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

**November 2019 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** |
|  | –7, –4, –2, 1, 8 | 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** |
| --- | --- | --- | --- |
|  | 8000 | 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** |
|  | 23 | 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** |
|  | 4.2 | 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 × 6 × 6 × 6 × 6 = 7776 | B1 | This mark is given for the correct answer only |

**Question 6 (Total 4 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
|  | 14 × 15 = 210 | P1 | This mark is given for a process to work out the number of seats in the cinema |
| = 196 | P1 | This mark is given for a process to work out how many tickets were sold |
| 210 – 196 = 14 | A1 | This mark is given for finding out how many tickets were **not** sold |

**Question 7 (Total 2 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
|  | 20 – 7 = 13 | M1 | This mark is given for a method to find out how many sweets Harry now has |
|  | A1 | This mark is given for the correct answer only |

**Question 8 (Total 2 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
| (a) | 6 × 8 – 5 = 43 | B1 | This mark is given for the correct answer only |
| (b) | 17 + 13 **÷ 3** = 10  or  17 + 13 **– 20** = 10 | B1 | This mark is given for a correct answer of ÷3 or –20 |

**Question 9 (Total 6 marks)**

| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
| --- | --- | --- | --- |
| (a) | 3 4 4 6 8 9 | M1 | This mark is given for a method to list the numbers in order |
| = 5 | A1 | This mark is given for the correct answer only |
| (b) | There are two odd numbers (3 and 9) in the list of 6 numbers | B1 | This mark is given for identifying either that there are 2 odd numbers or 6 numbers in total |
|  | B1 | This mark is given for the correct answer only (or an equivalent fraction) |
| (c) | 3 | P1 | This mark is given for deducing that (at least) one missing number must be 3 to be the mode |
| = 5  3 + 3 + 8 + 5 + *x* = 25  *x* = 25 – 19 = 6 | A1 | This mark is given for finding the other missing number |

**Question 10 (Total 3 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
|  | = 350 | P1 | This mark is given for a method to find out how many minutes Jon’s car was parked |
| 10 45 + 350 minutes =  10 45 + 5 50 | P1 | This mark is given for a process to find what time Jon drove out the car park |
| 16 35 | A1 | This mark is given for a correct answer only (accept 4.35 p.m.) |

**Question 11 (Total 3 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
| (a) | 3 stones = 19 kilograms | B1 | This mark is given for the correct answer only |
| (b) | 40 kilograms = 6.3 stones | M1 | This mark is given for reading off an appropriate conversion to use to find the conversion for 80 kg |
| 80 kilograms = 12.6 stones |  | This mark is given for a correct answer only (in the range 12.4 to 12.8) |

**Question 12 (Total 2 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
|  | = | P1 | This mark is given for a process to find a common denominator for the two fractions |
| =  = | P1 | This mark is given for correctly finding the number which is halfway between the two fractions (accept 0.35 or any equivalent fraction) |

**Question 13 (Total 2 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working an or answer examiner might expect to see** | **Mark** | **Notes** |
|  |  | B2 | These marks are given for a correct enlargement  (B1 is given for any two sides correct or a correct enlargement with scale factor other than 1 or 3) |
| A1 | This mark is given for the correct answer only |

**Question 14 (Total 3 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
|  | 1st offer: 2 × 20 = 40 litres for £3.50  2nd offer: 3 × 40 = 120 litres for £9.00 | P1 | This mark is given for a process to work out the total cost of each offer |
| 1st offer equates to 120 litres for £10.50 | P1 | This mark is given for a process to compare the two offers |
| The 40 litre bag is better value for money | C1 | This mark is given for a correct conclusion stated supported by correct working |

**Question 15 (Total 3 marks)**

| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
| --- | --- | --- | --- |
|  | 19.2 m = 1920 cm | M1 | This mark is given for a method to find the length of the plane in cm |
|  | M1 | This mark is given for a method to find the length of the model |
| 80 |  | This mark is given for the correct answer only |

**Question 16 (Total 2 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
|  | 4500 ×  = 81 | M1 | This mark is given for a method to find the interest paid after one year |
| 81 × 3 = 243 | A1 | This mark is given for the correct answer only |

**Question 17 (Total 4 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
|  | *ADB* = 64  Base angles of a isosceles triangle are equal | B1 | This mark is given for a finding the size of the angle *ADB* |
| *BDC* = *x*  64 + 64 + 2*x* = 180 | M1 | This mark is given for a method to find the value of *x* |
| Base angles of a isosceles triangle are equal  Angles in a triangle add up to 180 | C1 | This mark is given for correct reasons given for each stage of reasoning |
| 180 – 128 = 2*x*  2*x* = 52  *x* = 26 | A1 | This mark is given for the correct answer only |

**Question 18 (Total 4 marks)**

| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
| --- | --- | --- | --- |
| (a) | Ben’s age = *n*  Chloe’s age = 2*n*  Dan’s age = *n* – 5 | M1 | This mark is given for a method to find algebraic expressions for the ages of Ben, Chloe and Dan |
| *T* = *n* + 2*n* + *n* – 5 | M1 | This mark is given for method to find an algebraic expression for *T* |
| *T* = 4*n* – 5 | A1 | This mark is given for the correct answer only |
| (b) | 5*m* – 3*m* = 2*m* | C1 | This mark is given for a tick next to the correct identity |

**Question 19 (Total 3 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
|  | 500 ÷ 175 = 2.857…  300 ÷ 75 = 4  625 ÷ 250 = 2.5 | P1 | These marks is given for a process to find the multiples of 16 biscuits which can be made with each ingredient |
| 2.5 × 16 | P1 | This mark is given for a process to find the greatest number of biscuits Anna can make |
| 40 | 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** |
|  | *H* = (4 × 110) + 12 | M1 | This mark is given for a method to use the formula to find an estimate of the height of the building |
| 452 | A1 | This mark is given for a correct estimate of the height of the building |
| × 100 = 2.26…(%) | M1 | This mark is given for a method to find the percentage difference between the estimate and the real height |
| The difference between the estimate and the real height is less than 5% | A1 | This mark is given for a correct conclusion supported by correct working |

**Question 21 (Total 2 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
|  | For example:  There is no frequency label  The *y*-axis is not labelled  The polygon should not be closed  The polygon should not have a line at the bottom  The first and last points should not be connected  The point (15, 6) has been plotted incorrectly  The point (15, 6) has been plotted at (15, 8) | C2 | These marks are given for two correct statements  (C1 is given for one correct statement) |

**Question 22 (Total 2 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
|  | 127.5 ≤ length < 128.5 | B1 | This mark is given for 127.5 in the correct position |
| B1 | This mark is given for 128.5 in the correct position |

**Question 23 (Total 4 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
|  | × 3 = 72 | P1 | This mark is given for a process to find out how many stamps Tom originally had |
| × 3 = 90 | P1 | This mark is given for a process to find out how many stamps Tom had after buying some from Adam |
| 90 – 72 | P1 | This mark is given for a process to find how many stamps Tom bought from Adam |
| 18 | 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** |
| (i) | × 700 | M1 | This mark is given for a process to find out how many bags Stan should order |
| 238 | A1 | This mark is given for a correct answer only |
| (ii) | For example:  The sample is representative, otherwise the answer might be wrong  The sample is random, otherwise the answer might be different  The 50 people sampled are from the 700 in the fitness club, otherwise the answer might be inaccurate  17 out of every 50 people want a sports bag, otherwise the answer might be wrong |  | This mark is given for a valid assumption and an explanation |

**Question 25 (Total 3 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
| (a) |  | P1 | This mark is given for identifying the correct graph for the equation *y* = *x*3 |
| (b) |  | P1 | This mark is given for identifying the correct graph for the equation *y* = |

**Question 26 (Total 3 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
|  | The terms of 2*n*2 – 1 are  1, 7, 17, 31, 49… | M1 | This mark is given for a method to generate at least three terms of the first sequence |
| The terms of 40 – *n*2 are  39, 36, 31, 24, 15… | M1 | This mark is given for a method to generate at least three terms of the second sequence |
| 31 | A1 | This mark is given for a correctly identifying the only number in both sequence |

**Question 27 (Total 2 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
|  | ×  = 0.456 × 10–1 | M1 | This mark is given for a method to find an answer in standard form |
| 4.56 × 10–2 | A1 | This mark is given for the correct answer only |

**Question 28 (Total 3 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
|  | Ali’s company will use  = 18 workers  Hayley’s company will use  = 24 workers | P1 | This mark is given for a process to find the number of workers needed by each company |
| 24 – 18 | P1 | This mark is given for a process find out how many more workers Hayley’s company will need |
| 6 | A1 | This mark is given for the correct answer only |

**Question 29 (Total 5 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
|  | (2 × 6 × 8) + (2 × 6 × 18) + (2 × 8 × 18) =  96 + 216 + 288 cm2 | P1 | This mark is given for a process to find the area of at least three faces of the cuboid |
| 600 cm2 | P1 | This mark is given for a complete process to find the surface area of the cuboid |
| = 100 cm2  √100 = 10 cm | P1 | This mark is given for a process to find the length of one side of the cube |
| Volume of cuboid = 6 × 8 × 18 = 864 cm3  Volume of cube = 10 × 10 × 10 = 1000 cm3 | P1 | This mark is given for a process to find the volumes of the cube and the cuboid |
| Volumes are different so Janet is not correct | A1 | This mark is given for a correct conclusion supported by correct working |

**Question 30 (Total 3 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
|  | 2**b** =  = | M1 | This mark is given for a method to find the vector representing 2**b** |
| **a** – 2**b** =  = | M1 | This mark is given for a method to find the vector representing **a** – 2**b** |
|  | A1 | This mark is given for a correctly drawn vector on the diagram |