edexcel

Mark Scheme (Results)

November 2015

Pearson Edexcel GCSE
In Mathematics A (1MA0)
Higher (Calculator) Paper 2H

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If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.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

PAPER: 1MA0_2H					
Question		**Working**	**Answer**	**Mark**	**Notes**
1		2 3 5 8 9 3 2 5 7 8 9 4 1 2 4 5 1 6 1 3	Stem and leaf with key	3	B2 for a fully correct ordered stem and leaf (B1 for a correct unordered stem and leaf or for an ordered stem and leaf with at most 1 error or omission) B1 (indep) for a correct key (units not required)
2	(a)		Point plotted	1	B1 cao
	(b)		positive	1	B1 cao
	(c)		18 - 22	2	M1 for a single line segment with a positive gradient that could be used as a line of best fit or a vertical line from 10 or a point plotted at (10, y) where y is in the range 18 - 22 A1 18 - 22
	(d)		45	1	B1 cao
3			32 64 29	4	M1 for $2y$ or $y - 3$ M1 for adding their three expressions and setting equal to 125 M1 for correct method to solve $ay + b = 125$ A1 Ali 32, Bhavara 64 and Ceris 29
4			49	3	M1 for converting calculations to common units (either system is acceptable) M1 for dividing their total capacity by the refuelling rate A1 48.9 - 49.1

PAPER: 1MA0_2H					
Question		**Working**	**Answer**	**Mark**	**Notes**
5		0.65×80 = 52 $\frac{5}{8}$×80 = 50 52 - 50 Or $\frac{5}{8}$=0.625 0.65 − 0.625=0.025 0.025×80	2	4	M1 for method to calculate the time Celina sings M1 for method to calculate the time Zoe sings M1(dep on at least M1) for finding the difference between two times A1 cao Or M1 for a conversion to a common representation M1 (dep on M1) for finding the difference in their chosen representation M1 for using their proportional difference multiplied by 80 A1 cao
6			40 000	2	M1 for 100 × 100 isolated or 4 × 100 × 100 A1 cao
*7			No not enough	5	M1 for substituting into Pythagoras' theorem M1 for complete correct use of Pythagoras' theorem M1 for a complete method to find the perimeter of their trapezium A1 51.(20655..) C1 (dep on correct first 2 M marks) for correct conclusion dependent upon supporting calculations
*8			125m*l*	4	M1 for a complete method to find the cost per m*l* or the number of m*l* per £1 for one tube or for a method that results in at least 2 values that can be used to compare 2 tubes M1 for a complete method to find all three equivalent figures A1 3 correct figures suitable for comparison C1(dep on M2) for stating the correct tube size from their calculations

PAPER: 1MA0_2H					
Question		**Working**	**Answer**	**Mark**	**Notes**
9			Correct line drawn	2	M1 for two pairs of relevant arcs drawn A1 correct line drawn (with arcs) SC B1 Correct line no arcs visible
10	(a)	9×6	54	2	M1 for a method to find the speed e.g 9 ÷ 10, 9 ÷ 0.16 A1 cao
	(b)		Graph completed	3	B1 horizontal line from (30,21) to (45,21) M1 for a complete method to show the return journey is 30 mins or ½ hour evidenced by the line on the graph or by calculation A1 Correct line drawn from Luscoe (x,21) to (x + 30,0)
11	(a)		±7	2	M1 for intent to divide both sides by 3 as a first step or answer of 7 or -7 A1 ±7
	(b)		0.125 or $\frac{1}{8}$	1	B1 cao
	(c)		$27x^6$	2	M1 for either 27 or x^6 in a two term product A1 cao
	(d)		$p = \frac{w + 16}{4}$	2	M1 for ÷ 4 throughout or adding 16 to both sides as a first step A1 $p = \frac{w+16}{4}$ oe

PAPER: 1MA0_2H					
Question		**Working**	**Answer**	**Mark**	**Notes**
12			Rotation about (2,1) through 180°	3	B1 rotation B1 about (2,1) B1 through 180° Or B2 enlargement scale factor −1 B1 about (2,1) Note Award no marks if more than one transformation is given .
13	(a)		5 and 6	2	M1 for evidence that (x =) 4, 5, 6 or evidence that (y =) 5,6,7, 8 A1 cao
	(b)		Region identified	4	M1 for two of the lines $y = -1$,$y = 3x - 1$ and $y = 4 - x$ drawn M1 for three of the lines $y = -1$, $y = 3x - 1$ and $y = 4 - x$ drawn M1 any correct shading(in or out) satisfying at least two of the inequalities where the shading must extend from the appropriate line A1 Fully correct region shown by either shading in, shading out or the use of R Accept lines that are solid or dashed
14	(a)		76	3	M1 for 89% = 68 M1 for 68 ÷ 0.89 oe A1 for 76 – 76.41
	(b)		11.8	2	M1 for (68 − 60) ÷ 68 × 100 oe A1for 11.7 - 12

PAPER: 1MA0_2H					
Question		**Working**	**Answer**	**Mark**	**Notes**
*15	(a)			1	C1 for a complete reason eg Angles in a semicircle are 90°, alternate segment theorem
	(b)		2.75	4	M1 for 7 × sin 35 M1 for 7 × sin 35 × 2 M1 (indep) for "*DB*"× cos 70 A1 2.74 - 2.75
16	(a)		6.4×10^8	1	B1 cao
	(b)		5×10^2	2	M1 for $3 \div 6 \times 10^{7-4}$ or 0.5×10^3 or 500 or 30 000 000÷60 000 A1 cao
17			$y = 3x - 5$	3	M1 for recognition that the gradient of $\mathbf{L_2}$ is 3 M1 for substitution of $x=3$ and $y=4$ into $y =$ "m"x+c A1 $y = 3x - 5$ oe (SC B2 for '$3x - 5$ ' or $L_2 = 3x - 5$)
18	(a)		37	1	B1 cao
	(b)		36	2	M1 for identifying LQ and UQ e.g 35 – 71 A1 cao
	*(c)			2	C1 for a correct comparison of medians ft (a) C1 for a correct comparison of a measure of spread with correct figures ft (b) For the award of both marks at least one of the comparisons must be interpretative

PAPER: 1MA0_2H					
Question		**Working**	**Answer**	**Mark**	**Notes**
19	(a)		4.25	1	B1 cao
	(b)		7.20-7.21	3	B1 4.35 or 0.35 M1 for $4.35+\frac{1}{0.35}$ A1 7.2(0)-7.21 or $\frac{1009}{140}$ from a correct method seen
20		$\pi 2^2\times 2=8\pi$ $\pi 2^2\times\frac{20}{360}\times 3+\pi 2^2\times\frac{340}{360}\times 2$ $8\pi : \frac{74}{9}\pi$: 72 : 74 Or $\frac{20}{360}\times 3+\frac{340}{360}\times 2=\frac{37}{18}$ $2: \frac{37}{18}$ 36:37	36:37	4	M1 method to find relative cost of design A e.g. $\pi 2^2$, $k\times\pi 2^2$ M1 for a complete method to find the relative cost of the watch face for design B e.g. $\pi 2^2\times\frac{20}{360}\times\frac{3}{5}+\pi 2^2\times\frac{340}{360}\times\frac{2}{5}$ M1 (dep on M1, M1) for the cost of design A: cost of design B A1 cao Or M1 for method to find fraction of the sectors in design B $\frac{20}{360}, \frac{340}{360}$ M1 for complete method to find the relative cost of the watch face for design B M1 (dep on M1,M1) for the cost of design A: cost of design B A1 cao

PAPER: 1MA0_2H					
Question		**Working**	**Answer**	**Mark**	**Notes**
21			9 or 10	2	M1 for 35÷148×40 A1 9 or 10
22			$2x^2 + 7x + 4 = 0$	3	M1 for finding a correct coefficient M1 for a method to find a and c or b and c A1 $2x^2 + 7x + 4 = 0$ or $a = 2$, $b = 7$, $c = 4$
23	(a)		Graph drawn	2	B2 correct graph drawn (B1 for a graph translated up/down)
	(b)		Graph drawn	2	B2 for correct graph drawn (B1 for a graph reflected in the x axis or stretched by sf 2 parallel to the y axis)
24			31.1	5	M1 for $\frac{1}{2} \times 8.4 \times x \times \sin 40 = 100$ M1 for 100÷(0.5×8.4×sin 40) (= 37.(041...)) M1 (dep on 1st M1) for substituting the appropriate figures into the cosine rule eg $8.4^2+'37.041'^2-2\times8.4\times'37.041'\cos40^\circ$ M1 (dep on previous M1) for correct order of evaluation or (c^2=) 965.(897...) A1 31.07 - 31.1

PAPER: 1MA0_2H					
Question		**Working**	**Answer**	**Mark**	**Notes**
25		$\frac{18}{30}\times\frac{12}{29}+\frac{7}{30}\times\frac{23}{29}+\frac{5}{30}\times\frac{25}{29}$ or $1-(\frac{18}{30}\times\frac{17}{29}+\frac{7}{30}\times\frac{6}{29}+\frac{5}{30}\times\frac{4}{29})$ or $\frac{18}{30}\times\frac{7}{29}+\frac{18}{30}\times\frac{5}{29}+\frac{7}{30}\times\frac{18}{29}$ $+\frac{7}{30}\times\frac{5}{29}+\frac{5}{30}\times\frac{18}{29}+\frac{5}{30}\times\frac{7}{29}$	$\frac{502}{870}$	4	B1 for a second 'branch' probability seen (could be seen in a tree) M1 for a product of any first and second stage correct probabilities M1 for a complete method to find the required probability A1 for $\frac{502}{870}$ oe Note if decimals used they must be correct to 2 decimal places SC with replacement B2 for $\frac{502}{900}$ oe B0 M1 $\frac{18}{30}\times\frac{12}{30}$ or $\frac{7}{30}\times\frac{23}{30}$ or $\frac{5}{30}\times\frac{25}{30}$ M1 $\frac{18}{30}\times\frac{12}{30}+\frac{7}{30}\times\frac{23}{30}+\frac{5}{30}\times\frac{25}{30}$ A0

Q8	**Per 25ml**	**Per ml**	**Per £**
50ml	54.5	2.18	45.87155…
75ml	56	2.24	44.64285..
125ml	53.8	2.152	46.46840..

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: ±5°
Measurements of length: ±5 mm

PAPER: 1MA0_2H			
Question		**Modification**	**Notes**
Q01		MLP only: basis given for stem and leaf diagram.	B2 for a fully correct ordered stem and leaf (B1 for a correct unordered stem and leaf or for an ordered stem and leaf with at most 1 error or omission) B1 (indep) for a correct key (units not required)
Q02		Grid enlarged. Crosses changed to filled in circles. Right axis labelled	B1 cao B1 cao M1 for a single line segment with a positive gradient that could be used as a line of best fit or a vertical line from 10 or a point plotted at (10, *y*) where *y* is in the range 18 - 22 A1 18 - 22 B1 cao

PAPER: 1MA0_2H			
Question		**Modification**	**Notes**
Q07		Diagram enlarged and labelled ABCD clockwise from the top right. Measurement lines removed. Information about the length of lines given in the text.	M1 for substituting into Pythagoras' theorem M1 for complete correct use of Pythagoras' theorem M1 for a complete method to find the perimeter of their trapezium A1 51.(20655..) C1 (dep on correct first 2 M marks) for correct conclusion dependent upon supporting calculations
Q08		Diagram removed.	M1 for a complete method to find the cost per m*l* or the number of m*l* per £1 for one tube or for a method that results in at least 2 values that can be used to compare 2 tubes M1 for a complete method to find all three equivalent figures A1 3 correct figures suitable for comparison C1(dep on M2) for stating the correct tube size from their calculations
Q09		AB = 9 cm.	M1 for two pairs of relevant arcs drawn A1 correct line drawn (with arcs) SC B1 Correct line no arcs visible
Q15		Diagram enlarged. Measurement line remove – MLP. 7 cm and measurement line removed – Braille only.	C1 for a complete reason eg Angles in a semicircle are 90^o, alternate segment theorem M1 for $7 \times \sin 35$ M1 for $7 \times \sin 35 \times 2$ M1 (indep) for "*DB*"$\times \cos 70$ A1 2.74 - 2.75

PAPER: 1MA0_2H			
Question		**Modification**	**Notes**
Q18		Diagrams enlarged Dotty shading added	B1 40 cao M1 for identifying LQ and UQ e.g 35 – 70 A1 35 cao C1 for a correct comparison of medians ft (a) C1 for a correct comparison of a measure of spread with correct figures ft (b) For the award of both marks at least one of the comparisons must be interpretative
Q20		Diagrams enlarged.	M1 method to find relative cost of design A e.g. $\pi 2^2$, $k \times \pi 2^2$ M1 for a complete method to find the relative cost of the watch face for design B e.g. $\pi 2^2 \times \frac{20}{360} \times \frac{3}{5} + \pi 2^2 \times \frac{340}{360} \times \frac{2}{5}$ M1 (dep on M1, M1) for the cost of design A: cost of design B A1 cao Or M1 for method to find fraction of the sectors in design B $\frac{20}{360}, \frac{340}{360}$ M1 for complete method to find the relative cost of the watch face for design B M1 (dep on M1,M1) for the cost of design A: cost of design B A1 cao

PAPER: 1MA0_2H			
Question		**Modification**	**Notes**
Q23		Diagrams enlarged.	B2 correct graph drawn (B1 for a graph translated up/down) B2 for correct graph drawn (B1 for a graph reflected in the *x* axis or stretched by sf 2 parallel to the *y* axis)
Q24		Diagrams enlarged.	M1 for $\frac{1}{2} \times 8.4 \times x \times \sin 40 = 100$ M1 for 100÷(0.5×8.4×sin 40) (= 37.(041...)) M1 (dep on 1st M1) for substituting the appropriate figures into the cosine rule eg 8.4^2+'37.041'^{2}-2×8.4×'37.041'cos40° M1 (dep on previous M1) for correct order of evaluation or (c^2=) 965.(897...) A1 31.07 - 31.1

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