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# Mark Scheme

## Mock Set 4

Pearson Edexcel GCSE (9 – 1)  
In Mathematics (1MA1)  
Higher (Calculator) Paper 2H

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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 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.

**11 Number in brackets after a calculation**

Where there is a number in brackets after a calculation E.g.  $2 \times 6 (=12)$  then the mark can be awarded **either** for the correct method, implied by the calculation **or** for the correct answer to the calculation.

**12 Use of inverted commas**

Some numbers in the mark scheme will appear inside inverted commas E.g. "12"  $\times$  50 ; the number in inverted commas cannot be any number – it must come from a correct method or process but the candidate may make an arithmetic error in their working.

**13 Word in square brackets**

Where a word is used in square brackets E.g. [area]  $\times$  1.5 : the value used for [area] does **not** have to come from a correct method or process but is the value that the candidate believes is the area. If there are any constraints on the value that can be used, details will be given in the mark scheme.

**14 Misread**

If a candidate misreads a number from the question. Eg. uses 252 instead of 255; method or process marks may be awarded provided the question has not been simplified. Examiners should send any instance of a suspected misread to review.

### **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 awarded for a fully correct statement(s) with no contradiction or ambiguity
- 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

Paper: 1MA1/2H				
Question	Answer	Mark	Mark scheme	Additional guidance
1	3360, 4200	M1  A1	for a complete method to find one part of the ratio eg $7560 \div 9 \times 4$ (=3360) or $7560 \div 9 \times 5$ (=4200)  3360, 4200	If numbers are not in the correct order award M1 only
2	(a)(i) 1, 3, 5, 15 (ii) 3 (iii) 1, 3, 5, 9, 15, 21  (b) $\frac{8}{11}$	B1 B1 B1  M1  C1	cao cao cao  for $\frac{8}{a}$ where $a > 8$ or $\frac{b}{11}$ where $b < 11$  $\frac{8}{11}$ oe	Accept numbers in any order  Accept numbers in any order  Accept the equivalents of 0.72, 0.727..., 72% or 72.7(2727...)%
3	14.5 to 14.53	M1  M1  A1	for substituting into Pythagoras' theorem eg $16^2 = 6.7^2 + a^2$ or $\sqrt{16^2 - 6.7^2}$  for a complete method to find the unknown length eg $\sqrt{256 - 44.89}$  Answers in the range 14.5 to 14.53	Method must show they understand to square; $\sqrt{16 \cdot 16 - 6.7 \cdot 6.7}$ is sufficient
4	(a) 104 000 (b) $6 \times 10^{-2}$ (c) 0.65	B1 A1 M1  A1	cao cao $(300.3 \times 10^6) \div (4.62 \times 10^8)$ (=0.65) oe cao	Accept $6.5 \times 10^{-1}$

Paper: 1MA1/2H				
Question	Answer	Mark	Mark scheme	Additional guidance
5	15488	P1	for showing a process to depreciate by 20% eg $0.8 \times 25000 (=20000)$ oe	Could be shown in several stages eg $25000 - (25000 \times 20 \div 100)$  Or alternative methods eg $"20000" - (20000 \times (100 - 12) \div 100)$
		P1	for showing a process to depreciate by 12% as a second stage eg $"20000" \times 0.88 (= 17600)$	
		A1	cao	
6	7.5	P1	for using $\pi \times 4^2 \div 2 (=25.13..)$	"25.13" must come from a correct method involving $\pi$ .  Accept answers in the range 7.5 to 7.6 If an answer is given in the range but then incorrectly rounded award full marks.
		P1	for finding the area of the trapezium eg $64 - "25.13" (=38.86..)$	
		P1	for finding the sum of $AB$ and $DC$ eg $"38.86.." \div 5 \times 2 (=15.54..)$	
		P1	for complete process to find the missing length eg $"15.54.." - 8 (=7.546..)$	
		A1	7.5 to 7.6	
7	4.5	P1	for starting to use inverse proportionality eg $3 \times 4 \times y = 4200$ <b>or</b> $4200 \div (3 \times 4) (=350)$	Accept $4\frac{1}{2}$ or 4 hours 30 minutes
		P1	for a complete method eg $3150 \div ("350" \times 2) (=4.5)$	
		A1	4.5 oe	

Paper: 1MA1/2H				
Question	Answer	Mark	Mark scheme	Additional guidance
8	12000	P1  P1  A1	for $12\,180.9 = 1.005^3 \times P$ <b>or</b> $12\,180.9 \div 1.005$ (=12 120.29..)  for $12\,180.9 \div "1.005^3"$ (=12 000)  cao	Do not award this mark unless working is shown leading to the correct answer.
9	20	P1  P1  P1  A1	for showing a process to find the interior angle of the pentagon eg $(5 - 2) \div 5 \times 180$ (=108)  for finding the interior angle of the unknown polygon eg $360 - 90 - "108"$ (=162)  for a complete method to find $n$ eg $360 \div (180 - "162")$ (=20)  cao	Award if 108 is shown as an interior angle on the diagram (eg at <i>SPT</i> ) but <b>not</b> contradicted by other working or placed incorrectly Award if 162 is shown as an interior angle on the diagram (eg at <i>RPT</i> ) but <b>not</b> contradicted by other working or placed incorrectly  Do not award this mark unless working is shown leading to the correct answer.
10	$\frac{3}{5}, \frac{8}{5}$	M1  A1  M1  A1	for a method to eliminate one variable  for either $x = \frac{3}{5}$ or $y = \frac{8}{5}$ oe  (dep) for substituting found value in one of the equations <b>or</b> appropriate method after starting again  for $x = \frac{3}{5}$ and $y = \frac{8}{5}$ oe	(condone one arithmetic error)  Accept equivalent forms of these answers.  (condone one arithmetic error)  Accept equivalent forms of these answers.



Paper: 1MA1/2H					
Question	Answer	Mark	Mark scheme	Additional guidance	
11	(a)(i)	box plot	B1	for a fully correct box plot	Shown in the table or otherwise associated with the correct values. “in context” means some reference to number of lorries
	(ii)	20,170,200	B1	smallest value 20, lower quartile 170 and median 200	
	(b)	Statements	C2	for two comments one about median and one about IQR; one must be in context.	
			(C1	for one comment about median or about IQR)	
12	25.5	P1	for process to find $DH$ eg $15 \div DH = \sin 64$	all 3 elements of $\sin 64$ , $DH$ and 15 must be present in a correct equation all 3 elements of $\tan 28$ , $AD$ and 15 must be present in a correct equation  If an answer is given in the range but then incorrectly rounded award full marks.	
		P1	for process to find $AD$ eg $AD \div 15 = \tan 28$		
		P1	(dep on P1) for a full method to find angle $AHD$ eg $\tan^{-1} (“7.9756” \div “16.68902911”)$		
		A1	Answer in the range 25.5 to 25.6		
13	(a)	-4	B1	cao	Accept answer written as $u^{2r-3t}$
	(b)	$2r - 3t$	M1	for $a^{2r}$ or $a^{3t}$	
			A1	$2r - 3t$ oe	
	(c)	$16\sqrt{2}$ or $8\sqrt{8}$	M1	for $8^{\frac{3}{2}}$ or 22.62... or $n^2 = 8^3$ or $n^{\frac{1}{3}} = 8^{\frac{1}{2}}$	Accept the answer written as $\sqrt{512}$
			A1	$16\sqrt{2}$ or $8\sqrt{8}$	

Paper: 1MA1/2H				
Question	Answer	Mark	Mark scheme	Additional guidance
14	$\frac{18}{77}$	P1  P1  A1	for starting the process eg using $\frac{3}{7}$ and $\frac{6}{11}$ <b>or</b> finding the lowest multiple  for a complete process eg $\frac{3}{7} \times \frac{6}{11}$  $\frac{18}{77}$ oe	Accept equivalent fractions, 0.23..... or 23.(....)%
15	232	M1  C1	$14 \times 8 (=112)$ <b>or</b> $10 \times 12 (=120)$  $14 \times 8 + 10 \times 12$ oe	
16 (a)	Graph	M1  M1  A1	Sketches $y = x^2$  for a partially correct reflection of $y = x^2$ in the line $y = x$  for $y = x^2$ and $y^2 = x$ sketched.	An approximate sketch of the graph is all that is needed; no other information required.  The line $y = x$ does not need to be shown. If only part of $y=x^2$ has been drawn and therefore only part of the reflection shown, then award M0 M1.  Curves must pass through the origin. The label C is not needed if the intention is clear.
(b)	A,D,G,E	B3  (B2  (B1	for all 4 correct  for 3 correct)  for 2 correct)	

Paper: 1MA1/2H				
Question	Answer	Mark	Mark scheme	Additional guidance
17	201468 or 201469	P1  P1  P1  A1	for substitution eg $200720 = 1.04(200000 - G)$ <b>or</b> $200720 \div 1.04 (=193000)$  (dep P1) for process to isolate $G$ eg $G = 200000 - (200720 \div 1.04) = 7000$  (dep P2) for a full process to find $P_{17}$ using “7000”  201468 or 201469	
18	$-1 \frac{1}{2} < x < 1$    Sketch drawn	M1  A1 C2 (C1)	for a first step to solve the quadratic e.g. factorisation: $(2x + 3)(x - 1)$ <b>or</b> using the formula $\frac{-1 \pm \sqrt{1^2 - 4 \times 2 \times (-3)}}{2 \times 2}$  for $-1 \frac{1}{2}$ and 1 Solution set drawn for $1 \frac{1}{2} < x < 1$  for a correct solution set drawn for two values (not the correct solutions) or an attempt to draw the correct solution set for $1 \frac{1}{2} < x < 1$ with some errors.	Any attempt must at least show a circle at two values, and some attempt to add lines.
19	$\frac{2a+3b}{5}$	M1  M1  A1	for $\overrightarrow{AB} = \mathbf{b} - \mathbf{a}$ <b>or</b> $\overrightarrow{BA} = \mathbf{a} - \mathbf{b}$ <b>or</b> the correct use of the ratio  for a complete method eg $\frac{3}{5}(\mathbf{b}-\mathbf{a})+\mathbf{a}$  $\frac{2a+3b}{5}$ oe	

Paper: 1MA1/2H					
Question	Answer	Mark	Mark scheme		Additional guidance
20 (a)	Show	M1	for a method to show $ff(x)$ as an unsimplified fraction eg $ff(x) = \frac{1-\frac{1-x}{1+x}}{1+\frac{1-x}{1+x}}$		Note M marks can be awarded in either order
		M1	for a full method to write either the numerator or denominator as a single fraction eg $\frac{1+x-(1-x)}{1+x+(1-x)}$		
		C1	for a complete method with correct working		
(b)	$f^{-1}(x) = \frac{1-x}{1+x}$	B1	for $f^{-1}(x) = \frac{1-x}{1+x}$		
21	$\frac{1}{3}$	P1	for showing $x^2 + y^2 = \frac{13}{36}$ oe	for showing $\frac{x^2}{n} + \frac{y^2}{n} = \frac{13}{36}$ oe	Assuming $x = P(R)$ and $y = P(Y)$
		P1	for setting up an equation in $x$ eg $(1-x)x = \frac{1}{4}$ oe	for using $x^2 + y^2 = 13$	
		P1	for a process to solve the equation in $x$	for showing eg $\frac{y}{n} - 1 - \frac{y}{n} = \frac{1}{4}$ oe	
		P1	for a full method to find $P(Y)$		
		A1	$\frac{1}{3}$ from correct working		
					An answer of $\frac{1}{3}$ alone is insufficient for any marks; it must be supported by working shown.

