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Mark Scheme (Results)

November 2015

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

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If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.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

1MA0 1H November 2015					
Question		**Working**	**Answer**	**Mark**	**Notes**
1			69	4	M1 for finding 15% of £720 (=108) M1 (dep) for finding total of £720 plus interest (or 115% etc) (=828) M1 (dep on previous M1) dividing by 12 A1 cao OR M1 finding 720 ÷ 12 (=60) M1 (dep) finding 15% of "60" (=9) M1 (dep on previous M1) for adding, e.g. 60 + 9 A1 cao
2	(i)		19.44	2	B1 cao
	(ii)		19 440		B1 cao
3	(a)		$6n + 5$	2	B2 for $6n + 5$ (B1 for $6n + k$ where k is an integer or absent)
	(b)		No with explanation	2	M1 for "$6n + 5$" = 121 or any other valid method, e.g. counting on 6s (to get to 119 or more) A1 for No with complete explanation, e.g. $6n$=116 will not give a whole number
4	(a)		60	2	M1 for 200 × 0.3 oe A1 cao
	(b)		0.1	2	M1 subtracting sum of probabilities from 1, e.g. 1−(0.3+0.2+0.4) A1 cao

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Question		**Working**	**Answer**	**Mark**	**Notes**
5			20	3	M1 for 330÷120 (=2.75) or 200÷60 (=3 1/3) or 450 ÷180 (=2.5) M1 for 450÷180 (=2.5) AND 8×"2.5" A1 cao OR M1 for 120÷8 (=15) or 60÷8 (=7.5) or 180÷8 (=22.5) M1 for 330÷(120÷8) [=22] or 200÷(60÷8) [=26.6..] or 450÷(180÷8) A1 cao OR M1 for multiples of 120:60:180 M1 for multiplication linked to 450 and 8+8+4 A1 cao
6			40°	4	M1 for angle FBC=70 or CFG = x or ABF = 110 may be seen in diagram M1 for angle CBF = BFC =70 or 90 – ½ x A1 for 40 supported by working C1 (dep on M2) for all reasons and linked to appropriate working, e.g. Alternate angles are equal; Allied angles / Co-interior angles add up to 180°; Base angles of an isosceles triangle are equal; angles in a triangle add to 180°, angles on a straight line equals 180°
7	(a)		explanations	2	B2 for two aspects from: no time frame; responses vague; no "never" box (B1 for one correct aspect)
	(b)		question response boxes+	2	B1 for a question with a time frame (may appear with response boxes) B1 for at least 3 correctly labelled response boxes (non-overlapping and exhaustive) Do not accept inequality symbols.

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Question		**Working**	**Answer**	**Mark**	**Notes**
8		2p 1p ½ p Tot Sat 7 16 (31) 54 Sun (15) 14 17 (46) Tot (22)(30) 48 (100)	14	4	M1 for total Sat bottles 100 – 46 (=54) or for total ½ pint bottles 100 – 22 – 30 (=48) or (total 2 pint bottles on Sat) 22 – 15 (=7) M1 for total Sun bottles of ½ pint "48" – 31 (=17) or for total Sat bottles of 1 pint: "54" – 31 – (22 −15) (=16) M1 for 46 – 15 – "17" or for 30 – "16" A1 cao NB: any of the above figures could be shown in a 2-way table
*9			NO with evidence	4	M1 for 50 × 40 × 30 (=60000) M1 for "60000" ÷ 3000 (=20) M1 for "20" × £3.50 C1 eg for 70 and comparison resulting in NO OR M1 for £60 ÷ 3.50 (=17 bottles) M1 for "17" × 3000 (=51000) M1 for 50 × 40 × 30 (=60000) C1 eg for 51000 and 60000 and comparison resulting in NO

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Question		**Working**	**Answer**	**Mark**	**Notes**
10	(a)		$x^2 + 2x$	1	B1 cao
	(b)		$3y + 4x + 2$	2	M1 for a method to expand a bracket, e.g. $3y + 6$ or $4x - 4$ A1 cao
	(c)	$2t^2 + 10t - 3t - 15$	$2t^2 + 7t - 15$	2	M1 for 4 terms correct ignoring signs or 3 out of no more than 4 terms with signs correct unless ambiguous A1 cao
	(d)		$4a(2a + 3)$	2	M1 for $4a(na+c)$ or $2a(4a+6)$ or $a(8a+12)$ [n,c integers, $c \neq 0$] A1 cao
	(e)		$(y + 1)(y - 2)$	2	M1 for $(y \pm 1)(y \pm 2)$ unless ambiguous A1 cao
11	(a)		150	2	M1 for $180 - (360 - 330)$ or $180 - 30$ or $330 - 180$ or a complete diagram showing the bearing of 330° A1 cao
	(b)		11 40	4	M1 for $200 \div 120$ (=1 2/3 h) M1 for conversion between hours and minutes A1 for 1 h 40 min or 100 minutes B1 (ft dep on M1) for 11 40

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Question		**Working**	**Answer**	**Mark**	**Notes**
12	(a)		2, 0, 0, 6	2	B2 for 2, 0, 0, 6 (B1 for at least two of 2, 0, 0, 6); could be taken from graph
	(b)		Correct curve	2	M1 (ft) for at least 5 points plotted correctly A1 for a fully correct curve
	(c)		−0.6, 3.6	2	M1 (ft if M1 awarded in (b) and at least B1 in (a)) for indicating a point or line drawn at y=4, or one solution given A1 (ft) for both solutions
13			20	3	M1 for 30 × 14 (=420) or 18×10 (=180) M1 for 30 × 14 – 18 × 10 or "420" – "180" (=240) A1 cao
14			126	4	M1 for method to find exterior or interior angle of octagon M1 for method to find exterior or interior angle of pentagon M1 for complete method A1 cao

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Question		**Working**	**Answer**	**Mark**	**Notes**
15	(a)		19, 36, 51, 63, 73, 80	1	B1 cao
	(b)		cf graph	2	M1 for at least 5 of the 6 points plotted at each upper end of the interval (not joined) or 5 of the 6 points plotted consistently within interval (not upper end) and joined (dep on a cf table with no more than one arithmetic error) A1 correct graph
	*(c)		comparable value and conclusion	3	M1 for indication of a reading taken from a cf graph using weight = 3.4 kg or find UQ from 60 A1 for value given between 55 & 57 or 3.6 & 3.8 C1 (dep on at least M1) for conclusion (justified)
16			13.75	5	M1 for finding perimeter of rectangle e.g. $5x + 5 + 5x + 5 + 4x + 4x$ $(= 18x + 10)$ M1 for finding perimeter of trapezium e.g. $9x – 2 + 7x – 2 + 10x$ $(=26x – 4)$ M1 for equation e.g. $26x – 4 = 18x + 10$ (or $8x = 14$) A1 for finding the value of x as 1.75 B1 ft for subs of x into $5x + 5$ and evaluated (=13.75)
17			$x = 3\frac{1}{3}$ $y = -2$	4	M1 for a correct process to eliminate either variable (condone one arithmetic error) or to rearrange and substitute for elimination A1 cao for either x or y M1 (dep on M1) for correct substitution of found value into one of the equation or appropriate method after starting again (condone one arithmetic error) A1 cao

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Question		**Working**	**Answer**	**Mark**	**Notes**
18			$2\sqrt{5}$	2	M1 for multiplication of denominator and numerator by $\sqrt{5}$ A1 cao
19			756π	5	M1 for $\frac{1}{3}\pi r^2 \times 10$ (=270π) A1 for $r = 9$ M1 (dep on M1) for $\frac{1}{2} \times \frac{4}{3}\pi \times "9"^3$ (= 486π) M1 for 270π + "486π" oe A1 cao
*20			Proof	5	M1for finding one other vector expressed as **a** and/or **b** M1 for method to find one of $\overrightarrow{DM}$, $\overrightarrow{MA}$ or $\overrightarrow{DA}$ eg $\overrightarrow{DM}$ = −**b** + ½(3**b** +**a**) oe, $\overrightarrow{MA}$ = ½(3**b** + **a**) + **a** oe or $\overrightarrow{DA}$ = 2**b**+2**a** oe M1 for method to find two of $\overrightarrow{DM}$, $\overrightarrow{MA}$ or $\overrightarrow{DA}$ A1 for two of $\overrightarrow{DM}$ = ½ (**a** + **b**), $\overrightarrow{MA}$ = 1.5(**a** + **b**), $\overrightarrow{DA}$ =2(**a**+**b**) ie simplified but oe C1 (dep on working shown) for conclusion relating to correct working

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Question		**Working**	**Answer**	**Mark**	**Notes**
21	(a)		$\frac{9x-8}{x(2-x)}$	3	M1 for method to use a common denominator, e.g. $\frac{5(x)-4(2-x)}{x(2-x)}$ M1 (dep on M1) for correct expansion of brackets and combination of numerators e.g. $5x-8+4x$ $(=9x-8)$ A1 for $\frac{9x-8}{x(2-x)}$ or $\frac{9x-8}{2x-x^2}$
	(b)		$y = \frac{2-2t}{t+3}$	4	M1 for intention to multiply both sides by $y + 2$ as a first step e.g. $t \times y + 2 = 2 - 3y$ M1 for intention to correctly isolate their y terms on one side and the other terms on the other side, e.g. $ty+3y=2-2t$ M1 for intention to factorise, e.g. $y(t+3)$ $(=2-2t)$ A1 for $y = \frac{2-2t}{t+3}$ oe
*22			Similarity and proof	5	B1 for method matching a pair of opposite angles, e.g. if $EAB = x$, $BDE = 180-x$, $EAB + BDE = 180$ B1 for linking angles between quad and triangle, e.g. if $BDE = 180-x$ then $BDC = x$ B1 for stating or implying $ACE = BCD$ (same angle) C1 for Opposite angles of a cyclic quadrilateral add up to 180^o or statement linking three angles for similarity C1 for complete proof

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_1H			
Question		**Modification**	**Notes**
Q06		Diagram is enlarged.	Standard mark scheme
Q09		Model is provided for all candidates. Diagram also provided for MLP.	Standard mark scheme
Q10	(a)	MLP only: x changed to y Diagram is enlarged.	Standard mark scheme
Q12	(a) (b)	Wording added "There are four spaces to fill." 1.5 cm grid..Small squares removed.	Standard mark scheme
Q14		Diagram enlarged.	Standard mark scheme
Q15	(c)	Frequencies changed to 25, 20, 15, 10, 5, 5. Grid: 1.5 cm 3.4 kg changed to 3.5 kg.	Standard mark scheme
Q16		"trapezium" and "rectangle" put inside the shapes. MLP only: x changed to y.	Standard mark scheme
Q19		Model provided for all candidates. Diagram also provided for MLP.	Standard mark scheme

PAPER: 1MA0_1H			
Question		**Modification**	**Notes**
Q20		Diagram is enlarged. Lower case vectors enlarged.	Standard mark scheme
Q22		Diagram is enlarged.	Standard mark scheme

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