**GCSE Mathematics (1MA1)**

**Themed papers – Percentage: Increase and Decrease**

**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 3 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
|  | = 3.5;  =  = 2.67 | P1 | This mark is given for a process to calculate the initial or new pressure |
| × 100 = 24% | P1 | For a complete process to find the percentage decrease in pressure |
| No; the pressure decreases by 24%, which is greater than 20% | A1 | This mark is given for a correct conclusion with correct figures |

**Question 2 (Total 4 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
| (a) | = 2.04…,  = 107 | M1 | This mark is given for a method to find a value for *T* 2 |
| 4.52 × 103 | A1 | This mark is given for the correct answer only |
| (b) | = 0.97… | M1 | This mark is given for a method to find the scale factor of the decrease of *T* |
| The scale factor of the change of *T* is less than 1, therefore the value of *T* decreases | C1 | This mark is given for a correct explanation supported by correct working |

**Question 3 (Total 3 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
|  | 883 – 245 = 638 | M1 | This mark is given for a method to work out the increase in the insurance payment |
| × 100 | M1 | This mark is given for a method to work out the percentage increase |
| 260.41 | A1 | This mark is given for a correct answer in the range 260 to 260.5 |

**Question 4 (Total 2 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
|  | 5% = 2.30; 100% = 20 × 2.30 | M1 | This mark is given for a method to link 5% with 2.30 or 100 ÷ 5 (= 20) |
| 46 | A1 | This mark is given for a correct answer only |

**Question 5 (Total 2 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
|  | 0.8 × 25000 (=20000) | P1 | This mark is given for showing a process to depreciate by 20% This could be shown in several stage eg 25000 (25000 20 ÷ 100) |
| 20000 × 0.88 (= 17600)  Alternative method could be 20000 (20000 (100 12) ÷ 100) | P1 | This mark is given for showing a process to depreciate by 12% as a second stage. |
| 15488 | A1 | This mark is given for a correct answer only |

**Question 6 (Total 5 marks)**

| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
| --- | --- | --- | --- |
| (a) | 6.5 × 107 × 1.0064 | M1 | This mark is given for a method to find an estimate for the population in 2020 |
| 6.66 × 107 | A1 | This mark is given for a correct answer only |
| (b) | Growth is calculated using a compound calculation, not a simple one | C1 | This mark is given for a correct explanation |
| (c) | Common ratio is 1 + 0.06%, so 1.006 | M1 | This mark is given for a method to find the common ratio |
| Terms are generated by multiplying the previous term by 1.006, so a geometric progression is formed | C1 | This mark is given for a correct conclusion |

**Question 7 (Total 3 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
|  | Assume 100g of cereal = £1  Jack’s idea is to provide 125g for £1  = 20p per 25g | P1 | This mark is given for a start to the process |
| Sadia’s idea must match 20p per 25g so needs to sell for 80p | P1 | This mark is given for a complete process to find a solution |
| = 0.2  = 20% | A1 | This mark is given for the correct answer only |

**Question 8 (Total 3 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
|  | 52.00 – 41.60 (= 10.40) | M1 | This method mark is given for finding the total amount of the reduction |
| 10.40 ÷ 52 × 100 | M1 | This method mark is given for a method to find the amount of the reduction as a fraction of the original price |
| 20 (%) | A1 | This accuracy 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** |
|  | 293.25 ÷ 0.85 = 345 | P1 | This mark is given for a process to find the price of the TV after the second reduction |
| 345 ÷ 0.75 | P1 | This mark is given for a process to find the price of the TV after the second reduction |
| 460 | A1 | This mark is given for the correct answer only |

**Question 10 (Total 5 marks)**

| **Part** | **Working or answer an examiner might expect to see** | **Mark** | **Notes** |
| --- | --- | --- | --- |
| (a) | N: 13995 × 0.88 **or**  L: 14495 × 0.87 | P1 | This mark is given for a process to find the value of one car at the end of one year |
| N: 13995 × (0.88)3 **or**  L: 14495 × (0.87)3 | P1 | This mark is given for a process to find the value of one car at the end of 3 years |
| N: 13995 × (0.88)3 (= 9537.2006)  L: 14495 × (0.87)3 (= 9545.0005) | P1 | This mark is given for a complete process to find the value of both cars at the end of 3 years |
| N: £9537.20  L: £9545.00  Lauren’s car will have the greater value | C1 | This mark is given for a correct conclusion supported by working shown |
| (b) | Natasha’s car will be worth less | C1 | This mark is given for an appropriate explanation |

**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 | 6 | June 2018 | 2H | 3 | Ratio | R9/R11 | 3 | 84 | 2.51 | 2.88 | 2.79 | 2.72 | 2.63 | 2.46 | 2.1 | 1.48 | - | - | 0.85 |
| 2a | 9a | June 2018 | 3H | 2 | Number | N9 | 1 | 57 | 1.15 | 1.72 | 1.58 | 1.43 | 1.24 | 0.98 | 0.64 | 0.33 | - | - | 0.14 |
| 2b | 9b | June 2018 | 3H | 2 | Ratio | R9 | 2 | 17 | 0.34 | 1.03 | 0.68 | 0.47 | 0.3 | 0.16 | 0.06 | 0.01 | - | - | 0 |
| 3 | 2 | Nov 2018 | 3H | 3 | Ratio | R9 | 1 | 39 | 1.18 | 2.6 | 2.18 | 1.97 | 1.72 | 1.32 | 1.03 | 0.87 | - | - | 0.63 |
| 4 | 5 | Mock Set 1 | 3H | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |  |
| 5 | 5 | Mock Set 4 | 2H | 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |  |
| 6a | 10a | Mock Set 3 | 2H | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |  |
| 6b | 10b | Mock Set 3 | 2H | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |  |
| 6c | 10c | Mock Set 3 | 2H | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |  |
| 7 | 11 | Nov 2018 | 1H | 3 | Ratio | R3, R9 | 3 | 17 | 0.52 | 2.8 | 2.15 | 1.23 | 0.87 | 0.65 | 0.42 | 0.19 | - | - | 0.1 |
| 8 | 12 | Mock Set 1 | 1H | 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |  |
| 9 | 10 | Mock Set 3 | 3H | 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |  |
| 10a | 9a | Mock Set 2 | 2H | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |  |
| 10b | 9b | Mock Set 2 | 2H | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |  |
|  |  |  |  | **34** |  |  |  |  | **5.7** | **11.03** | **9.38** | **7.82** | **6.76** | **5.57** | **4.25** | **2.88** | **-** | **-** | **1.72** |