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Mark Scheme
Practice papers

GCSE Mathematics
Paper 5AM2H_01

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NOTES ON MARKING PRINCIPLES

1 All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.

2 Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.

3 All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e if the answer matches the mark scheme. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.

4 Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.

5 Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.

6 Mark schemes will indicate within the table where, and which strands of QWC, are being assessed. The strands are as follows:

i) *ensure that text is legible and that spelling, punctuation and grammar are accurate so that meaning is clear*
Comprehension and meaning is clear by using correct notation and labeling conventions.

ii*) select and use a form and style of writing appropriate to purpose and to complex subject matter*
Reasoning, explanation or argument is correct and appropriately structured to convey mathematical reasoning.

iii) *organise information clearly and coherently, using specialist vocabulary when appropriate*.
The mathematical methods and processes used are coherently and clearly organised and the appropriate mathematical vocabulary used.

7 With working

If there is a wrong 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.

If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.

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, and discuss each of these situations with your Team Leader.

If there is no answer on the answer line then check the working for an obvious answer.

Any case of suspected misread loses A (and B) marks on that part, but can gain the M marks. Discuss each of these situations with your Team Leader.

If there is a choice of methods shown, then no marks should be awarded, unless the answer on the answer line makes clear the method that has been used.

8 Follow through marks

Follow through marks which involve a single stage calculation can be awarded without working since you can check the answer yourself, 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.

9 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: e.g. incorrect canceling of a fraction that would otherwise be correct

It is not appropriate to ignore subsequent work when the additional work essentially makes the answer incorrect e.g. algebra.

Transcription errors occur when candidates present a correct answer in working, and write it incorrectly on the answer line; mark the correct answer.

10 Probability

Probability answers must be given a fractions, percentages or decimals. 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.

11 Linear equations

Full marks can be gained if the solution alone is given on the answer line, or otherwise unambiguously indicated 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.

12 Parts of questions

Unless allowed by the mark scheme, the marks allocated to one part of the question CANNOT be awarded in another.

13 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 includes all numbers within the range (e.g 4, 4.1)

Guidance on the use of codes within this mark scheme
M1 – method mark A1 – accuracy mark B1 – Working mark C1 – communication mark QWC – quality of written communication oe – or equivalent cao – correct answer only ft – follow through sc – special case dep – dependent (on a previous mark or conclusion) indep – independent isw – ignore subsequent working

Question		Working	Answer	Mark	Notes
1			225, 125, 75, 150, 10	3	M1 for 10 ÷ 4 (=2.5) A2 for all correct (A1 for at least 2 values correct)
2			1000	2	M1 for $73^2 \times 62 \div 330$ A1 for 1000 – 1001
*3			56	4	M1 for 180 – 106 (=74) M1 for 180 – 74 – 50 A1 cao C2 for angles on a straight line add up to 180^o **and** angles in a triangle add up to 180^o **and** corresponding angles (C1 for one or two correct reasons) **or** C2 for exterior angles of a triangle = sum of two interior opposite angles **and** corresponding angles (C1 for one correct reason)
4			74p	3	M1 for 1.28 ÷ 2 (=0.64) M1 for (340 – 3 × '64') ÷2 oe A1 for 74p or £0.74
5	(a)i		0.8	1	B1 0.8 oe
	(a)ii		0.37	2	M1 for 1 – 0.17 – 0.26 – 0.2 oe A1 0.37 oe
	(b)		34	2	M1 for 200 × 0.17 A1 cao

Question		Working	Answer	Mark	Notes
6			20.70	4	M1 for π × 170 (534.07) or π × 1.7 (=5.34..) A1 for 6 m seen M1 for '6' × 3.45 A1 cao
*7			No	4	M1 for 30 ÷ 6 (=5) or 24 ÷ 6 (=4) or 15 ÷ 6 (=2.5) M1 for '5' × '4' × '2' **or** '5' × '4' × '3' A1 for 40 bricks C1 ft for decision with supporting working
8			correct region shaded	4	M2 for both lines drawn 2 cm ± 0.2 from both fences (M1 for line drawn 2 cm ± 0.2 from either fence **or** lines drawn parallel to both fences but wrong distance) M1 for arc of circle drawn any radius centre *T* within rectangle (condone circle) A1 for correct region within guidelines of overlay
9			720, 1200	4	M1 for 2400 ÷ 5 × 4 oe (=1920) M1 for '1920' ÷ '(3 + 5)' (=240) M1 for '240'× 3 or '240'× 5 A1 for 720 and 1200
10			$P = 4b + 5r$	3	M1 for $4b$ or $5r$ M1 for $4b + 5r$ A1 cao

Question		Working	Answer	Mark	Notes
11			26 m	4	M1 for $2x + 2(x + 30)$ oe M1 for $2x + 2(x + 30) < 165$ A1 for $x < 26.25$ A1 ft for 26 **Alternative scheme** M1 for values for length and width where length = width+30 **and** perimeter evaluated M1 for a second trial using different values for length and width where length = width + 30 **and** perimeter evaluated A2 for 26
12			54400 cm^2 or 5.44 cm^2	5	M1 for $\pi \times 55^2$ oe M1 for $2 \times \pi \times 55 \times 130$ oe M1(dep on 1 previous M1) for $\pi \times 55^2 + 2 \times \pi \times 55 \times 130$ oe A1 for 54400 – 54428.1 or 5.44 – 5.44281 B1 for correct units
13	(a)		50	2	M1 for $1.8 \times 10 + 50$ A1 cao
	(b)		correct graph	3	B3 correct graph (B2 use of gradient or y intercept for table of values with at least 2 correct values) (B1 for at least one correct value)
	(c)		Yes	2	B1 for conversion of 40^oF or 40^oC using graph or table C1 for explanation ft their conversion

Question		Working	Answer	Mark	Notes
14	(a)		proof	2	M1 for $x \times x \times (x + 7)$ seen A1 for expansion of brackets and completion of proof
	(b)	5 - 300 6 – 559 5.5 – 378(.125) 5.4 – 361(.584) 5.3 – 345(.507) 5.2 – 329(.888) 5.1 – 314(.721) 5.15 – 322(.24)	5.1	4	B2 for correct evaluation of trial $5 < x < 6$ (B1 for correct evaluation of trial for $x = 5$ or $x = 6$) B1 for a further trial evaluated correctly for $5 < x < 5.1$ B1 for 5.1 NB: No working then no marks
15	(a)		$\frac{7}{8}, \frac{3}{10}, \frac{1}{20}, \frac{19}{20}$	2	B1 for $\frac{7}{8}$ B1 for $\frac{3}{10}, \frac{1}{20}, \frac{19}{20}$
	(b)		$\frac{7}{80}$	2	M1 for $\frac{1}{8} \times \frac{7}{10}$ A1
16			945	3	M1 for $\sqrt{\frac{666}{296}}$ oe **or** $\sqrt{\frac{296}{666}}$ oe M1 for $\left(\sqrt{\frac{666}{296}}\right)^3 \times 280$ oe A1 cao

Question		Working	Answer	Mark	Notes
17	(a)		4.75 , 7, 7.1875	2	B2 for all values correct; accept 4.75 7.1875 rounded to at least 2 sig figs (B1 for any one value correct)
	(b)		correct graph	2	M1 ft for points plotted A1 for correct curve
	(c)		0.45, 1.9	2	B1 ft for 0.45 B1 ft for 1.9 (SC: If no marks scored then M1 for horizontal line drawn at $y = 4.5$)
18			16.8	6	M1 for $\cos 62 = \frac{3.1}{BC}$ M1 for $BC = 3.1 \times \cos 62$ M1 for $AB = 3.1\tan 62$ (=5.83..) M1 for '5.83'$^2 + 8.4^2$ A1 for BC = 6.603… or BD = 10.225 A1 for 16.8 – 16.83

Question		Working	Answer	Mark	Notes
19	(a)		$S = \frac{8000}{f^2}$	3	M1 for $S \propto \frac{1}{f^2}$ or $S = \frac{k}{f^2}$ M1 for $500 = \frac{k}{4^2}$ A1 for $S = \frac{8000}{f^2}$
	(b)		8	2	M1 for substitution into $S = \frac{8000}{f^2}$ A1 cao
20	(a)		80	1	B1 cao
	(b)		15203	2	M1 for 80×1.3^{20} A1 for 15203 or 15204
	(c)		30	2	M1 for 130% A1 cao
21			1500	4	M1 for $\frac{1}{2} \times \frac{4}{3} \times \pi \times 8^3$ or $\frac{1}{3} \times \pi \times 8^2 \times 12$ M1 for $\frac{1}{2} \times \frac{4}{3} \times \pi \times 8^3 + \frac{1}{3} \times \pi \times 8^2 \times 12$ (=802.24…+1072.32… = 1876.6…) M1 for '1876.6…'× 0.8 A1 1500 – 1501.3

Question		Working	Answer	Mark	Notes
22			8.94	3	B1 for 253.5 or 28.35 seen M1 for upper bound ÷ lower bound A1
23	(a)		3	3	M1 for tangent drawn M1 for correct method to find gradient A1 2.5 – 3.5
	(b)		$33^1/_3$	3	M1 for area split into trapeziums M1 for correct area of one trapezium A1 26 – 35

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