**GCSE Mathematics (1MA1)**

**Themed papers – Trigonometry**

**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** |
|  | *AB* = sin 38° × 16*AB* = 0.61566 × 16 | M1 | This mark is given for a method to find the length of *AB* |
| 9.85 | A1 | This mark is given for the correct answer only |

**Question 2 (Total 2 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
|  | 16² = 6.7² + *a*² **or** $\sqrt{16²-6.7²}$ | M1 | This mark is given for substituting into Pythagoras’ theorem |
|  | M1 | This mark is given for a method to find the unknown length |
| 14.5 to 14.53 | A1 | This mark is given for an answer in the range of 14.5 to 14.53 |

**Question 3 (Total 2 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
|  | tan *x* =  | M1 | This mark is given for a method to recall the appropriate formula |
| 30.7 | A1 | This mark is given for an answer in range 30.6 to 30.7 |

**Question 4 (Total 3 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
| (a) | cos *ABC* =  = 0.6363… | M1 | This mark is given for a method to find a value for the cosine of the angle *ABC* |
| 50.5 | A1 | This mark is given for the correct answer only (using a calculator) |
| (b) | The value of cos *ABC* increases as the size of the angle decreases | C1 | This mark is given for a correct statement with a supporting reason |

**Question 5 (Total 5 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
|  | 7.52 – 62  | 1 | This mark is given for a method to find the third length of the right angled triangle shown |
| 7.52 – 62 = 56.25 – 36 = 20.25√20.25 = 4.5 | 1 | This mark is given for finding the third length of the right angled triangle shown |
| 24 – 4.5 – 10 = 9.5 | 1 | This mark is given for finding a length for a right angled triangle to be able to calculate angle *CDA* |
| tan *CDA* =  | 1 | This mark is given for finding the tangent of the angle *CDA* |
| angle *CDA* = 32.3° | 1 | This mark is given for an answer in the range 32.2–32.3 |

**Question 6 (Total 4 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
|  |  = 18*A* = 2 × 18 = 36°*B* = 3 × 18 = 54° | P1 | This mark is given for a process to find values for angles *A* and *B* |
| cos 36° = 0.809 | P1 | This mark is given for writing a value for cos *A* |
| *AB* =  =  | P1 | This mark is given for a process to find the length *AB* |
| 17.3 | A1 | This mark is given for the correct answer in the range 17.3 to 17.4 |

**Question 7 (Total 5 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
|  | cos *x* =  | M1 | This mark is given for the recall of appropriate formula |
| 57.2 | A1 | This mark is given for answer in range 57.2 to 57.203 |

**Question 8 (Total 3 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
| (a) |  | B1 |  |
| (b) | starts process eg  | M1 |  |
| 6 | A1 |  |

**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 | 24 | Jun-19 | 2F | 2 | Geometry | G20 | 1 | 17 | 0.34 | 1.24 | 0.65 | 0.22 | 0.06 | 0.01 | 0 |
| 2 | 21 | Mock Set 4 | 2F | 3 | Geometry | − | − | − | − | − | − | − | − | − | − |
| 3 | 27 | Mock Set 1 | 3F | 2 | Geometry | − | − | − | − | − | − | − | − | − | − |
| 4a | 23a | Jun-18 | 3F | 2 | Geometry | G20 | 1 | 19 | 0.37 | 1.37 | 0.7 | 0.23 | 0.05 | 0.01 | 0 |
| 4b | 23b | Jun-18 | 3F | 1 | Geometry | G20 | 2 | 1 | 0.01 | 0.04 | 0.02 | 0.01 | 0 | 0 | 0 |
| 5 | 22 | Nov-17 | 2F | 5 | Geometry | G17, G20 | 3 | 5 | 0.23 | 1.62 | 0.47 | 0.13 | 0.03 | 0.01 | 0 |
| 6 | 25 | Nov-18 | 3F | 4 | Geometry | R5, G20 | 3 | 5 | 0.19 | 1.74 | 0.39 | 0.12 | 0.02 | 0 | 0 |
| 7 | 29 | Mock Set 4 | 3F | 2 | Geometry | − | − | − | − | − | − | − | − | − | − |
| 8a | 26a | Specimen Set 1  | 1F | 1 | Geometry | − | − | − | − | − | − | − | − | − | − |
| 8b | 26b | 1F | 2 | Geometry | − | − | − | − | − | − | − | − | − | − |
|  |  |  |  | **19** |  |  | **10** | **47** | **1.14** | **6.01** | **2.23** | **0.71** | **0.16** | **0.03** | **0** |