Pearson

Mark Scheme

Mock Set 3

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

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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 3) Mark Scheme

Question	Working	Answer	Mark	Notes
1 (a)(i)		480 – 500	B1 B1	for line of best that can be used to estimate time of flight for 480 – 500 or ft lobf
(a)(ii)		reason	C1	for reason, e.g. lobf can vary, data is only a sample, scale cannot be read exactly
(b)(i)		9.4 – 9.8	M1 A1	for method to find gradient, e.g. triangle drawn with "change in distance ÷ change in time" for 9.4 – 9.8 or ft lobf
(b)(ii)		speed	C1	for speed (in miles per minute) oe
2 (a)		Shape drawn	M1 A1	shape drawn in correct orientation at (4, 5) (3, 7) (7, 7) cao
(b)		description	B1	ft for rotation, 90° anticlockwise, centre (5, 4) oe
3		29	P1 P1 P1 A1 B1	for process of forming an expression for one area, egg $2.5 \times 4x$, $7(2x - 3)$ for process of forming an equation, e.g. $10x = 7(2x - 3)$ or $10x = 14x - 21$ for complete process to solve the equation to find the value of $4x$ or the value of x for $4x = 21$ or $x = 5.25$ oe ft using found value of x or $4x$ in perimeter of **B**: $4x + 8$

Question	Working	Answer	Mark	Notes
4 (a)		$\frac{3}{4}, \frac{1}{4}$ $\frac{3}{4}, \frac{1}{4}, \frac{3}{4}, \frac{1}{4}$	B1 B1	for correct probabilities for A or for B or for first spin all correct
(b)		$\frac{3}{16}$	M1 A1	for process to find combined probability, e.g. $\frac{3}{4} \times \frac{1}{4}$ for $\frac{3}{16}$ oe, ft from diagram
5		355	M1 A1	for substitution, e.g. $\pi^2(10^2 - 8^2)$ for 355 (accept 355.3…)

Question	Working	Answer	Mark	Notes
6 (a)		$\frac{4}{7}$	B1	for $\frac{4}{7}$ oe
(b)	$\frac{4}{7}\times\frac{5}{8}$	$\frac{20}{56}$	P1 P1 A1	for start to process e.g. $\frac{5}{8}$ for correct process to multiply fractions, e.g. $\frac{4}{7}\times\frac{5}{8}$ ft from (a), e.g. $\frac{5}{14}$, $\frac{20}{56}$, $\frac{1120}{3136}$
7 (a)		$\frac{1}{5}$	B1	for $\frac{1}{5}$ oe
(b)		2.129754359	B1 B1	for 9.66(…) for 2.1297 – 2.1298
8		$t = 2(p^2 - a)$	M1 M1 A1	for correct first step, e.g. $p^2 = a + \frac{t}{2}$ for isolating term in t or dealing with the fraction, e.g. $p^2 - a = \frac{t}{2}$ or $2p^2 = 2a + t$ for $t = 2(p^2 - a)$ or $t = 2p^2 - 2a$

Question		Working	Answer	Mark	Notes
9			shown	M1	for use of parallel lines to find an angle, e.g. angle $BEF = x$
				M1	(dep M1) for second step, e.g. for angle $EBF = \frac{180 - x}{2}$ oe or angle $EFB = \frac{180 - x}{2}$ oe
				M1	for complete method leading to $w = 90 + \frac{1}{2}x$
				C1	for complete set of reasons linked to method: Alternate angles are equal Base angles of an isosceles triangle are equal, Angles in a triangle add up to 180 Angles on a straight line add up to 180
10	(a)		6.66×10^7	M1	for $6.5 \times 10^7 \times 1.006^4$
				A1	for 6.66×10^7 or $6.657(\ldots) \times 10^7$
	(b)		explanation	C1	for explanation, e.g. growth is compound not simple oe, increase in population changes each year oe
	(c)		Correct argument	M1	for method to find the common ratio, e.g. finds population in 3 successive yrs or 1.006
				C1	for convincing conclusion, e.g. terms are generated by multiplying previous term by 1.006 so a geometric progression is formed

Question		Working	Answer	Mark	Notes
11			4 : 10 : 21 : 7	P1 P1 A1	for process of using "twice", e.g. $\frac{3}{4} \times 2x$ or $\frac{1}{4} \times 2x$ or $(2 + 5) \times 2$ for combining ratios e.g. $\frac{2}{7}x : \frac{5}{7}x : \frac{3}{4} \times 2x : \frac{1}{4} \times 2x$ or correct but unsimplified ratio leading to given ratio cao
12			0.514	P1 P1 A1	for process to link 60% to a trigonometric ratio, e.g. tan $QPR = \frac{3}{5}$ or marks two suitable lengths on diagram for completing process to find angle QPR or length PQ, e.g. $QPR = 30.96\ldots$ or $PQ = \sqrt{3^2 + 5^2}$ for 0.514(…)
13			E, C, D, A, B	B3	for all correct (B2 for 3 or 4 correct B1 for 1 or 2 correct)
14			720	M1 A1	for $10 \times 9 \times 8$ oe cao

Question	Working	Answer	Mark	Notes
15	fd: 20 ÷ 28 = 0.8; 35 ÷ 20 = 1.75, 45 ÷ 15 = 3; 87 ÷ 15 = 5.8, 10 ÷ 10 = 1; 8 ÷ 10 = 0.8	histogram	C1 C1 C1	for 2 correct bars of different widths or at least 3 correct frequency densities for all bars in correct proportions or 4 correct bars with axes scaled for fully correct histogram with axes scaled
16 (a)		Shown	M1 A1	for method to establish at least one root in (2, 3), e.g. f(x) = $x^3 - 3x^2 + 3$, f(2) (= −1), f(3) (= 3) oe for supportive explanation e.g. “since there is a change in sign there must be at least one root in $2 < x < 3$ (as f is continuous)” oe
(b)		Shown	C1	for at least $x^3 = 3x^2 - 3$ and no incorrect steps.
(c)		2.153	M1 A1 A1	for $x_1 = \sqrt[3]{3 \times 2^2 - 3}$ for $x_1 =$ 2.080(…) for $x_2 =$ 2.153(…)
17		7.47	P1 A1	for process to find volume scale factor, e.g. $1 : \frac{500}{150}$, $\left(\frac{500}{150}\right)^{\frac{1}{3}} \times 5$ 7.46 – 7.47

Question	Working	Answer	Mark	Notes
18		2, −36	P1 P1 A1	for process to expand $(x - 8)(x + 4)$ or $(x - a)^2$ for process to find value of a (may be implied by $a = 2$) cao
19		44.6	P1 P1 P1 A1	for process of finding arc length, e.g. 25 – 9 − 9 (= 7) for process of linking arc length to circumference., e.g. $\frac{7}{\pi \times 18} = \frac{x}{360}$ for complete process, e.g. $x = \frac{7}{"\pi \times 18"} \times 360$ for 44.5 to 44.6
20		0.0654011543	B1 M1 A1	for stating bound for p, 5.365 or 5.375 or bound for s, 2.85 or 2.95 for use of two lower bounds in equation for 0.0654…

Question	Working	Answer	Mark	Notes
21		Shown	M1	for use of sine to find height, e.g. $\sin C = \frac{h}{b}$
			M1	for use of expression for the height of the triangle, e.g. area $= \frac{1}{2} \times$ base $\times$ height $= \frac{1}{2}ab\sin C$
			C1	for complete proof
22		13.7	P1	for setting up problem, assignment of variables, forming an equation, e.g. $2xy = 40$ oe
			P1	for forming a second equation, e.g. $2x + 2x + 2y + 2y + xy + xy = 100$ oe
			P1	for eliminating one variable, e.g. $4x + \frac{80}{x} + 40 = 100$ or $4x^2 - 60x + 80 = 0$ or $x^2 - 15x + 20 = 0$
			P1	for solving equation to find x or y, e.g. $x = \frac{15 \pm \sqrt{145}}{2}$ (=1.479...or 13.520….)
			P1	for process to find length of diagonal, e.g. $\sqrt{2^2 + 1.479..^2 + 13.520..^2}$
			A1	for 13.7(4…)