Pearson

Mark Scheme

Mock Set 2

Pearson Edexcel GCSE Mathematics (1MA1)
Higher Tier (Calculator)
Paper 2H

edexcel

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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 2H (Calculator): Mock (Set 2) Mark Scheme

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P1
A1

P1
P1
A1</td><td>Process to find total cycling,, e.g. 100 – 52 – 35 (= 13)
Complete process to find female running, e.g. 45 – (30 + (“13” −9))
cao
OR
process to find male Gym (22) or male total (55)
complete process to find female running, e.g. 35 – (“55” – “22” – 9)
cao
Note: the two-way table (or frequency tree) does not need to be fully complete</td></tr>
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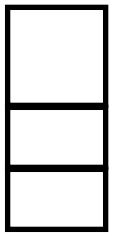
Question	Working	Answer	Mark	Notes
2		39%	P1	process to find proportion of group that are students , e.g. $\frac{15}{16}$
			P1	complete process to find the % of girls , e.g. $\frac{15}{16}\times\frac{5}{12}$
			A1	for 39(.0625)
				OR
			P1	process to scale up the ratio of teachers : students, so that students can be divided by 7+5 (=12),,
				e.g. 1 × 12 : 15 × 12 = 12 : 180 or a process to divide the "180" in the ratio 7:5,,
				e.g. 180 ÷ 12 × 7 (=105) **and** 180 ÷ 12 × 5 (=75)
			P1	complete process to find the % of girls , e.g. (75 ÷ (12+105+75)) × 100
			A1	for 39(.0625)
3		construction	B2	correct construction showing all necessary arcs.
			(B1)	(pair of intersecting arcs centred on *A* and *B*)
4 (a)		–1.2 & 3.2	B2	for both roots correct
			(B1)	(for one correct root)
(b)		(1, –5)	B1	cao

Question	Working	Answer	Mark	Notes
5		134	P1 P1 P1 P1 A1	process to find the distance around one or both ends of the track, e.g. $\pi \times 54$ (= 169.6460033) or ($\pi \times 54$) ÷ 2 (= 84.82300165) (dep on P1) complete process to find the total length of the track, e.g. 40 × 2 + "169.6460033" (= 249.6460033) process to find the circumference of wheel, e.g. $\pi \times 590$ (=1853.539666 mm) or $\pi \times 0.59$ (= 1.85353966 m) complete process to find the number of revolutions in consistent units,, e.g. "249.64…" ÷ "1.85…" or unrounded answer of 134.6860863 cao
6		Elevation	B2 (B1)	fully correct side elevation (a rectangle 4 high by 2 wide)
7 (a)		Shown	M1 M1 A1	for distance ÷ speed to find time, e.g. $(1.496 \times 10^{11}) \div (3 \times 10^{8})$ (= 498.666) (dep) for conversion to hours, e.g. "498.666" ÷ (60 × 60) 0.1385185185…
(b)		Explanation	C1	correct explanation, e.g. they have multiplied the indices rather than adding

Question	Working	Answer	Mark	Notes
8		$y = 3x - 1$	M1 A1	for $y = 3x + c$ or a line drawn with gradient 3 passing through A oe
9 (a)		Lauren £9537.20 £9545	P1 P1 P1 C1	process to find the value of one car at the end of one year, e.g. 13995 × 0.88 **or** 14495 × 0.87 process to find the value of one car at the end of 3 years, e.g. $13995 \times (0.88)^3$ **or** $14495 \times (0.87)^3$ complete process to find the value of both cars at the end of 3 years, e.g. $13995 \times (0.88)^3$ **and** $14495 \times (0.87)^3$ £9537.20(064) and £9545(.000985) and Lauren
(b)		Explanation	C1	appropriate explanation, e.g. explanation that her car will be worth less
10 (a)		72 – 80	M1 A1	for a single line segment with a positive gradient that could be used as a line of best fit or a horizontal line from 740 or a point plotted at (x, 740) where x is in the range 72 – 80 answer in range 72 – 80
(b)		Explanation	B1	explanation, e.g. 110 cm is outside of the range of the data, the line of best fit cannot be extended that far
11		4.7805×10^7	B1	cao
12		$(x + 11)(x - 11)$	B1	cao

Question	Working	Answer	Mark	Notes
13		Reasons	B1	e.g. Median plotted incorrectly
			B1	e.g. Range plotted rather than maximum or maximum nor plotted
14		$x = -4$ $y = 3.5$	M1	process to eliminate one variable or rearrangement of one equation leading to substitution (condone 1 arithmetic error)
			A1	for either $x = -4$ or $y = 3.5$
			M1	(dep on M1) correct substitution of found value or a correct process after starting again (condone one arithmetic error)
			A1	cao
15		Proof	M1	correct expansion or factorisation of a suitable expression for 2 consecutive integers,, e.g. $(n + 1)^2 - n^2 = n^2 + 2n + 1 - n^2$ or $(n + 1)^2 - n^2 = (n + 1 + n)(n + 1 - n)$
			A1	expansion or factorisation correctly simplified,, e.g. $2n + 1$ or $2n + 3$
			C1	correct conclusion drawn from fully correct working
16		Enlargement, scale factor –2, centre (4, 6)	B2	enlargement, scale factor –2, centre (4, 6)
			(B1)	(for 2 correct aspects) NB score B0 for more than one transformation

Question	Working	Answer	Mark	Notes
17		No with justification	P1	for one correct bound, e.g. 69.5, 70.5, 39.5, 40.5, 121.5, 122.5, 13.5, 14.5
			P1	for complete process to find the upper bound for the volume of the tank, e.g. 120.5 × 40.5 × 70.5 (= 344057.625)
			P1	for complete process to find the upper bound for the number of buckets, (upper bound for volume of tank ÷ lower bound for volume of bucket) e.g. "344057.625" ÷ 13500. Must be in consistent units **OR** correct process to compare the lower bound for 25 buckets of water with the upper bound for the volume of the tank, e.g. 13.5 × 1000 × 25 (= 337500)
			C1	correct conclusion based on correct calculations
18		2	M1	$T = \frac{k}{u^3}$ or $0.0096 = \frac{k}{5^3}$ or $T = \frac{1.2}{u^3}$
			M1	method to find u, e.g. $\sqrt[3]{\frac{1.2}{0.15}}$
			A1	cao
19		(– 5, – 7)	M1	method to start to complete the square, e.g. $(x + 5)^2$
			M1	$(x + 5)^2 – 7$
			A1	cao (dep on method seen)

Question	Working	Answer	Mark	Notes
20			M1 A1 C2 (C1)	for $ACD = 54°$, or $ADC = 66°$ (may be on diagram) for $CAD = 60°$ from correct working C2 for all correct reasons stated (C1 for one appropriate reason linked to a circle theorem used) Alternate segment theorem. Opposite angles of a cyclic quadrilateral add up to 180. Angles in a triangle add up to 180 Angles on a straight line add up to 180
21		$\frac{1}{46}$	M1 A1	$gf(x) = \frac{1}{3x^2 - 2}$ or $f(4) = 48$ oe
22		$c = a^2 + 8$ $d = 4a$	P1 A1 A1	process to expand $(a + \sqrt{8})^2$ given at least 3 terms correct $c = a^2 + 8$ $d = 4a$

Question	Working	Answer	Mark	Notes
23 (a)		shown	M1	method to find at least one root in [0, 1], e.g. $2x^3 + 4x - 3$ (= 0) and f(0) (= –3), f(1) (= 3) oe or f(0) = 0 and f(1) = 6 since there is a change in sign there must be at least one root in $0 < x < 1$ (as f is continuous), or 0 and 6 are either side of 3
(b)	$4x = 3 - 2x^3$ $x = \frac{3 - 2x^3}{4}$ $x = \frac{3}{4} - \frac{x^3}{2}$	shown	C1	for correct steps leading to rearranged equation
(c)	$x_1 = 0.75$ $x_2 = 0.5390625$ $x_3 = 0.671677351$	0.671677351	M1 M1 A1	for one correct iteration for two further iterations for 0.671(677351)

Question	Working	Answer	Mark	Notes
24		12.3	P1	for process to start, e.g. correct substitution into $\frac{1}{2}ab\sin C$, e.g. $0.5 \times 7 \times BC \times \sin 70 = 42$
			P1	(dep on P1) for process to rearrange to find BC, e.g. $BC = \frac{84}{0.5\times 7\times \sin 70}$ oe (= 12.77013327)
			P1	(dep on first P1) for process to find AB, e.g. $AB^2 = 72 + \text{“}BC\text{”}^2 - 2 \times 7 \times \text{“}BC\text{”} \times \cos 70$
			P1	for correct order of operations or 150.929(30436946)
			A1	for answer in range 12.28 – 12.3
25		9	P1	for process to start to solve problem, e.g. $\frac{7}{x+7}$ or $\frac{x}{x+6}$
			P1	for a correct product, e.g. $\frac{7}{x+7}\times\frac{x}{x+6}=\left(\frac{21}{80}\right)$
			P1	for processes to arrive at correct quadratic, e.g. $21x^2 - 287x + 882 = 0$
			P1	(dep on P2) correct substitution into the quadratic formula or factorisation of their quadratic
			A1	cao