

Mark Scheme (Results)

June 2011

Modular Mathematics (GCSE)  
Unit 1: 5MB1F\_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If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.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)

#### 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)    |                                                                                 | <table><tr><td>10p</td><td>  </td><td>2</td></tr><tr><td>20p</td><td>    </td><td>8</td></tr><tr><td>50p</td><td>   </td><td>3</td></tr><tr><td>£1</td><td>    </td><td>7</td></tr></table> | 10p  |                                                                                                                                                                                                                                                   | 2 | 20p |  | 8 | 50p |  | 3 | £1 |  | 7 | 3 | B3 for a fully correct table showing all tallies and frequencies<br>(B2 for 2 or 3 correct tally and related frequency entries or for 4 correct tallies or for 4 correct frequency totals)<br>(B1 for 1 correct tally or 1 correct frequency) |
| 10p      |                                                                                 | 2                                                                                                                                                                                           |      |                                                                                                                                                                                                                                                   |   |     |  |   |     |  |   |    |  |   |   |                                                                                                                                                                                                                                               |
| 20p      |                                                                                 | 8                                                                                                                                                                                           |      |                                                                                                                                                                                                                                                   |   |     |  |   |     |  |   |    |  |   |   |                                                                                                                                                                                                                                               |
| 50p      |                                                                                 | 3                                                                                                                                                                                           |      |                                                                                                                                                                                                                                                   |   |     |  |   |     |  |   |    |  |   |   |                                                                                                                                                                                                                                               |
| £1       |                                                                                 | 7                                                                                                                                                                                           |      |                                                                                                                                                                                                                                                   |   |     |  |   |     |  |   |    |  |   |   |                                                                                                                                                                                                                                               |
| (b)      | $10 \times 2 + 20 \times 8 + 50 \times 3 + 100 \times 7$ $20 + 160 + 150 + 700$ | 10.30                                                                                                                                                                                       | 2    | M1 for $10 \times "2"$<br>or $20 \times "8"$ or 160 or 1.6(0)<br>or $50 \times "3"$ or 150 or 1.50<br>or $100 \times "7"$ or 700<br>or evidence of adding all 20 original coin values<br><br>A1 ft from table shown using correct money notation. |   |     |  |   |     |  |   |    |  |   |   |                                                                                                                                                                                                                                               |
| 2 (a)    |                                                                                 | E                                                                                                                                                                                           | 1    | B1 cao                                                                                                                                                                                                                                            |   |     |  |   |     |  |   |    |  |   |   |                                                                                                                                                                                                                                               |
| (b)      |                                                                                 | A                                                                                                                                                                                           | 1    | B1 cao                                                                                                                                                                                                                                            |   |     |  |   |     |  |   |    |  |   |   |                                                                                                                                                                                                                                               |
| (c)      |                                                                                 | 16                                                                                                                                                                                          | 1    | B1 cao                                                                                                                                                                                                                                            |   |     |  |   |     |  |   |    |  |   |   |                                                                                                                                                                                                                                               |
| (d)      |                                                                                 | 28                                                                                                                                                                                          | 1    | B1 cao                                                                                                                                                                                                                                            |   |     |  |   |     |  |   |    |  |   |   |                                                                                                                                                                                                                                               |
| (e)      |                                                                                 | 1 and a half cameras                                                                                                                                                                        | 1    | B1 cao                                                                                                                                                                                                                                            |   |     |  |   |     |  |   |    |  |   |   |                                                                                                                                                                                                                                               |

| 5MB1F 01 |                                                                                                                                                  |                   |      |                                                                                                                                                                                                                                                                                                                                                                                                                        |
|----------|--------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Question | Working                                                                                                                                          | Answer            | Mark | Notes                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 3 (a)    |                                                                                                                                                  | Monday and Friday | 2    | B1 for Monday<br>B1 for Friday                                                                                                                                                                                                                                                                                                                                                                                         |
| (b)      | Alfie<br>$6 + 8.5 + 8 + 4.5 + 4.5$<br>$= 31.5$<br>Viv<br>$7 + 8.5 + 6 + 3 + 5 = 29.5$<br><br>$31.5 - 29.5$<br><br>or<br>$-1 + 0 + 2 + 1.5 - 0.5$ | 2 hours           | 3    | M1 for Alfie = $6 + 8.5 + 8 + 4.5 + 4.5$ (= 31.5 or 31.30)<br>or Viv = $7 + 8.5 + 6 + 3 + 5$ (29.5 or 29.3)<br><br>Allow one error reading 5 values<br>M1 (dep) for “31.5” – “29.5”<br>(If incorrect values used must be Alfie’s total – Viv’s total)<br>A1 cao<br><br>or<br>M1 for at least two of - 1 or 0 or 2 or 1.5 or – 0.5 seen, may be on diagram (ignore signs)<br>M1 for $- 1 + 0 + 2 + 1.5 - 0.5$<br>A1 cao |

| 5MB1F_01 |                                                    |                                  |      |                                                                                                                                                                                                                                                        |
|----------|----------------------------------------------------|----------------------------------|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Question | Working                                            | Answer                           | Mark | Notes                                                                                                                                                                                                                                                  |
| 4 (a)(i) |                                                    | Impossible                       | 1    | B1 cao                                                                                                                                                                                                                                                 |
| (ii)     |                                                    | Certain                          | 1    | B1 cao                                                                                                                                                                                                                                                 |
| (b)      |                                                    | 1A 1B 1C<br>2A 2B 2C<br>3A 3B 3C | 2    | B2 for all 9 correct outcomes, with no extras, ignoring repeats. Note: these could be in a table (B1 for at least 6 correct outcomes)<br><br>(SC B1 for 6 correct combinations for spinning Steve's spinner twice: AA AB AC BB BC CC ignoring repeats) |
| 5 (a)    | 18 – 10                                            | 8                                | 2    | M1 for 18 – 10<br>A1 cao<br>[SC: B1 for 10 to 18, 10 – 18, 18 to 10 oe, if M0 scored]                                                                                                                                                                  |
| (b)      |                                                    | 13                               | 1    | B1 cao                                                                                                                                                                                                                                                 |
| (c)      | (13+14+12+10+13+16+14+13+18+16) ÷ 10<br>= 139 ÷ 10 | 13.9                             | 2    | M1 for (13+14+12+10+13+16+14+13+18+16) ÷ 10 allow one error, omission or extra in 10 temperatures, condone missing brackets.<br>A1 cao                                                                                                                 |

| 5MB1F_01 |                                                                                                                                                                                                                                                                                                    |               |      |                                                                                                                                                                                                                                                                                         |
|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Question | Working                                                                                                                                                                                                                                                                                            | Answer        | Mark | Notes                                                                                                                                                                                                                                                                                   |
| 6 (a)    | $\frac{90}{360}$                                                                                                                                                                                                                                                                                   | $\frac{1}{4}$ | 1    | B1 for $\frac{1}{4}$ oe or 25% or 0.25 or quarter                                                                                                                                                                                                                                       |
| (b)      | $360 - (42 + 90 + 108) =$<br>$360 - 240 = 120$<br>Followed by<br>$120 \div 20 = 6^\circ/\text{person}$<br>$90 \div 6$<br><br>OR<br>$\frac{90}{120} = \frac{3}{4}$<br>$\frac{3}{4}$ of 20<br><br>OR<br>$120 = \frac{1}{3}$ of the whole<br>Total number = $20 \times 3 = 60$<br>$\frac{1}{4}$ of 60 | 15            | 4    | M1 for $360 - (42 + 90 + 108)$<br>A1 for 120<br>M1 for $90 \div ("120" \div 20)$<br>A1 cao<br><br>or<br>M1 for $360 - (42 + 90 + 108)$<br>A1 for 120<br>M1 for $\frac{3}{4}$ of 20<br>A1 cao<br><br>or M1 for $360 - (42 + 90 + 108)$<br>A1 for 120<br>M1 $\frac{1}{3}$ of 60<br>A1 cao |

| 5MB1F 01 |                                 |                   |      |                                                                                                                                                                                                                                                                                                                                                                                                                                |
|----------|---------------------------------|-------------------|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Question | Working                         | Answer            | Mark | Notes                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 7        | (15 15 – 15 05 + 15 55 – 15 35) | 30                | 2    | <p>M1 for ((15) 15 – (15) 05) and 15 55 – 15 35)<br/> OR “10” and “20” seen as durations of CB and J.<br/> At least one must be correct and any incorrect value must be associated with correct start and finish times.</p> <p>A1 for 30 cao</p>                                                                                                                                                                               |
| 8        |                                 | $\frac{5}{24}$ oe | 3    | <p>B3 for <math>\frac{5}{24}</math> oe<br/> [B2 for <math>\frac{5}{24}</math> where “5” is in the table or clearly identified as the number of boys who walk.<br/> (Accept final answer of 0 if accompanied by 0 in the table or indication that no boys walk) ]<br/> [B1 for <math>\frac{a}{24}</math> , where <math>a \leq 13</math> or 5 seen or 0 alone<br/> or <math>\frac{0}{24}</math> given only as final answer.]</p> |

| 5MB1F_01 |                                                                                                                                                                                                                                            |              |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Question | Working                                                                                                                                                                                                                                    | Answer       | Mark | Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 9 (a)    |                                                                                                                                                                                                                                            | 6.40 to 6.80 | 1    | B1 for answer in the range 6.40 to 6.80                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| (b)      |                                                                                                                                                                                                                                            | 3.40 to 3.80 | 1    | B1 for answer in the range 3.40 to 3.80                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| (c)      | Using an initial value of \$n<br>$\$n = \text{€}(n \div 1.4)$ converts \$ to €<br>$\text{€}(n \div 1.4) = \text{£}((n \div 1.4) \div 1.1)$ converts € to £<br>$\$65 = \text{£}((n \div 1.4) \div 1.1) \times (65 \div n)$<br>scales to £65 | 40 to 44 inc | 4    | M1 for method to find 2 matching figures for dollars and euros.<br>May be calculated or from graph.<br>(To check accuracy if values read from graph, apply exchange rate of 1€ : \$1.4 and accept correct value in euros $\pm 1\text{€}$ )<br><br>M1 for method to find 2 matching figures for euros and pounds.<br>May be calculated or from graph.<br>(To check accuracy if values read from graph, apply exchange rate of £1:1.1€ and accept correct value in pounds $\pm \text{£}1$ )<br><br>M1 (dep on award of at least one other M1) for using $65 \div n$ where n is initial value in dollars used.<br><br>A1 for answer in range 40 to 44 inclusive |
| 10       | $14 \times 3 + 10 \times 3 = 72$<br>$43 + 14 \times 1 + 10 \times 1 = 67$<br>$43 + 14 \times 2 = 71$                                                                                                                                       | 67           | 5    | B1 for identifying 3 adults, 3 children and 1 infant<br>(may be implied by correct working)<br><br>M3 for $14 \times 3 + 10 \times 3 (= 72)$<br>or $43 + 14 \times 2 (= 71)$<br>or $43 + 14 \times 1 + 10 \times 1 (= 67)$<br>(M2 for $3 \times 14 (=42)$ or $3 \times 10 (=30)$ or $2 \times 14(=28)$ )<br>(M1 for 14 or 10 or 43 or 12 seen)<br><br>A1 for 67 identified as final answer                                                                                                                                                                                                                                                                   |

| 5MB1F_01 |                                                                                                                                                                                                |                                                                             |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Question | Working                                                                                                                                                                                        | Answer                                                                      | Mark | Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| 11 (a)   |                                                                                                                                                                                                | 14   8<br>15   2 4<br>16   0 2 4 4 8<br>17   0 3 4 9<br><br>14   8 = 148 cm | 3    | B2 for a fully correct ordered diagram<br>(B1 for correct unordered diagram or ordered with at most two errors)<br>B1 for a correct key eg 14   8 = 148 cm (cm not required)                                                                                                                                                                                                                                                                                                                                                                       |
| * (b)    | Boy's Median = 170<br>Girl's Median = 164<br>Boy's Mean = 170(.38)<br>Girl's Mean = 164<br>Boy's Range = 27<br>Girl's Range = 31<br><br>15   7 9<br>16   2 6 8 9<br>17   0 3 4 6 6<br>18   1 4 | Compares:<br>medians/means<br>+<br>Range<br>+<br>Spread                     | 3    | A maximum 2B marks from:<br>B1 for a correct mean or median for either the boys or the girls.<br>B1 for a correct range for either the boys or the girls.<br>B1 for a correct stem and leaf diagram drawn for the boys (no need for a key)<br><br>C1 for any correct comparison, which includes the boys and the girls, of either<br>2 correct (ft) medians or 2 correct (ft) means<br>or<br>2 correct(ft) ranges<br>or<br>a correct statement following from comparing the correct stem and leaf diagrams, which includes the boys and the girls. |

| 5MB1F 01 |                     |                                                                                            |      |                                                                                                                                                                  |
|----------|---------------------|--------------------------------------------------------------------------------------------|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Question | Working             | Answer                                                                                     | Mark | Notes                                                                                                                                                            |
| 12 (a)   | See scatter graph   | (12, 14)<br>and<br>(17,20) plotted                                                         | 1    | B1 for correct plotting of both points                                                                                                                           |
| (b)      |                     |                                                                                            | 1    | B1 Positive                                                                                                                                                      |
| (c)      |                     | 16 to 18                                                                                   | 2    | B2 16-18<br>or<br>M1 for a single line segment from m=11 to m=16 within overlay<br>A1 ft their line of best fit ( $\pm$ ) 2mm                                    |
| 13 (a)   | $1 - 0.3 - 0.1 - x$ | $0.6 - x$                                                                                  | 2    | M1 for $0.3 + 0.1 + x + P(2) = 1$ oe<br><br>A1 $0.6 - x$ or $\frac{6}{10} - x$ or $1 - (0.4 + x)$<br><br>Or<br>$1 - 0.3 - 0.1 - x$                               |
| (b)      |                     | $300x$                                                                                     | 1    | B1 for $300x, x \times 300$ oe                                                                                                                                   |
| 14       |                     | Overlapping response boxes<br>Leading/biased question<br>Age too personal<br>Missing units | 2    | B2 for any two of: overlapping response boxes, too personal to ask person's age, a leading or biased question, missing units<br><br>(B1 – just one of the above) |



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