**GCSE Mathematics (1MA1) – Foundation Tier Paper 2F**

**Summer 2022 student-friendly mark scheme**

**Please note that this mark scheme is not the one used by examiners for making scripts. It is intended more as a guide to good practice, indicating where marks are given for correct answers. As such, it doesn't show follow-through marks (marks that are awarded despite errors being made) or special cases.**

**It should also be noted that for many questions, there may be alternative methods of finding correct solutions that are not shown here – they will be covered in the formal mark scheme.**

## NOTES ON MARKING PRINCIPLES

**Guidance on the use of codes within this mark scheme**

M1 – method mark. This mark is generally given for an appropriate method in the context of the question. This mark is given for showing your working and may be awarded even if working is incorrect.

P1 – process mark.  This mark is generally given for setting up an appropriate process to find a solution in the context of the question.

A1 – accuracy mark. This mark is generally given for a correct answer following correct working.

B1 – working mark. This mark is usually given when working and the answer cannot easily be separated.

C1 – communication mark. This mark is given for explaining your answer or giving a conclusion in context supported by your working.

Some questions require all working to be shown; in such questions, no marks will be given for an answer with no working (even if it is a correct answer).

**Question 1 (Total 1 mark)**

| Part | Working or answer an examiner might expect to see | Mark | Notes |
|------|---------------------------------------------------|------|-------|
|      | 1480                                              | B1   | This mark is given for the correct answer only |

**Question 2 (Total 1 mark)**

| Part | Working or answer an examiner might expect to see | Mark | Notes |
|------|---------------------------------------------------|------|-------|
|      | $\dfrac{7}{10}$                                   | B1   | This mark is given for the correct answer only |

**Question 3 (Total 1 mark)**

| Part | Working or answer an examiner might expect to see | Mark | Notes |
|------|---------------------------------------------------|------|-------|
|      | 3                                                 | B1   | This mark is given for the correct answer only |

**Question 4 (Total 1 mark)**

| Part | Working an or answer examiner might expect to see | Mark | Notes |
|------|---------------------------------------------------|------|-------|
|      | For example: 125  or  250                         | B1   | This mark is given for a correct 3-digit answer ending in 0 or 5 |

**Question 5 (Total 1 mark)**

| Part | Working or answer an examiner might expect to see | Mark | Notes |
|------|---------------------------------------------------|------|-------|
|      | 40                                                | B1   | This mark is given for the correct answer only |

**Question 6 (Total 1 mark)**

| Part | Working or answer an examiner might expect to see | Mark | Notes |
|------|---------------------------------------------------|------|-------|
|      | –11, –7, –2, 3, 8, 10                             | B1   | This mark is given for the correct answer (accept numbers in reverse order) |

**Question 7 (Total 3 marks)**

| Part | Working or answer an examiner might expect to see | Mark | Notes |
|------|---------------------------------------------------|------|-------|
| (a) | Hexagon | B1 | This mark is given for the correct answer only |
| (b) | *AF* | B1 | This mark is given for the correct answer only (accept *FA*) |
| (c) | *AB* or *EF* | B1 | This mark is given for the correct answer only (accept *BA* or *EF*) |

**Question 8 (Total 4 marks)**

| Part | Working or answer an examiner might expect to see | Mark | Notes |
|------|---------------------------------------------------|------|-------|
| (a) | (3, 2) | B1 | This mark is given for the correct answer only |
| (b) |  | B1 | This mark is given for the correct answer only |
| (c) |  | B2 | These marks are given for a circle drawn with centre (1, –1) <br><br> (B1 is given for a circle drawn with radius 4 cm and any centre **or** for any circle drawn with centre (1, –1) |

**Question 9 (Total 3 marks)**

| Part | Working or answer an examiner might expect to see | Mark | Notes |
|------|---------------------------------------------------|------|-------|
| (a) | 23 | B1 | This mark is given for the correct answer only |
| (b) | 10 : 56 | M1 | This mark is given for one or both of 10 or 56 identified |
|     |         | A1 | This mark is given for the correct answer only (or equivalent, e.g. 5 : 28) |

**Question 10 (Total 3 marks)**

| Part | Working or answer an examiner might expect to see | Mark | Notes |
|------|---------------------------------------------------|------|-------|
|  | 1428 – 150 = 1278 | P1 | This mark is given for a process to find the cost of six monthly payments |
|  | 1278 ÷ 6 | A1 | This mark is given for a process to find the cost of one monthly payment |
|  | 213 | A1 | This mark is given for the correct answer only |

**Question 11(Total 3 marks)**

| Part | Working or answer an examiner might expect to see | Mark | Notes |
|------|---------------------------------------------------|------|-------|
|  | 180 – 116 – 25 = 39 | M1 | This mark is given for a method to find the angle *ACB* |
|  | $x = 39$ | A1 | This mark is given for the correct answer only |
|  | Angles in a triangle ad up to 180 **and** Vertically opposite angles are equal | C1 | This mark is given for a two correct reasons stated |

**Question 12 (Total 3 marks)**

| Part | Working or answer an examiner might expect to see | Mark | Notes |
|---|---|---|---|
| (a) | $(28 \div 7) + 5 = 9$ | B1 | This mark is given for the correct answer only |
| (b) | $154 \div 11 = 14$ | P1 | This mark is given for a process to complete the number machine |
|  | $8 + 14 = 6$ | A1 | This mark is given for the correct answer only |

**Question 13 (Total 3 marks)**

| Part | Working an or answer examiner might expect to see | Mark | Notes |
|---|---|---|---|
|  | <table><tr><td></td><td>Single</td><td>Double</td><td>King size</td><td>Total</td></tr><tr><td>With mattress</td><td></td><td></td><td>67</td><td></td></tr><tr><td>Without mattress</td><td>17</td><td></td><td></td><td>59</td></tr><tr><td>Total</td><td></td><td>45</td><td>83</td><td>198</td></tr></table> | C1 | This mark is given for placing at least four pieces of given data in the two-way table |
|  | <table><tr><td></td><td>Single</td><td>Double</td><td>King size</td><td>Total</td></tr><tr><td>With mattress</td><td></td><td></td><td>67</td><td>139</td></tr><tr><td>Without mattress</td><td>17</td><td></td><td>16</td><td>59</td></tr><tr><td>Total</td><td>70</td><td>45</td><td>83</td><td>198</td></tr></table> | C1 | This mark is given for finding and correctly placing at least one unknown piece of given data in the two-way table (e.g. 16 or 139 or 70) |
|  | <table><tr><td></td><td>Single</td><td>Double</td><td>King size</td><td>Total</td></tr><tr><td>With mattress</td><td>53</td><td>19</td><td>67</td><td>139</td></tr><tr><td>Without mattress</td><td>17</td><td>26</td><td>16</td><td>59</td></tr><tr><td>Total</td><td>70</td><td>45</td><td>83</td><td>198</td></tr></table> | C1 | This mark is given for a fully correct table |

**Question 14 (Total 2 marks)**

| Part | Working or answer an examiner might expect to see | Mark | Notes |
|---|---|---|---|
| (i) | > | B1 | This mark is given for the correct answer only |
| (ii) | = | B1 | This mark is given for the correct answer only |

**Question 15 (Total 4 marks)**

| Part | Working or answer an examiner might expect to see | Mark | Notes |
|------|---------------------------------------------------|------|-------|
| (a) | $(0 \times 3) + (1 \times 57) + (2 \times 84) + (3 \times 75) +$ $(4 \times 81)$ <br> $= 0 + 57 + 168 + 225 + 324$ | M1 | This mark is given for a method to find the total number of social media accounts |
|      | 774 | A1 | This mark is given for the correct answer only |
| (b) | $300 \div 2 = 150$ <br> $3 + 57 + 84 = 144$ <br> $3 + 57 + 84 + 75 = 219$ | M1 | This mark is given for a method to find the median number of social media accounts |
|      | 3 | A1 | This mark is given for the correct answer only |

**Question 16 (Total 3 marks)**

| Part | Working or answer an examiner might expect to see | Mark | Notes |
|------|---------------------------------------------------|------|-------|
|      | $62 \div 12.4 = 5$ | P1 | This mark is given for a process to find the scale factor |
|      | $5 \times 9.4$ | P1 | This mark is given for a process to find the width of the building |
|      | 47 | A1 | This mark is given for the correct answer only |

**Question 17 (Total 3 marks)**

| Part | Working or answer an examiner might expect to see | Mark | Notes |
|---|---|---|---|
| |  | B3 | This mark is given for a correct line between $x = -2$ and $x = 4$<br><br>(B2 is given for a correct straight line segment through at least 3 of (–2, 6), (–1, 5), (0, 4), (1, 3), (2, 2) (3, 1) (4, 0)<br><br>**or**<br><br>all points plotted but not joined<br><br>**or**<br><br>a line with negative gradient drawn through (0, 4))<br><br>(B1 is given for at least two points stated or plotted<br><br>**or**<br><br>a line with negative gradient drawn through (0, 4)<br><br>**or**<br><br>a line with gradient –1) |

**Question 18 (Total 3 marks)**

| Part | Working or answer an examiner might expect to see | Mark | Notes |
|---|---|---|---|
| | $25.3 \times 60 = 1518$ minutes | P1 | This mark is given for a process to convert the number of hours to minutes |
| | $1518 \div 115$ | P1 | This mark is given for a process to find the mean length of time for each missed appointment |
| | 13.2 | A1 | This mark is given for the correct answer only |

**Question 19 (Total 5 marks)**

| Part | Working or answer an examiner might expect to see | Mark | Notes |
|------|---------------------------------------------------|------|-------|
| | $3000 \div 150 = 20$ | P1 | This mark is given for a process to find out how many bags can be filled |
| | $17.60 \div 20 = 0.88$ | P1 | This mark is given for a process to find the cost of a small bag |
| | $0.88 \times 0.35 = 0.308$ | P1 | This mark is given for a process to work out 35% of the cost of a bag |
| | $0.88 + 0.308 = 1.188$ | P1 | This mark is given for a process to work out the lowest price to achieve a 35% profit per bag |
| | 1.19 | A1 | This mark is given for the correct answer only |

**Question 20 (Total 4 marks)**

| Part | Working an or answer examiner might expect to see | Mark | Notes |
|------|---------------------------------------------------|------|-------|
| (a) |  | B2 | These marks are given for three correct probabilities 0.87, 094 and 0.94 added to the tree diagram (B1 is given for 0.87 or 0.94 correctly placed) |
| (b) | $0.13 \times 0.06$ | M1 | This mark is given for a method to work out the probability |
| | 0.0078 | A1 | This mark is given for the correct answer only |

**Question 21 (Total 3 marks)**

| Part | Working or answer an examiner might expect to see | Mark | Notes |
|------|---------------------------------------------------|------|-------|
| (a) | $(x^3)^5 = x^{(3 \times 5)} = x^{15}$ | B1 | This mark is given for the correct answer only |
| (b) | $4x + 12 + 28 - 14x$ | M1 | This mark is given for a method to expand at least one bracket |
| | $40 - 10x$ | A1 | This mark is given for the correct answer only |
| (c) | $3(5x^3 + x^2y)$ <br> **or** <br> $3x(5x^2 + xy)$ <br> **or** <br> $x^2(15x + 3y)$ | M1 | This mark is given for a method to eliminate at least one factor |
| | $3x^2(5x + y)$ | A1 | This mark is given for the correct answer only |

**Question 22 (Total 2 marks)**

| Part | Working or answer an examiner might expect to see | Mark | Notes |
|------|---------------------------------------------------|------|-------|
| | Translation $\begin{pmatrix} -5 \\ 6 \end{pmatrix}$ | B1 | This mark is given for translation stated |
| | | B1 | This mark is given for the vector $\begin{pmatrix} -5 \\ 6 \end{pmatrix}$ |

**Question 23 (Total 2 marks)**

| Part | Working or answer an examiner might expect to see | Mark | Notes |
|------|---------------------------------------------------|------|-------|
| | $89.5 \leq$ length $< 90.5$ | B1 | This mark is given for 89.5 shown in the correct position |
| | | B1 | This mark is given for 90.5 shown in the correct position |

**Question 24 (Total 5 marks)**

| Part | Working or answer an examiner might expect to see | Mark | Notes |
|------|---------------------------------------------------|------|-------|
| (a) | $700 \times 2000 = 1\,400\,000$ | P1 | This mark is given for a process to find the area available at Festival B |
| | Festival A: $80\,000 \div 425 = 188.23\ldots$  Festival B: $1\,400\,000 \div = 6750 = 207.40\ldots$ | P1 | This mark is given a method to find the area available per person at (at least) one Festival |
| | $207.40\ldots - 188.23\ldots = 19.17\ldots$ | P1 | This mark is given for finding the difference in area per person |
| | 19 (to the nearest whole number) | A1 | This mark is given for the correct answer only |
| (b) | For example:  300 cm$^2$ is 0.3 m $\times$ 0.3 m = 0.09 m$^2$  3 m$^2$ is 300 cm $\times$ 300 cm = 90 000 cm$^2$ | C1 | This mark is given for a valid statement relating scale factor to area |

**Question 25 (Total 4 marks)**

| Part | Working or answer an examiner might expect to see | Mark | Notes |
|------|---------------------------------------------------|------|-------|
| | $4 - -3 = 7$  $9 - 1 = 8$ | P1 | This mark is given for a process to use coordinates to find the translation of $L$ to $M$ |
| | $7 \div 2 = 3.5$  $8 \div 2 = 4$ | P1 | This mark is given for a process to use the ratio 2 : 3 |
| | $5 \times 3.5 + -3$  $5 \times 4 + 1$ | P1 | This mark is given for a process to use coordinates to find the translation of $L$ to $N$ |
| | (14.5, 21) | A1 | This mark is given for the correct answer only |

**Question 26 (Total 3 marks)**

| Part | Working or answer an examiner might expect to see | Mark | Notes |
|---|---|---|---|
| | $679 \times 0.96 = 651.84$ | M1 | This mark is given for a method to find the decrease in value after one year (given also if $679 \times (0.96)^3$ seen) |
| | $651.84 \times 0.96 \times 0.96$<br><br>**or**<br><br>$679 \times (0.96)^3$ | M1 | This mark is given for a method to find the decrease in value after three years |
| | 600.74 | A1 | This mark is given for the correct answer only (accept 600.73) |

**Question 27 (Total 4 marks)**

| Part | Working or answer an examiner might expect to see | Mark | Notes |
|---|---|---|---|
| | $18 \div 4.5 = 4$ **or** $8 \times 4.5 = 36$<br><br>(18 litres = 4 gallons **or**<br><br>8 gallons = 36 litres) | P1 | This mark is given for a process to convert between litres and gallons |
| | $40.8 \div 0.85 = 48$ **or** $27 \times 0.85 = 22.95$<br><br>(£40.80 = €48 **or** €27 = £22.95) | P1 | This mark is given for a process to convert between euros and pounds |
| | Sam pays £22.95 for 4 gallons<br><br>Leo pays £20.40 for 4 gallons<br><br>**or**<br><br>Sam pays €27 for 18 litres<br><br>Leo pays €24 for 18 litres | P1 | This mark is given for a process to make a comparison between petrol prices |
| | For example:<br><br>Sam is wrong, petrol is cheaper in Wales | C1 | This mark is given for the valid conclusion supported by correct working |

**Question 28 (Total 3 marks)**

| Part | Working or answer an examiner might expect to see | Mark | Notes |
|------|---------------------------------------------------|------|-------|
| | $10x + 4y = 54$<br>$6x + 4y = 28$<br>$4x = 26$<br>$(x = 6.5)$ | M1 | This mark is given for a method to eliminate one variable |
| | $(5 \times 6.5) + 2y = 27$<br>$32.5 - 27 = -2y$<br>$y = -\dfrac{5.5}{2}$ | M1 | This mark is given for substituting a found value into one of the equations |
| | $x = 6.5,\ y = -2.75$ | A1 | This mark is given for the correct answer only (or equivalent) |