

Mark Scheme (Results)

Summer 2014

Pearson Edexcel GCSE
In Mathematics B (2MB01)
Unit 2: 5MB2H_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. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.
- 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. Examiners should also 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 indicate within the table where, and which strands of QWC, are being assessed. 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If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.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.

Any case of suspected misread loses A (and B) marks on that part, but can gain the M marks. Discuss each of these situations with your Team Leader.

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.

Transcription errors occur when candidates present a correct answer in working, and write it incorrectly on the answer line; mark the correct answer.

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.

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

PAPER: 5MB2H_01					
Question		Working	Answer	Mark	Notes
1			350	3	M1 for finding 30% of 500 (=150) M1 dep for subtraction of discount from 500 A1 cao OR M1 for $1 - 0.3$ (= 0.7) M1 dep for $500 \times "0.7"$ A1 cao
2	(a)		$2e - f$	2	M1 (implied) for $2e$ or $-f$ A1 oe
	(b)		$6x + 10$	2	M1 for $2 \times 3x$ (= 6x) or 2×5 (= 10) A1 cao
3			375 25 1250 500	3	M1 for $15 \div 6$ (= 2.5) oe (can be implied by one answer correct) A1 for two answers correct B1 all correct
*4			Yes $200 > 180$ oe	4	M1 for converting using figures from the graph or for 5 miles = 8 km oe M1 for correct method to convert 240 km into miles (=150 miles) or to convert 350 miles into km (= 560 km) or to convert 180 miles into km (= 288 km) M1 (dep on M2) for correct method for comparison eg 180 miles with $350 - 150$ (= 200) miles eg 288 km with $560 - 240$ (= 320) km C1 for a correct statement that she will have to stop oe with appropriate supporting evidence eg Yes and 200 miles is too far eg Yes and $330 < 350$ eg Yes and 20 miles under" oe eg Yes and $320 > 288$

PAPER: 5MB2H_01					
Question		Working	Answer	Mark	Notes
5	(a)		x^6	1	B1 cao
	(b)		y^2	1	B1 cao
	(c)		t^6	1	B1 cao
6			500	4	<p>M1 for a correct method to convert cm to m or m to cm or cm³ to m³ or m³ to cm³ (can be implied eg 4 packets drawn in container height)</p> <p>M1 for correct method for one volume or correct method to get at least 2 multipliers from packet to container (can be implied on the diagram)</p> <p>M1 for complete correct method (ignore incorrect conversions)</p> <p>A1 cao</p>

PAPER: 5MB2H_01				
Question	Working	Answer	Mark	Notes
*7		80	4	<p>B1 for $EBF = 50$ or $ABE = 50$</p> <p>M1 for angles given that can lead to $x = 80$ as the next step eg $EBF = 50$ and $ABE = 50$ eg $EBF = 50$ and $BFG = 100$ eg $EBF = 50$ and $BFE = 80$ eg $EBF = 50$ and $DEB = 130$ and $ABE = 50$</p> <p>A1 cao</p> <p>C1 for stating correct reasons appropriate to their method shown</p> <p>eg Base <u>angles</u> of an <u>isosceles</u> triangle are <u>equal</u>. with <u>Angles</u> in a <u>triangle</u> add up to <u>180°</u> with <u>Alternate angles</u> are equal</p> <p>eg Base <u>angles</u> of an <u>isosceles</u> triangle are <u>equal</u>. with <u>Alternate angles</u> are equal with <u>Angles</u> on a <u>straight line</u> add up to <u>180°</u></p> <p>eg Base <u>angles</u> of an <u>isosceles</u> triangle are <u>equal</u>. with The <u>exterior angle</u> of a triangle is <u>equal</u> to the sum of the <u>opposite interior angles</u>. with <u>Allied angles</u> / <u>Co-interior angles</u> add up to <u>180°</u></p>

PAPER: 5MB2H_01					
Question		Working	Answer	Mark	Notes
8			blue paint 5 white paint 4	5	<p>M1 attempts multiples of either 12 or 15 (at least 3 but condone errors if intention is clear)</p> <p>M1 attempts multiples of both 12 and 15 (at least 3 but condone errors if intention is clear)</p> <p>M1 (dep on M1) for a division of 60 by 12 or 15, or counts up “multiples” or answer blue : white in the ratio 5 : 4</p> <p>A1 blue paint 5; white paint 4</p> <p>OR</p> <p>M1 correct expansion of either number into factors M1 correct expansion of both number into factors M1 (dep on M1) demonstrates two expansions that include 3 oe A1 blue paint 5; white paint 4</p>
9			$2n + 1$	2	<p>M1 for $2n$ or $2n + k$ where $k \neq 1$ A1 for $2n + 1$</p>
10	(a)		$2x^2 + 7x + 3$	2	<p>M1 for 4 terms correct with or without signs or 3 out of exactly 4 terms correct (the terms may be in an expression or table) A1 cao</p>
	(b)		$4x(x + 2y)$	2	<p>M1 for $4x(ax + by)$, a & b integers or $ax(x + 2y)$ or any expression with brackets which multiplies to give $4x^2 + 8xy$ A1 cao</p>

PAPER: 5MB2H_01					
Question		Working	Answer	Mark	Notes
11		$0.0034 \times 10^5 = 340$ $34 \times 10^{-5} = 0.00034$ $-3.4 \times 10^{-3} = -0.0034$ $3.4 \times 10^4 = 34\,000$ $34 \times 10^2 = 3400$	-3.4×10^{-3} 34×10^{-5} 0.0034×10^5 34×10^2 3.4×10^4	3	<p>M1 for changing at least 1 correctly to standard form or for changing at least 1 correctly to an ordinary number</p> <p>M1 at least 3 correct changes to standard form or at least 3 correct changes to ordinary numbers</p> <p>A1 ordered</p> <p>[S.C. B2 (if no working) for 4 in the correct order or all correct but reverse order]</p>
12			20	3	<p>M1 for indication that angle between a tangent and radius is 90 (could be seen on the diagram)</p> <p>M1 for $OAC = 20$ or $AOC = 70$ or $BOC = 140$ or $ABC = ACB$ or $BCA = \frac{180 - 40}{2} (= 70)$</p> <p>A1 cao</p>
13			62	4	<p>M1 for B to C time = $210 \div 70$ (= 3 h)</p> <p>M1 for A to B dist = $(5 - "3") \times 50$ (= 100)</p> <p>M1 (dep on M1) for average speed = total distance $\div$ total time or $210 + "(2 \times 50)" \div 5$</p> <p>A1 cao</p>

PAPER: 5MB2H_01					
Question	Working	Answer	Mark	Notes	
14	<p>Front or Back: $\frac{1}{2} \times 3x(13x - 3 + 5x - 3)$ $= 27x^2 - 9x$ or $\frac{1}{2} (4x)(3x) + 3x(5x - 3)$</p> <p>Top: $(5x - 3)(x + 2)$ $= 5x^2 + 7x - 6$</p> <p>Bottom: $(13x - 3)(x + 2)$ $= 13x^2 + 23x - 6$</p> <p>Each Side: $5x(x + 2)$ $= 5x^2 + 10x$</p> <p>Total SA = $2(27x^2 - 9x) +$ $2(5x^2 + 10x) + (5x^2 + 7x - 6)$ $+ (13x^2 + 23x - 6)$</p> <p>$= (54 + 10 + 5 + 13) x^2$ $+ (-18 + 20 + 7 + 23) x$ $+ (-6 - 6)$</p>	$82x^2 + 32x - 12$	4	<p>M1 finds the area of at least 2 faces (condone omission of brackets)</p> <p>M1 writes a correct algebraic expression for the area of at least 3 different faces</p> <p>M1 correct expressions for all 6 faces and adds</p> <p>C1 (dep on M3) for correct algebraic expression as a correct summary</p>	

PAPER: 5MB2H_01					
Question	Working	Answer	Mark	Notes	
15	$x = 0.15555\dots$ $10x = 1.5555\dots$ $9x = 1.4$ $x = \frac{1.4}{9} = \frac{14}{90}$ OR $x = 0.1 + y$ where $y = 0.0555\dots$ $10y = 0.5555\dots$ $100y = 5.5555\dots$ $90y = 5$ so $y = 5/90$ $x = 0.1 + 5/90 = 1/10 + 5/90$	$\frac{7}{45}$	3	M1 for $0.155(5\dots)$ or $0.1 + 0.055(5\dots)$; This can be implied in subsequent working. M1 for 2 correct recurring decimals which when subtracted will leave an integer or a terminating decimal number with a correct fraction for their 2 recurring decimals A1 for $\frac{7}{45}$ [SC: B1 for an answer of $\frac{15}{99}$ oe, with or without working]	
16		$30 - 10\sqrt{5}$	2	M1 for 4 terms correct with or without signs or 3 out of exactly 4 terms correct (the terms may be in an expression or table) or $25 - 10\sqrt{5} + 5$ A1 cao	
17		$y = -\frac{1}{2}x + 2$	3	M1 for gradient = $-\frac{1}{m}$ or $-\frac{1}{2}$ M1 for substitution of $x = -2$, $y = 3$ into their $y = mx + c$ where c is a constant to be found A1 for $y = -\frac{1}{2}x + 2$ oe eg accept $2y + x = 4$	
18		$\frac{3x}{x+4}$	3	M1 for $3x(x-2)$ M1 for $(x-2)(x+4)$ 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: 5MB2H_01		
Question	Modification	Notes
Q02	MLP only. x changed to y	
Q04	2cm grid. label right axis	
Q05a	MLP only. x changed to y	
Q06	2 models provided as well as diagram	
Q10a	MLP only. x changed to y	
Q10b	MLP only. x changed to e and y to f	
Q12	BC joined with a dashed line	

