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Mark Scheme (Results)

March 2013

GCSE Mathematics (2MB01) Foundation
5MB3F (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If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.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

5MB3F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
1	(a)		$\frac{1}{10}$	1	B1 for $\frac{1}{10}$ or equivalent fraction
	(b)		0.25	1	B1 for 0.25
2	(a)		35.91	1	B1 for 35.91
	(b)		1.2	1	B1 for 1.2
	(c)		6.859	1	B1 for 6.859
	(d)		1.6	1	B1 for 1.6
3	(a)		3	1	B1 for 3
	(b)		5.8	1	B1 for 5.8 oe
	(c)		85	1	B1 for 85
4	(a)		hexagon	1	B1 for hexagon
	(b)		5	1	B1 cao

5MB3F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
5			No with (£)120 & (£)130 or (£)10 difference	4	M1 for correct method to work out morning sales of the daffodils or of the tulips eg 75 × 0.8 (= 60) eg 50 × 0.9 (= 45) eg 105 M1 for correct method to work out total afternoon sales eg (120 – 75) × 0.2 + (80 – 50) × 0.2 (=15) eg 9 + 6 (=15) M1 (dep on M1) correct method to work out total sales eg total morning sales + total afternoon sales A1 for no (profit) **and** (£)120 & (£)130 or (£)10 difference OR M1 for correct method to work out the morning sales or the afternoon sales of either daffodils or tulips eg 75×0.8 (= 60) eg (120 – 75) × 0.2 (= 9) eg 50 × 0.9 (= 45) eg (80 – 50) × 0.2 (= 6) M1 for correct method to work out profit/loss on tulips or on daffodils eg 60 + 9 (= 69) eg 45 + 6 (= 51) M1 for correct method to work out profit/loss on tulips **and** on daffodils A1 for no (profit) **and** (£)120 & (£)130 or (£)10 difference NOTE: working can be in pence or £

5MB3F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
6	(a)		reflection	1	B1 for correct reflection
	(b)		2	1	B1 for 2
	(c)		parallel lines	1	B1 for two parallel lines drawn
	(d)		A and F or B and D	1	B1 for A and F or B and D
*7			no and reason	3	M1 adding 6.25 km, 4 km 750 m and 8½ km M1 addition with consistent and correct use of units C1 for no and a correct comparison eg no and 19.5 (km) oe eg no and 0.5 (km) oe
8			B and F	2	B2 for B and F and no extras (B1 for B or F)

5MB3F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
9			3	3	M1 for 90×0.2 (= 18) M1(dep) for $(90 \times 0.2) \div 6$ or '18' ÷ 6 A1 cao OR M1 for $6 \div 0.2$ (= 30) M1(dep) for $90 \div (6 \div 0.2)$ or $90 \div$ '30' A1 cao OR M1 for $6 \div 90$ (= 0.0666… seen) M1(dep) for $0.2 \div (6 \div 90)$ A1 cao OR M1 for $6 \times (1 \div 0.2)$ or 6×5 or (= 30) M1(dep) for '30'+'30'+'30' A1 cao
10		140÷1000 = 0.14 (litres) OR 1.2×1000 = 1200 (ml)	no and reason	2	M1 for 140 ÷ 1000 C1 for no (oe) and 0.14 seen OR M1 for 1.2 × 1000 C1 for no (oe) and 1200 seen OR M1 1*l* = 1000m*l* C1 for no with correct explanation

5MB3F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
11	(a)		2436	1	B1 for 2436
	(b)		£267.96	3	M1 for '2436' × 11 or '2436' × 0.11 A1 for digits 26796 or f.t. from (a) A1 for £267.96 or 26 796p
12	(a)		9	1	B1 cao
	(b)		12	1	B1 cao
	(c)		4	1	B1 cao
	(d)		22	2	M1 for 2 × 5 (= 10) and 3 × 4 (= 12) A1 cao
13			68	4	M1 for 112 ÷ 8 (= 14) M1 for combining litres to get a target of '14' eg 5+5+3+1 eg 3+3+3+3+... M1 for correct method to find at least two different costs for tins of paint totalling 14 or 15 OR for correct method to find the cost of 14 litres of paint using at least two different sizes of tin A1 for (£) 68 OR M1 for 5 × 8 (= 40) or 3 × 8 (= 24) M1 for combining the coverage areas to get a target of 112 eg 40+40+24+8 eg 24+24+24+24+ ... M1 for correct method to find at least two different costs for tins of paint totalling 14 or 15 OR for correct method to find the cost of 14 litres of paint using at least two different sizes of tin A1 for (£) 68

5MB3F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
14			accurate drawing	3	B3 for complete triangle with all three aspects: 8 cm line (± 2mm) 30° angle (± 2°) 50° angle (± 2°) (B2 for all 3 aspects but incomplete triangle, or complete triangle with 2 aspects only) (B1 for one aspect)
*15			Scheme B gives most	4	M1 for correct method to find 3% of 2500 M1 for correct method to compare Scheme A and Scheme B for the same length of time A1 for correct answers for both schemes C1 f.t. (dep on a comparison for the same length of time) for Scheme B gives the most OR M1 for correct method to convert £5.35 into a % of 2500 M1 for for correct method to compare Scheme A and Scheme B for the same length of time A1 for 2.5(68)(%) C1 f.t. (dep on a comparison for the same length of time) for Scheme B gives the most

5MB3F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
16			correct tessellation	2	B2 for 6 or more additional shapes tessellating (B1 for 4 or 5 shapes tessellating correctly)
17	(i)		30	1	B1 cao
	(ii)		40	1	B1 cao
18	(a)		$4x + 1 = 19$	2	M1 for $x + x + 1 + 2x$ (= 19) A1 for $4x + 1 = 19$ following working
	(b)		4.5	2	M1 for subtracting 1 from both sides or for dividing each term by 4 A1 for 4.5 or 4½
	(c)		14.5	2	M1 for ('4.5' + 1) + 2 × '4.5' or 19 – '4.5' or 3 × '4.5' + 1 A1 for 14.5 or 14½ or ft '4.5'
19			correct shaded region	2	B1 for arc of circle, centre oak tree, radius 4cm (± 2mm) B1 for shaded region where the tree can be planted, bounded by sides of garden and arc of circle centre oak tree

5MB3F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
20			144	3	M1 for exterior angle = 360 ÷ 5 (= 72) M1 (dep) for '72' + '72' or 2 × '72' A1 cao **OR** M1 for interior angle = $\frac{3\times180}{5}$ (= 108) M1 (dep) for 360 – 2 × '108' A1 cao **OR** M1 for interior angle = $\frac{3\times180}{5}$ (= 108) or exterior angle = 360 ÷ 5 (= 72) M1 (dep) for $180-\left(\frac{3\times180}{5}-\frac{360}{5}\right)$ or 180 – ('108' – '72') A1 cao

5MB3F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
*21		Cost of wages, rent and other expenses last year 92 000+10 800+7000 =109 800 Cost of wages, rent and other expenses this year 1.075× 92 000 $+\frac{7}{9}\times 10\,800$ + 7000÷2 = 98 900+8400+3500 = 110 800 Costs are more this year, so she cannot increase the amount she spends on goods	no, with working and reason	4	M1 for an attempt to calculate using 7.5% and 92000 (eg 7.5% of 92000 or increase of 7.5%) eg 92000+6900 or 98900 M1 for an attempt to find a fractional amount of 10800 eg $\frac{7}{9}\times 10800$ or 8400 or $\frac{2}{9}\times 10800$ or 2400 M1 for complete method of increasing 92000 by 7.5%, finding $\frac{7}{9}$ of 10800 and halving 7000 with at least all of these three added together. C1 for statement eg "no" with both 110800 & 109800 seen OR "no" with "1000 more" OR "no" and compares 181800 with 182800 oe

5MB3F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
22	(a)		$-3, -2, -1, 0, 1$	2	B2 for all 5 values and no others (B1 for 4 correct values and no others or $-4, -3, -2, -1, 0, 1$ or $-3, -2, -1, 0, 1, 2$)
	(b)		$-2 \leq x < 4$	2	B2 for $-2 \leq x < 4$ (B1 for $-2 \leq x$ or $x < 4$ or $-2 < x \leq 4$) [Note: accept the use of any letter other than x throughout and ignore any attempt to list integer values]
23			6.87	4	M1 for $\pi \times 4 \times 4$ or $\pi \times 4^2$ or $\pi \times 16$ or $\pi r^2 = 50.26...$ M1 for 'πr^2' $\div 2$ M1 for $8 \times 4 -$ '$\pi r^2 \div 2$' A1 for 6.86 – 6.88
24	(a)		$5, -4, -3$	2	B2 for 5, −4 and −3 (B1 for 5 or −4 or −3)
	(b)		correct curve	2	B2 for fully correct curve (B1 ft for at least 5 points plotted correctly)

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