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Mark Scheme (Results)

March 2012

GCSE Mathematics (2MB01) Foundation
5MB2F (Non-Calculator) 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If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.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)		8 000 000	1	B1 cao
	(b)		Seven thousand, one hundred and two	1	B1 cao
	(c)		15.5	1	B1 cao
	(d)		420	1	B1 cao
2		$4 \times 3 + 2 \times 5$ $= 12 + 10$	22	2	M1 for 4×3 or 2×5 or 12 or 10 A1 cao
3	(a)	$\frac{12}{20}$	3/5	2	M1 for a fraction equivalent to $\frac{12}{20}$, unsimplified A1 cao [SC: B1 for $\frac{2}{5}$ if M0 scored]
	(b)		6 cells shaded	1	B1 for any 6 cells shaded
4	(a)		64	1	B1 cao
	(b)		1000	1	B1 for 1000 or one thousand
	(c)		$4 <$ answer < 5	1	B1 for $4 <$ "answer for $\sqrt{20}$" < 5 [accept answer in words, eg. "greater than 4 and less than 5"]

5MB2F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
5	(a)		$5g$	1	B1 or $g5$
	(b)		$4m$	1	B1 or $m4$
	(c)		$20ef$	1	B1 or equivalent simplified form
6	(i)		8.8 to 9.2 cm	3	B1 for answer in the range 8.8 to 9.2 cm inclusive
	(ii)		Midpoint within guidelines		B1 for midpoint shown within guidelines
	(iii)		Perpendicular (overlay)		B1 for perpendicular drawn anywhere on the line PQ so that the angle is between 88 and 92 degrees
7	(i)		64	2	B1 cao
	(ii)		Vertically opposite angles		B1 for 'vertically **opposite angles**' or '**vertically opposite** angles'
8	(a)		1, 2, 3, 6, 9, 18	2	B2 for all 6 factors and no extra ones, ignore repeats [B1 for 4 correct factors in a list containing no more than 6 numbers or all 6 correct factors with one extra incorrect factor]
	(b)		21, 28	1	B1 cao

5MB2F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
9	(a)	38.5 – 36.8 OR Counting on the scale from '38.5' to 36.8	1.7	2	M1 for 38.5 A1 for 1.7
	(b)		Temp. at 37.3	1	B1 for temp shown at 37.3 ± 0.1
10	(a)(i)		A symmetrical diagram	3	M1 for at least two tiles placed so that they are symmtrical with the given black tiles or with each other. A1 for a correct positioning of the 4 tiles.
	(ii)	44 – 10	34		B1 cao
	(b)	6.20 × 5	31.00	2	M1 for 6.20 × 5 oe A1 for 31.00 (accept 31)

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Question		**Working**	**Answer**	**Mark**	**Notes**
11	(a)		**0**, 1.20, 6, **12, 18**, 24, 30, **36**	2	B2 for a fully correct table [B1 for 2 correct entries]
	(b)		Single line from (0, 0) to (30, 36)	2	B2 for a fully correct graph [B1 for at least 4 points plotted correctly or for a single line from (0,0) or for a short straight line segment joinning any two correct points]
	(c)	250 × 1.2 OR 30 × 10 from table Or for values read from the graph and used	300	2	M1 for correct use of any point the table or any point on the graph, eg 250 × 1.2 or 30 × 10 oe A1 **ft** for 300
*12		630 ÷ 3 = 210 630 – 210 = 420 100 + 30 × 12 = 100 + 360 = 460	Arnold's Computers (since it is £40 cheaper there)	4	M1 for 630 – 630 ÷ 3 oe or 420 seen M1 for 100 + 30 × 12 oe or 460 seen A1 for 420 and 460 C1 (dep on m1) for drawing a correct conclusion from their two computer prices

5MB2F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
13	(a)	20 + 28 10 × 8/5 = 16 60 – 16 OR 60 × 5/8 = 37.5 37.5 – 10	48 44 km or 27.5 miles	1 3	B1 cao B1 for 5 miles = 8 km or equivalent statement or use of conversion factor 8/5 or 5/8 M1 for 10 × '8/5' (= 16) or 60 × '5/8' (= 37.5) A1 for 44 km or 27.5 miles, accept76 km or 47.5 miles (units must be quoted)
14	(a)(i) (ii) (b)		27 Add 5 $5n - 3$	2 2	B1 cao B1 for 'add 5' oe B2 for $5n - 3$ (oe, including unsimplified) (B1 for $5n + k$, $k \neq -3$ or k is absent, or $n = 5n - 3$)

5MB2F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
*15		500 × 1000 × 400 = 200 000 000 20 × 50 × 40 = 40 000 200 000 000 ÷ 40 000 = 5000 OR (500 ÷ 20) × (1000 ÷ 50) × (400 ÷ 40) = 25 × 20 × 10 = 5000	Proof	4	B1 for a correct unit conversion, could be seen on the diagram or in working M1 for 500 × 1000 × 400 or 200 000 000 or 20 × 50 × 40 or 40 000 or 5 × 10 × 4 or 200 or 0.2 × 0.5 × 0.4 or 0.04 M1(dep) for '200 000 000' ÷ '40 000' C1 for fully correct working leading to final answer of 5000 OR B1 for a correct unit conversion, could be seen on the diagram or in working M1 for (500 ÷ 20) or (1000 ÷ 50) or (400 ÷ 40) or at least two of 25, 20, 10 seen M1(dep) for '25' × '20' × '10' C1 for fully correct working leading to final answer of 5000

5MB2F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
16		30 ÷ 12 = 2.5 220 × 2.5 40 × 2.5 150 × 2.5 2 × 2.5	550 100 375 5	3	M2 for any one of 220 + 220 + 110 or 40 + 40 + 20 or 150 + 150 + 75 or 2 + 2 + 1 or 550 or 100 or 375 or 5 A1 for all 4 correct values OR M1 for 30 ÷ 12 oe or sight of 2.5 M1(dep) for 220 × '2.5' or 40 × '2.5' or 150 × '2.5' or 2 × '2.5' oe or 550 or 100 or 375 or 5 A1 for all 4 correct values OR M1 for 220 ÷ 12 or 40 ÷ 12 or 150 ÷ 12 or 2 ÷ 12 or $18\frac{1}{3}$ or $3\frac{1}{3}$ or 12.5 or $\frac{1}{6}$ seen M1(dep) for '$18\frac{1}{3}$' × 30 or '$3\frac{1}{3}$' × 30 or '12.5' × 30 or '$\frac{1}{6}$' × 30 or 550 or 100 or 375 or 5 A1 for all 4 correct values **Continued on next page**

5MB2F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
					OR M1 for M1 for 220 ÷ 2 or 40 ÷ 2 or 150 ÷ 2 or 2 ÷ 2 or 110 or 20 or 75 or 1 seen M1(dep) for '110' × 5 or '20' × 5 or '75' × 5 or '1' × 5 or 550 or 100 or 375 or 5 seen A1 for all 4 correct values (SC: B2 for 275, 50, 187.5 and 2.5 or B1 for 275 or 50 or 187.5 or 2.5, if M0 scored)
*17		$x+2 + 2x+3 + 2x + x + 3 + 2$ $= 6x + 10$ $=2(3x + 5)$ OR Half way round × 2 = $(x+2 + 2x+3) \times 2$ $= 3x + 5$ Perimeter = $2(3x + 5)$	Proof	4	B1 for $x + 2$ or $2x + 3$ seen M1 for perimeter = "x+2" + "2x+3" + $2x + x + 3 + 2$ oe A1 for $6x + 10$ C1 (dep) for factorising $6x + 10$ to give $2(3x + 5)$ OR B1 for $x + 2$ or $2x + 3$ seen M1 for $2 \times$ ("x+2" + "2x+3") A1 for $6x + 10$ C1 (dep) for doubling $3x + 5$ to give perimeter = $2(3x + 5)$

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