edexcel

Mark Scheme (Results)

Summer 2014

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

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Summer 2014
Publications Code UG039400
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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If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.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 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.

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: 1MA0_2H					
Question		**Working**	**Answer**	**Mark**	**Notes**
1			(4, 5½)	2	M1 for $\frac{2+6}{2}$ or $\frac{3+8}{2}$ or 4, 5½ without brackets A1 for (4, 5½) oe NB: (4,5) gets 0 without working
2	(a)		Points plotted	1	B1 for points plotted at (12, 6) and (13, 2)
	(b)		Description	1	B1 for description; accept negative correlation.
	(c)		5 – 7	2	M1 for evidence of use of graph eg a single straight line segment with negative gradient that could be used as a line of best fit **or** an indication on the diagram from 12 on the *y* axis. A1 for 5 – 7
3			2.064(285714…)	2	M1 for substitution of 0.7 into expression or 2.89 or 2.06 seen A1 for 2.064(285714…) or $\frac{289}{140}$
4			28.3	2	M1 for $\pi \times 9$ or $2 \times \pi \times 4.5$ oe A1 for 28.25 – 28.3
5			Translation $\begin{pmatrix} 5 \\ -3 \end{pmatrix}$	2	B1 for translation B1 for $\begin{pmatrix} 5 \\ -3 \end{pmatrix}$ NB No marks if more than one transformation given.
6			2.15 pm	3	M1 for 240 ÷ 60 (=4) M1 for adding at least 3 of the 4 periods of time eg 20 (mins) + "4 (hrs)" + 25 (mins) + 30 (mins) (=5 h 15 min) oe or 2.15 without units A1 for 2.15 pm 14 15 (h or pm) oe

PAPER: 1MA0_2H					
Question		**Working**	**Answer**	**Mark**	**Notes**
*7			54 with reasons	3	M1 for angle *RWY* or angle TWZ = 180 − 126 (= 54) or angle *TWR* or angle *WRS* = 126 (may be marked on diagram) A1 for 54 C1 for appropriate reasons for method shown eg. Angles on a straight line add up to 180 and Alternate angles are equal OR Corresponding angles are equal and Angles on a straight line add up to 180 OR Vertically opposite angles are equal and Allied angles / Co-interior angles add up to 180 OR Angles at a point add up to 360 with other reasons as above.
8	(a)		$\frac{29}{100}$	2	M1 for 13 + 11 + 5 (=29) A1 for $\frac{29}{100}$ oe (SC B1 for $\frac{16}{100}$ oe)
	(b)		195	2	M1 for $1500 \times \frac{13}{100}$ oe A1 for 195
	(c)		reasons	2	B2 for 2 valid reasons eg sample too small, customers at this time may not be representative of ages of all customers (B1 for 1 reason)

PAPER: 1MA0_2H					
Question		**Working**	**Answer**	**Mark**	**Notes**
9			$5\frac{2}{3}$	4	M1 for $AB = 2x$ or $DC = 2x + 4$ or for $38 - 4$ M1(dep) for x + "x" + "$2x$" + "$2x + 4$" or for "38 – 4" ÷ 6 M1 for "$6x + 4$" = 38 A1 for $5\frac{2}{3}$ oe NB: Accept answers in the range 5.6 to 5.7 if M3 scored. SC if M0 then B2 for answer in range 5.6 – 5.7
10	(a)		p^6	1	B1 cao
	(b)		t^5	1	B1 cao
	(c)		6	1	B1 cao
	(d)		4	1	B1 cao
11			186.20	5	M1 for use of consistent units to find volume, 11 × 4 × 0.06 (=2.64) or 1100× 400 × 6 (=2640000) M1 (dep on vol calculation) for attempt to find number of bags needed, eg "2.64" ÷ 0.4 (=6.6 →7) M1 for the cost of gravel before discount eg "6.6" × 38 or "7" × 38 M1 for attempt to find the total cost after discount"266" × 0.7 oe A1 for 186.2(0) OR M1 for cost of gravel per bag after discount, 38 × 0.7 (=26.60) M1 for use of consistent units to find volume, 11 × 4 × 0.06 (=2.64) or 1100× 400 × 6 (=2640000) M1 (dep on vol calculation) for attempt to find number of bags needed, eg "2.64" ÷ 0.4 M1 for total cost of gravel after discount "7" × "26.6" A1 for 186.2(0)

PAPER: 1MA0_2H					
Question		**Working**	**Answer**	**Mark**	**Notes**
12	(a)		$5n - 1$	2	B2 for $5n - 1$ oe (B1 for $5n + c$ ($c \neq -1$ or absent) or $n = 5n - 1$)
	(b)		$2(3n - n^2)$	1	B1 for $2(3n - n^2)$ oe
13	(a)		$-4, -3, -2, -1, 0$	2	B2 for all 5 correct values; ignore repeats, any order (B1 for 4 correct (and no incorrect) values or all 5 correct values and -5)
	(b)		$x > 4½$	2	M1 for an attempt to expand brackets (eg $6\times x - 6\times 2$) or $6x - 12$ or for an intention to divide both sides by 6 as the first step or for $4½$ oe seen A1 for $x > 4½$ oe
14		12, 24, 36, 48, 60, 72, …. 8, 16, 24, 32, 40, 48, 56, 64, 72,…	25.80	5	M1 for listing at least 3 multiples of each of 12 and 8 or 24 in two lists of multiples or from factor trees M1 (dep) for attempt to find a common multiple of 12 and 8 above 60 (=72) M1 (dep M2) for method to find the number of boxes **and** the number of packs 72 ÷12 (=6) and 72 ÷ 8 (=9) M1 for finding the total cost by multiplying numbers by cost and adding eg "6" × 2.50 + "9" × 1.20 A1 for 25.8(0)

PAPER: 1MA0_2H					
Question		**Working**	**Answer**	**Mark**	**Notes**
15	(a)		7.5	3	M1 for $4.5^2 + 6^2$ (=56.25) M1 for $\sqrt{56.25}$ or $\sqrt{(4.5^2 + 6^2)}$ A1 for 7.5
	(b)		217	4	M1 for use of appropriate trig ratio eg tan $CAB = \frac{4.5}{6}$ (= 0.75), sin $CAB = \frac{4.5}{"7.5"}$ (= 0.6), cos $CAB = \frac{6}{"7.5"}$ (= 0.8) M1 for inverse trig shown correctly eg $CAB = \tan^{-1}\frac{4.5}{6}$ (= 0.75), $CAB = \sin^{-1}\frac{4.5}{"7.5"}$ (= 0.6), $CAB = \cos^{-1}\frac{6}{"7.5"}$ (= 0.8) A1 for 36.8 to 37 (or 53 to 53.2 if identified as *ACB*) B1ft for bearing 180 + "36.8" if "36.8" is not 40-50 eg 216.8 to 217
16			1.875×10^8	2	M1 for digits 1875 A1 cao
17	(a)		7.5	2	M1 for sight of $\frac{9}{6}$ (=1.5) oe or $\frac{6}{9}$ (=0.66..) oe or $\frac{5}{6}$ (=0.83..) oe or $\frac{6}{5}$ (=1.2) oe or a ratio, eg 6:9 oe or decimal, eg 1.5 oe A1 cao
	(b)		8	2	M1 for $12 \times \frac{6}{9}$ oe or $12 \div \frac{9}{6}$ oe or $\frac{12}{"7.5"} \times 5$ oe A1 cao

PAPER: 1MA0_2H					
Question		**Working**	**Answer**	**Mark**	**Notes**
18	(a)		209.69 or 209.70	3	M1 for $200 \times \frac{3.3}{100}$ oe or 200 × 1.033 or 6.6(0) or 206.6(0) M1 (dep) for (200 + "6.6") × $\frac{1.5}{100}$ oe or 200 × 1.033 × 1.015 oe or 3.099 or 3.09 or 3.10 or an answer between 209.69 and 209.7 A1 for 209.69 or 209.7(0)
	(b)	Train Pay Diff Old 200 510 310 New 225 535.50 310.50 Diff 25 25.50 50p	Comparison	3	M1 for method to find cost of tickets before increase eg $\frac{225}{1.125}$ (=200) oe or $\frac{225}{112.5} \times 12.5$ oe or pay before increase, $\frac{535.50}{1.05}$ (=510) oe A1 for 25 (train) **and** 25.5(0) (pay) or 310 **and** 310.5(0) C1 (dep on M1) ft for statement comparing rises leading to conclusion based on two comparable amounts eg pay increase greater than train increase
19			(2, 1⅓, 1)	2	M1 for finding coordinates of *P* (6, 4, 3) or *OT* = ⅓ *OP* or 2 correct coordinate values A1 oe
20			75.5	3	M1 for 25 × 67.8 (= 1695) or 55 × 72.0 (= 3960) M1 (dep) for ("3960" − "1695") ÷ 30 A1 cao

PAPER: 1MA0_2H					
Question		**Working**	**Answer**	**Mark**	**Notes**
21	(a)	$y^2 - 2y - 5y + 10$	$y^2 - 7y + 10$	2	M1 for all 4 terms correct (condone incorrect signs) or 3 out of 4 terms correct with correct signs A1 cao
	*(b)	$(4n^2 + 2n + 2n + 1)$ $- (2n + 1)$ $= 4n^2 + 4n + 1 - 2n - 1$ $= 4n^2 + 2n$ $= 2n(2n + 1)$	Proof	3	M1 for 3 out of 4 terms correct in the expansion of $(2n + 1)^2$ or $(2n + 1)\{(2n+1)-1\}$ A1 for $4n^2 + 2n$ or equivalent expression in factorised form C1 for convincing statement using $2n(2n + 1)$ or $2(2n^2 + n)$ or $4n^2 + 2n$ to prove the result
*22			Yes	3	M1 for $1 - 0.6$ (=0.4) M1 for ("0.4")^3 oe C1 (dep on M1) for 0.064 oe leading to a correct deduction OR M1 for $1-\Pr(3H, 0T) - \Pr(2H, 1T) - \Pr(1H, 2T)$ oe M1 for $1-(0.6)^3-3(0.6)^2(0.4)-3(0.6)(0.4)^2$ C1 (dep on M1) for 0.064 oe leading to a correct deduction
23	(a)		Explanation	1	B1 for appropriate explanation eg "a sample in the same proportions as the population"
	(b)		26	2	M1 for $\frac{314}{"599"} \times 50$ (=26.2…) A1 cao

PAPER: 1MA0_2H					
Question		**Working**	**Answer**	**Mark**	**Notes**
24			8	3	M1 for $p = \frac{k}{t}$ oe ($k \neq 1$) or $12 = \frac{k}{4}$ M1 for correct method to find k or $p = \frac{48}{t}$ oe or (dep on M1) for k=48 A1 cao OR M1 for $\frac{6}{4}$ oe M1 for $12 \div \frac{6}{4}$ oe A1 cao
25			302	3	M1 for $\frac{1}{2} \times \frac{4}{3} \times \pi \times 4^3$ oe (= 133.9 – 134.2) M1 for $\frac{1}{3} \times \pi \times 4^2 \times 10$ oe (= 167.4 – 167.7) A1 for 301 – 302 (or 96π or $\frac{288}{3}\pi$)
26		$y(5y + 24) = 0$ $\frac{-24 \pm \sqrt{(24^2)}}{10}$	$x = 6, y = 0$ $x = -3.6, y = -4.8$	5	M1 for substitution for elimination eg $(2y + 6)^2 + y^2 = 36$ M1 (dep on M1) for expansion eg $4y^2 + 12y + 12y + 36$ (3 out of 4 terms correct) A1 for $4y^2 + 24y + 36 + y^2 = 36$ oe M1 for a correct attempt to solve a 2 or 3 term quadratic equation eg by factorising or correct substitution into a quadratic formula A1 for $x = 6$, $y = 0$ and $x = -3.6$ oe, $y = -4.8$ oe SC: B1 (if M0 scored) for all 4 values mis-associated or one correct pair of values.

PAPER: 1MA0_2H					
Question		**Working**	**Answer**	**Mark**	**Notes**
27			43.9	5	M1 for $\frac{11}{\sin 100}=\frac{9}{\sin D}$ oe M1 for sin $D=\frac{9\sin 100}{11}$ (=0.80575…) or D = 53.68… M1 for angle DCA= 180 − 100 − "D" (=26.317..) M1 for area of $ABCD$ = 2 × ½ × 11 × 9 × sin"26.317" A1 for 43.8 – 43.9 **OR** M1 for $\frac{11}{\sin 100}=\frac{9}{\sin D}$ oe M1 for sin $D=\frac{9\sin 100}{11}$ (=0.80575…) or D = 53.68… M1 for (height=) 9 × sin (180 − 100 − "D") or height = 3.990… M1 for area of $ABCD$ = (2 × ½) × 11 × "height" A1 for 43.8 – 43.9 **OR** M1 for $11^2 = AD^2 + 9^2 - 2\times AD\times 9\times\cos 100$ M1 for $AD=\frac{18\cos 100+\sqrt{(18\cos 100)^2-4(1)(-40)}}{2(1)}$ M1 for $AD=\frac{18\cos 100+\sqrt{169.7(69795...)}}{2(1)}$ (= 4.95195(…)) M1 for area of $ABCD$ = 2 × $\frac{1}{2}$ × "4.95195" × 9 × sin100 A1 for 43.8 – 43.9

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: ±5º
Measurements of length: ±5 mm

PAPER: 1MA0_2H			
Question		**Modification**	**Notes**
Q02		1 ½cm grid (Crosses changed to solid circles)	Standard mark scheme
Q03	(a)	MLP only: *x* changed to *y*.	Standard mark scheme
Q09	(b)	On the diagram, AD is labelled as x cm	Standard mark scheme
Q19		model provided as well as diagram OP joined	Standard mark scheme
Q25		model provided as well as a diagram	Standard mark scheme
Q27		Wording inserted “AB is parallel to DC. AD is parallel to BC”.	Standard mark scheme

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