

Mark Scheme (Results)

March 2012

GCSE Mathematics (2MB01)
Paper 5MB1F_01 (Calculator)

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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If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.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

5MB1F_01					
Question		Working	Answer	Mark	Notes
1	(a)		42	1	B1 cao
	(b)		81	1	B1 cao
2	(a)		14	1	B1 cao
	(b)		Bus	1	B1 cao
	(c)	$8 + 2 + 14 + 6 + 3 + 7$	40	2	M1 for (8+) $2+14+6+3+7$ or ft from (a) A1 for 40 or ft from (a) SC: award B1 for 32
3*			diagram or chart	4	B1 for suitable labelling or key to differentiate Alexa and Ryan B1 for 5 correct day labels OR a linear scale B1 for accurately representing the data C1 for fully correct diagram or chart with correct and clear labelling and linear numerical scale
4	(a)		Ka	1	B1 cao
	(b)		1	1	B1 cao
	(c)		Fusion	1	B1 cao

5MB1F_01					
Question	Working	Answer	Mark	Notes	
5	(a)		unlikely	1	B1 cao
	(b)		impossible	1	B1 cao
	(c)		cross at 0	1	B1 for cross at 0 (tolerance 2mm)
	(d)		$\frac{2}{11}$	2	B2 for $\frac{2}{11}$ oe (B1 for $\frac{x}{11}$, $x < 11$, $x \neq 2$ or $\frac{2}{x}$, $x > 2$, $x \neq 11$) NB: ignore probabilities given in words.
6	(a)(i)		12	2	B1 cao
	(ii)		450		B1 cao
	(b)	$\pounds 12 \div 200$	6p	2	M1 for correct use of cost \div number of units (eg $\pounds 12 \div 200$ or '6' or '0.06') A1 for 6p or $\pounds 0.06$ [units important] oe or ft "12"
	(c)	$1300 \times 6p$	$\pounds 78$	2	M1 for $1300 \times$ "b" or correct use of graph with suitable multiplier or '78' or '7800' A1 ft for $\pounds 78$ oe (accept $\pounds 78$ to $\pounds 80$) NB: penalise a lack of monetary units once (at the first error)

5MB1F_01				
Question	Working	Answer	Mark	Notes
7	$13.68 + 2 \times 8.10 + 6.99$ $36.87 \div 3$ $36.87 - 12.29$ $40 - 24.58$ OR $(13.68 \div 3) \times 2 = 9.12$ $(8.10 \div 3) \times 2 = 5.40$ $(6.99 \div 3) \times 2 = 4.66$ $9.12 + 5.40 + 5.40 + 4.66 =$ 24.58 $40 - 24.58$	15.42	4	M1 for $13.68 + 2 \times 8.10 + 6.99$ oe (=36.87) M1 for $(“36.87” \div 3) \times 2$ oe or $”36.87” - (“36.87” \div 3)$ oe M1 for $40 - “24.58”$ A1 cao OR M1 for $(13.68 \div 3) \times 2$ or $(8.10 \div 3) \times 2$ or $(6.99 \div 3) \times 2$ oe M1 for $“9.12” + 2 \times “5.40” + “4.66”$ M1 for $40 - “24.58”$ A1 cao OR M1 for $(13.68 \div 3) \times 2$ or $(8.10 \div 3) \times 2$ or $(6.99 \div 3) \times 2$ M1 for subtracting the special offer cost of at least one of each item from 40 M1 for successively subtracting costs of all 4 items A1 cao
8	Complete answer: time at: leaving home leaving Sudbury arrival at Chelmsford arrival at meeting	Schedule planned	3	B1 for leaves home at 0750 or earlier B1 for catches the 0800 train or earlier train OR the next train is consistent with home departure time B1 ft showing arrival time in Chelmsford at 0844 AND arrival time at meeting at 0904 ft (dep on meeting arrival time by 9.30)

5MB1F_01					
Question	Working	Answer	Mark	Notes	
9	(a)(i)		2.23	4	B1 cao
	(ii)	$2.19+3\times 2.23+2.26+2.28+2\times 2.29+2.31+2.33$ $22.64 \div 10$	2.264		M1 for summing heights and dividing by 10 A1 for 2.26(4)
	(iii)		0.14		B1 accept – 0.14
	(b)		mean for men is greater and range for women is greater	2	B1 ft for comparison of means B1 ft for comparison of ranges
10	(a)	$299 - 140$	159	1	B1 cao
	(b)	$140 - 45 - 37$ or $140 - 82$ $58 + 47$	105	2	M1 for $140 - 45 - 37$ or 58 seen A1 cao
	(c)		(T,T) (T,C) (T,S) (C,C) (C,S) (S,S)	2	B2 All 6 combinations present with no incorrect combinations (B1 at least 3 different combinations) Ignore repeated combinations for B1 or B2

5MB1F_01				
Question	Working	Answer	Mark	Notes
11	$360 \div 60$ Apple = $18 \times 6 = 108$ Banana = $23 \times 6 = 138$ Orange = $9 \times 6 = 54$ Pear = $10 \times 6 = 60$	108, 138, 54, 60	4	M1 for evidence of method for at least one angle (could be implied by one correct angle on pie chart or working or in table) A2 for all angles drawn correctly ($\pm 2^\circ$) (A1 for at least one angle drawn correctly or all angles correct in the table) B1 for sectors labelled with fruit names (dependent on at least one angle drawn correctly and exactly 4 sectors)
12	(a) $0.10 + 0.25 + 0.30$ or $1 - (0.15 + 0.20)$	0.65	2	M1 for $0.10 + 0.25 + 0.30$ or $1 - (0.15 + 0.20)$ A1 for 0.65 oe SC B1 for 0.85
	(b) 200×0.30	60	2	M1 for 200×0.30 A1 cao

5MB1F_01				
Question	Working	Answer	Mark	Notes
13*	$2329 \times 0.9 = 2096.1$ $2147 \times 0.95 = 2039.65$ OR $4658 \times 0.9 = 4192.2$ $4294 \times 0.95 = 4079.3$	Royal European	5	<p>M1 for use of 2329 or 2147 (or sight of 4658 or 4294) ie selection of correct column</p> <p>M1 for attempting to calculate the discount for both their figures eg $2329 \times 0.1 (=232.90)$ oe AND $2147 \times 0.05 (=107.35)$ oe; $4658 \times 0.1 (=465.8)$ oe AND $4294 \times 0.05 (=214.7)$ oe)</p> <p>OR for attempting to find the discounted price for one eg $2329 \times 0.9 (=2096.1)$ oe or $2147 \times 0.95 (=2039.65)$ oe or $4658 \times 0.9 (=4192.2)$ oe or $4294 \times 0.95 (=4079.3)$ oe</p> <p>M1 for attempting to find the discounted price for both eg $2329 \times 0.9 (=2096.1)$ oe AND $2147 \times 0.95 (=2039.65)$ oe; $4658 \times 0.9 (=4192.2)$ oe AND $4294 \times 0.95 (=4079.3)$ oe</p> <p>A1 for 2096(.1) and 2039(.65) OR 4192(.2) and 4079(.3) figures rounded or truncated.</p> <p>C1 (dep on at least M1) for a statement deducing the cheapest company, but figures used for the comparison must also be stated somewhere, and a clear association with the name of each company.</p>

5MB1F_01				
Question	Working	Answer	Mark	Notes
14	(a)	$\begin{array}{r l} 7 & 1\ 3\ 8 \\ \hline 8 & 1\ 4\ 4\ 7\ 8 \\ \hline 9 & 1\ 2\ 3\ 5\ 6\ 6\ 6\ 8 \\ \hline 10 & 0\ 1\ 3\ 4 \end{array}$ <p>Key: 7 1 means 71cm</p>	3	B2 for fully correct diagram Accept a stem of 70, 80, 90, 100 (The order of the numbers in the stem may be reversed) (B1 for ordered leaves or unordered leaves (with one error or omission)) B1 for a correct key (units may be omitted)
	(b)	104 – 71	1	B1 for 33 or ft from diagram
	(c)		1	B1 for 92.5 or ft from diagram if ordered.

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