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Mark Scheme (Results)

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Pearson Edexcel GCSE
In Mathematic 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.

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If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.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

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.

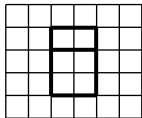| **Guidance on the use of codes within this mark scheme** |
| --- |
| M1 – method mark for appropriate method in the context of the question
A1 – accuracy mark
B1 – Working mark
C1 – communication mark
QWC – quality of written communication
oe – or equivalent
cao – correct answer only
ft – follow through
sc – special case
dep – dependent (on a previous mark or conclusion)
indep – independent
isw – ignore subsequent working |

PAPER: 1MA0/1H				
Question	Working	Answer	Mark	Notes
1		Diagram drawn	3	B3 for fully correct shape (B2 for 3 or 4 vertices correct or enlargement scale factor 3 in wrong position or enlargement, centre *A*, with different scale factor) (B1 for 2 vertices correct or enlargement, not from *A*, with different scale factor)
2		17.6(0)	4	M1 18 × 6.45 (= 116.1(0)) or 18 × 645 = (11610) M1 for 18 × 6.45 – 98.50 in the correct order but units may not be consistent A1 for digits 1760 A1 (dep on M2) for correct placement of decimal point after subtraction (of appropriate values)
3 (a)		4	2	M1 for 20 ÷ 5 (=4) Allow build up method to 4 lots of 1:5 A1 cao
(b)		6	2	M1 for a full method to find the number of red counters needed eg 20 ÷ 2 – "4" A1 ft from (a)
4 (a)		5	1	B1 cao
(b)		Lines added	2	B1 for a horizontal line from (5, 8) to (6.30, 8) B1 for a single straight line with the correct gradient and length, down to the time axis eg (6.30, 8) to (8.30, 0)
5			2	B2 for correct side elevation (B1 for a rectangle with base 2 squares or height 3 squares)

PAPER: 1MA0/1H				
Question	**Working**	**Answer**	**Mark**	**Notes**
6 (a)		$50 < a \leq 60$	1	B1 for correctly identifying the modal class interval e.g. 50 – 60 oe
(b)		Polygon	2	B2 for fully correct frequency polygon - points plotted at the midpoint (B1 for all points plotted accurately but not joined with straight line segments **or** all points plotted accurately and joined with last joined to first to make a polygon **or** all points at the correct heights and consistently within or at the ends of the intervals **and** joined (can include joining last to first to make a polygon)) NB: ignore parts of graph drawn to the left of the 1st point or the right of the last point; ignore any histograms drawn.
7	$(7 + 3 + 3) \times (4 + 3 + 3) - 7 \times 4 = 102$ OR $2 \times 7 \times 3 + 2 \times 4 \times 3 + 4 \times 3 \times 3 = 102$	11	4	M1 for a correct method to find the area of one appropriate rectangle M1 for a complete method to find the area of the path M1 (dep on M1) for "102" ÷ 10 A1 cao from correct working
*8		Bathroom Mart and correct figures	4	M1 for $\frac{1}{3} \times 1500$ (= 500) or $\frac{2}{3} \times 1500$ (= 1000) M2 for a correct method to reduce 1500 by 60% and then by a further 15% eg $1500 \times$ "0.4" $\times$ "0.85" (= 510) oe (M1 for method to find 60% or 40% of 1500 e.g. $\frac{60}{100} \times 1500$ (= 900) C1 for 510 **and** 500 with a correct conclusion.

In question 7, the "1st" appears as: ignore parts of graph drawn to the left of the 1st point.

PAPER: 1MA0/1H				
Question	**Working**	**Answer**	**Mark**	**Notes**
*9		95° with reasons	4	M1 for angle *DBC* = 180 – 125 (= 55) **or** angle *EAC* = 180 – 125 (=55) (May be on diagram) A1 for *x* = 95 C2 (dep on M1) with full reasons for their given method, e.g. angles on a straight <u>line</u> add up to <u>180°</u> **and** angles in a <u>triangle</u> add up to <u>180°</u> **and** <u>corresponding</u> angles are equal **or** <u>allied</u> angles / <u>co-interior</u> angles add up to <u>180º</u> **and** angles in a <u>triangle</u> add up to <u>180°</u> (C1 (dep on M1) for one appropriate reason linked to parallel lines) M1 for angle *CDB* = 125 – 30 (= 95)) (May be on diagram) A1 for *x* = 95 C2 (dep on M1) for full reasons, for their given method, e.g. <u>exterior</u> angles are equal to the sum of the <u>interior opposite</u> angles **and** <u>corresponding angles</u> are equal (C1 (dep on M1) for one of these appropriate reasons linked to parallel lines)
10 (a)		Diagram	2	B2 for fully correct solution with all three aspects with no ambiguity Aspect 1: circle at 3 Aspect 2: circle not shaded Aspect 3: arrow pointing left indicating extension beyond −4 or line extending beyond −4 (B1 for any two aspects)
(b)		$x \geq 5$	2	M1 for intention to add 7 to both sides (of inequality or equation) or to divide all 3 terms by 4 as a first step, or (*x* =) 5 A1 for $x \geq 5$ oe
11		125 miles or 200 km	3	B1 for 5 miles = 8 km or equivalent statement or for $\frac{5}{8}$ or $\frac{8}{5}$ used correctly M1 for method to use the correct conversion to find 40 (km) or 150 (miles) or 240 × *r* with 0.6 ≤ *r* ≤ 0.7 or 25 × *s* with 1.5 ≤ *s* ≤ 1.7 A1 for 200 km or 125 miles (units must be given)

PAPER: 1MA0/1H

Question	Working	Answer	Mark	Notes
12 (a)		049	1	B1 for answer in range 47 to 51
(b)		12	2	M1 for line drawn on a bearing of 320° ±2° A1 for answer in range 10 to 14
13 (a)		75	2	M1 for 3 × 5 × 5 oe A1 cao
(b)	$108 = 3t^2$ $t^2 = \dfrac{108}{3} = 36$	±6	2	M1 for $(t^2 =) \dfrac{108}{3} (= 36)$ A1 for 6 or –6 or both
(c)		$a = \dfrac{v-u}{t}$	2	M1 for subtracting u from both sides or dividing both sides by t as a first step A1 for $a = \dfrac{v-u}{t}$ oe
14	**B** at (1, 0), (1, –1), (3, –2) **C** at (–2, –1), (–2, –2), (0, –3) Rotation 90° clockwise (or 270° anti-clockwise) about (–2, 2)	Rotation 90° clockwise centre (–2, 2)	3	M2 for stating rotation 90° clockwise (or 270° anti-clockwise) or centre (–2, 2) (M1 for showing **B** and **C** correctly on the grid) A1 for a fully correct description NB Award a maximum of M1 if more than one transformation is given
15 (a)		–3, 8	2	M1 for 3 + (3 – 9) (= –3) oe or 5 + (5 – 2) (= 8) oe or $\dfrac{x+9}{2} = 3$ or $\dfrac{y+2}{2} = 5$ A1 cao
(b)		y = –0.5x + 6.5	3	M1 for a correct method to find the gradient (= –0.5), ft the possible use of coordinates in part (a) M1 for method to find c eg substituting into y = "–0.5"x + c A1 for y = –0.5x + 6.5 oe

PAPER: 1MA0/1H

Question	Working	Answer	Mark	Notes
16		10	3	M1 for 15 × 7 (= 105) or 9 × 5 (= 45) M1 for (15 × 7 − 9 × 5) ÷ (15 − 9) A1 cao
17 (a)	<table><tr><td>x</td><td>−2</td><td>−1</td><td>0</td><td>1</td><td>2</td><td>3</td></tr><tr><td>y</td><td>0.25</td><td>**0.5**</td><td>**1**</td><td>2</td><td>**4**</td><td>**8**</td></tr></table>	0.5, 1, 4, 8	2	B2 for all 4 correct (B1 for 2 or 3 correct)
(b)		Correct graph	2	M1 for at least 5 points plotted correctly from their table, provided at least B1 scored in part (a) A1 cao for a correct graph drawn from (−2, 0.25) to (3, 8)
*18	Boys Girls Median: 115 112 Range: 41 33 IQR: 17 9	Comparison of data	4	B1 for correct median for girls or boys B1 for any correct range or IQR C1 for a correct comparison of the medians C1 ft for a correct comparison of the ranges or IQRs For the award of both C marks at least one of the comparisons made must be in the context of the question and all figures used for comparisons correct. OR B2 for an accurately drawn boxplot (superimposed) C1 for a correct comparison of the medians C1 for a correct comparison of the ranges or IQRs For the award of both C marks at least one of the comparisons made must be in the context of the question

PAPER: 1MA0/1H

Question	Working	Answer	Mark	Notes
19	$4x - 2y = 26$ $x - 2y = 11$ $3x = 15$ $2x - y = 13$ $2x - 4y = 22$ $3y = -9$	$x = 5$ $y = -3$	3	M1 for correct process to eliminate one variable (condone one arithmetic error) M1 (dep) for substituting found value in one of the equations or appropriate method after starting again (condone one arithmetic error) A1 for $x = 5$ and $y = -3$
20 (a)		1.21×10^4	2	M1 for 12.1×1000 (= 12100) oe A1 cao
(b)		4.5	3	M1 for $4.503 \times 10^9 \div 10^6$ (= 4503) oe or for $4.503 \times 10^9 \div 10^3$ (= 4503000) oe M1 for $4.503 \times 10^9 \div 10^6 \div 10^3$ (=4.503 with no other digits) A1 for cao
21		3.75 oe	3	M1 for a correct scale factor or ratio using two corresponding sides from similar triangles or two sides from the same triangle (may be seen in an equation) e.g $\dfrac{6}{1.5}$ oe or $\dfrac{1.5}{6}$ oe or $\dfrac{5}{6}$ or $\dfrac{6}{5}$ etc. (accept these written as ratios) M1 for a complete method to find ED A1

PAPER: 1MA0/1H				
Question	**Working**	**Answer**	**Mark**	**Notes**
22		$9x^2 + 7x - 2$	4	M1 for finding an expression for a missing length eg $4x - 1 - x - x$ $(=2x - 1)$ or $x+ 2 - 2x$ $(=2 - x)$ M1 for a correct expression for one area from the cross-section, eg. $x \times 2x$ or $(4x - 1)(x + 2 - 2x)$ or for one volume of cuboid(s), eg. $x \times 2x \times (x + 1)$ M1 for a complete method to find the volume A1 for $9x^2 + 7x - 2$ or $(9x - 2)(x + 1)$ oe
23 (i)		38 30	3	M1 for evidence of frequency density calculation, eg 6 on the frequency density axis for the height of the first column or 5 is 1 cm² can be implied by 30 as the second missing frequency A1 for 38 and 30
(ii)		30–50 bar height 0.8 cm		B1 for 30 – 50 bar of height 0.8 cm
24		1.2	3	M1 for $I \propto \dfrac{1}{d^2}$ or $I = \dfrac{k}{d^2}$ or $k = Id^2$ or $30 = \dfrac{k}{2^2}$ or $k = 120$ M1 (dep) for $I = \dfrac{"120"}{10^2}$ A1 cao

PAPER: 1MA0/1H				
Question	**Working**	**Answer**	**Mark**	**Notes**
25		$\dfrac{52}{72}$	4	B1 for $\dfrac{3}{8}$ or $\dfrac{2}{8}$ or $\dfrac{1}{8}$ seen as second probability M1 for $\dfrac{4}{9} \times \dfrac{3}{8}$ or $\dfrac{3}{9} \times \dfrac{2}{8}$ or $\dfrac{2}{9} \times \dfrac{1}{8}$ M1 for $1 - (\dfrac{4}{9} \times \dfrac{3}{8} + \dfrac{3}{9} \times \dfrac{2}{8} + \dfrac{2}{9} \times \dfrac{1}{8})$ or $\dfrac{4}{9} \times \dfrac{3}{8} + \dfrac{4}{9} \times \dfrac{2}{8} + \dfrac{3}{9} \times \dfrac{4}{8} + \dfrac{3}{9} \times \dfrac{2}{8} + \dfrac{2}{9} \times \dfrac{4}{8} + \dfrac{2}{9} \times \dfrac{3}{8}$ A1 for $\dfrac{52}{72}$ oe OR B1 for $\dfrac{5}{8}$ or $\dfrac{6}{8}$ or $\dfrac{7}{8}$ seen as second probability M1 for $\dfrac{4}{9} \times \dfrac{5}{8}$ or $\dfrac{3}{9} \times \dfrac{6}{8}$ or $\dfrac{2}{9} \times \dfrac{7}{8}$ M1 for $\dfrac{4}{9} \times \dfrac{5}{8} + \dfrac{3}{9} \times \dfrac{6}{8} + \dfrac{2}{9} \times \dfrac{7}{8}$ A1 for $\dfrac{52}{72}$ oe SCB2 $\dfrac{52}{81}$ oe

PAPER: 1MA0/1H				
Question	**Working**	**Answer**	**Mark**	**Notes**
26		8	4	M1 for $(2\sqrt{10})^2 - 2^2 \ (=36)$ A1 for $(CD =) 6$ M1 (dep on M1) for '6' $\times 4 - \dfrac{1}{2} \times$ '6' $\times 2 - \dfrac{1}{2} \times 2 \times 2 - \dfrac{1}{2} \times$ ('6' $- 2) \times 4$ C1 for area of 8 from fully correct working
27		32 : 45	5	M1 for a correct expression for surface area of the cylinder $(=2\times\pi\times3^2 + 6\pi h)$ or surface area of the sphere $(=4\times\pi\times6^2)$ M1 (dep) for equating 'surface area of cylinder' and '2 × surface area of sphere', $2\times\pi\times3^2 + 6\pi h = 2 \times4\times\pi\times6^2$ M1 (dep) for a method to isolate h M1 for $\pi\times3^2\times$'45' oe and $\dfrac{4}{3}\times\pi\times6^3$ oe 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: ±5°
Measurements of length: ±5 mm

PAPER: 1MA0_1H			
Question		**Modification**	**Notes**
1		The enlargement has been drawn on the grid. Grid has been enlarged. Wording has been changed to: 'On the grid there are two shapes, shape X and shape Y. A point A is marked on the grid. Describe fully the transformation that maps shape X onto shape Y.'	B3 for an enlargement of scale factor 3 with centre A (B2 for 2 aspects described) (B1 for 1 aspect described)
4		Diagram enlarged. Axes labels have been moved to the top of the vertical axis and to the left of the horizontal axis. Right axis has been labelled.	As standard mark scheme
5		Model provided for all candidates. Diagram enlarged and also provided for MLP. Wording has been changed to: 'They show a prism. An arrow points to the side elevation of the prism. Now look at the three shapes below the diagram of the prism, shape A, shape B and shape C. Which shape A, B or C shows the view from the direction of the arrow? [The three diagrams show: A the front elevation, B the plan and C the side elevation].	B2 for shape C only indicated (B1 for shape C and one other shown)

PAPER: 1MA0_1H				
Question		**Modification**		**Notes**
6	(a)	The letter 'a' has been changed to 't' for all candidates. Frequency numbers have been changed to 5, 15, 15, 20, 5.		Standard mark scheme with letter change
	(b)	Grid has been enlarged. Axes labels have been moved to the top of the vertical axis and to the left of the horizontal axis. Right axis has been labelled.		Standard mark scheme Tolerance to **within** half a square
7		Diagram enlarged. Shading changed to dotty shading.		Standard mark scheme
9		Diagram has been enlarged. Wording added 'Angle CEA is marked x.'		Standard mark scheme
10	(a)	Diagram enlarged.		Standard mark scheme
12	(b)	North lines have been extended to 9cm. A line has been added between Y and L and this line has been extended to 9cm. The distance from point Y to T is now 10.8 cm. [Leeway will be needed for answering the question]. '80 km' changed to '100 km'.		M1 for line drawn on a bearing of 320 ±5 drawn A1 for an answer in the range 20 to 30

PAPER: 1MA0_1H			
Question		**Modification**	**Notes**
14		Grid has been enlarged. Triangle B and Triangle C have been drawn on the grid. Question changed to: 'A cut out shape has been provided.' '(a) Describe fully the transformation that maps triangle A onto triangle B. (b) Describe fully the single transformation that maps triangle B onto triangle C. (c) Describe fully the single transformation that maps triangle A onto triangle C.	(a) B1 for one aspect of rotation 90°clockwise or centre (0,1) (b) B1 for translation or vector $\binom{-3}{-1}$ (c) B1 for rotation of 90°clockwise with centre (−2,2)
	(a) (b)	The table has been turned to vertical format and left aligned. Wording added 'There are four spaces to fill.' Grid has been enlarged.	(a) Standard Mark scheme (b) Standard mark scheme- Allow extra tolerance
18		Diagram enlarged. Lines on the box plot have changed to, '95, 105, 115, 120, 135.'	Boys :Range 40, IQR 15 Standard Mark scheme
21		Diagram enlarged.	Standard Mark scheme

PAPER: 1MA0_1H			
Question		**Modification**	**Notes**
22		Model provided for all candidates. Diagram enlarged and also provided for MLP. MLP only: x changed to y.	M1 for finding an expression for a missing length eg $4y - 1 - y - y$ $(=2y - 1)$ or $y + 2 - 2y$ $(=2 - y)$ M1 for a correct eypression for one area from the cross-section, eg. $y \times 2y$ or $(4y - 1)(y + 2 - 2y)$ or for one volume of cuboid(s), eg. $y \times 2y \times (y + 1)$ M1 for a complete method to find the volume A1 for $9y^2 + 7y - 2$ or $(9y - 2)(y + 1)$ oe
23	(i)	Diagram enlarged. Distances have been changed to '30, 40, 30, 20, 20'. Wording added 'There are two spaces to fill.	M1 for evidence of frequency density calculation, eg 6 on the frequency density axis for the height of the first column or 5 is 1 cm² can be implied by 30 as the second missing frequency A1 for 40 and 30
	(ii)	'	B1 for 30 – 50 bar of height 1 cm
24		Braille only: letter 'I' changed to 'S'.	Standard Mark scheme
25		Diagram enlarged.	Standard Mark scheme
26		Diagram enlarged.	Standard Mark scheme
27		Two models provided for all candidates. Diagrams enlarged and also provided for MLP.	Standard Mark scheme