**GCSE Mathematics (1MA1)**

**Themed papers – Mean**

**Compiled from student-friendly mark schemes**

**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 6 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
| (a) | 2 ÷ 40 × 100 | B1 | This mark is given for reading 2 students from the 20 to 24 bar |
| 5 | A1 | This mark is given for a correct answer only |
| (b) | 11, 8, 13, 6 and 2 | M1 | This mark is given for frequencies of 11, 8, 13, 6 and 2 used |
| 11 × 2 + 8 × 7 + 13 × 12 + 6 × 17 + 2 × 22  = 380 | M1 | This mark is given for totalling frequencies multiplied by correct mid‑interval terms 2, 7, 12, 17 and 22 |
|  | M1 | This mark is for dividing by the number of students |
| 9.5 | C1 | This mark is given for a correct estimate supported by correct working |

**Question 2 (Total 3 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
|  | 30 × 60 (= 1800)  20 × 54 (= 1080) | P1 | This mark is given for a process to find the **total** mark of the whole class and the **total** mark of the girls |
|  | (1800 – 1080) = 720 | P1 | This mark is given for a process to find the **total** mark of the boys |
|  | 720 ÷ 10 = 72 | A1 | This mark is given for the correct answer only |

**Question 3 (Total 3 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
|  | (1 × 7.5) + (2 × 12.5) + (7 × 17.5) + (8 × 22.5)  = 7.5 + 25 + 122.5 + 180 | M1 | This mark is given for a method to find four products within the intervals |
|  | M1 | This mark is for a method to find ∑*ft* ÷ 18 |
| 18.6 | A1 | This mark is given for a correct answer in the range 18.61 to 18.62 |

**Question 4 (Total 3 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
|  | 4 × 5 = 20 kg  5 × 9 = 45 kg | P1 | This mark is given for a process to find the weight of the red bricks or the blue bricks |
| 20 + 45 + 6 = 71 kg | P1 | This mark is given for a process to find the weight of all the bricks |
| Average weight of bricks is  = 7.1 kg  so Donna is incorrect | C1 | This mark is given for finding the average weights of the bricks with a correct conclusion stated |

**Question 5 (Total 3 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
|  | 30 × 14 = 420  18 × 10 = 180 | C1 | This mark is given for a method to find total number of counters in all bags and boxes and the total number of counters in the bags |
| 420 – 180 = 240 | C1 | This mark is given for a method to find the total number of counters in the boxes |
| The mean number of counters per box is 240 ÷ 12 = 20, so Mark is wrong | C1 | This mark is given for a complete solution |

**Question 6 (Total 4 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
|  | 15.6 × 10 = 156  9.2 × 10 = 92  11.2 × 40 = 448 | P1 | This mark is given for a process to find total scores of either women, children or all people |
| (448 – 156 – 92) ÷ 20 | P1 | This mark is given for a complete process to find average score of men |
| 10 | A1 | This mark is given for the correct answer only |
| The mean is reduced (since the total is reduced but the number of men stays the same) | C1 | This mark is given for a correct reason |

**Question 7 (Total 4 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
|  | 30 × 32.85 = 985.5)  **or**  11 × 31.9 = 350.9 | P1 | This mark is given for a start to the process |
| 985.5 – 350.9 ÷ 19 | P1 | This mark is given for a complete process to find the mean |
| 33.4 | A1 | This mark is given for a correct answer only |

**Question 8 (Total 3 marks)**

| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
| --- | --- | --- | --- |
| (a) | π × 80 = 251.327… | 1 | This mark is given for finding the length of the circumference of the circle |
| 251.327 ÷ 8 = 31.4… | 1 | This mark is given for the correct answer only |
| (b) | No, the mean distance stays the same because the total distance and the number of points stays the same | 1 | This mark is given for a correct comment |

**Question 9 (Total 4 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
| (a) | 200 + 3300 + 2000 + 0 + 1800 = 7300 | 1 | This mark is given for *fx* with *x* consistent within intervals |
| 7300 ÷ 20 | 1 | This mark is given Ʃ*fx* ÷ Ʃ*f* |
| 365 | 1 | This mark is given for the correct answer only |
| (b) | Yes, since outliers can affect the mean | 1 | This mark is given for a correct comment |

**Performance data:**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Q** | **Taken from** | | | **Total Marks available** | **TOPIC** | **Spec Ref** | **AO** | **% Mean marks** | **Edexcel mean averages Marks of candidates who achieved grade:** | | | | | | | | | | |
| **Q** | **Series** | **Paper** | **ALL** | **9** | **8** | **7** | **6** | **5** | **4** | **3** | **2** | **1** | **U** |
| 1a | 4a | Nov 2018 | 3H | 2 | Ratio | R9 | 2 | 70 | 1.4 | 2 | 2 | 1.8 | 1.8 | 1.75 | 1.47 | 0.94 | - | - | 0.49 |
| 1b | 4b | Nov 2018 | 3H | 4 | Statistics | S2, S4 | 2 | 33 | 1.3 | 4 | 3.76 | 2.74 | 2.16 | 1.51 | 1.12 | 0.61 | - | - | 0.39 |
| 2 | 7 | June 2017 | 1H | 3 | Statistics | S4 | 3 | 54 | 1.61 | 2.93 | 2.67 | 2.18 | 1.65 | 1.1 | 0.55 | 0.17 | - | - | 0.06 |
| 3 | 4 | Nov 2019 | 3H | 3 | Statistics | S4 | 1 | 40 | 1.20 | 3.00 | 2.59 | 2.21 | 1.84 | 1.42 | 0.99 | 0.62 | - | - | 0.22 |
| 4 | 6 | Nov 2019 | 1H | 3 | Statistics | S4 | 3 | 29 | 0.86 | 2.67 | 2.7 | 2.06 | 1.62 | 1.03 | 0.55 | 0.25 | - | - | 0.04 |
| 5 | 12 | Mock Set 2 | 1H | 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 6a | 8a | Mock Set 3 | 1H | 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 6b | 8b | Mock Set 3 | 1H | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 7 | 12 | Mock Set 4 | 3H | 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 8a | 3a | Nov 2017 | 2H | 2 | Geometry | G17 | 1 | 28 | 0.57 | 1.75 | 1.5 | 1.6 | 1.37 | 1 | 0.59 | 0.29 | - | - | 0.12 |
| 8b | 3b | Nov 2017 | 2H | 1 | Statistics | S4 | 3 | 26 | 0.26 | 0.75 | 0.71 | 0.49 | 0.52 | 0.31 | 0.26 | 0.2 | - | - | 0.14 |
| 9a | 5a | Nov 2017 | 1H | 3 | Statistics | S4 | 1 | 20 | 0.59 | 2.50 | 2.24 | 1.75 | 1.23 | 0.90 | 0.63 | 0.36 | - | - | 0.16 |
| 9b | 5b | Nov 2017 | 1H | 1 | Statistics | S4 | 3 | 2 | 0.02 | 0.25 | 0.18 | 0.11 | 0.06 | 0.03 | 0.02 | 0.01 | - | - | 0.01 |
|  |  |  |  | **32** |  |  |  |  | **7.81** | **19.85** | **18.35** | **14.94** | **12.25** | **9.05** | **6.18** | **3.45** | **-** | **-** | **1.63** |