Mark Scheme

Mock Set 2

Pearson Edexcel GCSE Mathematics (1MA1)
Higher Tier (Non-Calculator)
Paper 1H

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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

Higher tier Paper 1H (Non-calculator): Mock (Set 2) Mark Scheme

Question	Working	Answer	Mark	Notes
1		Ali 80 Beth 200	M1 A1	starts with a first step , e.g. 280 ÷ (2 + 5) (= 40) cao
2		71°	M1 M1 A1 C1 C1	finds an angle using parallel lines, e.g. *BEF* as 38º or *EAB* as x. shows a complete process to arrive at the required angle could be evidenced by angles shown on the diagram cao alternate, corresponding or allied (co-interior) unambiguously given *and appropriate for their working* for all other reasons given, e.g. Angles on a straight line add up to 180, Angles in a triangle add up to 180, Base angles of an isosceles triangle are equal *and appropriate for their working*
3		$3x + 1$	P1 P1 A1	process to start to problem e.g. states perimeter algebraically, e.g. $2x + 3 + 5x - 2 + 5x + 3$ (dep P1) continues process e.g. simplifies to $12x + 4$ or divides their linear expression (linked to perimeter) by 4 cao

Question	Working	Answer	Mark	Notes
4		No with correct figures	P1	starts process e.g. starts to find volume by showing how to find a prism which is part of the shape, or shows how to find the complete cross-sectional area, e.g. (1 × 10 × 10) or (½ × 2 × 5) + (1 × 15) (= 20)
			P1	(dep P1) complete process shown to find the vol of the pool (= 200 m^3)
			P1	process to convert between litres and cm^3, e.g. 1 cm^3 = 100 000 litres or 200 000 litres
			A1	time taken, e.g. 40 000 sec, 666.66.. minutes, 11.11.. hours
			C1	comparison with correct comparable figures used, e.g. 36 000 < 40 000, 600 < 666.66…, or 11.11… (10 given)
5 (a)		20	M1	for complete proportion statement, e.g. 12 × 5 ÷ 3 oe
			A1	cao
(b)i		statement	C1	e.g. work rate of each man is the same / does not change over time
ii		statement	C1	e.g. if rate slower it takes longer / rate faster takes less time i.e. needs to refer to how the rate changes
6 (a)		complete	B1	1/6, 5/6 shown on left hand branches,
		tree diagram	B1	1/8, 7/8, 1/8, 7/8 shown on right hand branches
(b)		$\frac{35}{48}$	M1	$\frac{5}{6}\times\frac{7}{8}$ oe (or ft their tree diagram, dep on having probabilities shown)
			A1	oe (or ft tree diagram, dep on having probabilities shown)

Question	Working	Answer	Mark	Notes
7 (a)		$n^2 + 2$	M1 A1	begins to work with 2nd differences (e.g. shown as 2) or $n^2 + k$ ($k \neq 2$) cao
(b)		2502	B1	ft a quadratic expression
8		$8\frac{4}{5}$	M1 A1	writes as improper fractions, e.g. $\frac{11}{4}, \frac{16}{5}$ for $8\frac{4}{5}$, $\frac{44}{5}$ oe
9		$5(3p + 7q)$	P1 P1 A1	for start to process, e.g. derivation of algebra using information, e.g. $3p + 7q$ or 50 divided in the ratio 3: 7 for process to find mass of 1 litre of R, e.g. $(3p + 7q) \div (3+7)$ or 15 : 35 oe oe
10		21	P1 P1 A1	for start to process, e.g. use of a multiple of 1.1 or 110% oe or works with an area for A and increases by 10% for complete process, e.g. derivation of 121%, 1.21 oe or works with area of A and C to find percentage increase cao

Question		Working	Answer	Mark	Notes
11	(a)		Graph	B1 B1	for at least 5 of the 6 points plotted consistently within each interval for a fully correct cumulative frequency graph
	(b)		37 to 39	M1 M1 A1	for showing a method to find 25% of 80 (= 20) for evidence of reading from the graph from 60 (dependent on having a cf graph) estimate in the range 37 to 39 (ft their cf graph)
12			No (supported)	C1 C1 C1	for showing method to find total of all (30 × 14 or 420) or for bags (18 × 10 or 180) or using Mark's result 18 × 10 + 12 × 4 (dep C1) or showing method to find total for boxes, e.g. "420" – "180" (= 240) or both totals using Mark's mean e.g. 18 × 10 + 12 × 4 and 30 × 14 for showing complete solution, e.g. leading to 240 ÷ 12 and 20, or 420 and 180 + 48 = 228
13			Proof	M1 A1	for a fully complete method as far as finding two correct decimals that, when subtracted, give a terminating decimal (or integer) and showing intention to subtract, e.g. $9x = 3.9$ correct working to conclusion

Question		Working	Answer	Mark	Notes
14	(a)		46 to 50	P1 P1 A1	for start to process e.g. evidence of using volume, e.g. 1490 ÷ $\frac{4}{3}\pi r^3$ oe or use of estimates complete process , e.g. number = $\frac{3\times 1500}{4\times 3\times 2^3}$ arrives at estimate, e.g. 46 to 50
	(b)		would be less	C1	e.g. most divisors have been made smaller
15	(a)		300	B1 B1	for correct use of indices rules, e.g. sight of 3 from $\sqrt[4]{27\times 3}$ or sight of 10^2 for 300, 3×10^2 oe
	(b)		$\frac{25}{9}$	M1 A1	shows understanding of notation by working out one step, e.g. reciprocal or cube root (to both numbers). oe
16			$t=\frac{6+3k}{k-2}$	M1 M1 M1 A1	intention to multiply both sides by $t-3$ as the first step isolate terms in *t* ie by moving *t* terms to one side of the equation, and everything else to the other side factorise for *t* (dep on having an expression that can factorise for *t*). oe

Question	Working	Answer	Mark	Notes
17 (a)		$(x-y)(3x-3y-2)$	M1 A1	identify $x-y$ as a common factor , e.g. $(x-y)(\ldots\ldots..)$ oe
(b)		$\frac{3x}{2x-5}$	M1 M1 A1	factorise $2x^2+x-15$ [= $(2x-5)(x+3)$] or $3x^2+9x$ [= $3x(x+3)$] $\frac{1}{(2x-5)(x+3)}\times\frac{3x(x+3)}{1}$ cao
18		$\sqrt{3}$	C1 C1 C1	first step shown towards simplifying, e.g. $\frac{4\sqrt{3}}{1+\sqrt{3}\sqrt{3}}$ simplifies denominator, e.g. $\frac{4\sqrt{3}}{1+3}$ conclusion to get result
19		shows result	C1 C1 C1	shows expansion of the squares of any three consecutive numbers shown algebraically, e.g. $(4n^2+4n+1)$ or $(4n^2+12n+9)$ or $(4n^2+20n+25)$ simplifies , e.g. $12n^2+36n+35$ arrives at $12(n^2+3n+2)+11$ (oe) and concludes result

Question	Working	Answer	Mark	Notes
20		0.5	M1	writes $\overrightarrow{CD}$ as $-\mathbf{a} + \mathbf{b}$ or $\overrightarrow{MD}$ as ½ ($-\mathbf{a} + \mathbf{b}$) oe
			M1	writes $\overrightarrow{BM}$ as $\overrightarrow{BD}$ + $\overrightarrow{DM}$ or $\mathbf{b}$ − ½ (“$-\mathbf{a} + \mathbf{b}$”) or $\overrightarrow{BC}$ + $\overrightarrow{CM}$ or $\mathbf{a}$ + ½ (“$-\mathbf{a} + \mathbf{b}$”) where “$-\mathbf{a} + \mathbf{b}$” is ft their expression for $\overrightarrow{CD}$ or 2 × $\overrightarrow{MD}$
			A1	for stating k as 0.5, and supported by a vector method
21		width = $1\frac{2}{3}$ length = 9	P1	start to process e.g. establishes that $x^2 = xy + 66$
			P1	process to form equation in one variable, e.g. substitute in: e.g. $(3y + 4)^2 = y(3y + 4) + 66$ or $x^2 = 66 + (x(x - 4))/3$
			P1	process to arrive at equation to be solved $3y^2 + 10y - 25 = 0$ or $x^2 + 2x - 99 = 0$ oe
			P1	process to solve, e.g. $(3y - 5)(y + 5) = 0$ or $(x - 9)(x + 11) = 0$
			P1	selection of $y = 5/3$ or $x = 9$ as only solution, and subs to find other variable
			A1	y (width) = $1\frac{2}{3}$ (cm) and x (length) = 9 (cm)
22		proof	C1	if YG is the height of AYB and XH is the height of AXB then $YG=XH$ since the areas are the same
			C1	$XMH = GMY$ (opposite angles) or $XHM = YGM$ (both 90°) | identifies heights XH (=h) and GY (=H)
			C1	conclusion that triangles MHX and YGM are congruent | association of $\sin x = h/XM$ and $\sin x = H/YM$
			C1	conclusion and statement that $XM = MY$