**GCSE Mathematics (1MA1) – Foundation Tier Paper 3F**

**November 2020 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**

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| --- |
| **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** |
|  | = 3 | 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** |
| --- | --- | --- | --- |
|  | 8 | 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** |
|  |  | 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** |
|  | 6.25 | B1 | This mark is given for the correct answer only |

**Question 5 (Total 1 mark)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
|  | ­6, –4, 0, 1, 7 | B1 | This mark is given for the correct answer only |

**Question 6 (Total 2 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
| (a) | 5 | B1 | This mark is given for the correct answer only |
| (b) | 5 and 6 | B1 | This mark is given for the correct answer only |

**Question 7 (Total 2 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
|  |  | M1 | This mark is given for a method to find the number of shaded squares as a fraction of the total |
|  | A1 | This mark is given for the correct answer only |

**Question 8 (Total 3 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
|  | 200 ÷ 25 = 8 | P1 | This mark is given for a process to find the number of boxes of tiles |
| 8 × 9.75 | P1 | This mark is given for a process to find the total cost of the boxes of tiles |
| 78 | A1 | This mark is given for a correct answer only |

**Question 9 (Total 4 marks)**

| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
| --- | --- | --- | --- |
| (a) | = 30 | B1 | This mark is given for a correct answer only |
| (b) | 3.5 × 12 = 42 | B1 | This mark is given for a correct answer only |
| (c) |  | B1 | This mark is given for a correct answer only (accept 0.05) |

**Question 10 (Total 3 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
| (a) | 80 | B1 | This mark is given for the correct answer read off the graph |
| (b) | 8 | B1 | This mark is given for the correct answer only |
| (c) | For example:  Yes, because 27 is greater than 7  Yes, because the drop is 20 more  Yes, the gradient is steeper (in the first 3 minutes) and is then less steep (in the last 3 minutes)  Yes, because the drop is 20 less in the last 3 minutes | C1 | This mark is given for a conclusion and reason |

**Question 11 (Total 3 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
|  | 360 – 130 – 95 – 65 = 70 | M1 | This mark is given for a method to find the missing angle of the quadrilateral |
| 180 – 70 | M1 | This mark is given for a method to find the angle *y* |
| 110 | A1 | This mark is given for the correct answer only |

**Question 12 (Total 2 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
| (a)(i) | 20, 15 | B1 | This mark is given for a correct answer only |
| (a)(ii) | 45, 40, 35, 30, 25, 20, 15, 10, 5, 0, –5  11th term | B1 | This mark is given for a correct answer only |
| (b) | (4 × 9) + 3 = 39 | B1 | This mark is given for a correct answer only |

**Question 13 (Total 2 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working an or answer examiner might expect to see** | **Mark** | **Notes** |
|  | 10 + 7 + 4 + 5 + (10 – 4) + (7 – 5)  = 26 + 6 + 2 | M1 | This mark is given for a method to find the length of the perimeter |
| 34 | A1 | This mark is given for the correct answer only |

**Question 14 (Total 4 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
| (a) | 5*x* + *y* | M1 | This mark is given for 5*x* or *y* seen |
| A1 | This mark is given for the correct answer only |
| (b) | 5*p* = 15 | M1 | This mark is given for subtracting 7 from both sides of the equation |
| 3 | A1 | This mark is given for the correct answer only |

**Question 15 (Total 5 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
| (a) | Shop A: 30 ÷ 4 = 7.5 so 8 packets needed  Shop B: 30 ÷ 6 = 5, so 5 packets needed | P1 | This mark is given for a method to find the number of packets of batteries needed from each shop |
| Shop A: 8 × 1.60 = 12.80  Shop B: 5 × 2.70 = 13.50 | P1 | This mark is given for a method to find the cost of the packets of batteries from one shop |
| P1 | This mark is given for a method to find the cost of the packets of batteries from both shops |
| Harry should buy batteries from Shop A | C1 | This mark is given for a valid conclusion following correct working |
| (b) | For example:  No, since A is 12 and B is 13.50  No, since A is just 80p less and B is the same.  No, since A is less and B has not changed.  No, since A is 1.50 less  No, since 40p is less than 45p | C1 | This mark is given for a valid conclusion following correct working |

**Question 16 (Total 4 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
| (a) |  | M1 | This mark is given for a method to find the probability where  seen (*n*> 5) or  seen (*m* < 11) |
|  | A1 | This mark is given for the correct answer only |
| (b) | 1 – 0.3 = 0.7 | B1 | This mark is given for the correct answer only |

**Question 17 (Total 2 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
|  | For example:  6 cm  6 cm  8 cm | M1 | This mark is given for one line drawn with length 6 cm |
| A1 | This mark is given for an isosceles triangle correctly drawn |

**Question 18 (Total 3 marks)**

| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
| --- | --- | --- | --- |
|  | For example:  $345 ÷ 15 = $23 | M1 | This mark is given for a method to use the figures given on the graph |
| $23 = £18  $345 = 15 × £18 | M1 | This mark is given for a method to read off an appropriate conversion from the graph |
| £270 | A1 | This mark is given for the correct answer in the range 260 – 270 |

**Question 19 (Total 4 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
| (a) | × (total number of sandwiches) = 56  total number of sandwiches =  × 100 | M1 | This mark is given for a method to find the total number of sandwiches |
| 140 | A1 | This mark is given for the correct answer only |
| (b) | = 0.3214285… | M1 | This mark is given for a method to find the percentage |
| 32% (to the nearest whole number) | A1 | This mark is given for the correct answer only |

**Question 20 (Total 4 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
|  | 3 × 80 = 240 | P1 | This mark is given for a process to find the total amount of money shared |
| 240 – 100 – 65 = 75 | P1 | This mark is given for a process to find out how much money Carl has |
| 75 – (3 × 5) – 20 = 40 | P1 | This mark is given for a process to find out how much money Carl has in ten pound notes |
| 40 ÷ 10 = 4 | A1 | This mark is given for the correct answer only |

**Question 21 (Total 4 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working an or answer examiner might expect to see** | **Mark** | **Notes** |
| (a) | 25 | A1 | This mark is given for the correct answer only |
| (b) | For example:  Simon; he uses more trials  Simon; he does 10 times more  Simon, since 100 > 10 | C1 | This mark is given for a valid conclusion with a correct reason |

**Question 22 (Total 5 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
|  |  | M1 | This mark is given for a square of side 6 cm |
| A1 | This mark is given for a fully correct plan |

**Question 23 (Total 5 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
| (a) | *n*3 + 5  = *n*8 | B1 | This mark is given for the correct answer only |
| (b) | *c* 3 – 2 × *d* 4 – 1 | M1 | This mark is given for either *c* or *d* 3 seen |
| *cd* 3 | A1 | This mark is given for the correct answer only |
| (c) | 5*x* > 14 | M1 | This mark is given for a method to remove the fraction from the inequality |
| *x* > | A1 | This mark is given for the correct answer only |

**Question 24 (Total 3 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
|  | = 1.25,  = 1.5 | P1 | This mark is given for a process to find out how many hours Andy cycles and runs for |
| 1 hour 15 minutes + 1 hour 30 minutes | P1 | This mark is given for a process to convert into hours and minutes |
| 2 hours and 45 minutes | A1 | This mark is given for the correct answer only |

**Question 25 (Total 2 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
|  | 9.35 ≤ *m* < 9.45 | B1 | This mark is given for 9.35 in the correct position |
| B1 | This mark is given for 9.45 in the correct position |

**Question 26 (Total 5 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
| (a) | 5 × 9 = 45 3 kg  10 × 14 = 140 5 boxes = 10 kg | P1 | This mark is given for a process to find the areas of the lawns and the amount of grass seed required |
| = 3.111… | P1 | This mark is given for a process to find the comparative sizes of the lawns |
| 3 × 3.111… = 9.333… kg | P1 | This mark is given for a process to find the amount of grass seed needed for the larger lawn |
| Yes, Maisie has enough grass seed | C1 | This mark is given for a valid conclusion supported by correct working |
| (b) | Yes, there is an effect.  9 kg is not enough grass seed since 9.333… kg is required | C1 | This mark is given for a valid conclusion supported by correct working |

**Question 27 (Total 4 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
| (a) | , ; , , , | B2 | These marks are given for six fully correct probabilities  (B1 is given for at least two correct probabilities) |
| (b) | × | M1 | This mark is given for a method to find the probability |
|  | A1 | This mark is given for the correct answer only |

**Question 28 (Total 2 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
| (a) | *x* = –2, *y* = 4 | B1 | This mark is given for the correct answer only |
| (b) | 0.6, 3.4 | M1 | This mark is given for correct answers shown on the graph or given as coordinates (for example (0.6, 0) and (3.4, 0) |
| A1 | This mark is given for the correct answer only (in the ranges 0.55 to 0.6 and 3.4 to 3.45 |

**Question 29 (Total 1 mark)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
|  | (6 × 4 × 10) = 120 | M1 | This mark is given for a method to find the volume of the prism |
| 120 × 0.8 | M1 | This mark is given for a method to find the mass of the prism |
| 96 | A1 | This mark is given for the correct answer only |