Q7	(a)	Diagram has been enlarged.	B1 cao
Q7	(b)	Diagram has been enlarged.	B1 cao
Q7	(c)	Diagram has been enlarged.	B1 cao

PAPER: 5MB2F_01

Question		Modification	Notes
Q8	(a)	Grid has been enlarged.	B1 cao
Q8	(b)	Grid has been enlarged.	B1 cao
Q8	(c)	Grid has been enlarged.	B1 cao
Q12	(a)	MLP a changed to x . b changed to y .	B1 for xy oe
Q12	(b)	MLP x changed to y .	B1 for $3y^2$ oe
Q12	(c)	MLP x changed to e y changed to f	M1 for $3e + e (=4e)$ or $-2f - 3f(= -5f)$ A1 cao
Q13		Model provided for all candidates. Also diagram provided for MLP. Diagram has been enlarged	M1 for $120 \div (5 \times 8)$ oe A1 cao
Q14		Grid has been enlarged. Right axis labelled.	M1 for converting ft to m or m to ft M1 (dep) for difference in heights in consistent units A1 for $185 - 210$ feet or $55 - 63$ metres

PAPER: 5MB2F_01

Question	Modification	Notes
Q15	Diagram has been enlarged. Wording added: "Angle EBA is marked x ".	<p>M1 for (CED=) 35 M1 for (EBD=) $180 - (50 + 35 + 35) (=60)$ A1 for $x = 120$ oe C1 (dep on M1) for two of</p> <ol style="list-style-type: none"> 1. base <u>angles</u> of <u>isosceles</u> triangle <u>equal</u> 2. <u>angles</u> in <u>triangle</u> add to <u>180</u> 3. <u>angles</u> on straight <u>line</u> add to <u>180</u> <p>OR</p> <p>M1 for (CED=) 35 or (ECD=) 110 M1 for (EBD=) $110 - 50 (=60)$ A1 for $x = 120$ oe C1 (dep on M1) for two of</p> <ol style="list-style-type: none"> 1. base <u>angles</u> of <u>isosceles</u> triangle are <u>equal</u> 2. <u>exterior angle</u> of triangle equals <u>sum</u> of <u>interior opposite angles</u> 3. <u>angles</u> on straight <u>line</u> add to <u>180</u> <p>OR</p> <p>M1 for (CED=) 35 M1 for (ECA=) $35 + 35 (=70)$ or $50 + \text{'ECD'}$ A1 for $x = 120$ oe C1 (dep on M1) for both of</p> <ol style="list-style-type: none"> 1. <u>exterior angle</u> of triangle equals <u>sum</u> of <u>interior opposite angles</u> 2. base <u>angles</u> of <u>isosceles</u> triangle are <u>equal</u>

PAPER: 5MB2F_01

Question		Modification	Notes
Q16		Diagrams have been removed.	M1 for $40 \div 50 (= 0.8)$ or $90 \div 120 (= 0.75)$ OR $50 \div 40 (= 1.25)$ or $120 \div 90 (= 1.33\dots)$ OR appropriate calculation that could lead to a comparative figure, e.g. $9 \times 50 (= 450)$ or $4 \times 120 (= 480)$ M1 for method to compare figures for both boxes, e.g. $40 \div 50 (= 0.8)$ and $90 \div 120 (= 0.75)$ C1 for correct comparative figures for both boxes leading to a correct comparison, e.g. 0.8 and 0.75 and large (box) or 120 paperclip (box) or 90p (box)
Q17	(a)		M1 for correct expression with at least one factor extracted or $6xy$ (linear expression in y) A1 cao
Q17	(b)		B1 cao
Q17	(c)	MLP and Braille: a changed to x .	B1 cao

PAPER: 5MB2F_01

Question	Modification	Notes
Q18	Diagram has been enlarged. 9 metres moved to top of diagram 4.5 metres moved to the left of diagram.	M1 for $9 \div 0.1 (=90)$ or $4.5 \div 1.5 (=3)$ oe M1 for '3' \times '90' oe (=270) A1 cao OR M1 for $4.5 \div 0.1 (=45)$ or $9 \div 1.5 (=6)$ oe M1 for '6' \times '45' oe (=270) A1 cao OR M1 for $9 \times 4.5 (=40.5)$ or $1.5 \times 0.1(=0.15)$ oe M1 for '40.5' \div '0.15' (=270) A1 cao

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