**GCSE Mathematics (1MA1) – Foundation Tier Shadow Paper 2F**

**Set 1 Summer 2023 student-friendly mark scheme**

**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.<br><br>P1 – process mark. This mark is generally given for setting up an appropriate process to find a solution in the context of the question.<br><br>A1 – accuracy mark. This mark is generally given for a correct answer following correct working.<br><br>B1 – working mark. This mark is usually given when working and the answer cannot easily be separated.<br><br>C1 – communication mark. This mark is given for explaining your answer or giving a conclusion in context supported by your working.<br><br>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 1 mark)**

| Part | Working or answer an examiner might expect to see | Mark | Notes |
|---|---|---|---|
| | 17 000 | B1 | This mark is given for the correct answer only |

**Question 2 (Total 1 mark)**

| Part | Working or answer an examiner might expect to see | Mark | Notes |
|---|---|---|---|
| | $\frac{9}{10}$ | B1 | This mark is given for the correct answer only |

**Question 3 (Total 1 mark)**

| Part | Working or answer an examiner might expect to see | Mark | Notes |
|---|---|---|---|
| | $\frac{950}{100} = 9.5$ | B1 | This mark is given for the correct answer only |

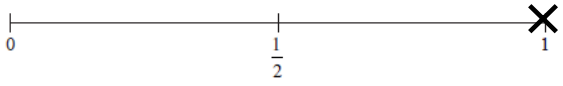
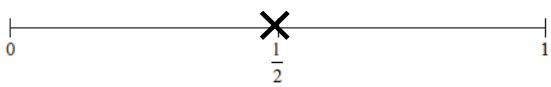
**Question 4 (Total 1 mark)**

| Part | Working or answer examiner might expect to see | Mark | Notes |
|---|---|---|---|
| | $14g$ | B1 | This mark is given for the correct answer only |

**Question 5 (Total 1 mark)**

| Part | Working or answer an examiner might expect to see | Mark | Notes |
|---|---|---|---|
| | 90 | B1 | This mark is given for the correct answer only |

**Question 6 (Total 2 marks)**

| Part | Working or answer an examiner might expect to see | Mark | Notes |
|---|---|---|---|
| (a) |   | B1 | This mark is given for a cross marked at 1 |
| (b) |   | B1 | This mark is given for a cross marked at $\frac{1}{2}$ |

**Question 7 (Total 3 marks)**

| Part | Working or answer an examiner might expect to see | Mark | Notes |
|---|---|---|---|
| (a) | 6.8 | B1 | This mark is given for an answer in the range 6.6 to 7.0 |
| (b) | 47 | B1 | This mark is given for an answer in the range 45 to 49 |
| (c) | equilateral | B1 | This mark is given for the correct answer only |

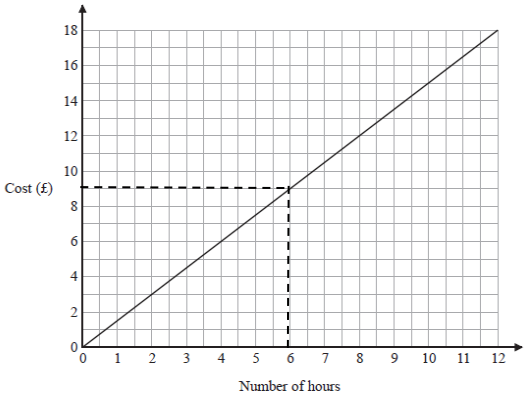
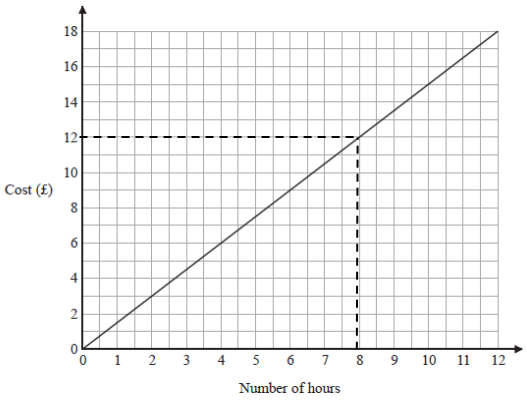
**Question 8 (Total 3 marks)**

| Part | Working or answer an examiner might expect to see | Mark | Notes |
|---|---|---|---|
| | $10 + 20 = 30$<br>**or**<br>$10 \times 6 = 60,\ 20 \times 6 = 120$ | P1 | This mark is given for a process to find the total distance *PR* in cm<br>**or**<br>This mark is given for a process to convert cm to km |
| | $30 \times 6$<br>**or**<br>$60 + 120$ | P1 | This mark is given for a process to find the total distance *PR* in km |
| | 180 | 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 |
|---|---|---|---|
| (a) | 37 | B1 | This mark is given for the correct answer only |
| (b) | 9 : 30 | M1 | This mark is given for a method to find the unsimplified ratio of the second term to the fifth term |
| | 3 : 10 | A1 | This mark is given for the correct answer only |

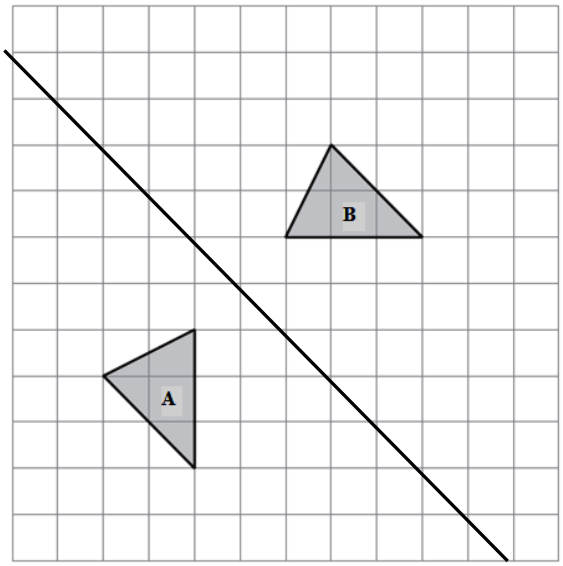
**Question 10 (Total 4 marks)**

| Part | Working or answer an examiner might expect to see | Mark | Notes |
|---|---|---|---|
| (a) |  <br>(£) 9 | B1 | This mark is given for the correct answer only |
| (b) |  <br>17 00 or 5 p.m. | M1 | This mark is given for a method to use the graph to find out how many hours £12 pays for |
| | | M1 | This mark is given for a method to add 09 00 to 8 hours |
| | | 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 |
|---|---|---|---|
| a | $40 \times 2 = 80$, $50 \times 3 = 150$, $60 \times 5 = 300$, $70 \times 6 = 420$, $80 \times 4 = 320$, $90 \times 2 = 180$ | M1 | This mark is given for a first step to find the total weight of the people in the gymnasium |
| | $80 + 150 + 300 + 420 + 320 + 180$<br>**or**<br>$1500 - (80 + 150 + 300 + 420 + 320 + 180)$ | M1 | This mark is given for a full method to find the total weight of the people in the gymnasium (or the amount less than 1500 kg) |
| | 1450 kg<br>**or**<br>50 kg les than 1500 kg | A1 | This mark is given for finding the total weight of the people in the gymnasium (or the amount less than 1500 kg) |

**Question 12 (Total 2 marks)**

| Part | Working or answer an examiner might expect to see | Mark | Notes |
|---|---|---|---|
| b |  | B1 | This mark is given for a correct mirror line drawn on the diagram |
| | For example:<br>Andrew has reflected in the *y*-axis, not the *x*-axis | C1 | This mark is given for a correct explanation only |

**Question 13 (Total 2 marks)**

| Part | Working or answer examiner might expect to see | Mark | Notes |
|---|---|---|---|
| | $15 \times 65$ | M1 | This mark is given for a method to find the total number of people in the hospital |
| | 975 | A1 | This mark is given for the correct answer only |

**Question 14 (Total 4 marks)**

| Part | Working or answer an examiner might expect to see | Mark | Notes |
|---|---|---|---|
| | $9 \times 6 \times 3 = 162$<br>**or**<br>$90 \times 60 \times 30 = 162\,000$ | P1 | This mark is given for a process to find the volume of the brick using consistent measures of cm or mm |
| | $72 \times 42 \times 27 = 81\,648$<br>**or**<br>$720 \times 420 \times 270 = 81\,648\,000$ | P1 | This mark is given for a process to find the volume of the crate using consistent measures of cm or mm |
| | $\frac{81648}{162}$ **or** $\frac{81648\,000}{162\,000}$ | P1 | This method is given for a process to find to find how many bricks fit into a crate |
| | 504 | 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 |
|---|---|---|---|
| | $P(< 5) = \frac{4}{6}$ | P1 | This mark is given for a process to find at least one probability |
| | $P(> 3) = \frac{5}{8}$ | P1 | This mark is given for a process to find both probabilities |
| | Since $\frac{4}{6} = \frac{16}{24}$ and $\frac{5}{8} = \frac{15}{24}$, Sammy is more likely to get a number less than 5 on the dice | A1 | This mark is given for a correct conclusion supported by correct values (accept 0.6666… and 0.625 used) |

**Question 16 (Total 3 marks)**

| Part | Working or answer an examiner might expect to see | Mark | Notes |
|---|---|---|---|
| | 44 km × (2 hour and 15 minutes) | | This mark is given for a method to use distance = speed × time |
| | $44 \times 2.25$ | M1 | This mark is given for a full method, converting 2 hour 15 minutes to 2.25 |
| | 99 | A1 | This mark is given for the correct answer only |

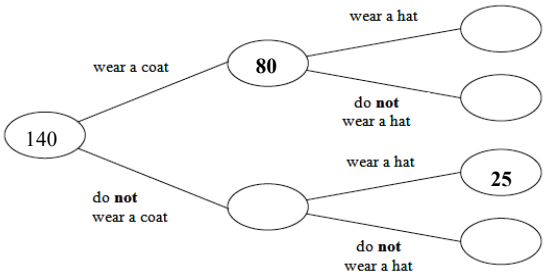
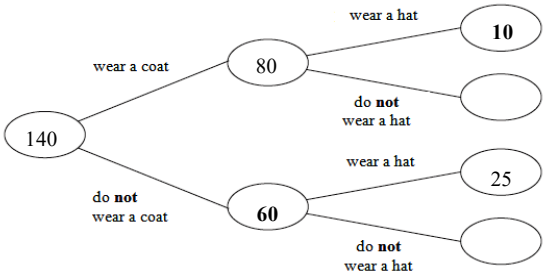
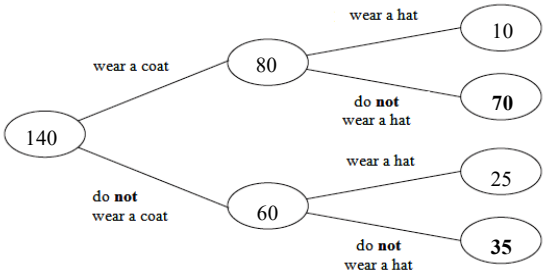
**Question 17 (Total 4 marks)**

| Part | Working or answer an examiner might expect to see | Mark | Notes |
|---|---|---|---|
| | $375 + 225 + 470 = 1070$ | P1 | This mark is given for a process to find the total number of seats in theatres **A, B** and **C** |
| | $380 \times 4 = 1520$ | P1 | This mark is given for a process to find the total number of seats in all four theatres |
| | $1520 - 1070 =$ | P1 | This mark is given for a complete process to find the number of seats in theatre **D** |
| | 450 | A1 | This mark is given for the correct answer only |

**Question 18 (Total 6 marks)**

| Part | Working or answer an examiner might expect to see | Mark | Notes |
|---|---|---|---|
| (a) | $270 \div 15 = 18$ | P1 | This mark is given for a process to find the number of packs bought |
| | $18 \times 4$ | P1 | This mark is given for a process to find the total cost |
| | 72 | A1 | This mark is given for the correct answer only |
| (b) | $2500 \div 36 = 69.444\ldots$ | P1 | This mark is given for a process to find the cost of each carton (in pence) |
| | $\frac{200}{350} \times 69.444\ldots = 39.6825\ldots$<br>**or** $\frac{200}{350} \times \frac{2500}{36} = \frac{500\,000}{12\,600} = 39.6825\ldots$ | P1 | This mark is given for a process to find the cost of 200 m*l* of juice (in pence) |
| | 40 | A1 | This mark is given for the correct answer rounded to the nearest penny only |

**Question 19 (Total 5 marks)**

| Part | Working or answer an examiner might expect to see | Mark | Notes |
|---|---|---|---|
| (a) |  | C1 | This mark is given for adding the first two pieces of information to the frequency tree |
| |  | C1 | This mark is given for deducing two more pieces of information to add to the frequency tree<br>140 – 80 = 60<br>35 – 25 = 10 |
| |  | C1 | This mark is given for deducing the final two pieces of information to add to the frequency tree<br>80 – 10 = 70<br>60 – 25 = 35 |
| (b) | $\frac{70}{80}$ | M1 | This mark is given for a method to find the number of people who wear a coat but not a hat as a fraction of the total number of people who wear a coat |
| | 87.5 | A1 | This mark is given for the correct answer only |

**Question 20 (Total 3 marks)**

| Part | Working or answer examiner might expect to see | Mark | Notes |
|---|---|---|---|
| (a) | $\sqrt{1577} - 32 = 39.711\ldots - 32 = 7.711\ldots$<br>$2.3^2 - 5 = 5.29 - 5 = 0.29$ | M1 | This mark is given for 7.711… or 0.29 seen |
| | $\frac{7.711...}{0.29} = 26.591237\ldots$ | A1 | This mark is given for at least three decimal places given, correctly rounded or truncated |
| (b) | $\frac{1}{0.8} = 1.25$ | B1 | This mark is given for a correct answer only |

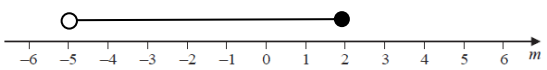
**Question 21 (Total 2 marks)**

| Part | Working or answer an examiner might expect to see | Mark | Notes |
|---|---|---|---|
| | For example<br>$84 = 2 \times 42$<br>$42 = 2 \times 21$<br>$21 = 3 \times 7$ | M1 | This mark is given for a complete method to find the prime factors |
| | $2 \times 2 \times 3 \times 7$ | A1 | This mark is given for the correct answer only |

**Question 22 (Total 1 mark)**

| Part | Working or answer an examiner might expect to see | Mark | Notes |
|---|---|---|---|
| | For example:<br>Hermione is wrong; she should have said "there are 12 red counters because 1 is a quarter of 4 and a quarter of 48 is 12" | C1 | This mark is given for a correct explanation |

**Question 23 (Total 6 marks)**

| Part | Working or answer an examiner might expect to see | Mark | Notes |
|---|---|---|---|
| (a) | 7 | B1 | This mark is given for the correct answer only |
| (b) |  | B2 | These marks are given for a fully correct diagram<br>(B1 is given for a line from –5 to 2 but with incorrect endpoint notation) |
| (c) | $\frac{4}{5}h < 16$ | M1 | This mark is given for a method to add 6 to both sides of the inequality |
| | $4h < 80$ | M1 | This mark is given for a method to multiply both sides of the inequality by 5 |
| | $h < 20$ | A1 | This mark is given for the correct answer only |

**Question 24 (Total 4 marks)**

| Part | Working or answer an examiner might expect to see | Mark | Notes |
|---|---|---|---|
| | Area of triangle = $\frac{1}{2} \times 7 \times 5x$<br>Area of rectangle = $4(3x + 1)$ | P1 | This mark is given for a process to find an expression for the area of one of the shapes |
| | | P1 | This mark is given for a process to find an expression for the area of both of the shapes |
| | $\frac{1}{2} \times 7 \times 5x = 4(3x + 1) + 18$<br>$17.5x = 12x + 4 + 18$<br>$5.5x = 22$ | P1 | This mark is given for a process to write and solve an equation in $x$ |
| | $(x =)\ 4$ | A1 | This mark is given for a correct answer only |

**Question 25 (Total 3 marks)**

| Part | Working or answer an examiner might expect to see | Mark | Notes |
|---|---|---|---|
| | $900 \times \frac{65}{100} = 585$ | P1 | This mark is given for a process to find the weight of turnips and parsnips sold |
| | $\frac{585}{(9+4)} = 45$ | P1 | This mark is given for a process to find the weight of parsnips sold |
| | $45 \times 4 = 180$ | A1 | This mark is given for the correct answer only |

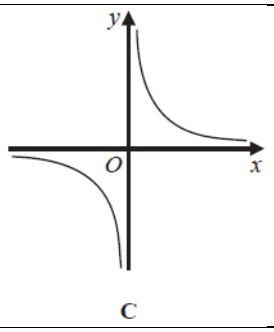
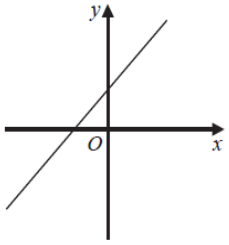
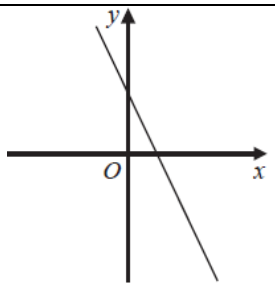
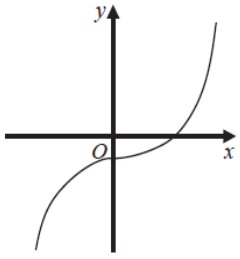
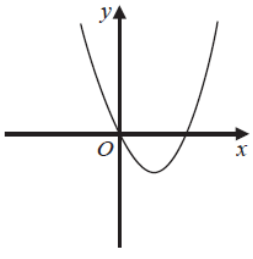
**Question 26 (Total 2 marks)**

| Part | Working or answer an examiner might expect to see | Mark | Notes |
|---|---|---|---|
| | $2.725 \leq d < 2.735$ | B1 | This mark is given for a 2.725 in the correct position |
| | | B1 | This mark is given for a 2.735 in the correct position |

**Question 27 (Total 4 marks)**

| Part | Working or answer an examiner might expect to see | Mark | Notes |
|---|---|---|---|
| | Ronnie's house:<br>$280\,000 \times 1.025 \times 1.025$<br>Tom's house:<br>$260\,000 \times 1.06 \times 1.06$ | P1 | This mark is given a for a first step of a process to find the value of at least one house after two years |
| | | P1 | This mark is given a for a first step of a process to find the value of both houses after two years |
| | Ronnie's house:<br>$280\,000 \times (1.025)^2 = 294\,175$<br>Tom's house:<br>$260\,000 \times (1.06)^2 = 292\,136$ | P1 | This mark is given a for a full process to find the value of both houses after two years |
| | Ronnie's house has the greatest value | C1 | This mark is given for a correct conclusion supported by correct working |

**Question 28 (Total 3 marks)**

| Part | Working or answer an examiner might expect to see | Mark | Notes |
|---|---|---|---|
| | <table><tr><th>Equation</th><th>Graph</th></tr><tr><td>$y = \frac{2}{x}$</td><td>  <br><br>C</td></tr><tr><td>$y = x + 4$</td><td>  <br><br>D</td></tr><tr><td>$y = 6 - 3x$</td><td>  <br><br>A</td></tr><tr><td>$y = x^3 - 3$</td><td>  <br><br>E</td></tr><tr><td>$y = x^2 - 3x$</td><td>  <br><br>B</td></tr></table><br>**C, D, A, E, B** | B3 | These marks are given for all five graphs correctly matched in the table<br>(B2 is given for 3 or 4 graphs correctly matched<br>B1 is given for 1 or 1 graphs correctly matched) |