Mark Scheme (Results)

November 2010

GCSE

GCSE Mathematics (Modular) 5MB2F
Unit 2 - Foundation

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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If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.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)		3109	1	B1 cao
	(b)		6 hundredths	1	B1 for 6 hundredths or 0.06 or $\frac{6}{100}$
	(c)		4300	1	B1 cao
2	(a)	$2 \times 16.50 + 13.50$	46.50	2	M1 for 2 × 16.50 + 13.50 A1 cao
	(b)	$3 \times 20 - "46.50"$	13.50	2	M1 for $3 \times 20 - "46.50"$ A1 ft
3	(a)		C	1	B1 cao
	(b)		D	1	B1 cao
	(c)		2	1	B1 cao
4	(a)		0.25	1	B1 cao
	(b)		$\frac{3}{4}$	1	B1 cao
	(c)		9 squares shaded	1	B1 for any 9 squares shaded

5MB2F/01				
Question	Working	Answer	Mark	Notes
5 (a)		Pattern drawn	1	B1 for correct pattern
(b)		37	2	M1 for continuation or diagrams A1 cao **OR** M1 for sequence of numbers seen 4, 7, 10, 13, 16 etc A1 cao **OR** M1 for use of formula $3n + 1$ with $n = 12$ A1 cao
(c)		No	2	M1 for attempt to divide 69 by 3 A1 for 'No' and comment on the fact that this is the number needed for pattern 23 **OR** M1 for Starts at 3 and builds up to 61 A1 for 'No' and comment on fact that 61 sticks are needed for pattern 20 NB: 0 for an answer that is an incorrect mathematical statement, or an answer that has an incorrect conclusion (eg "yes")

5MB2F/01					
Question		Working	Answer	Mark	Notes
6	(i)		4 or 5	1	B1 for 4 or 5
	(ii)		30 or 40	1	B1 for 30 or 40
	(iii)		29	1	B1 cao
7	(a)		Pair of parallel lines	1	B1 for any pair of parallel lines marked.
	(b)		Acute	1	B1 cao
	(c)		Correct angle marked	1	B1 cao
8	(a)		-1	1	B1 cao
	(b)		14	2	M1 for $5 - -9$ or $-9 - 5$ A1 for 14 or -14
	(c)		No + reason	2	M1 for attempt to find middle of -7 and 3 eg, may see -7 and 3 on number line **or** $(-7-3) \div 2$ **or** $(-3-7) \div 2$ A1 for 'No' and correct reason

5MB2F/01				
Question	Working	Answer	Mark	Notes
9*	$65 + 110 = 175$ $65 + 65 = 130$ $2 \times 28 + 25 + 21$	£102	4	M1 for some idea of putting lengths together $65 + 65$ oe or $65 + 110$ oe seen, or, or finding the total length of wood eg 65×5+220 (=545) or 7 pieces of wood from which those needed can be cut C1 for a combination of lengths of wood that will allow all lengths to be cut, for example, 2 lengths of 1.8m, 1 length of 1.5m, 1 length of 1m C1 ft for clearly showing a combination of allowed prices for their chosen lengths eg $2 \times 28 + 25 + 21$ A1 cao
10*	$25 \div 5$, $15 \div 5$, $12 \div 5$, $5 \times 3 \times 2$	No	4	M2 for 5, 3, 2 (could be on the diagram) (M1 for $25 \div 5$ or $15 \div 5$ or $12 \div 5$) C2 QWC: No as only 30 whole bricks will fit oe statement **or** No and dimensions of a possible box given **or** No as only 2 layers of 15 will fit oe (C1 for correct conclusion from candidate's working even if incorrect eg vol: 4500÷125=36 so yes)

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Question		Working	Answer	Mark	Notes
11	(a)		-2, (1), 4, 7, 10, (13)	2	B2 for 4 values correct (B1 for 2 or 3 values correct)
	(b)		Single line from (-2, -2) to (3, 13)	2	M1 for plotting at least 5 of their points correctly **OR** single straight line with positive gradient passing thro' (0,4) from $x = -2$ to $x = 3$ **OR** single straight line of gradient 3 from $x = -2$ to $x = 3$ **OR** correct straight line that passes through 3 correct points A1 cao for correct straight line from at least (-2,-2) to (3,13)

5MB2F/01				
Question	Working	Answer	Mark	Notes
12 (a)	$10 + 45 + 20 + 25 = 10$ 1 hour 40 minutes	07 10	3	M1 for $10 + 45 + 20 + 25$ or 100 seen M1 for correct attempt to convert to hours and minutes A1 cao **OR** M2 for clear attempt to subtract all times from 08 50 (may be seen as working backwards) (M1 for clear attempt to take at least one time away from 08 50) A1 cao
(b)		11 20	1	B1 for 11 20 **or** twenty past eleven oe
(c)		12	1	B1 cao
(d)		Straight line from $(12\ 20, 12)$ to $(13\ 50, 12)$ and from $(13\ 50, 12)$ to $(14\ 30, 0)$	3	M1 for straight line segment on graph M1 for straight line with negative segment A1 for correct graph **or** M1 for straight line segment on graph M1 for 12 ÷ 18 oe or 40 minutes seen A1 for correct graph SC: B2 for the correct straight line translated to left or right

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Question	Working	Answer	Mark	Notes
13	$BFD = 42°$ $GFB = 110^o$ $110 - 42$	68	3	M1 for EDC=42 or DHF= 180-110 (=70) M1 for $180 - 42 - 70$ A1 cao **OR** M1 for $BFD = 42°$ or $BFH = 110°$ M1 for $110 - 42$ A1 cao **OR** M1 for $AFH = 180 - 110 (=70°)$ M1 for $180 - 70 - 42$ A1 cao
14 (a)		$6m$	1	B1 cao
(b)		x^{12}	1	B1 for x^{12} or x^{7+5}
(c)		$y(3y + 2)$	1	B1 cao

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Question	Working	Answer	Mark	Notes
15	$3600 \times 4 = 14400$ $\dfrac{2}{5} = 40\%$ $\dfrac{1}{4} = 25\%$ $30 + 40 + 25 = 95\%$ Saved 5% 10% of 14400 = 1440 5% of $1440 = 1440 \div 2$	£720	5	M1 3600×4 (=14400) B1 for $\dfrac{2}{5} = 40\%$ **or** $\dfrac{1}{4} = 25\%$ M1 for 30% + 40% + 50% (=95%) M1 for complete method to find 5% of 14400 A1 cao **OR** M1 for 3600×4 (=14400) B1 for 30% = $^3/_{10}$ M1 for $\dfrac{3}{10} + \dfrac{2}{5} + \dfrac{1}{4}$ $\left(= \dfrac{19}{10} \right)$ oe M1 for complete method to find $\dfrac{1}{20}$ of 14400 A1 cao **OR** M1 3600×4 (=14400) M1 for 0.3×14400 oe $\left(= 4320 \right)$ M1 for $\dfrac{2}{5} \times 14400$ oe $\left(= 5760 \right)$ M1 $14400 - 3600 - 4320 - 5760$ A1 cao SC if no other marks award M1 for 0.3 x 3600 (=1080) M1 for $\dfrac{2}{5} \times 3600$ (=1440)