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Mark Scheme

Mock Paper – Set 1

Pearson Edexcel GCSE
In Mathematics (1MA1)
Higher (Calculator) Paper 3H

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Publications Code

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

Mock Paper 1MA1: 3H					
Question		**Working**	**Answer**	**Mark**	**Notes**
1			9 30 am	3	P1 lists multiples of 24 and 20 with at least 3 numbers in each list or expansion of 24 and 20 into factors A1 identifies 120 (mins) or 2 (hours) as LCM A1 for 9 30 am oe
2			No with explanation	2	C1 for expansion of $(x + 5)^2$ with at least 3 terms correct or substitution of the same number into both expressions C1 No with $(x + 5)^2 = x^2 + 10x + 25$ or No with correct evaluation of both expressions
3			36.4	4	P1 a strategy to start to solve the problem e.g. 105 ÷ (5 – 2) (= 35) P1 process to find Laura's share e.g. 385 – 2 × "35" – 5 × "35" (= 140) or 385 ÷ "35" – 2 – 5 (= 4) P1 process to find the percentage Laura gets e.g. "140"÷ 385 × 100 oe or "4" ÷ 11 × 100 oe A1 answer in range 36.3 to 36.4, accept 36%

Mock Paper 1MA1: 3H					
Question		**Working**	**Answer**	**Mark**	**Notes**
4			mistakes identified	2	C1 points joined with curve, not line segments C1 points not plotted at mid-points
5			46	2	M1 links 5% with 2.30 or 100 ÷ 5 (= 20) A1 cao
6			36	3	P1 a correct process to find either an interior or an exterior angle, e.g. (180 × 3) ÷ 5 (= 108) or 360 ÷ 5 (= 72) P1 (dep) a complete process to find angle *CFD* A1 cao
7	(a)		34.93	5	P1 process to find area of circle or semicircle $\pi \times 4.2^2$ (÷ 2) P1 process to find area of garden (= 74.7...) P1 process to find number of boxes "74.7" ÷ 12 P1 process to find cost "7" × 4.99 A1 cao
	(b)		Correct statement	1	C1 e.g. She might need to buy fewer boxes

Mock Paper 1MA1: 3H					
Question		**Working**	**Answer**	**Mark**	**Notes**
8	(a)			2	B1 places probs for round, e.g. 4/7 and 3/7 B1 places probs for square, e.g. 3/8, 5/8, 3/8, 5/8
	(b)		$\frac{15}{56}$	2	M1 ft for "3/7" × "5/8" A1 15/56 oe
9	(i)		D	1	B1 cao
	(ii)		A	1	B1 cao
10			$12m^5r^7$	2	M1 2 of 3 parts correct in a product A1 cao

Mock Paper 1MA1: 3H					
Question		**Working**	**Answer**	**Mark**	**Notes**
11	(a)		8	1	B1
	(b)		box plot drawn	3	C1 at least 2 correctly plotted values including box or whiskers/tails or 5 correct values and no whiskers/tails C1 at least 2 correctly plotted values including box and whiskers/tails C1 fully correct box plot (min = 153, LQ = 164, median = 170, UQ = 175, max = 186)
	(c)		comparisons	2	C1 a correct comparison of medians C1 a correct comparison of a measure of spread For the award of both marks at least one of the comparisons must be interpretative
12			No supported by correct values	4	P1 process to find volume of wood, e.g. 3 × 20 × 120 (= 7200) P1 process to find a density, e.g. 8000 ÷ "7200" or 1030 ÷ 1000 P1 complete process to find two densities for comparison P1 No with a comparison of the correct densities, 1.03 and 1.11... or 1030 and 1111

Mock Paper 1MA1: 3H					
Question		**Working**	**Answer**	**Mark**	**Notes**
13	(a)	$f(x) = x^3 + 5x - 4$	shown	2	M1 method to establish at least one root in $0 < x < 1$, e.g. $f(0) = -4$ and $f(1) = 2$ C1 as there is a sign change there must be at least one root in $0 < x < 1$ (as f is continuous)
	(b)	$x^3 + 5x - 4 = 0$ $x^3 + 5x = 4$ $x(x^2 + 5) = 4$	shown	2	C1 at least one correct step in rearrangement C1 fully correct chain of reasoning
	(c)		0.709(21985) or $\frac{100}{141}$	3	B1 $x_1 = 0.8$ oe M1 $x_2 = \frac{4}{(0.8)^2 + 5}$ oe A1 0.709(21985) or $\frac{100}{141}$ oe
14			8.3	3	M1 $0.5 = r^8$ or $0.5 = (1 - \frac{x}{100})^8$ M1 $\sqrt[8]{0.5}$ can be implied by 0.917(…) seen A1 8.29 – 8.3

Mock Paper 1MA1: 3H					
Question		**Working**	**Answer**	**Mark**	**Notes**
15			102.4	2	M1 uses $(10 \div 8)^2$ oe or $(8 \div 10)^2$ oe A1 cao
16			1.08 and explanation	5	B1 finds a bound of a: 6.425 or 6.435 or 6.434999... or a bound of b: 5.5135 or 5.5145 or 5.5144999.. P1 uses UB and LB in equation P1 process of choosing correct bounds, e.g. $\sqrt{\frac{6.435}{5.5135}}$ or $\sqrt{\frac{6.425}{5.5145}}$ A1 for 1.079... and 1.080... both values must clearly come from correct working C1 for 1.08 from 1.079... and 1.080... and "both LB and UB round to 1.08"
17			$5x$	3	P1 starts process by substituting to find volume of cylinder and volume of sphere e.g. $\pi \times (3x)^2 \times h$ and $\frac{4}{3}\pi \times (\frac{1}{2}x)^3$ P1 for forming a correct equation A1 cao

Mock Paper 1MA1: 3H					
Question		**Working**	**Answer**	**Mark**	**Notes**
18			$m = \frac{4-5f}{f+3}$	4	M1 for multiplying both sides by 5 + *m* as a first step M1 for correctly moving their *m* terms to one side and their other terms to the other side M1 for factorising A1 for $m = \frac{4-5f}{f+3}$ oe
19			38.6	5	P1 process to find *CD*, e.g. $\tan 34 = \frac{CD}{20}$ P1 process to find *BD*, e.g. $\cos 34 = \frac{20}{BD}$ or $BD^2 = 20^2 + \text{“}CD\text{”}^2$ P1 uses sine rule to find *AD* e.g. $\frac{AD}{\sin 60} = \frac{\text{"}BD\text{"}}{\sin(180-60-45)}$ P1 process to find *DAC*, e.g. $\sin DAC = \frac{\text{"}DC\text{"}}{\text{"}AD\text{"}}$ A1 answer in range 38.5 – 38.6

Mock Paper 1MA1: 3H					
Question		**Working**	**Answer**	**Mark**	**Notes**
20	(a)		18	1	B1 cao
	(b)		shown	2	C1 for first step, e.g. $(2x - 3)^2 + 2$ C1 fully correct chain of reasoning that includes correct expansion of $(2x - 3)^2$
	(c)		1, 5	4	P1 process to find fg(x) and form an equation, e.g. $4x^2 - 12x + 11 = 2(x^2 + 2) - 3$ P1 process to reduce equation to $ax^2 + bx + c = 0$ P1 process to solve quadratic equation A1 cao

Mock Paper 1MA1: 3H					
Question		**Working**	**Answer**	**Mark**	**Notes**
21				4	C1 draws AO and OC and considers angles around the point O (algebraic notation may be used, e.g. angles labelled x and y) C1 uses "angle at centre..." to find angle ABC (e.g. $\frac{1}{2}x$) or angle ADC (e.g. $\frac{1}{2}y$) C1 for $ABC + ADC = \frac{1}{2}x + \frac{1}{2}y$ C1 complete proof with all reasons given, e.g. angles at a point add up to 360°, the angle at the centre of a circle is twice the angle at the circumference NB: do **not** accept "opposite angles of a cyclic quadrilateral add up to 180°"