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Mark Scheme

Pearson Edexcel GCSE (9-1)
Mathematics – 1MA1
Trial of Specimen Papers (Set 1)

Paper 2 (1MA1/2H): Calculator
Higher Tier

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General marking guidance

These notes offer general guidance, but the specific notes for examiners appertaining to individual questions take precedence.

1 All candidates must receive the same treatment. Examiners must mark the last candidate in exactly the same way as they mark the first.

Where some judgement is required, mark schemes will provide the principles by which marks will be awarded; exemplification/indicative content will not be exhaustive. When examiners are in doubt regarding the application of the mark scheme to a candidate's response, the response should be sent to review.

2 All the marks on the mark scheme are designed to be awarded; mark schemes should be applied positively. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme. If there is a wrong answer (or no 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.

Questions where working is not required: In general, the correct answer should be given full marks.
Questions that specifically require working: In general, candidates who do not show working on this type of question will get no marks – full details will be given in the mark scheme for each individual question.

3 Crossed out work

This should be marked **unless** the candidate has replaced it with an alternative response.

4 Choice of method

If there is a choice of methods shown, mark the method that leads to the answer given on the answer line.

If no answer appears on the answer line, mark both methods **then award the lower number of marks.**

5 Incorrect method

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 for your Team Leader to check.

6 Follow through marks

Follow through marks which involve a single stage calculation can be awarded without working as you can check the answer, 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.

7 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 or its context. (eg. an incorrectly cancelled fraction when the unsimplified fraction would gain full marks).

It is not appropriate to ignore subsequent work when the additional work essentially makes the answer incorrect (eg. incorrect algebraic simplification).

8 Probability

Probability answers must be given as a fraction, percentage or decimal. 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.

9 Linear equations

Unless indicated otherwise in the mark scheme, full marks can be gained if the solution alone is given on the answer line, or otherwise unambiguously identified 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).

10 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 all numbers within the range.

Guidance on the use of abbreviations within this mark scheme	
M	method mark awarded for a correct method or partial method
P	process mark awarded for a correct process as part of a problem solving question
A	accuracy mark (awarded after a correct method or process; if no method or process is seen then full marks for the question are implied but see individual mark schemes for more details)
C	communication mark
B	unconditional accuracy mark (no method needed)
oe	or equivalent
cao	correct answer only
ft	follow through (when appropriate as per mark scheme)
sc	special case
dep	dependent (on a previous mark)
indep	independent
awrt	answer which rounds to
isw	ignore subsequent working

Mark scheme GCSE (9 – 1) Mathematics

Paper 1MA1_2H			
Question	**Working**	**Answer**	**Notes**
1		$t = \frac{w - 11}{3}$	M1 For isolating term in *t*, eg. $3t = w - 11$ or dividing all terms by 3, eg. $\frac{w}{3} = \frac{3t}{3} + \frac{11}{3}$ A1 for $t = \frac{w-11}{3}$ oe
2	£: 1980 ÷ 1.34 = 1477.61 2250 ÷ 1.52 = **1480.26** €: 1480 × 1.34 = 1983.2 2250 ÷ 1.52 × 1.34 = 1983.55 $: 1480 × 1.52 = 2249.6 1980 ÷ 1.34 × 1.52 = **2245.9**	Jardins of Paris	P1 correct process to convert one price to another currecncy, eg 1980 ÷ 1.34 P1 for a complete process leading to 3 prices in the same currency C1 for 3 correct and consistent results and a correct comparison made.
3		Mean of 96 or net deviation of 0 so target met	M1 for correct interpretation of the graph, with at least one correct reading or a line drawn through 96 with at least one correct deviation M1 complete method to find mean of six months sales, eg. (110+84+78+94+90+120)÷6 (= 96) or the sum of six deviations, eg. (14–12–18–2–6+24)÷6 (= 0) C1 for a correct answer of 96 or 0 with correct conclusion

Paper 1MA1_2H				
Question		**Working**	**Answer**	**Notes**
4	(a)		$160 < h \leq 170$	B1 for identifying the correct class interval
	(b)		1. Points should be plotted at mid-interval values 2. The polygon should not be closed	C1 for a correct error identified C1 for a correct error identified
5	(a)		graph	M1 for method to start to find distance cycled in 36 mins, eg. line drawn of correct gradient or $15 \times \frac{36}{60}$ or 15×36 C1 for correct graph from 9.00 am to 9.36 am C1 for graph drawn from "(9.36, 9)" to (10.45, "9" + 8)
	(b)		4.5	M1 for 18×0.25oe A1 cao
6			8112	M1 for complete method, eg. 7500×1.04^2 A1 cao

Paper 1MA1_2H				
Question	**Working**	**Answer**	**Notes**	
7		No with supporting evidence	P1 P1 C1	for the start of a correct process, eg. two of x, $2x$ and $2x+7$ oe or a fully correct trial, eg. 5 + 10 + 17 = 32 (dep on P1) for setting up an equation using 3 algebraic terms, eg. $x + 2x + 2x + 7 = 57$ or a correct trial totalling 57, eg. 10 + 20 + 27 = 57 for a correct deduction from correct answers, eg. Chris has 20 so it is impossible for all to have 20 since 60 marbles would be needed.
8		66.9	P1 P1 P1 A1	for process to find the area of one shape, eg. 19×16 (= 304) or $\pi \times 8^2$ (= 201.06...) for process to find the shaded area, eg. "304" – "201.06" ÷2 (= 203.46...) for a complete process to find required percentage, eg. $\frac{"203.46"}{304} \times 100$ for answer in range 66 to 68
9		135	B1 P1 A1	for identifying the angle of 70^o (on the diagram), showing understanding of notation for process to find an angle in triangle *ABC*, eg. for process to find angle *BAC*, eg. $(180 – 50) \div 2$ (= 65^o) for 135

Paper 1MA1_2H			
Question	**Working**	**Answer**	**Notes**
10 (a)		–1.5	M1 for method to find gradient, eg. 210 ÷ 140 A1 for correct interpretation of the negative gradient
(b)			C1 for explanation, eg. rate of change of depth of water in tank
11 (a)		0.49	M1 for 0.7 × 0.7 A1 for 0.49 oe
(b)		0.51	M1 for a correct process, eg. 1 – "0.49" or 0.7 × 0.3 + 0.3× 0.7 + 0.3 × 0.3 A1 for 0.51 oe
12 (a)		0.4	B1 For 0.4 oe
(b)		0.586	M1 for "3.48207....." ÷ 17.34 or 3.48207..... ÷ "17.34" or 0.200811... A1 for 0.585 to 0.586
13	$(3x - 1)(4x^2 + 20x - 3x - 15)$ $(x + 5)(12x^2 - 4x - 9x + 3)$ $(4x - 3)(3x^2 - x + 15x - 5)$	Fully correct algebra to show given result	M1 for method to find the product of any two linear expressions; eg. 3 correct terms or 4 terms ignoring signs M1 (dep) for method of 6 products, 4 of which are correct (ft their first product) A1 for fully accurate working to give the required result

Paper 1MA1_2H			
Question	**Working**	**Answer**	**Notes**
14	angle *BAD* = angle *DCA* = 22.62^{o} angle *DBA* = angle *DAC* = 67.38^{o}	33.8	P1 for recognition of similar triangles or equal ratio of sides OR for a method to find angle *BAD* or angle *DBA* and state that this is the same as angle *DCA* or angle *DAC* P1 for process to find *CB*, eg. $\frac{5}{13} = \frac{13}{CB}$ A1 for an answer rounding to 33.8
15		18.3	P1 for a start to the process interpreting the information correctly, eg. $T = k\sqrt{L}$ oe P1 for a correct scale factor of $\sqrt{1.4}$ A1 for 18.3 to 18.4
16		84	M1 for correct interpretation of given information leading to a method to find fd, eg. 20 ÷ 100 (thousand) or for an acceptable key P1 for a process to find at least two required frequencies, eg. 0.8 × 50 (= 40), 0.6 × 50 (= 30), 0.14 × 100 (= 14) A1 for 84 cao

Paper 1MA1_2H			
Question	**Working**	**Answer**	**Notes**
17		$n^2 - n + 1$ oe	M1 for correct deduction from differences, eg. 2nd difference of 2 implies $1n^2$ or sight of $1^{2,}\ 2^2, 3^2, ..$ M1 for sight of $1^{2,}\ 2^2, 3^2, ..$ linked with 1, 2, 3, ... A1 for $n^2 - n + 1$ oe OR M1 for $a + b + c = 1$ or $4a + 2b + c = 3$ or $9a + 3b + c = 7$ oe M1 for a method to eliminate one unknown leaving simultaneous equations in the other two A1 for $n^2 - n + 1$ oe
18		$3x^2 + 10x$	M1 start a chain of reasoning, eg. $3(x+2)^2 - 2(x+2) - 8$ M1 continue chain by expanding brackets correctly, eg. $3x^2 + 12x + 12 - 2x - 4 - 8$ A1 for $3x^2 + 10x$ ($a = 3$, $b = 10$)
19		8.63 to 8.65	P1 for a start of process, eg. $0.5x(x - 2) = 2.5$ P1 for rearranging to give a quadratic equation, eg $x^2 - 2x - 5$ (= 0) oe. P1 (dep on P1) for a process to solve their 3-term quadratic equation, condoning one sign error in use of formula ($x = 3.449...$ and $x = -1.449...$) P1 for selecting the positive value of x and applying Pythagoras to find the hypotenuse, eg. $\sqrt{}$ ("3.449"^{2} + "1.449"^{2}) (= 3.74...) P1 (dep on previous P1)for complete process to find perimeter A1 for answer in the range 8.63 to 8.65

Paper 1MA1_2H			
Question	**Working**	**Answer**	**Notes**
20 (a)		3 to 4	C1 for a tangent drawn at $t = 6$ B1 for a gradient in the range 3 to 4 or ft "tangent"
(b)		452	C1 for splitting the area into 3 strips and a method of finding the area of one shape under the graph, eg. $\frac{1}{2} \times 4 \times 35$ (= 70) M1 for complete process to find the area under the graph, eg "70" + $\frac{1}{2} \times 4 \times (35 + 51)$ (= 172) + $\frac{1}{2} \times 4 \times (51 + 54)$ (= 210) [= 452] A1 for 452
21		10169 or 10171	P1 for correct use of formula to find number in 2016, eg. 1.05(9500 – 250) (= 9712.5) P1 for complete iterative process, eg. 2017: 1.05("9712.5" – 250) (= 9935.625) 2018: 1.05("9935.625" – 250) C1 for answer of 10169.90... rounded or truncated to nearest whole number
22		1.5	B1 for any correct bound clearly identified, eg. 99.65 →x→ 99.75 or 66.5 →y→ 67.5 M1 (dep on B1) for method to find UB, eg. "99.75" ÷ "66.5" A1 for 1.5
23		$y = -\frac{4}{3}x + \frac{25}{3}$ oe	M1 for method to find gradient of tangent, eg. $-1 \div \frac{3}{4} = -\frac{4}{3}$

Paper 1MA1_2H			
Question	**Working**	**Answer**	**Notes**
			M1 (dep) for method to find *y*-intercept using $y = "-\frac{4}{3}"x + c$ A1 $y = -\frac{4}{3}x + \frac{25}{3}$ oe
24		Proof	C1 for joining *AO* (extended to *D*) and considering angles in two triangles (algebraic notation may be used here) C1 for using isosceles triangle properties to find angle *BOD* (eg. $x + x = 2x$) or angle *COD* (eg. $y + y = 2y$) C1 for angle $BOC = 2x + 2y$ [= 2×angle *BAO* + 2×angle *CAO*] C1 for completion of proof with all relevant reasons given, eg. base angles of isosceles triangle are equal and sum of angles at a point is 360^o

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