**GCSE Mathematics (1MA1)**

**Themed papers – Solve linear equations**

**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 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 2 (Total 4 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
| (a) | 3*t* = 12*t* = 4 | B1 | This mark is given for the correct answer only |
| (b) | 8 | B1 | This mark is given for the correct answer only |
| (c) | 6*w* = 18 | M1 | This mark is given for a method for subtracting 2 from both sides of the equation |
| *w* = 3 | 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** |
| (a) | 5 | B1 | This mark is given for the correct answer only |
| (b) | 12 | B1 | This mark is given for the correct answer only |

**Question 4 (Total 3 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
| (a) | 3*x* = 51*x* = 17 | B1 | This mark is given for the correct answer only |
| (b) |  × 4 = 3 × 4*y* = 12 | B1 | This mark is given for the correct answer only |
| (c) | 2*f* = 11*f* = 5.5 | B1 | 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** |
|  | 4 | M1 | for method to isolate terms in *p* on one side and constants on the other side |
|  | A1 | 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** |
| (a) | 3 | B1 | This mark is given for the correct answer only |
| (b) | 5 | M1 | for a correct first step eg subtraction of 7 from both sides |
| A1 | 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** |
|  | 7*f* + 6 – 6 = 27 – 6; 7*f* = 21 | M1 | This mark is given for an intention to subtract 6 from both sides of the equation |
| *f* = 3 | 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** |
|  | 3*x* – 12 = 123*x* = 24 | M1 | This mark is given for a method to solve the equation |
| 8 | A1 | This mark is given for the correct answer only |

**Question 9 (Total 2 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
|  | 4*x* – 24 = 444*x* = 68 | M1 | This mark is given for a first step to find the value of *x* |
| *x* = 17 | A1 | This mark is given for the correct answer only |

**Question 10 (Total 2 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
|  | 3*m* – 12 = 21 | M1 | This mark is given correctly expanding brackets |
| 3*m* = 33*m* = 11 | A1 | This mark is given for the correct answer only |

**Question 11 (Total 1 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
|  | *y* = 4 × 10.5 = 42 | 1 | This mark is given for the correct answer only |

**Question 12 (Total 2 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
|  | 4*x* – 20 = 18 | M1 | This mark is given for expanding brackets as a first step to solving the equation |
| 4*x* = 38, *x* = 9.5 | A1 | This mark is given for the correct answer only |

**Question 13 (Total 2 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
|  |  | M1 | for correct expansion of the bracket, **or** for intention to divide both sides by 9 as the first step |
| 13 | A1 | This mark is given for the correct answer only |

**Question 14 (Total 2 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
| (a) | 11 – 5 = 4*c*  | M1 |  |
| 1.5 | A1 | This mark is given for the correct answer only |
| (b) | Either divide both sides by 5, eg. $\frac{5(e+7)}{5}=\frac{20}{5}$ or for expanding the bracket, eg. 5×*e* + 5×7 = 20 | M1 |  |
|  | –3 | A1 | This mark is given for the correct answer only |

**Question 15 (Total 3 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
|  | 5*x* – 6 = 3*x* – 3 | 1 | This mark is given for expanding brackets |
| 5*x –* 6 –3*x* = –32*x* – 6 = –3 | 1 | This mark is given for isolating *x* on one side of the equation |
| 2*x* = 3*x* = 1 | 1 | 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** |
| --- | --- | --- | --- |
|  | 5*x* + 3 = 75*x* = 4 | M1 | This mark is given for isolating the *x* terms and the number terms |
| *x =*  | A1 | This mark is given for the correct answer only |

**Question 17 (Total 3 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
|  | 5 – *x* = 2(2*x* – 7)5 – *x* = 4*x* – 14 | M1 | This mark is given for a method to remove the fraction from the equation |
| 4*x* + *x* = 14 + 55*x* = 19 | M1 | This mark is given for a method to isolate *x* on one side of the equation |
| *x* = 3.8 | 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** |
| **1a** | 8a | Nov 2019 | 2F | 1 | Algebra | A7 | 1 | **90** | 0.90 | 0.97 | 0.96 | 0.92 | 0.83 | 0.65 | 0.34 |
| **1b** | 8b | Nov 2019 | 2F | 1 | Algebra | A7 | 1 | **84** | 0.84 | 0.92 | 0.91 | 0.86 | 0.74 | 0.53 | 0.30 |
| **2a** | 10a | June 2019 | 1F | 1 | Algebra | A17 | 1 | **93** | 0.93 | 0.99 | 0.99 | 0.97 | 0.91 | 0.77 | 0.47 |
| **2b** | 10b | June 2019 | 1F | 1 | Algebra | A17 | 1 | **93** | 0.93 | 0.99 | 0.98 | 0.96 | 0.91 | 0.82 | 0.54 |
| **2c** | 10c | June 2019 | 1F | 2 | Algebra | A17 | 1 | **82** | 1.64 | 1.98 | 1.96 | 1.85 | 1.48 | 0.76 | 0.22 |
| **3a** | 7a | Spec Set 1 | 3F | 1 | Algebra | − | − | **−** | − | − | − | − | − | − | − |
| **3b** | 7b | Spec Set 1 | 3F | 1 | Algebra | − | − | **−** | − | − | − | − | − | − | − |
| **4a** | 11a | June 2018 | 2F | 1 | Algebra | A17 | 1 | **88** | 0.88 | 0.99 | 0.98 | 0.95 | 0.85 | 0.57 | 0.19 |
| **4b** | 11b | June 2018 | 2F | 1 | Algebra | A17 | 1 | **77** | 0.77 | 0.97 | 0.93 | 0.85 | 0.66 | 0.36 | 0.13 |
| **4c** | 11c | June 2018 | 2F | 1 | Algebra | A17 | 1 | **72** | 0.72 | 0.98 | 0.96 | 0.84 | 0.53 | 0.17 | 0.03 |
| **5** | 17c | Spec Set 2 | 2F | 2 | Algebra | − | − | **−** | − | − | − | − | − | − | − |
| **6a** | 8a | Mock Set 4 | 2F | 1 | Algebra | − | − | **−** | − | − | − | − | − | − | − |
| **6b** | 8b | Mock Set 4 | 2F | 2 | Algebra | − | − | **−** | − | − | − | − | − | − | − |
| **7** | 11d | Mock Set 1  | 1F | 2 | Algebra | − | − | **−** | − | − | − | − | − | − | − |
| **8** | 19a | Nov 2018 | 2F | 2 | Algebra | A17 | 1 | **65** | 1.29 | 1.97 | 1.71 | 1.30 | 0.80 | 0.43 | 0.20 |
| **9** | 19 | Nov 2019 | 3F | 2 | Algebra | A17 | 1 | **63** | 1.26 | 1.83 | 1.62 | 1.27 | 0.75 | 0.28 | 0.04 |
| **10** | 16c | June 2018 | 1F | 2 | Algebra | A17 | 1 | **51** | 1.02 | 1.87 | 1.59 | 1.09 | 0.54 | 0.18 | 0.05 |
| **11** | 3 | Nov 2017 | 1F | 1 | Algebra | N4 | 1 | **43** | 0.43 | 0.87 | 0.65 | 0.43 | 0.20 | 0.13 | 0.08 |
| **12** | 19a | June 2017 | 1F | 2 | Algebra | A17 | 1 | **39** | 0.77 | 1.62 | 1.19 | 0.71 | 0.34 | 0.12 | 0.03 |
| **13** | 17c | Mock Set 3 | 3F | 2 | Algebra | − | − | **−** | − | − | − | − | − | − | − |
| **14a** | 16a | Spec Set 1 | 2F | 2 | Algebra | − | − | **−** | − | − | − | − | − | − | − |
| **14b** | 16b | Spec Set 1 | 2F | 2 | Algebra | − | − | **−** | − | − | − | − | − | − | − |
| **15** | 16 | Nov 2017 | 2F | 3 | Algebra | A17 | 1 | **28** | 0.83 | 2.19 | 1.33 | 0.77 | 0.36 | 0.17 | 0.01 |
| **16** | 18 | Mock Set 2  | 2F | 2 | Algebra | − | − | **−** | − | − | − | − | − | − | − |
| **17** | 25 | June 2018 | 3F | 3 | Algebra | A17 | 1 | **5** | 0.15 | 0.87 | 0.23 | 0.05 | 0.01 | 0 | 0 |
|  |  |  |  | **41** |  |  |  |  | **13.36** | **20.01** | **16.99** | **13.82** | **9.91** | **5.94** | **2.63** |