**GCSE Mathematics (1MA1)**

**Themed papers – Percentages**

**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 5 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
|  | 8500 × 1.2 = 10200  or  8500 + (8500 × 0.2) = 10200 | P1 | This mark is given for a process to find total cost of the van |
|  | 12 × 531.25 = 6375 | P1 | This mark is given for a process to find total cost of the 12 payments |
| 10200 – 6375 = 3825 | P1 | This mark is given for a complete process to find the value of the deposit |
| 3825 : 6375 | P1 | This mark is given for a process to find a correct unsimplified ratio |
| (Dividing both sides by 1275)  3 : 5 | 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** |
|  | Price of washing machine (*x*) + 20% = 600  *x* + 0.2*x* = 600  1.2*x* = 600  *x* = 600 ÷ 1.2 | M1 | This mark is given for a complete method to find the price of the washing machine before VAT of 20% was added |
| 500 | 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** |
|  | 900 ÷ 1.2 = | M1 | This mark is given for a method to find the price of the computer before VAT is added |
| 750 | A1 | 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** |
| --- | --- | --- | --- |
|  | × 100 = 144 | P1 | This mark is given for a process to find the amount of interest added before tax |
| × 100 | P1 | This mark is given for a process to find the interest rate |
| 1.8 | A1 | This mark is given for the correct answer only |

**Question 5 (Total 4 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
|  | 105 ÷ (5 – 2) (= 35)  Kim gets £70, Molly gets £175 | P1 | This mark is given for a strategy to start to solve the problem |
| 385 – (2 × 35) – (5 × 35) (= 140)  or  (385 ÷ 35) – 2 – 5 (= 4) | P1 | This mark is given for a process to find Laura’s share |
| × 100  or  × 100 | P1 | This mark is given for a process to find the percentage Laura gets |
| 36.4% | A1 | This mark is given for an answer in range 36.3 to 36.4 |

**Question 6 (Total 3 marks)**

| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
| --- | --- | --- | --- |
|  | 100 ÷ 1.38 (= £72.46)  or  222 × 1.38 (= €306.36) | P1 | This mark is given for a process to use the currency conversion rate |
|  | = 0.2461  or  = 0.2461 | P1 | This mark is given for a complete process to find the percentage required |
|  | 24.6% | A1 | This mark is given for an answer in the range 24.6 – 24.61 |

**Question 7 (Total 5 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
|  | 2100 × 0.4 = 840 | P1 | This mark is given for a process to find the three managers’ share of the bonus |
| 2100 – 840 = 1260 | P1 | This mark is given for a process to find the seven salesmens’ share of the bonus |
| 1260 ÷ 7 = 180 | P1 | This mark is given for a process to find one salesman’s share of the bonus |
| 2100 ÷ 10 = 210  = 0.1666 = 16.66% | P1 | This mark is given for a process to find the percentage difference between the actual bonus and the salesman’s suggestion |
| No, the salesman would only receive and extra 16.66%, not 25% | C1 | This mark is given for a correct conclusion supported by correct working |

**Question 8 (Total 3 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
|  | = 180 000 | P1 | This mark is given for a process to find the cost of the house in 2007 |
|  | P1 | This mark is given for a process to find the cost of the house in 2003 |
| 150 000 | A1 | This mark is given for the correct answer only |

**Question 9 (Total 3 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
|  | Area of B = 1.1 × Area of A | P1 | This mark is given for a using a multiple of 1.1 |
| Area of C = 1.1 × Area of B  = 1.1 × 1.1 × Area of A | P1 | This mark is given for a for complete process to derive of 1.21 |
| Area of C = 1.21 × Area of A,  a 21% increase | A1 | This mark is given for the correct answer only |

**Question 10 (Total 3 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
|  | **P** : **Q** = 1 : 1.5  **Q** : **R** = 1.5 : 2.25 | P1 | This mark is given for a process to find the ratio of the volumes of **P** and **Q**, and of **Q** and **R** |
| **P** : **R** = 1 : 2.25  = 4 : 9 | P1 | This mark is given for a process to find the ratio of the volume of **P** to the volume of **R** |
|  | A1 | This mark is given for a correct answer only |

**Question 11 (Total 3 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
|  | 5.64 ÷ 12 = 0.47 | 1 | This mark is given for finding the cost of one bottle |
| 50 – 47 = 3 | 1 | This mark is given for finding the profit on the sale of one bottle |
| × 100 = 6.4 (to one decimal place) | 1 | This mark is given for the correct answer only |

**Question 12 (Total 5 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
|  | 20 litres of yellow paint and 30 litres of blue paint | P1 | This mark is given for the a process to find the overall ratio of litres |
| (20 ÷ 5) = 4 tins of yellow paint needed  (30 ÷ 10) = 3 tins of blue paint needed  Cost = (4 × 26) + (3 × 48)  = 104 + 144 = 248 | P1 | This mark is given for a process to find the total cost of making 50 litres of green paint |
| 50 litres of green paint costs £248  10 litres of green paint costs £49.60 | A1 | This mark is given for finding out the cost of making 10 litres of green paint |
| = 0.35 | P1 | This mark is given for a process to find Robert’s percentage profit |
| 35% | 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 averages Marks of candidates who achieved grade:** | | | | | | | | | | |
| **Q** | **Series** | **Paper** | **ALL** | **9** | **8** | **7** | **6** | **5** | **4** | **3** | **2** | **1** | **U** |
| 1 | 4 | June 2018 | 2H | 5 | Ratio | N13/R4/R5/R9 | 2 | 67 | 3.37 | 4.63 | 4.2 | 3.82 | 3.44 | 3.03 | 2.49 | 1.87 | - | - | 1.31 |
| 2 | 9 | June 2017 | 1H | 2 | Ratio | R9 | 1 | 62 | 1.24 | 1.95 | 1.82 | 1.56 | 1.29 | 0.99 | 0.62 | 0.29 | - | - | 0.14 |
| 3 | 10 | Mock Set 4 | 1H | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |  |
| 4 | 10 | June 2019 | 3H | 3 | Ratio | R9 | 3 | 57 | 1.7 | 2.75 | 2.43 | 2.08 | 1.74 | 1.29 | 0.74 | 0.3 | - | - | 0.13 |
| 5 | 3 | Mock Set 1 | 3H | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |  |
| 6 | 2 | Mock Set 2 | 3H | 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |  |
| 7 | 3 | Nov 2018 | 1H | 5 | Ratio | N2, R6, R9 | 3 | 54 | 2.71 | 4.7 | 4.58 | 3.86 | 3.7 | 3.29 | 2.68 | 1.9 | - | - | 1.16 |
| 8 | 11 | June 2018 | 3H | 3 | Ratio | R9 | 3 | 45 | 1.34 | 2.86 | 2.47 | 1.87 | 1.31 | 0.79 | 0.38 | 0.12 | - | - | 0.05 |
| 9 | 10 | Mock Set 2 | 1H | 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |  |
| 10 | 12 | June 2019 | 1H | 3 | Ratio | R6, R9, N2, N8 | 2 | 42 | 1.27 | 2.67 | 2.19 | 1.68 | 1.2 | 0.73 | 0.34 | 0.1 | - | - | 0.08 |
| 11 | 2 | Nov 2017 | 2H | 3 | Ratio | R9 N13 | 3 | 42 | 1.27 | 2.75 | 2.41 | 2.27 | 1.99 | 1.64 | 1.26 | 1.04 | - | - | 0.88 |
| 12 | 10 | Nov 2018 | 2H | 5 | Ratio | R5, R9, R10 | 3 | 40 | 2.02 | 4.2 | 3.94 | 3.53 | 3.39 | 2.76 | 1.83 | 0.93 | - | - | 0.37 |
|  |  |  |  | **41** |  |  |  |  | **14.92** | **26.51** | **24.04** | **20.67** | **18.06** | **14.52** | **10.34** | **6.55** | **-** | **-** | **4.12** |