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Mark Scheme

Pearson Edexcel GCSE (9-1)
Mathematics – 1MA1
Trial of Specimen Papers (Set 1)

Paper 1 (1MA1/1H): Non-Calculator
Higher Tier

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November 2015

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 then mark both methods **as far as they are identical** and award these 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

Paper 1MA1_1H				
Question	**Working**	**Answer**	**Notes**	
1		42	P1 process to start problem solving eg forms an appropriate equation P1 complete process to solve their equation A1 cao	
2		4 m^2	B1 substitution into formula eg $35 = \frac{140}{A}$ oe A1 4 stated C1 (indep) units stated	
3		0.22	P1 begins process of subtraction of probabilities from 1 A1 oe	
4		48	P1 begins to work with rectangle dimensions eg $l+w=7$ or $2\times l+w$ (=11) C1 shows a result for a dimension eg using $l=4$ or $w=3$ P1 begins process of finding total area eg 4 × "3" × "4" A1 cao	
5		explanation	M1 works with volume eg 240000 M1 uses conversion 1 litre = 1000 cm^3 M1 uses 8000 eg vol ÷ 8000 (=30) M1 uses "30" eg "30" × 2.50 C1 for explanation and 75 stated	begins working back eg 70÷2.50 (=28) uses conversion 1 litre = 1000 cm^3 uses 8000 eg "28"× 8000 (=224000) works with vol. eg 240000 for explanation with 240000 and 224000

Paper 1MA1_1H					
Question		**Working**	**Answer**	**Notes**	
6	(a)		Sharif	B1	Sharif with mention of greatest total throws
	(b)		No (supported)	P1 A1 P1	starts working with proportions Conclusion: correct for Paul, but not for the rest; or ref to just Paul's results selects Sharif or overall and multiplies P(heads)×P(heads) eg ¾ × ¾
	(c)	Tot: H 300 T 100	$\frac{9}{16}$	A1	oe
7	(a)		$\frac{\sqrt{3}}{2}$	B1	
	(b)		6	M1 A1	starts process eg $\sin 30 = \frac{x}{12}$ answer given
8	(a)		5.7×10^{26} to 6×10^{26}	B1 M1 A1	uses estimates eg 1.9 or 2 process of multiplication eg 0.57×10^{27} or 2×0.3 between 5.7×10^{26} and 6×10^{26}
	(b)		explanation	C1	eg overestimate a number is rounded up

Paper 1MA1_1H			
Question	**Working**	**Answer**	**Notes**
9		'Yes' with correct working	P1 begins process of working with mean eg 35×10 (=350) or 33×11 (=363) or 10×(35−33) (=20) or 11×(35−33) (=22) P1 (dep) finding the difference eg "363"−"350", or 33 – "20" or 35 – "22" C1 'Yes' with 13 from correct working
10 (a)		5	P1 begins to work with scaling factors (eg 5) or ÷6 A1 cao
(b)		10	P1 works with 1:2 ratio eg no. red counters is 30÷2 (=15) A1 ft
11		25	B1 cao
12		37.5 mph	P1 shows process of finding first distance eg 50 × 3 (=150) P1 shows process of finding time for second part eg 150 ÷ 30 (=5 h) P1 shows process of working with av sp. (dist ÷ time) (= 300÷(3+5) = 300÷8) C1 conclusion with supporting evidence, correct notation and units eg 37.5 mph
13		$\sqrt[3]{4m^2-1}$ or $\sqrt[3]{(2m+1)(2m-1)}$	M1 clear fractions or remove sq rt sign as first step M1 (dep) clear fractions and remove sq rt sign A1 $(k=)\sqrt[3]{4m^2-1}$ or $\sqrt[3]{(2m+1)(2m-1)}$
14		$\frac{-2}{13}$	M1 multiplies all terms by 2 or 3 to reconcile fractions as first step M1 complete process of expanding brackets and isolating x term A1 cao

Paper 1MA1_1H			
Question	**Working**	**Answer**	**Notes**
15		$\frac{2x-5}{x+5}$	M1 factorising to give $(2x - 5)(x + 1)$ M1 factorising to give $(x + 5)(x + 1)$ A1 cao
16		D, A, B, C	B2 B2 for all correct (B1 for at least 2 correct)
17		SAS	M1 links angles PQR and PRQ (eg isosceles triangle) with full reasons M1 links TR and SQ with full reasons C1 gives full conclusion for congruency eg SAS
18		75π	P1 starts process by using $\frac{250}{3}\pi$ and $\frac{1}{2}\times\frac{4}{3}\pi r^3$ to find radius P1 starts process using ½ curved surface area eg $(4 \times \pi \times \text{“5”}^2) \div 2$ P1 complete process shown eg $(4 \times \pi \times \text{“5”}^2) \div 2 + (\pi \times \text{“5”}^2)$ A1 for 75π
19		$\sqrt{31}$	M1 expands brackets eg $36 + 6\sqrt{5} - 6\sqrt{5} - \sqrt{25}$ (=31) M1 rationalises the denominator eg using $\sqrt{31}$ with numerator & denominator A1 for $\sqrt{31}$

Paper 1MA1_1H					
Question	**Working**	**Answer**	**Notes**		
20		proof (supported)	M1 M1 A1 C1	for any two consecutive integers expressed algebraically eg $n + 1$ and n (dep) for the difference between the squares of "two consecutive integers" expressed algebraically eg $(n + 1)^2 - n^2$ for correct expansion and simplification of difference of squares eg $2n + 1$ for showing statement is correct (with supportive evidence) eg $n + n + 1 = 2n + 1$ and $(n + 1)^2 - n^2 = 2n + 1$	for sight of $p^2 - q^2 = (p - q)(p + q)$ for deduction that $p - q = 1$ for linking these two statements eg substitution of 1 for $p - q$ for fully stated proof and deduction eg $p^2 - q^2 = 1 \times (p + q) = p + q$
21		$\frac{10x - x^2}{45}$	P1 P1 P1 P1 A1	for $\frac{x}{10}$ or $\frac{10-x}{10}$ or $\frac{x-1}{9}$ or $\frac{10-x}{9}$ or $\frac{x}{9}$ or $\frac{9-x}{9}$ seen on diagram or in a calculation for $\frac{x}{10} \times \frac{10-x}{9}$ or $\frac{10-x}{10} \times \frac{x}{9}$ for $\frac{x}{10} \times \frac{10-x}{9} + \frac{10-x}{10} \times \frac{x}{9}$ (dep on P3) for beginning to process the algebra $\frac{10x - x^2}{45}$ oe	for $\frac{x}{10} \times \frac{x-1}{9} + \frac{10-x}{10} \times \frac{9-x}{9}$ for $1 - (\frac{x}{10} \times \frac{x-1}{9} + \frac{10-x}{10} \times \frac{9-x}{9})$

Paper 1MA1_1H			
Question	**Working**	**Answer**	**Notes**
22			M1 states AB as $6\mathbf{b} - 3\mathbf{a}$ M1 for $AX = \frac{1}{3}AB$ or $\frac{1}{3}$"$(6\mathbf{b} - 3\mathbf{a})$" or ft to $2\mathbf{b} - \mathbf{a}$ M1 for $\overrightarrow{CY} = \overrightarrow{CB} + \overrightarrow{BY}$ or $6\mathbf{b} + 5\mathbf{a} - \mathbf{b}$ $(=5\mathbf{b} + 5\mathbf{a})$ M1 for $\overrightarrow{CX} = 3\mathbf{a} +$ "$2\mathbf{b} - \mathbf{a}$" or $\overrightarrow{CX} = 6\mathbf{b} - \frac{2}{3}$"$(6\mathbf{b} - 3\mathbf{a})$" $(= 2\mathbf{a} + 2\mathbf{b})$ C1 for $\frac{2}{5}\overrightarrow{CY} = \frac{2}{5}(5\mathbf{a} + 5\mathbf{b}) = 2(\mathbf{a} + \mathbf{b}) = \overrightarrow{CX}$
23		$y = -\frac{1}{2}x + \frac{3}{2}$	P1 for a process to find the gradient of the line AB P1 (dep) for a process to find the gradient of a perpendicular line eg use of $-1/m$ P1 (dep on P2) for substitution of $x=5$, $y=-1$ A1 equation stated oe

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