**GCSE Mathematics (1MA1)**

**Themed papers – Inequalities**

**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**

|  |
| --- |
| **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 7 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
| (a) |  | B2 | These marks are given for a line with an unshaded circle at 4 and arrow beyond –5(B1 is given for two of these aspects seen) |
| (b) | 4, 5, 6, 7 | B2 | These marks are given for all four numbers(B1 is given for 2 or 3 correct values) |
| (c) | 3*x* ≥ *x* + 12  | M1 | This mark is given for subtracting 5 from both sides of the inequality |
| 2*x* ≥ 12 | M1 | This mark is given for a full method to solve the inequality |
| *x* ≥ 6 | A1 | This mark is given for a correct answer only |

**Question 2 (Total 2 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
|  | −2, −1, 0, 1, 2 | B2 | This mark is given for the correct answer only(B1 is given for the numbers −2, −1, 0, 1) |

**Question 3 (Total 5 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working an or answer examiner might expect to see** | **Mark** | **Notes** |
| (a) | 14*n* – 11*n* > 63*n* > 6 | M1 | This mark is given for a method to solve the inequality |
| *n* > 2 | A1 | This mark is given for the correct answer only |
| (b) |  |
|  | M1 | This mark is given for drawing a line from ­–5 to ­1 |
| M1 | This mark is given for an open circle drawn at –5 or a closed circle drawn at 1 |
| A1 | This mark is given for a completely correct diagram |

**Question 4 (Total 2 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
|  | –3 ≤ *p* < 1 | C2 | These marks are given for a fully correct interval(C1 given for either –3 ≤ *p* or *p* < 1 seen) |

**Question 5 (Total 2 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
| (a) |   |
|  |  | C1 | This mark is given for drawing a line from ­–2 to ­3 |
|  |  | A1 | This mark is given for a completely correct diagram |
| (b) | 4*y* < 9 | M1 | subtract 7 from both sides of inequality or equation or divide all terms of inequality or equation by 4 or 4*y* < 9 |
| *y* < 2.25 | A1 | 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** |
|  |  | M1 | for complete method to find the critical value, eg multiplies out brackets, adds 3 and divides by 3, **or** shows critical value of 8 |
| *n* < 8 | A1 | This mark is given for the correct answer only |

**Question 7 (Total 4 marks)**

| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
| --- | --- | --- | --- |
| (a) |  | M1 | This mark is given for a line of the correct length line or one correct end and line |
| −2 3 | A1 | This mark is given for a correct answer only |
| (b) | 5*n* > 24or >  | M1 | This mark is given for a first step of a method to solve the inequality  |
| *n* > 4.8 | A1 | This mark is given for a 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** |
| **1b** | 19b | Nov 2018 | 3F | **2** | Algebra | A22 | 1 | **57** | 1.15 | 1.84 | 1.54 | 1.17 | 0.67 | 0.22 | 0.06 |
| **1c** | 19c | Nov 2018 | 3F | **3** | Algebra | A22 | 1 | **25** | 0.74 | 2.38 | 1.34 | 0.64 | 0.21 | 0.06 | 0.03 |
| **2** | 19b | June 2017 | 1F | **2** | Algebra | A22 | 1 | **52** | 1.04 | 1.79 | 1.52 | 1.11 | 0.59 | 0.17 | 0.03 |
| **3a** | 20a | June 2019 | 2F | **2** | Algebra | A22 | 1 | **17** | 0.33 | 1.15 | 0.59 | 0.23 | 0.07 | 0.01 | 0.01 |
| **3b** | 20b | June 2019 | 2F | **3** | Algebra | A22 | 2 | **15** | 0.44 | 0.90 | 0.64 | 0.44 | 0.25 | 0.11 | 0.03 |
| **4** | 19 | Nov 2019 | 1F | **2** | Algebra | A22 | 2 | **13** | 0.25 | 0.82 | 0.47 | 0.20 | 0.06 | 0.02 | 0.02 |
| **5a** | 20a | Spec Set 2 | 3F | **2** | Algebra | − | − | − | − | − | − | − | − | − | − |
| **5b** | 20b | Spec Set 2 | 3F | **2** | Algebra | − | − | − | − | − | − | − | − | − | − |
| **6** | 30 | Mock Set 4  | 1F | **2** | Algebra | − | − | − | − | − | − | − | − | − | − |
| **7a** | 22a | Mock Set 1 | 2F | **2** | Algebra | − | − | − | − | − | − | − | − | − | − |
| **7b** | **22b** | Mock Set 1 | 2F | **2** | Algebra | − | − | − | − | − | − | − | − | − | − |
|  |  |  |  | **26** |  |  |  |  | **2.80** | **7.04** | **4.56** | **2.62** | **1.18** | **0.37** | **0.12** |