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Mark Scheme (Results)

November 2010

GCSE

GCSE Mathematics (5384H)
Paper 14H

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NOTES ON MARKING PRINCIPLES

1 Types of mark

M marks: method marks A marks: accuracy marks
B marks: unconditional accuracy marks (independent of M marks)

2 Abbreviations

cao – correct answer only
ft – follow through
isw – ignore subsequent working
SC: special case
dep – dependent
oe – or equivalent (and appropriate)
indep - independent

3 No working

If no working is shown then correct answers normally score full marks
If no working is shown then incorrect (even though nearly correct) answers score no marks.

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If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.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

5 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.

6 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.

7 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.

8 Linear equations

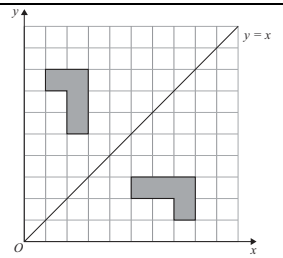
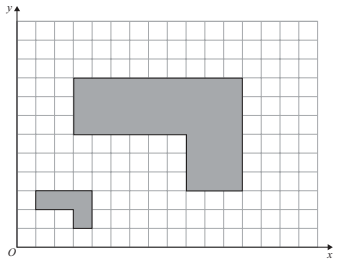
Full marks can be gained if the solution alone is given on the answer line, or otherwise unambiguously indicated in working (without contradiction elsewhere). Where the correct solution only is shown substituted, but not identified as the solution, the accuracy mark is lost but any method marks can be awarded.

9 Parts of questions

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

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

5384H/14H					
Question		Working	Answer	Mark	Notes
1	(a)	3×100	300	2	M1 for 3×100 or $100 \div 6 \times 18$ oe A1 cao
	(b)	$2 \div ½ \times 6$	24	2	M1 for $2 \div ½ \times 6$ oe A1 cao
2	(a)			2	B2 cao (B1 for shape in the correct orientation or for shape above the line, elongated or shortened by one square with either top or bottom in the correct position and correct orientation)
	(b)			3	B3 for correct enlargement in correct position (B2 for enlargement SF 3 in incorrect position or enlargement, centre *O,* but different scale factor) (B1 for 4 lines enlarged by SF 3 or enlargement, not from *O*, different scale factor)
3		$8 \div 20 \times 100$	40	2	M1 for $8 \div 20 \times 100$ oe A1 cao
4	(a)	$2x = 10 - 3 = 7$ $x = 7 \div 2$	3.5	2	M1 for $2x = 10 - 3$ or $2x = 7$ or $(10 - 3) \div 2$ A1 for 3.5 oe
	(b)(i)		c^{11}	2	B1 accept c^{5+6}
	(ii)		e^{8}		B1 accept e^{12-4}

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Question	**Working**	**Answer**	**Mark**	**Notes**
5		2.42927(0474)	2	B2 for 2.42927 … (B1 for 19.56 or 8.0518 or 2.43 or 2.429 or 2.4292 or 2.4293 or digits 242927 or $\frac{97800}{40259}$ seen)
6		−2, −1, 0, 1, 2	2	B2 for −2, −1, 0, 1, 2 (B1 for one extra or one missing) A1 cao
7 (a)		$7x$	1	B1 for $7x$ or $7 \times x$ oe
(b)		$5y$	1	B1 for $5y$ or $5 \times y$ oe
(c)		$T = 7x + 5y$	1	B1 f.t. dep on B1 in (a) or (b), for $T = 7x + 5y$ oe
8 (a)			2	B2 for correct front elevation (B1 for the correct diagram with extra row or extra column) Internal lines need not be drawn
(b)			2	B2 for correct plan - it can be rotated (B1 for any rectangle that is not a square) Internal lines need not be drawn

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Question		**Working**	**Answer**	**Mark**	**Notes**
9	(a)	$k - 5 = 24 \div 3$ $k = 8 + 5$	13	2	M1 for $k - 5 = 24 \div 3$ or $3 \times k - 3 \times 5$ oe A1 cao
	(b)	$x^2 = 162 \div 2$ $x = \sqrt{81}$	9	2	M1 for $162 \div 2$ or 81 seen A1 for 9 (accept –9 or ± 9)
10		$= 14.56 \times 10^{-16}$	1.456×10^{-15}	2	M1 for digits 1456×10^n or $A \times 10^{-15}$, $1 < A < 2$ A1 for 1.456×10^{-15}
11			A and 3 B and 2 C and 4 D and 1	2	B2 for all 4 correct (B1 for 2 correct)
12		$19.5 \times 1000 \div 210 = 19500 \div 210$ $= 92.8(5714\ldots)$ or $92 \times 210 = 19320 = 19.32$ / $93 \times 210 = 19530 = 19.53$ / or $19500 \div 92 = 211.95$ $19500 \div 93 = 209.67$	explanation	3	M1 for converting between m/ and / correctly or for 0.21 or 19500 seen M1 for '19500' ÷ '210' or $92 \times$ '210' or $93 \times$ '210' or '19500' ÷ 92 A1 for a worded explanation with correct calculations
13	(a)		–15, (–8), –7,–6, 1, (20)	2	B2 for all 4 correct (B1 for 2 or 3 correct)
	(b)		graph	2	B2 for fully correct graph B1 ft for 6 'points' plotted correctly ± 1square B1 for smooth curve plotted through all '5 or 6 plotted points' provided B1 awarded in (a)

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Question	**Working**	**Answer**	**Mark**	**Notes**
14	Angle *ADC* = 180 − 128 = 52° *x* = 2 × 52° or reflex angle *AOC* = 256° *x* = 360 − 256	104	2	M1 for valid method to get angle *ADC* or 128 × 2 or 256° seen (can be on the diagram) A1 cao
15	*AB* = 8cos 37° = 8 × (0.7986…) = 6.389…	6.38 – 6.39	3	M1 for cos37 = $\frac{AB}{8}$ M1 for *AB* = 8 cos 37° or 6.4 seen (dep on 1st M1) A1 for 6.38 – 6.39 OR M1 for $\frac{AB}{\sin 53} = \frac{8}{\sin 90}$ M1 for *AB* = $\frac{8\sin 53}{\sin 90}$ or 6.4 seen (dep on 1st M1) A1 for 6.38 – 6.39 S.C. M2 A0 for 6.12 (radians) or 6.69 (grad)
16	35.5 × 26.5	940.75	3	B1 for sight of 35.5 or 26.5 or 35.4999(…) or 26.4999(…) M1 for UB length × UB width where 35.**49** ≤ UB length ≤ 35.5 26.**49** ≤ UB width ≤ 26.5 A1 for 940.74 – 940.75 (or $\frac{3763}{4}$)
17	$\frac{3x+2x}{6}=8$	9.6	2	M1 for $\frac{3x+2x}{6}=8$ oe or $\frac{x}{2}\times 6+\frac{x}{3}\times 6=8\times 6$ or $\frac{x}{2}\times 2+\frac{x}{3}\times 2=8\times 2$ or $\frac{x}{2}\times 3+\frac{x}{3}\times 3=8\times 3$ A1 for 9.6 oe (accept $\frac{48}{5}$)

5384H/14H				
Question	**Working**	**Answer**	**Mark**	**Notes**
18	$a \times (3 + n) = 6a - n$ $3a + an = 6a - n$ $an + n = 6a - 3a$ $n(a + 1) = 3a$	$n = \frac{3a}{a+1}$	4	M1 for multiplying both sides by $3+n$ M1 for correctly isolating 'terms in n' from $6a - n$ = any one of $a(3 + n)$, $3a + an$, $3a + n$ or $3 + an$ M1 for correctly factorising 'terms in n' A1 for $\frac{3a}{a+1}$ oe
19 (a)	½ (8.3 × 10.5) sin 62° = 43.575 × 0.88294… = 38.47444136	38.5	2	M1 for ½ (8.3 × 10.5) sin 62° A1 for 38.45 – 38.5 o SC: M1 AO for ± 32.2 (rad) or 36.0 (grad)
(b)	$8.3^2 + 10.5^2 - 2(8.3)(10.5) \cos 62$ = 68.89 + 110.25 – 174.3(0.46947…) = 179.14 – 81.828… *OR* = $\sqrt{97.3111...}$ = 9.8646320	9.86	3	M1 for correct substitution into cosine rule M1 dep for correct order of evaluation (excluding square root) (can be implied by 97.3 seen) A1 for 9.86 – 9.865 SC: M2 AO for 7.86 (rad) or 9.01(grad)

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