

# Mark Scheme (Results)

June 2011

Modular Mathematics (GCSE)  
Unit 2: 5MB2F\_01 (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If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.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 as 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)

<b>Guidance on the use of codes within this mark scheme</b>
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)	2, 5, 8, 17, 25	1	B1 cao
	(b)	-10, -7, -3, 0, 6	1	B1 cao
2	(a)	1.15 or 13:15 Quarter past one	1	B1 (am/pm optional)
	(b)	Hands on clock 2.30 shown	1	B1 Length of hour hand $\leq$ length of minute hand. Hour hand points to 2 or to between 2 and 3
	(c)	4.20 – 3.30 50 mins	2	M1 for 20 + 30 or 4.20 – 3.30 or 3.30 and 4.20 clearly shown on time line. A1 for 50
3	(a)(i)	(-) 2	1	B1 cao
	(ii)	(-) 11	1	B1 cao
	(b)	-17	1	B1 cao
4	(a)	$4d$	1	B1 accept $4 \times d, d \times 4, d4$
	(b)	$f + 10$	2	M1 for $f$ or $1f$ or 10 or for $3f$ $2f$ and $4 + 6$ A1 for $f + 10$ (accept $1f + 10$ )
5		Circle radius 5 cm drawn	2	M1 for an accurately drawn circle with radius other than $5\text{cm} \pm 2\text{mm}$ OR any attempt to draw a circle that has any 2 points lying at opposite ends of any diameter within the overlay for circumference. A1 within overlay $5\text{cm} \pm 2\text{mm}$ (any centre may be used)

5MB2F_01				
Question	Working	Answer	Mark	Notes
6		(a) >> on 2 parallel lines	1	B1
		(b) A on acute angle	1	B1
7	38 × 3 = 114	(a) 3	2	M1 38 × 3 or 114 or 38 + 38 + 38 or repeated addition to 114 or 120 – 38 – 38 – 38 or 120 ÷ 38 (or equivalent use of 40) A1 cao
		(b) £6	1	B1 cao
8		(a) 3 or 15	1	B1
		(b) 12 or 24	1	B1
		(c) 2 or 3	1	B1
9		(a) 0.25	1	B1 cao
		(b) 80%	1	B1 cao
		(c) 1:3	1	B1 cao
10	80 + 70 = 150 180 – 150	(a) 30°	2	M1 for 180 – (80 + 70) A1 cao
		(b) 40 + 122 + 90 = 252 360 – 252	2	M1 for 360 – 252 or 360 – (40 + 122 + 90) A1 cao



5MB2F_01				
Question	Working	Answer	Mark	Notes
11	$8 \times 1.5$ $20.90 \div 2$ $1.5 \times 18$ $28.95 + 12 + 20.90 + 27$	£12(.00) £10.45 £27(.00) £88.85	4	B1 B1 B1 B1 ft total of four figures: 28.95 + "12" + 20.90 + "27"
12	$5 + 5 + 5 + 3 + 2 + 6 = 26$ $26 \div 4 = 6.5$ 7  $2 + 3 = 5$ , 5m needs 1.25, 6m needs 1.5 $1.25 + 1.25 + 1.25 + 1.25 + 1.5$ $= 6.5$ 7	7	4	M1 Start to find perimeter adding at least 3 of the six side lengths 2, 3, 5, 5, 5, 6 M1 for adding at least 5 of 6 side lengths or total perimeter p where $24 < p \leq 26$ M1 (dep on first M1) for "26" $\div$ by 4 or 6(.5) seen A1 7 cao  OR M1 for linking sufficient number of rolls with a least 1 side (this may be indicated on diagram). M1 for linking sufficient number of rolls with a least 5 sides (this may be indicated on diagram). M1 (dep on first M1) Add their number of rolls for all 6 side lengths or 6(.5) seen. A1 7 cao
13	(a)	49	1	B1 cao
	(b)	5	1	B1 for 5
	(c)	8	1	B1 cao

5MB2F_01				
Question	Working	Answer	Mark	Notes
14 (a)(i)		16	1	B1 cao
(ii)		Reason	1	B1 add 3 or $3 \times 5 + 1$ or $3n + 1$
(b)		25	1	B1 cao
(c)		Yes with reason	1	B1 for "Yes" and "keep adding 3" or $3 \times 11 + 1$ or 11 <sup>th</sup> term or multiple of 3 plus 1
15*	$6 \times 2 + 3 \times 2 = 12 + 6 = 18$ or $2 \times 5 + 4 \times 2 = 18$ or $6 \times 5 - 4 \times 3 = 18$  $18 \div 2.5 = 7.2$ or $2.5 \times 7 = 17.5$ or $2.5 \times 8 = 20$	8 packs	4	M2 for a complete correct method for finding total area. (can be implied by 18) (M1 for attempt to calculating at least one area, $6 \times 2 (=12)$ or $3 \times 2$ or $2 \times 5 (=10)$ or $4 \times 2 (=8)$ or $2 \times 2$ or $6 \times 5 (=30)$ or $3 \times 4 (=12)$ )  M1 for their area $\div 2.5$ or repeated addition of 2.5 of their area or equivalent repeated subtraction.  C1 for clear communication that 8 full packs are required supported by their calculations provided at least 1 of the first 2 method marks awarded.  SCB3 for 8 identified as answer.

5MB2F_01				
Question	Working	Answer	Mark	Notes
16	<p>Exeter coach after 20, 40, 60, 80, 100... Plymouth coach after 16, 32, 48, 64, 80, 96, ...</p> <p>or</p> <p>Timetable schedule for the coaches Exeter coach at 8.00, 8.20, 8.40, 9.00, 9.20... Plymouth coach at 8.00, 8.16, 8.32, 8.48, 9.04, 9.20...</p> <p>or</p> <p>LCM of 16 and 20 is 80</p>	9:20 (am)	3	<p>M1 for attempt to list multiples of 16 and 20 (at least the first 3 of each, condone 1 addition error) M1(dep) for identifying their LCM A1 9:20 oe (do not accept 9.20pm)</p> <p>or</p> <p>M1 for attempt to draw up a timetable showing when the coaches will run (at least 3 extra times for each, condone 1 addition error) M1(dep) for identifying the first time common to both timetables. A1 9:20 oe (do not accept 9.20pm)</p> <p>or</p> <p>M1 attempt to find the LCM M1 for <math>2 \times 2 \times 2 \times 2 \times 5</math> oe seen A1 9:20 oe (do not accept 9.20pm)</p>

5MB2F_01				
Question	Working	Answer	Mark	Notes
17	$2 \times 4 \times 4 + 7 = 32 + 7 = 39$	39	2	M1 for $2 \times 4 \times 4$ or $2 \times 16$ A1 cao
18	Table of values $x = -1 \ 0 \ 1 \ 2 \ 3$ $y = -2 \ 2 \ 6 \ 10 \ 14$ OR Using $y = mx + c$ , gradient = 4, y intercept = 2	Line from (-1,-2) to (3,14)	3	<b>(Table of values)</b> 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 -1 and 3  <b>(No table of values)</b> M2 for at least 2 correct points (and no incorrect points) plotted OR line segment of $y = 4x + 2$ 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 -1 and 3  <b>(Use of <math>y = mx + c</math>)</b> M2 for at least 2 correct points (and no incorrect points) plotted OR line segment of $y = 4x + 2$ drawn (ignore any additional incorrect segments) (M1 for line drawn with gradient 4 OR line drawn with a y intercept of 2) A1 for correct line between -1 and 3

5MB2F_01				
Question	Working	Answer	Mark	Notes
19*	$24 \times 2 = 48$ $56 \div 8 \times 5 = 35$  OR $24 \times 2 = 48$ $48 \div 5 \times 8 = 7.68$	Monday	4	<p>M1 for a correct method to obtain two comparable time periods or speeds. eg <math>24 \times 2 (= 48 \text{ miles})</math>, <math>56 \div 2 (= 28 \text{ km})</math></p> <p>M1 for a correct method to convert between miles and km or mph and km/h eg <math>24 \times \frac{8}{5}</math>, <math>48 \times \frac{8}{5}</math>, <math>56 \times \frac{5}{8}</math>, <math>28 \times \frac{5}{8}</math></p> <p>A1 for two correct values (using same units) for comparison</p> <p>C1 for day identified from a clear attempt to use comparable time periods and speeds/distances</p> <p>Note: day alone scores zero</p>

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