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Mark Scheme (Results)

March 2011

GCSE

GCSE Mathematics (Modular) – 5MB2F
Paper 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If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.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

5MB2F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
1	(a)		Kite drawn	1	B1 Accept a rhombus, square, etc.
	(b)		Parallelogram	1	B1
2	(a)		9	1	B1 cao
	(b)		0.6,2.8,4.71,13.4	1	B1 cao
	(c)		0.7	1	B1 cao
3	(a)		5	1	B1 cao
	(b)		Line of symmetry	1	B1 for line of symmetry
4	(i)		Acute	2	B1 cao
	(ii)		53°		B1 for an angle 51°-55°
5	(i)		130	2	B1 for 130 cao
	(ii)		Reason		B1 for reason eg "angles on a (straight) line (sum to) 180° NB: those underlined are the essential elements of an answer.

5MB2F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
6	(a)		$3c$	1	B1 cao
	(b)		$2x + 6y$	2	B2 for $2x + 6y$ (B1 for $2x$ or $6y$)
7	(a)		Pattern	1	B1
	(b)	7,10,13,16,19,22,25,28,31,34,37,40 43,46,49; or $3n+4$	49	2	M1 for method eg counting up in 3s (to at least pattern number 6; allow errors if intention is clear), diagram extension (ft), use of $3n+4$ (could be shown as part of a valid calculation eg 15×3) A1 49
8		Ticket sales: $16 \times 100 = £1600$ Meals: $12 \times 100 = 1200$ Fixed costs: $230 + 150 + 30 = 410$; $410+1200=1610$ or $1600-230-150-30=1190$; $1190-1200 = -10$ Total $410 + 1200 = £1610$ (<£1600) OR £1610÷100=£16.10 ticket price (>£16) OR £1600 – 410 – 1200 = - £10 (or £10 needed) OR £1600-1200 = £400 (< £410 costs)	No. £1610 >£1600 £410 >£400	4	M1 for addition of 230, 150, 30 (or + 410) (=422 or 800) M1 for 12×100 (= 1200) A1 for £1610 total costs or £16.10 ticket price needed. C1 (dep on at least M1) for correct comparison and statement that "£1610">"£1600" and that costs will not be covered. OR M1 for subtraction of 230, 150, 30 (or - 410) M1 for 12×100 (=1200) A1 for £400 left or -£10 C1 (dep on at least M1) for correct comparison and statement that "£410">"£400" and that costs will not be covered.

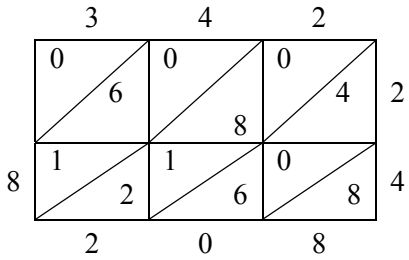
5MB2F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
9	(a)	-7 to -9	2	1	B1 Accept -2
	(b)	8 to -7	15	1	B1 cao
10	(a)	$\frac{1}{2} \times \frac{1}{5} =$	$\frac{1}{10}$	1	B1 oe
	(b)	$\frac{1}{2} + \frac{3}{8} = \frac{4}{8} + \frac{3}{8} =$	$\frac{7}{8}$	2	M1 common denominators with at least one numerator correct or an unsimplified answer, or a fraction that is not completely processed eg $\frac{1 \times 8 + 2 \times 3}{2 \times 8}$ OR conversion to correct decimals: 0.5 + 0.375 A1 for $\frac{7}{8}$ or 0.875
11	(a)		12	1	B1 cao
	(b)		200 cm^3	3	M1 for $10 \times 4 \times 5$ A1 cao B1 (indep) for cm^3

5MB2F_01				
Question	**Working**	**Answer**	**Mark**	**Notes**
12	London: £15, £34, £26 (£75) → 450, 1020, 780 (2250) KC Prague: 450, 750, 810 KC (2010KC) → £15, £25, £27 (£67) £ to KC is ×30; KC to £ is ÷30.	Yes. Cheaper in Prague (More in London)	5	M1 conversion method (× or ÷ as appropriate) or evidence of use of graph (seen, or implied, by at least lines or evidence of conversion by marks on axes) for at least one figure. M1 (dep) conversion applied to 3 figures or totals (converted figures must be stated, marks on graph insufficient) A1 converted figures shown (all three individual items or totals converted correctly; NB: no tolerance on graph) M1 totalling converted amounts C1 (dep on at least M1) comparison of "**totals"** and correct conclusion Eg "2250KC">"2010KC", "£75">"£67" so cheaper to buy in Prague.
13	Zparts: 150 is 15 boxes; 15 × £35 = £525 CompParts: 150÷11 is 13.6 so 13 offers (150-13)×£4=137×4=£548 OR 13×11=143; 150-143=7 extra (13×10+7)=137; 137×4=£548 OR 150×4=£600 13 offers so 13 free: 13×4=52; 600-52=£548	Zparts £525 CompParts £548 so Zparts cheaper	5	M1 for 15 × £35 (= £525) M1 for attempt to account for 1 free (eg ÷11 or listing with 10 charged and one not) M1 for ×4 (may be shown as ×40) A1 for totals of £548 and £525 OR unit costs of £3.64/£3.63 and £3.50 (oe) C1 (dep on at least M1) for making comparison figures clear and giving correct deduction.

<table>
<tr><th colspan="5">5MB2F_01</th></tr>
<tr><th>Question</th><th>Working</th><th>Answer</th><th>Mark</th><th>Notes</th></tr>
<tr>
<td>14</td>
<td>
<table>
<tr><td>x</td><td>-3</td><td>-2</td><td>-1</td><td>0</td><td>1</td></tr>
<tr><td>y</td><td>-3</td><td>-1</td><td>1</td><td>3</td><td>5</td></tr>
</table>
</td>
<td>Line</td>
<td>3</td>
<td>(Table of values)
M1 for at least 2 correct attempts to find points by substituting values of x.
M1 ft for plotting at least 2 of their points (any points plotted from their table must be correct)
A1 for correct line between -3 and 1

(No table of values)
M2 for at least 2 correct points (and no incorrect points) plotted OR
line segment of 2x+3 drawn (ignore any additional incorrect segments)
(M1 for at least 3 correct points with no more than 2 incorrect points)
A1 for correct line between -3 and 1

(Use of y=mx+c)
M2 for at least 2 correct points (and no incorrect points) plotted OR
line segment of 2x+3 drawn (ignore any additional incorrect segments)
(M1 for line drawn with gradient of 2 OR line drawn with a y intercept of 3 and a positive gradient)
A1 for correct line between -3 and 1</td>
</tr>
</table>

5MB2F_01				
Question	**Working**	**Answer**	**Mark**	**Notes**
15	342 ×24 6840 1368 8208 24 ×342 7200 960 48 8208  300 40 2 6000 800 40 20 1200 160 8 4 6000+800+40+1200+160+8=8208	8208	3	M1 for a complete method with relative place value correct. Condone 1 multiplication error, addition not necessary. M1 (dep) for addition of all the appropriate elements of the calculation. A1 cao M1 for a complete grid with not more than 1 multiplication error, addition not necessary (inside numbers) M1 (dep) for addition of all the appropriate elements of the calculation (eg outside numbers) A1 cao M1 for sight of a complete partitioning method, condone 1 multiplication error, addition not necessary. M1 (dep) for addition of all the appropriate elements of the calculation. A1 cao

5MB2F_01				
Question	**Working**	**Answer**	**Mark**	**Notes**
16 (a)		21	1	B1 cao
(b)		$4n+1$	2	M1 for $4n + k$ ($k \neq 1$) A1 oe NB $n = 4n + 1$ gets M1 only.
17	$300 \div (2 + 3 + 5) \times 5 =$ $300 \div 10 \times 5 =$	150	2	M1 for $300 \div (2 + 3 + 5)$ or 300×5 or 30 seen or 60:90:150 A1 cao

5MB2F_01				
Question	**Working**	**Answer**	**Mark**	**Notes**
18	LCM (40, 24) = 120 Rolls 120 ÷ 40 = Sausages 120 ÷ 24 = OR Rolls 40 is 2 × 2 × 2 (×5) Sausages 24 is 2 × 2 × 2 (×3) 40, 80, **120**, 160, 200, 240, 280 24, 48, 72, 96, **120**, 144, 168	Rolls (packs) 3 Sausages (trays) 5 Hot dogs 120	5	M1 attempts multiples of either 40 or 24 (at least 3 but condone errors if intention is clear) M1 attempts multiples of both 40 and 24 (at least 3 of each but condone errors if intention is clear) M1 (dep on M1) division by 40 or 24 or counts up multiples. (implied if one answer correct or answers reversed) A1 rolls (packs) 3, sausages (trays) 5 OR any multiple of 3,5 A1 hot dogs 120 or ft on both of their packs or ft 'common multiple' OR M1 expansion of either number into factors M1 demonstrates one of the expansions that includes 8 oe M1 demonstrates a 2nd expansion that includes 8 oe A1 cao for rolls (packs) 3, sausages (trays) 5 A1 hot dogs 120
19	Bottom / top is 5 × 10 = 50; 50 × 2 = 100; 280 – 100 = 180 Other dimensions: 10 + 10 + 5 + 5 = 30; 180 ÷ 30 =	6	4	M1 recognition that the bottom/top is 5 × 10 (= 50), 50 seen M1 for 280 – 2 × "50" (= 180) M1 for "180" ÷ "other dimensions" or valid attempt to find height using these dimensions A1 cao

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