**GCSE Mathematics (1MA1)**

**Themed papers – Similarity and congruence**

**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** |
| --- | --- | --- | --- |
| (a) | Trapezium | B1 | This mark is given for the correct answer only |
| (b) | C and D | B1 | This mark is given for the correct answer only |

**Question 2 (Total 4 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
| (a) |  × 9  | M1 | This mark is given for a method to find the length *PR* |
| 6 | A1 | This mark is given for the correct answer only |
| (b) | *GK* = *HK* – *HG* = 10 – 4 = 6 cm*EG* = *GK* = 6 cm*FG* = *HG* = 4 cm | P1 | This mark is given for a method to find the lengths of the sides of triangles *EGH* and *KGF* |
| *EF* = *EG* – *FG* = 2 cm | A1 | This mark is given for the correct answer only |

**Question 3 (Total 3 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working an or answer examiner might expect to see** | **Mark** | **Notes** |
|  | The ratio of the area of square **A** to the area of square **B** is 1 : 4 | P1 | This mark is given for a process to find the ratio of the areas of squares **A** and **B** |
| The ratio of the shaded area in square **A** to the area of square **B** is 1 : 8 | P1 | This mark is given for a process to find the ratio of the *shaded* area of square **A** to the area of square **B** |
|  = 12.5% | 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** |
| --- | --- | --- | --- |
|  |  = 2.5,  = 2.5,  = 2.5 | M1 | This mark is given for a method to divide at least a pair of corresponding sides |
| All sides are enlarged by the same factor, so triangles are similar | C1 | This mark is given for a correct comment |

**Question 5 (Total 1 mark)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
|  | No, because similar rectangles would have the same ratio of length and width | C1 | This mark is given for a correct explanation |

**Question 6 (Total 4 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
| (a) |  = 1.5 | M1 | This mark is given for a method to find a correct ratio between the lengths *DE* and *AB* |
| 1.5 × 6.4 = 9.6 | A1 | This mark is given for the correct answer only |
| (b) | 15 ÷ 1.5 | M1 | This mark is given for a method to find the length *CB* |
| 10 | 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) | *AE* =  × 2.6 | M1 | This mark is given for a method to find the length *AE* |
| 3.9 | A1 | This mark is given for the correct answer only |
| (b) | *BC* = 6.15 ×  = 4.1*AB* = 6.15 – 4.1 | M1 | This mark is given for a method to find the length *AB* |
| 2.05 | 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 | 9a | Nov-18 | 3F | 1 | Geometry | G4 | 1 | **35** | 0.35 | 0.59 | 0.42 | 0.34 | 0.28 | 0.19 | 0.06 |
| 1b | 9b | Nov-18 | 3F | 1 | Geometry | G7 | 1 | **87** | 0.87 | 0.95 | 0.92 | 0.88 | 0.81 | 0.69 | 0.49 |
| 2 | 21 | Jun-17 | 3F | 2 | Geometry | G6, G19 | 2 | **18** | 0.35 | 1.15 | 0.55 | 0.2 | 0.05 | 0.01 | 0 |
| 3a | 29a | Nov-19 | 1F | 2 | Ratio | R12 | 1 | **18** | 0.35 | 1.11 | 0.59 | 0.29 | 0.16 | 0.12 | 0.03 |
| 3b | 29b | Nov-19 | 1F | 2 | Ratio | G6, R12,  | 3 | **40** | 0.79 | 1.36 | 1.04 | 0.77 | 0.5 | 0.47 | 0.19 |
| 4a | 27a | Jun-18 | 3F | 2 | Ratio | R12, G19 | 1 | **16** | 0.31 | 1.34 | 0.57 | 0.17 | 0.04 | 0.01 | 0.01 |
| 4b | 27b | Jun-18 | 3F | 2 | Ratio | R12, G19,  | 1 | **14** | 0.29 | 1.3 | 0.53 | 0.15 | 0.04 | 0.02 | 0.02 |
| 5 | 20 | Jun-19 | 1F | 3 | Ratio | R9, R12, G16 | 3 | **12** | 0.37 | 1.23 | 0.59 | 0.28 | 0.13 | 0.07 | 0.03 |
| 6 | 16 | Nov-18 | 1F | 1 | Ratio | R2 | 2 | **7** | 0.07 | 0.3 | 0.11 | 0.05 | 0.03 | 0.03 | 0.01 |
| 7a | 21a | Jun-17 | 2F | 2 | Ratio | R12, G19 | 1 | **4** | 0.07 | 0.28 | 0.07 | 0.04 | 0.03 | 0.01 | 0.01 |
| 7b | 21b | Jun-17 | 2F | 2 | Ratio | R12,  | 1 | **4** | 0.07 | 0.19 | 0.08 | 0.07 | 0.06 | 0.02 | 0 |
|  |  |  |  | **20** |  |  |  |  | **3.89** | **9.8** | **5.47** | **3.24** | **2.13** | **1.64** | **0.85** |