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

**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**

|  |
| --- |
| **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** |
|  |  | 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** |
| --- | --- | --- | --- |
|  | 29 000 | 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** |
|  | 6*e* | 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** |
|  | 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** |
|  | 27 | B1 | This mark is given for the correct answer only |

**Question 6 (Total 3 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
|  | 105 + 20 = 125 minutes  2 hours and five minutes | M1 | This mark is given for converting the length of the film and the walk to the bus stop into hours and minutes |
| 14 30 + 2 05 = 16 45 | A1 | This mark is given for finding the time Liz reaches the bus stop |
| Yes, Liz will get to the stop in time to catch the bus | C1 | 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** |
|  | For example:  There is no label for the mark  The vertical axis jumps from 0 to 71  The bars are not all the same width | C2 | These marks are given for two correct reasons stated  (C1 is given for one reason correctly stated) |

**Question 8 (Total 3 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
| (a)(i) | 30 | B1 | This mark is given for the correct answer only |
| (a)(ii) | Angles on a straight line add up to 180° | C1 | This mark is given for a correct reason stated |
| (b) | For example:  90 + 280 = 370  The two angles don’t add up to 360  280 should be 270 | C1 | This mark is given for a correct reason stated |

**Question 9 (Total 4 marks)**

| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
| --- | --- | --- | --- |
| (a) | 25 | B1 | This mark is given for the correct answer (in the range 24 to 26) |
| (b) | 40 ÷ 10 × 6 | M1 | This mark is given for a method to substitute into the rule |
| 24 | A1 | This mark is given for the correct answer only |
| (c) | For example:  the two answers are quite close or  answer to (b) is less than answer to (a)  the rule gives a smaller answer | C1 | This mark is given for a correct comparison stated |

**Question 10 (Total 2 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
| (a) | *m* = 36 ÷ 3 = 12 | B1 | This mark is given for the correct answer only |
| (b) | *x* = 7 – 3 = 4 | B1 | 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** |
|  | 4 × 10 × 15 | M1 | This mark is given for a method to find the volume of the cuboid |
| 600 | A1 | This mark is given for the correct answer only |
| cm3 | B1 | This mark is given for the correct units stated |

**Question 12 (Total 2 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
|  | L23, L29, U23, U29 | B2 | These marks are given for all four outcomes stated correctly with no extras or repeats  (B1 is given for two or three correct outcomes) |

**Question 13 (Total 3 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working an or answer examiner might expect to see** | **Mark** | **Notes** |
|  | 4725 ÷ 28 = 152.67857…  152 bags | P1 | This mark is given for a process to find out the number of bags that can be filled |
| 152 × 28 = 4256 | P1 | This mark is given for a process to find out how many sweets are used |
| 4725 – 4256 = 19 | 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** |
|  | × 360 = 150°  × 360 = 135°  × 360 = 75° | M1 | This mark is given for a method to find at least one angle correctly |
| City  Rovers  United | A1 | This mark is given for three angles drawn correctly |
| B1 | This mark is given for all three sectors labelled correctly |

**Question 15 (Total 4 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
|  | *T* = (3 × 5) + (4 × –7)  = 15 – 28 | M1 | This mark is given for a method to substitute values to find *T* |
| *T* = –13 | A1 | This mark is given for the correct answer only |
| 38 = (3 × 6) + (4 × *y*)  *y* = | M1 | This mark is given for a method to substitute values and rearrange to find *y* |
| *y* = 5 | A1 | This mark is given for the correct answer only |

**Question 16 (Total 4 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
|  | (60 + 90) ×  = 100 | P1 | This mark is given for a process to find the pass mark |
| 60 ×  = 42 | P1 | This mark is given for a process to find the mark scored on paper 1 |
| 100 – 42 | P1 | This mark is given for a process to find the mark needed on paper 2 to pass |
| 58 | A1 | This mark is given for the correct answer only |

**Question 17 (Total 5 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
| (a) | 30 ×  = 120 | P1 | This mark is given for a process to find the number of oranges needed to make 8 litres |
| = | P1 | This mark is given for a process to find the number of boxes oranges needed to make 8 litres |
| 5 | A1 | This mark is given for the correct answer only |
| (b) | For example:  1260 : 280  126 : 28 (dividing by 10)  63 : 14 (dividing by 2) | M1 | This mark is given for a process to find the ration in its simplest form |
| 9 : 2 | A1 | This mark is given for the correct answer only |

**Question 18 (Total 2 marks)**

| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
| --- | --- | --- | --- |
|  | Rotation of 180° | C1 | This mark is given for the correct transformation stated |
| about (–1, 0) | C1 | This mark is given for the correct centre of rotation stated |

**Question 19 (Total 2 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
|  | Rytis = 1, Linda = 3, Adam = 6 | P1 | This mark is given for a process to find the correct proportions in which the money is shared |
| Linda’s fraction =  = | 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** |
|  | £1.80 ÷ 12 = 15p | P1 | This mark is given for a process to find the cost of one pencil |
| × 7 = 35p | P1 | This mark is given for a process to find the cost of one pen |
| 35 × 5 | P1 | This mark is given for a process to find the cost of five pens |
| 1.75 | 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) | 2 × 2 × 3 × 7 | M1 | This mark is given for a 2, 2 3 and 7 seen |
| A1 | This mark is given for the correct answer only |
| (b) | 60, 120, 180, 240, 300, 360, 420 …  84, 168, 252, 336, 420 …  **or**  84 = 2 × 2 × 3 × 7  60 = 2 × 2 × 3 × 5  LCM = 2 × 2 × 3 × 5 × 7 | M1 | This mark is given for a method to find the LCM |
| 420 | A1 | This mark is given for the correct answer only |

**Question 22 (Total 5 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
| (a) | 4 6 8  1 5  2 10  3 7 9 | M1 | This mark is given for 2 and 10 correctly placed in the intersection |
| M1 | This mark is given for 4, 6 and 8 placed in *A* only  or  1 and 5 placed in *B* only  or  3, 7 and 9 placed in (*A* ∪ *B*)′ |
| C1 | This mark is given for all numbers correctly placed in the Venn diagram |
| (b) | *n*(*A* ∩ *B*) = 2 | M1 | This mark is given for a method to identify the number of elements in *A* ∩ *B* |
|  | A1 | This mark is given for the correct answer only |

**Question 23 (Total 5 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
|  | 3000 ÷ 5 = 600 | P1 | This mark is given for a start to the process to solve the problem |
| 1200 : 1800 | P1 | This mark is given for a process to find the ratio of the number of tins in small boxes to the number of tins in large boxes |
| :  = 200 : 90 | P1 | This mark is given for a process to find the ratio of the number of small boxes to the number of large boxes |
| = 0.3103448… ≈ 31% | P1 | This mark is given for a process to find to find the percentage of tins in large boxes |
| Carlo is not correct; 31% of the boxes filled with tins are large boxes | C1 | This mark is given for a valid conclusion supported by correct working |

**Question 24 (Total 4 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
| (a) | |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | *x* | –2 | –1 | 0 | 1 | 2 | | *y* | **13** | 6 | **5** | **4** | **–3** | | B2 | These marks are given for all 4 points correct  (B1 is given for two or three points correct) |
| (b) |  | B1 | This mark is given for five points plotted correctly |
| A1 | This mark is given for a fully correctly plotted graph |

**Question 25 (Total 2 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
|  | sin 34° =  *x* = 178 × sin 34°  *x* = 178 × 0.559 | M1 | This mark is given for a method to find the value of *x* |
| *x* = 99.5 (mm) | A1 | This mark is given for the correct answer only (in the range 99.5 – 99.54) |

**Question 26 (Total 2 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
|  | 2 ×  =  3 ×  = | M1 | This mark is given for a method to find the vectors 2**a** and 3**b** |
| –  = | A1 | This mark is given for the correct answer only |

**Question 27 (Total 4 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
|  | *CB* = √(92 – 62) = √45 | P1 | This mark is given for a process to find the length *CB* |
| = √45 | P1 | This mark is given for correctly finding the length *CB* (accept 6.7) |
| × *π* × (√45)2 = 11.25*π* | P1 | This mark is given for a process to find the area of the quarter circle |
| 35.3 (to 3 significant figures) | A1 | This mark is given for the correct answer only (in the range 35.2 to 35.3) |

**Question 28 (Total 2 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
|  | 360 ÷ 15 | M1 | This mark is given for a method to find the number of sides of the polygon |
| 24 | A1 | This mark is given for the correct answer only |

**Question 29 (Total 1 mark)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
|  | 2 | B1 | This mark is given for the correct answer only |