

Mark Scheme (Results)

November 2013

Pearson Edexcel GCSE

In Mathematics Modular (2MB01)

Unit 2: (5MB2H_01) Higher (Non-Calculator)

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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 labeling 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If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.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 canceling 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	(a)		11	2	M1 for $20 \div 2$ or 10 or list/table with 4 pairs of at least 5 pairs correct A1 cao
	(b)		$3n + 1$	2	B2 for $3n + 1$ oe (B1 for $3n + k$, $k \neq 1$ or absent)
2	(a)		5^{10}	1	B1 cao
	(b)		7^3	1	B1 cao
3			16	2	M1 for correct substitution of values eg $6^2 - 5 \times 4$ A1 cao
4	(i)		126	2	B1 cao
	(ii)		Reason		B1 for reason relating to geometrical property & parallel lines which is not contradicted by method shown elsewhere eg <u>alternate</u> angles are <u>equal</u> , <u>corresponding</u> angles are <u>equal</u> , <u>allied angles</u> / <u>co-interior angles</u> add up to <u>180°</u>

PAPER: 5MB2H_01					
Question		Working	Answer	Mark	Notes
5	(a)		400	2	M1 for the correct scale factor 2.5 oe eg $\frac{20}{8}$, $\frac{8}{20}$, 160+160+80 or 160÷8×20 oe A1 cao
	*(b)		12	3	M1 for number of scones for limiting ingredients, eg 2×6 (=16) or 8+4 (=12) A1 for 12 cao C1 ft (dep on M1) for displaying both limiting calculations and reaching correct conclusion for their working OR M1 for proportion of limiting ingredient e.g. 80 ÷ 40 (=2) or 300 ÷ 200 (=1.5) A1 for 12 cao C1 ft (dep on M1) for displaying both limiting calculations and reaching correct conclusion for their working OR M1 for relating proportion in list to proportion Sophie has. e.g. 200 ÷ 40 or 300 ÷ 80 or 5 or 3.75 or 3.8 oe A1 for 12 cao C1 ft (dep on M1) for displaying both limiting calculations and reaching correct conclusion for their working
6	(a)		Correct diagram	2	B2 (B1 any isometric face correct)
	(b)		6	2	M1 for $(1) \times 2 \times 3$ or $2 \times 4 \times 6 \div (2 \times 2 \times 2)$ A1 cao

PAPER: 5MB2H_01					
Question		Working	Answer	Mark	Notes
7	(a)		$e + 7f$	2	B2 for $e + 7f$ (B1 for e or $7f$)
	(b)		$10c + 15d$	1	B1 cao
	(c)		$2x - 7$	4	M1 for $x + x + 3 + 2x (= 4x + 3)$ M1 for $2(3x - 2) (= 6x - 4)$ M1 for '6x' - '4x' - '4' $\pm$ '3' oe A1 cao OR M1 for $2(3x - 2) (= 6x - 4)$ M1 for '6x' - $x - x - 2x (= 2x)$ oe M1 for '-4' $\pm$ 3 A1 cao
8		$\frac{90 \times 0.5}{5} = \frac{45}{5}$	$8.9 - 9.5$	2	M1 for at least two of 90, 0.5 and 5 A1 for $8.9 - 9.5$
9	(a)		1.52×10^8	2	M1 for 1.52×10^n or 1.5×10^n or 152×10^6 A1 cao
	(b)		0.0024	1	B1 cao

PAPER: 5MB2H_01				
Question	Working	Answer	Mark	Notes
10		126	3	<p>M1 for (angle BCD =) $\frac{180 \times (10 - 2)}{10}$ (= 144)</p> <p>M1 (dep) for (angle DCX =) $360 - '144' - 90$ oe A1 cao</p> <p>OR</p> <p>M1 for (exterior angle =) $\frac{360}{10}$ (= 36)</p> <p>M1 (dep) for (angle DCX =) $90 + '36'$ oe, eg $180 - (90 - 36)$ A1 cao</p>
11		66400	5	<p>M1 for explicit area of a trapezium eg $(3+4) \div 2 \times 14$ (=49) or $(60+62) \div 2 \times 14$ (=854)</p> <p>OR</p> <p>M1 for implicit area of trapezium eg 3×14 (=42) and $0.5 \times 14 \times 1$ (=7) or $3 \times 14 \times 4$ (=168) and $0.5 \times 14 \times 1 \times 4$ (=28)</p> <p>M1 for area of a rectangle using correct dimensions eg 68×2 (=136), 30×68 (=2040)</p> <p>M1 for a complete and correct method to find the total area</p> <p>M1 (dep on at least one previous M1) for multiplying their total area by 200 (where total area is a calculation involving at least two areas)</p> <p>A1 cao</p>

PAPER: 5MB2H_01					
Question		Working	Answer	Mark	Notes
12	(a)		$2a(3b + 5c)$	2	B2 cao (B1 for $a(6b + 10c)$ or $2(3ab + 5ac)$ or $2a(\text{linear term in } b \text{ and } c)$)
	(b)		$x^2 + 2x - 35$	2	M1 for 3 terms out of 4 correct including signs or all 4 terms correct ignoring signs A1 cao
	(c)		$\frac{2t^4}{m^2}$	2	B2 for $2m^{-2}t^4$ oe (B1 $\frac{2t^4}{m^n}, n \neq 2$ oe or $\frac{2t^k}{m^2}, k \neq 4$ oe or $m^{-2}t^4$ oe)
	(d)		$(y-4)(y+4)$	1	B1 cao
	(e)		h^{-6}	1	B1 for h^{-6} or $\frac{1}{h^6}$
13			7.5	3	B1 for length given as $\frac{\sqrt{120}}{4}$ oe M1 for squaring $\frac{\sqrt{120}}{4}$ or $\frac{120}{4 \times 4}$ oe A1 for $\frac{120}{16}$ oe or $7\frac{1}{2}$ or 7.5 oe SC B1 for $\sqrt{30} \times \sqrt{30}$

PAPER: 5MB2H_01					
Question		Working	Answer	Mark	Notes
*14			113	5	<p>B1 for stating angle $TAO = 90$ M1 for stating angle OBA or angle $OAB = 90 - 58 (=32)$ M1 for stating angle $ABT = 180 - 58 - 41 (=81)$ or angle $AOB = 180 - 64 (=116)$ A1 for 113 clearly identified as the answer C1 (dep on M1) for correct statements for method used: angle between <u>tangent</u> and <u>radius</u> = <u>90°</u> AND at least one of base <u>angles</u> of an <u>isosceles</u> triangle are <u>equal</u> sum of <u>angles</u> in a <u>triangle</u> is <u>180</u> sum of <u>angles</u> in a <u>quadrilateral</u> is <u>360</u></p> <p>NB angles may be seen in diagram</p>
15	(a)		$y = 4x + 2$	2	<p>B2 for $y = 4x + 2$ oe (B1 for $y = 4x + c$ or $4x + 2$ or $L = 4x + 2$)</p>
	(b)		$y = 4x - 14$	3	<p>B1 for gradient = 4 M1 for $-6 = '4' \times 2 + c$ or $y - -6 = '4'(x - 2)$ A1 for $y = 4x - 14$ oe</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: 5MB2H_01			
Question		Modification	Notes
Q1		2cm squares. Shading is dotted. 'Grey' changed to 'shaded'. 'Centimetre' removed throughout the question.	Standard mark scheme
Q4		Parallel lines labelled AB and CD. Extra wording inserted 'AB is parallel to CD'.	Standard mark scheme
Q6		Models for part (b) – dimensions of $2 \times 4 \times 6$ given. Wording given below	
Q6	(a)	Look at the model or at the diagram for Question 6(a). They show a cuboid. For the cuboid (i) write down the number of faces, (ii) write down the number of edges, (iii) write down the number of vertices.	
Q6	(b)	Look at the two models or at the diagram for Question 6(b). They are NOT accurate. A different box has been made to hold cubes. This box is in the shape of a cuboid. A cube is also shown. Each cube has edges of length 2 cm Work out the largest number of cubes that can fit into the box.	

PAPER: 5MB2H_01			
Question		Modification	Notes
Q7	(c)	MLP only: x changed to y . Information given about the diagram.	Standard mark scheme
Q11		Shape rotated 90° clockwise to fit measurement more easily. On diagram 'cm' removed. Wording inserted 'All measurements are in centimetres.'	Standard mark scheme
Q12	(a)	a changed to e , b changed to f , c changed to g .	B2 cao (B1 for $e(6f + 10g)$ or $2(3ef + 5eg)$ or $2e(\text{linear term in } f \text{ and } g)$)
Q12	(b)	x changed to y .	Standard mark scheme

