

# Mark Scheme (Results)

March 2013

GCSE Mathematics (2MB01) Higher  
5MB1H (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 labelling 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If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.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 cancelling 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

| 5MB1H 01 |     |                       |                       |      |                                                                                                                                                                                                                                                                                          |
|----------|-----|-----------------------|-----------------------|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Question |     | Working               | Answer                | Mark | Notes                                                                                                                                                                                                                                                                                    |
| 1        |     | $105 \div 7 \times 4$ | 60                    | 2    | M1 $105 \div (4+3)$ or a complete build up method<br>A1 cao                                                                                                                                                                                                                              |
| 2        |     | $0.93 \times 800$     | 744                   | 2    | M1 $0.93 \times 800$ oe or 744<br>A1 cao                                                                                                                                                                                                                                                 |
| 3        | (a) |                       | Two different reasons | 2    | B2 for TWO aspects from<br>No time frame given<br>Non-exhaustive responses<br>Responses not specific<br>(B1 ONE correct aspect)                                                                                                                                                          |
|          | (b) |                       | Question              | 2    | B1 for a question with a time frame for frequency of use<br>B1 for at least 3 correctly labelled response boxes (non-overlapping, need not be exhaustive) OR for a set of response boxes that are exhaustive (could be overlapping)<br><br>[Do not allow inequalities in response boxes] |
|          | (c) |                       | Two different reasons | 2    | B2 for TWO different aspects<br>(B1 for ONE aspect)<br>Too small a sample, time of day, specific day, place, same type of people, not random                                                                                                                                             |

| 5MB1H_01 |  |         |    |    |   |    |               |      |                                                                                                                                                                                                                                                                                                                                                                                                                  |  |
|----------|--|---------|----|----|---|----|---------------|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| Question |  | Working |    |    |   |    | Answer        | Mark | Notes                                                                                                                                                                                                                                                                                                                                                                                                            |  |
| 4        |  |         | TT | D  | S |    | 11            | 4    | M1 for a 2-way table or diagram showing at least 3 pieces of information correctly placed<br>M1 17 girls or 4 boys with slalom skis<br>M1 12 boys with downhill skis or 4 girls with twin tips<br>A1 cao<br><br>OR<br>M1 for 40-23 (=17)<br>M1 for one part subtraction ie '17'-8 or '17'-5<br>M1 for ('17'-8) -5 or ('17' - 5) - 8<br>A1 cao                                                                    |  |
|          |  | B       | 7  | 12 | 4 | 23 |               |      |                                                                                                                                                                                                                                                                                                                                                                                                                  |  |
|          |  | G       | 4  | 8  | 5 | 17 |               |      |                                                                                                                                                                                                                                                                                                                                                                                                                  |  |
|          |  |         | 11 | 20 | 9 | 40 |               |      |                                                                                                                                                                                                                                                                                                                                                                                                                  |  |
| *5       |  |         |    |    |   |    | Yes and £1562 | 6    | B1 283 or 285<br>M1 for working out the total cost of 2 adults 1 way or 1 adult both ways<br>M1 for a correct method for calculating 75% of an adult fare for 1 journey or for 1 journey there and back.<br>M1 for working out the total cost of 2 adults and 1 child<br>A1 1562 or 38<br>C1 Dep on a previous M1, correct conclusion ft for their total cost (identified) providing it is written with a £ sign |  |

| 5MB1H_01 |     |                                                                        |                                            |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|----------|-----|------------------------------------------------------------------------|--------------------------------------------|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Question |     | Working                                                                | Answer                                     | Mark | Notes                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 6        |     | 2   6 7 9<br>3   0 4<br>4   2 2 4 7 7<br>5   3 6 7 8 8<br>6   3 4 6    | Stem and leaf<br>2   6 means 26<br><br>Key | 3    | B2 for a fully correct ordered diagram<br>(B1 for a correct unordered diagram or ordered with at most two errors or omissions)<br>B1 for a correct key<br>Accept stem written as 20,30 etc but key only acceptable if consistent with this.                                                                                                                                                                                                       |
| 7        | (a) |                                                                        | 64.5                                       | 1    | B1 cao                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|          | (b) |                                                                        | 65.5 or 65.49                              | 1    | B1 for 65.5 or 65.49 or 65.499 oe                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 8        |     |                                                                        | Box plot drawn                             | 3    | B3 for fully correct box plot<br>(B2 for 3 correctly plotted values including box <u>and</u> tails)<br>(B1 for 2 correctly plotted values including box <u>or</u> tails)                                                                                                                                                                                                                                                                          |
| *9       |     | Ranges 50 and 46<br>IQR s 19 -21 and 19-21<br>Medians 47 and <b>44</b> | Comparison of data                         | 4    | B1 Correct calculation of the median<br>B1 Correct calculation of the ranges or the IQRs<br>C1 for a correct comparison (ft) of medians<br>C1 for a correct comparison of ranges or IQRs (ft) with interpretation<br>or<br>B1 Correct calculation of the median (47)<br>B1 Correct calculation of the ranges or the IQRs<br>C1 for a correct comparison of ranges or IQRs (ft)<br>C1 for a correct comparison of medians (ft) with interpretation |

| 5MB1H_01 |        |                                                                                              |                |      |                                                                                                                                                                                                                                                                   |
|----------|--------|----------------------------------------------------------------------------------------------|----------------|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Question |        | Working                                                                                      | Answer         | Mark | Notes                                                                                                                                                                                                                                                             |
| 10       | (a)    | $20 \times 12 + 30 \times 27 + 40 \times 18 + 50 \times 23 + 60 \times 10$<br>$3520 \div 90$ | 39(.11111)     | 4    | M1 for finding at least 4 products $fx$ consistently within interval (including end points)<br>M1 (dep) for use of at least 4 correct midpoints<br>M1 for $\sum fx \div 90$<br>A1 39.(1...)                                                                       |
|          | (b)    |                                                                                              | 12,39,57,80,90 | 1    | B1 cao                                                                                                                                                                                                                                                            |
|          | (c)    |                                                                                              |                | 2    | B1 for at least 4 of "5 points" plotted correctly $\pm 0.5$ full square<br>B1 (dep) for points joined by curve or line segments providing no gradient is negative.<br>(SC: B1 if 4 or 5 points plotted not at end but consistent within each interval and joined) |
|          | (d)(i) |                                                                                              | 36-39          | 3    | B1 answer within the range 36-39 or ft cf graph                                                                                                                                                                                                                   |
|          | (ii)   |                                                                                              | 19-23          |      | B2 answer within 19-23<br>Or<br>M1 for reading off from 50 on a cf graph<br>A1 ft ( $\pm 0.5$ square)                                                                                                                                                             |
| 11       |        | $1200 \times 0.8^4$                                                                          | 4              | 3    | M1 0.8 or 960 or 2160 seen<br>M1 for $0.8^n$ where $n$ is 2 or greater or for 768 or 614.40<br>A1 cao and supported by working                                                                                                                                    |

| 5MB1H_01 |     |                              |                                                           |      |                                                                |
|----------|-----|------------------------------|-----------------------------------------------------------|------|----------------------------------------------------------------|
| Question |     | Working                      | Answer                                                    | Mark | Notes                                                          |
| 12       |     | $\frac{140}{420} \times 135$ | 45                                                        | 2    | M1 $\frac{140}{420} \times 135$ oe<br>A1 cao                   |
| 13       | (a) |                              | 10 and 18                                                 | 2    | B2 Two correct values<br>(B1 one correct value)                |
|          | (b) |                              | Bars at heights<br>3cm and 2cm                            | 2    | B2 for two correct bars<br>(B1 for one correct bar)            |
| 14       |     |                              | A and $y = x^2 + 4$<br>B and $y = x^3$<br>C and $y = 2^x$ | 3    | B3 for all correct<br>(B2 for 2 correct)<br>(B1 for 1 correct) |

| 5MB1H_01 |     |                                                                              |        |      |                                                                                                                                                                      |
|----------|-----|------------------------------------------------------------------------------|--------|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Question |     | Working                                                                      | Answer | Mark | Notes                                                                                                                                                                |
| 15       | (a) | Tree diagram<br>Or<br>$1 - 0.6 = 0.4$<br>$1 - 0.8 = 0.2$<br>$0.4 \times 0.2$ | 0.08   | 3    | B1 for 0.4 or 0.2 seen oe<br>M1 Indication of correct branch formed on tree diagram (or otherwise) leading to $0.4 \times 0.2$ or “0.4” $\times$ “0.2”<br>A1 0.08 oe |
|          | (b) | $0.4 \times 0.2 + 0.6 \times 0.8$                                            | 0.56   | 3    | M1 $0.6 \times 0.8$ or “0.4” $\times$ “0.2”<br>M1 $0.6 \times 0.8 + “0.4” \times “0.2”$ or “0.08” + “0.48”<br>A1 0.56 oe                                             |





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