

Mark Scheme (Results)

June 2012

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If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.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

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Question		Working	Answer	Mark	Notes
1	(a)		Mary, 5, blue, dog	1	B1 cao
	(b)		2	1	B1 for 2 or ft from their table
	(c)		cat	1	B1 for cat or ft from their table
2	(a)	2×12	24	1	B1 cao
	(b)	e.g. $12 + 6$	18	2	M1 for $4.5 \times 12 - 3 \times 12$ or $(4.5 - 3) \times 12$ or $12 + 6$ or 6 seen "54" – "36" oe A1 cao
	(c)	$2.75 \times 12 \times 8$	2.64	3	M2 for complete method seen, " 2.75×12 " $\times 8$ or " $12+12+9$ " $\times 8$ or " 2.75×8 " $\times 12$ or " 33 " $\times 8$ "96" + "96" + "72" or the digits 264 seen (M1 for 2.75×12 or $12+12+9$ or $24+9$ or "33" or 2.75×8 or 12×8 or 24×8 or 9×8 or 192 seen or 96 seen or 72 seen) A1 cao (SC M1 $(12+12+8) \times 8$ but not 32×8) Note: The method marks can also be awarded if the candidate uses 0.08
3	(i)		Impossible	3	B1 cao B1 for cross marked at $\frac{1}{2}$ B1 for $\frac{1}{6}$ oe
	(ii)		$\frac{1}{2}$		
	(iii)		$\frac{1}{6}$		

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Question	Working	Answer	Mark	Notes												
4	<p>e.g.</p> <table border="1"> <thead> <tr> <th>Start time</th> <th>Finish time</th> </tr> </thead> <tbody> <tr> <td>(A)10 00</td> <td>(10 05)</td> </tr> <tr> <td>(B)10 05</td> <td>(C)10 48</td> </tr> <tr> <td>(10 48)</td> <td>(15 11)</td> </tr> <tr> <td>(D)15 11</td> <td>(E)15 53</td> </tr> <tr> <td>(15 53)</td> <td>(F)15 58</td> </tr> </tbody> </table> <p>e.g. leave house (before) 8 00 catch 8 05 train arrive in Middleton at 8 48 leave Middleton 14 42 arrive back 15 26 get home (after) 15 31</p>	Start time	Finish time	(A)10 00	(10 05)	(B)10 05	(C)10 48	(10 48)	(15 11)	(D)15 11	(E)15 53	(15 53)	(F)15 58	Completed schedule	5	<p>M1 (indep) for establishing a start time at least 5 minutes before (B) or the end time, provided the end time is not after (B)</p> <p>M1 (indep) for establishing a correct start and finish time from the first train timetable using (B) and (C) or their equivalent bracketed values if (B) and/or (C) is missing</p> <p>M1 (indep) for establishing at least 4 hours in Middleton by using (C) and (D) or their equivalent bracketed values if (C) and/or (D) is missing</p> <p>M1 (indep) for establishing a correct start and finish time from the second train timetable using (D) and (E) or their equivalent bracketed values if (D) and/or (E) is missing. (E) can be after 16 00.</p> <p>A1 for a fully correct schedule with (F) before 16 00 and at least 5 minutes after (E) or the start time, provided the start time is not before (E)</p> <p>(Note: If the candidate writes a schedule without using the table then mark their written schedule.)</p> <p>(Note: Candidates can use 12hour clocktimes.)</p>
Start time	Finish time															
(A)10 00	(10 05)															
(B)10 05	(C)10 48															
(10 48)	(15 11)															
(D)15 11	(E)15 53															
(15 53)	(F)15 58															

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Question	Working	Answer	Mark	Notes
5	(a)	Thursday	1	B1 cao
	(b)	45	1	B1 cao
	(c)	Bar chart completed	2	B2 for bars of correct length, correctly shaded (condone Sophie's bar left unshaded) (B1 for one correct length bar with correct shading or two correct length bars with incorrect or no shading)
	(d)	Comparison	1	B1 for one correct comparison, e.g. Sophie spent more time (on the Internet) at the beginning of the week than Zach (Note: if candidates quote total amounts of time spent on the internet they must be correct or support by evidence of how they got them. Sophie: 215min or 3h35min Zach: 240min or 4h)

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Question	Working	Answer	Mark	Notes
*6	<p>e.g. $\pounds 25 = \\$40$, so $\pounds 100 = \\$160$ $\pounds 20 = \\$32$, so $\pounds 40 = \\$64$</p> <p>$\pounds 100 + \pounds 40 = \\$160 + \pounds 64 =$ $\\$224$ (London)</p> <p>$\\$220$ (New York) < $\\$224$ (London)</p>	New York is less expensive	4	<p>B1 for stating a correct conversion fact from the graph $\\$40 \equiv \pounds 25$ oe M1 (indep) ft for a complete method to convert \pounds to $\\$ using their conversion fact e.g. $40 \div 25 \times 140$ oe A1 ft for $\\$224$ C1 ft (dep on M1) for more (expensive) in London oe OR B1 for stating a correct conversion fact from the graph $\pounds 25 \equiv \\$40$ oe M1 (indep) ft for a complete method to convert $\\$ to \pounds using their conversion fact e.g. $25 \div 40 \times 220$ oe A1 ft for $\pounds 137.5(0)$ C1 ft (dep on M1) for less (expensive) in New York oe</p>
7	<p>$(8 = 3 + 3 + 2 =) \pounds 9 + \pounds 9 +$ $2 \times \pounds 3.75 = \pounds 25.50$ $\pounds 40 - \pounds 25.50 = \pounds 14.50$</p>	14.50	3	<p>M1 for $2 \times 9 + 2 \times 3.75$ oe or $18 + 7.5(0)$ or $25.5(0)$ seen M1 for $40 - "25.50"$ A1 cao</p> <p>(SC B1 for $\pounds 10$ or $\pounds 13$ or $\pounds 12.25$)</p>

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Question	Working	Answer	Mark	Notes	
8	(a)		3, 7, 5, 4, 2, 3	2	M1 for at least one correct frequency or tally A1 for 3, 7, 5, 4, 2, 3 cao (B2 for correct frequencies without the use of tallies)
	(b)		2	1	B1 for 2 or ft from their frequency table
	(c)		Diagram or chart	3	M1 (ft from their frequency table) for a diagram or chart, e.g. bar chart, stick graph, pictogram, pie chart, showing correct data for at least 3 scores M1 (indep) for correct scale and label on vertical axis or fully correct labelling on horizontal axis or a suitable key A1 (ft from their frequency table) for fully correct diagram or chart (to include all axes labelled)
9			15, 17 , 12, 44 18 , 22, 16 , 56 33 , 39 , 28, 100	3	B3 fully correct table (B2 for 4 or 5 correct entries) (B1 for 2 or 3 correct entries)
10	(a)		$b - a$	1	B1 cao
	(b)		$\frac{(a + b)}{2}$	1	B1 for $\frac{(a + b)}{2}$ oe

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Question		Working	Answer	Mark	Notes
*11		$2 \times 39.50 + 3 \times 23.75 = 150.25$ $2 \times 40.25 + 3 \times 21.85 = 146.05$	Seawagon	4	M1 for $2 \times 39.50 + 3 \times 23.75$ or 150.25 or $2 \times 40.25 + 3 \times 21.85$ or 146.05 or $2a + 3b$, where a and b are consistent values from table or sight of 39.50 and 23.75 or 40.25 and 21.85 M1 for $2 \times 39.50 + 3 \times 23.75$ and $2 \times 40.25 + 3 \times 21.85$ A1 for (£)150.25 and (£)146.05 C1 (dep on M1) for Seawagon or ft from their answers and condone stating an incorrect difference
12	(a)		(5, 300) plotted	1	B1 for point plotted at (5, 300) allow $\pm \frac{1}{2}$ square tolerance
	(b)		The greater the age the less the value	1	B1 for the greater the age the less the value (price, cost etc.) Accept negative correlation but "negative" or "negative relationship" gets B0
	(c)		500 to 800 inc.	2	B2 for an answer in the range 500 to 800 (inc.) OR M1 for a single straight line segment with negative gradient that could be used as a line of best fit A1 ft from their line of best fit [SC: B1 ft reading from their single straight line with negative gradient at Age = 4 if M0 scored]

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Question		Working	Answer	Mark	Notes
13	(a)	$1 - (0.15 + 0.32 + 0.27)$ $1 - (15 + 32 + 27)$ $1 - \left(\frac{15}{100} + \frac{32}{100} + \frac{27}{100}\right)$	0.26 26% $\frac{26}{100}$ (oe)	2	M1 for $1 - "(0.15 + 0.32 + 0.27)"$ oe or 26 seen A1 for 0.26 or $\frac{26}{100}$ (oe) or 26% (must include the % sign) [Note: 0.26 seen in the table and contradicted by an incorrect answer on the answer line gets M1A0]
	(b)	0.15×300	45	2	M1 for $0.15 \times 300 (=45)$ oe A1 accept 45 out of 300

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Question	Working	Answer	Mark	Notes										
14	(a)	<table border="1"> <tr><td>5</td><td>9</td></tr> <tr><td>6</td><td>3 5 6 6</td></tr> <tr><td>7</td><td>1 2 5 5 6 7 9 9</td></tr> <tr><td>8</td><td>3 9</td></tr> </table> <p>Key: eg, 7/2 represents 72</p>	5	9	6	3 5 6 6	7	1 2 5 5 6 7 9 9	8	3 9	3	M1 for at least 2 correct 'rows' with correct stem and correct ordered or unordered leaf A1 for a fully correct ordered stem and leaf diagram B1 for a key [Ignore spacing on leaves provided the order is correct]		
	5	9												
6	3 5 6 6													
7	1 2 5 5 6 7 9 9													
8	3 9													
(*b)	<table border="1"> <tr><td>Gill</td><td>Jamal</td></tr> <tr><td>HV 95 ></td><td>HV 89</td></tr> <tr><td>LV 75 ></td><td>LV 59</td></tr> <tr><td>Mean 80 ></td><td>Mean 73</td></tr> <tr><td>Range 20 <</td><td>Range 30</td></tr> </table>	Gill	Jamal	HV 95 >	HV 89	LV 75 >	LV 59	Mean 80 >	Mean 73	Range 20 <	Range 30	<p>Comparisons</p>	5	<p>M1 for '72+59+76+...'÷15 or 1095 ÷ 15 (= 73) M1 for 95 – 75 (=20) or '89' – '59' (= 30) or '89' and '59' seen ft from their stem and leaf diagram in (a) A1 for mean of Jamal's scores is 73 cao or for ranges of 20 and 30 cao C1 (dep on first M1) ft for a correct comparison of mean scores, e.g. Gill's mean score > Jamal's mean score oe C1 ft for a correct comparison of ranges, (dep on M1 awarded for correct method to find range) e.g. The range of Gill's scores < The range of Jamal's scores or a correct comparison of both end values (dep on M1 awarded for '89' and '59' seen) , e.g. Gill's lowest score > Jamal's lowest score and Gill's highest score > Jamal's highest score. oe</p> <p>[For the award of C2, the word 'score' must be explicitly stated. If not deduct 1 mark]</p>
Gill	Jamal													
HV 95 >	HV 89													
LV 75 >	LV 59													
Mean 80 >	Mean 73													
Range 20 <	Range 30													

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