**GCSE Mathematics (1MA1)**

**Themed papers – Standard form**

**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 2 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
|  |  ×  =  × 10(9 – 3) | M1 | This mark is given for a method to find the value in standard form |
| 2.3 × 106 | A1 | This mark is given for the correct answer only |

**Question 2 (Total 3 marks)**

| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
| --- | --- | --- | --- |
| (a) | 0.47 | B1 | This mark is given for the correct answer only |
| (b) | 2.4 × 9.5 × 103 × 105 = 22.8 × 108 | M1 | This mark is given for correct values which are not in standard form |
| 2.28 × 109 | A1 | This mark is given for the correct answer only |

**Question 3 (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 4 (Total 2 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
|  | 13.8 × 5.4 × 107 × 10–12= 74.52 × 10–5= 7.452 × 10–4 | 1 | This mark is given for the digits 7452 seen |
| 0.000 745 2 | 1 | This mark is given for the correct answer only |

**Question 5 (Total 2 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
|  | 5.62 × 10–3 | B1 | This mark is given for the correct answer only |
| 1452 | 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** |
| (a) | 7.547 × 10–5 | B1 | This mark is given for the correct answer only |
| (b) | 34 200 | B1 | This mark is given for the correct answer only |
| (c) |  ×   | M1 | This mark is given for a method to work out the calculation |
| 3.082 × 1015 | A1 | This mark is given for any number equal to 3.082 × 1015 |

**Question 7 (Total 4 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
| (a) | 26 730 | B1 | This mark is given for the correct answer only |
| (b) | 7.04 × 10–2 | B1 | This mark is given for the correct answer only |
| (c) |  ×  = 1.5 × (106 – –2) | M1 | This mark is given for 1.5 of 10*n*, where *n* ≠ 8 |
| 1.5 × 108 | 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** |
| (a) | 3.4 × 108 | B1 | This mark is given for the correct answer only |
| (b) |  | M1 | This mark is given for converting at least one numberorfor digits 183 seen |
| 0.0000183 | A1 | This mark is given for an answer in the range 0.0000183 to 0.000018332 |

**Question 9 (Total 3 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
| (a) | 3.246 × 107 | B1 | This mark is given for the correct answer only |
| (b) | 0.00496 | B1 | This mark is given for the correct answer only |
| (c) | No; *B* is bigger since the power of 10 is bigger | C1 | This mark is given for a correct conclusion with a valid explanation given |

**Question 10 (Total 3 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
|  | 6 × 0.0003 or 0.06 × 0.03 | 1 | This mark is given for a process to start the calculation or sight of 1.8 × 10*n* where *n* ≠ –3 |
| 0.0018 or or 18 × 10–4 | 1 | This mark is given for a complete process to find a value for the calculation  |
| 1.8 × 10–3 | 1 | This mark is given for the correct answer only |

**Question 11 (Total 4 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
| (a) | (1.496 × 1011) ÷ (3 × 108) (= 498.666…) | M1 | This mark is given for a method to find the number of seconds taken for light to reach the earth |
| 498.666… ÷ (60 × 60) | A1 | This mark is given for converting the number of seconds into hours |
| 0.1385185185 = 0.139 to 3 significant figures | A1 | This mark is given for showing the answer to be 0.139 hours as required |
| (b) | For example, Danesh has multiplied the indices rather than adding them | C1 | This mark is given for a correct explanation |

**Question 12 (Total 4 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
| (a) | 104 000 | B1 | This mark is given for the correct answer only |
| (b) | 6 × 10-2 | A1 | This mark is given for the correct answer only  |
| (c) | (300.3 × 106) ÷ ( 4.62 × 108)  | M1 | This mark is given for setting up a calculation to find the average  |
| 0.65 | A1 | This mark is given for the correct answer only |

**Performance data:**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Q** | **Taken from**  | **Total Marks available** | **TOPIC** | **Spec Ref** | **AO** | **% Mean marks** | **Edexcel mean averagesMarks of candidates who achieved grade:** |
| **Q** | **Series** | **Paper** | **ALL** | **5** | **4** | **3** | **2** | **1** | **U** |
| 1 | 18 | Jun-18 | 3F | 2 | Number | N9 | 1 | 52 | 1.04 | 1.77 | 1.46 | 1.05 | 0.71 | 0.41 | 0.16 |
| 2a | 15a | Jun-17 | 2F | 1 | Number | N9 | 1 | 68 | 0.68 | 0.95 | 0.86 | 0.72 | 0.52 | 0.33 | 0.15 |
| 2b | 15b | Jun-17 | 2F | 2 | Number | N9 | 1 | 44 | 0.87 | 1.6 | 1.23 | 0.84 | 0.52 | 0.25 | 0.08 |
| 3 | 27 | Nov-19 | 2F | 2 | Number | N9 | 1 | 44 | 0.88 | 1.38 | 1.14 | 0.87 | 0.59 | 0.38 | 0.12 |
| 4 | 25 | Nov-17 | 3F | 2 | Number | N9 | 1 | 40 | 0.79 | 1.32 | 0.99 | 0.77 | 0.6 | 0.41 | 0.25 |
| 5a | 27a | Jun-19 | 2F | 1 | Number | N9 | 1 | 39 | 0.39 | 0.82 | 0.61 | 0.36 | 0.19 | 0.08 | 0.03 |
| 5b | 27b | Jun-19 | 2F | 1 | Number | N9 | 1 | 73 | 0.73 | 0.94 | 0.86 | 0.75 | 0.65 | 0.52 | 0.3 |
| 6a | 27a | Nov-18 | 2F | 1 | Number | N9 | 1 | 36 | 0.36 | 0.71 | 0.53 | 0.34 | 0.2 | 0.09 | 0.05 |
| 6b | 27b | Nov-18 | 2F | 1 | Number | N9 | 1 | 77 | 0.77 | 0.93 | 0.87 | 0.78 | 0.68 | 0.51 | 0.24 |
| 6c | 27c | Nov-18 | 2F | 2 | Number | N9 | 1 | 60 | 1.19 | 1.51 | 1.43 | 1.19 | 0.95 | 0.62 | 0.27 |
| 7a | 26a | Mock Set 3 | 3F | 1 | Number | − | − | − | − | − | − | − | − | − | − |
| 7b | 26b | Mock Set 3 | 3F | 1 | Number | − | − | − | − | − | − | − | − | − | − |
| 7c | 26c | Mock Set 3 | 3F | 2 | Number | − | − | − | − | − | − | − | − | − | − |
| 8a | 26a | Mock Set 1  | 3F | 1 | Number | − | − | − | − | − | − | − | − | − | − |
| 8b | 26b | Mock Set 1  | 3F | 2 | Number | − | − | − | − | − | − | − | − | − | − |
| 9a | 28a | Nov-19 | 3F | 1 | Number | N9 | 1 | 31 | 0.31 | 0.7 | 0.52 | 0.29 | 0.09 | 0.02 | 0 |
| 9b | 28b | Nov-19 | 3F | 1 | Number | N9 | 1 | 35 | 0.35 | 0.76 | 0.56 | 0.33 | 0.13 | 0.04 | 0 |
| 9c | 28c | Nov-19 | 3F | 1 | Number | N9 | 2 | 61 | 0.61 | 0.82 | 0.76 | 0.62 | 0.4 | 0.19 | 0.01 |
| 10 | 21 | Nov-17 | 1F | 3 | Number | N9 | 1 | 8 | 0.25 | 0.82 | 0.4 | 0.22 | 0.1 | 0.06 | 0.03 |
| 11a | 28a | Mock Set 2  | 2F | 3 | Number | − | − | − | − | − | − | − | − | − | − |
| 11b | 28b | Mock Set 2  | 2F | 1 | Number | − | − | − | − | − | − | − | − | − | − |
| 12a | 22a | Mock Set 4  | 2F | 1 | Number | − | − | − | − | − | − | − | − | − | − |
| 12b | 22b | Mock Set 4  | 2F | 1 | Number | − | − | − | − | − | − | − | − | − | − |
| 12c | 22c | Mock Set 4  | 2F | 2 | Number | − | − | − | − | − | − | − | − | − | − |
|  |  |  |  | **36** |  |  |  |  | **9.22** | **15.03** | **12.22** | **9.13** | **6.33** | **3.91** | **1.69** |