

## GCSE Mathematics (1MA1) – Foundation Tier Paper 3F

### November 2022 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.

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 1 mark)**

Part	Working or answer an examiner might expect to see	Mark	Notes
	0.408, 0.41, 0.46, 0.5	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
	2000	B1	This mark is given for a correct answer only

**Question 3 (Total 1 mark)**

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

**Question 4 (Total 1 mark)**

Part	Working an or answer examiner might expect to see	Mark	Notes
	19	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
	18	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)	<p>Average monthly temperature (°C)</p> <p>Months</p> <p>6 (months)</p>	B1	This mark is given for the correct answer only
(b)	May and October	B1	This mark is given for the correct answers only

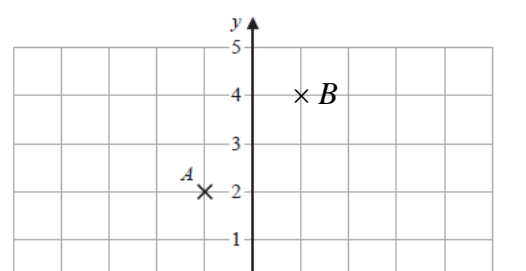
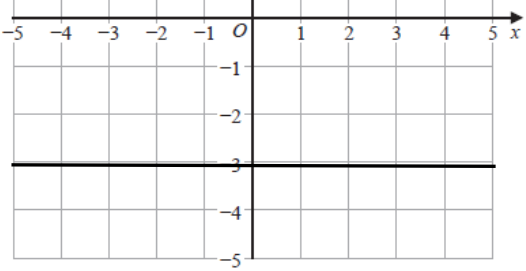
**Question 7 (Total 3 marks)**

Part	Working or answer an examiner might expect to see	Mark	Notes
	$\frac{1}{4} \times 208 = 52$ large bars $52 \times \text{£}1 = \text{£}52$	P1	This mark is given for a process to work out the total value of the large bars
	$\frac{3}{4} \times 208$ (or $208 - 52$ ) = 156 small bars $156 \times \text{£}0.6 = \text{£}93.60$	P1	This mark is given for a process to work out the total value of the small bars
	$52 + 93.60 = 145.60$	A1	This mark is given for the correct answer only

**Question 8 (Total 2 marks)**

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	$121 - 19 = 102$	B1	This mark is given for the correct answer only
(b)	$\frac{143 + 21 + 45 + 19}{4} = \frac{328}{4} = 82$	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)	$(-1, 2)$	B1	This mark is given for the correct answer only
(b)		B1	This mark is given for the correct point <i>B</i> marked on the grid
(c)		B1	This mark is given for the correct line marked on the grid

**Question 10 (Total 2 marks)**

Part	Working or answer an examiner might expect to see	Mark	Notes
(i)	For example: 11, 10 or 9, 6	B1	This mark is given for a two correct terms stated
(ii)	For example: The difference goes down by 1 each time Take away 4, then 3, then 2, then 1 Take away 4, then 3, then 4, then 3...	C1	This mark is given for a correct explanation stated

**Question 11 (Total 2 marks)**

Part	Working or answer an examiner might expect to see	Mark	Notes
	$8 \times 5 \times 4$	M1	This mark is given for a method to find the volume of the cuboid
	160	P1	This mark is given for the correct answer only

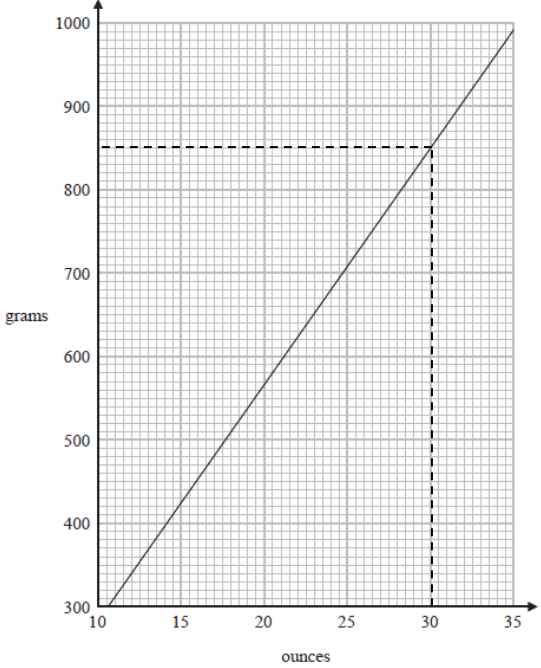
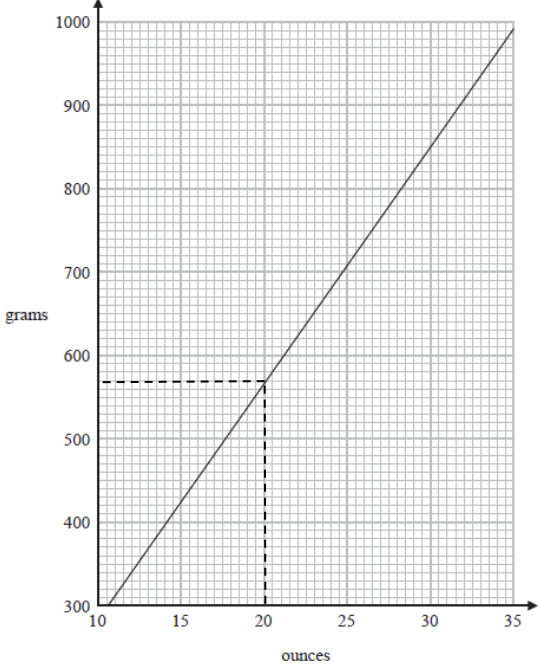
**Question 12 (Total 2 marks)**

Part	Working or answer an examiner might expect to see	Mark	Notes
	Amol has $n$ sweets Gemma has $6n$ sweets Harry has $3n$ sweets	M1	This mark is given for to represent the number of sweets each person has algebraically
	1 : 6 : 3	A1	This mark is given for the correct answer only

**Question 13 (Total 3 marks)**

Part	Working an or answer examiner might expect to see	Mark	Notes
(a)(i)	$360 - 120 - 120 - 80 = 40$	B1	This mark is given for the correct answer only
(a)(ii)	For example: The angles of a quadrilateral add up to 360	C1	This mark is given for a correct reason stated
(b)	For example: The angles of a triangle add up to 180, not 190	C1	This mark is given for a correct explanation

**Question 14 (Total 3 marks)**

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	 <p>30</p>	B1	This mark is given for the correct answer only
(b)	 <p>20 ounces = 570 g 80 ounces = 2280</p>	M1	This mark is given for a method to read off the graph at a factor of 80
		A1	This mark is given for the correct answer in the range 2238 to 2296

**Question 15 (Total 5 marks)**

Part	Working or answer an examiner might expect to see	Mark	Notes
	1 kg of carrots = $1.74 \div 3 = 0.58$	P1	This mark is given for a process to find the cost of 1 kg of carrots
	2.5 kg of onions = $2.36 - (2 \times 0.58) = 1.20$	P1	This mark is given for a process to find the cost of 2.5 kg of onions
	1 kg of onions = $1.20 \div 2.5 = 0.48$	P1	This mark is given for a process to find the cost of 1 kg of onions
	4 kg of onions = $4 \times 0.48 = 1.92$	P1	This mark is given for a process to find the cost of 4 kg of onions
	Yes, Stuart has enough money to buy 4 kg of onions	C1	This mark is give for a valid statement supported by correct working

**Question 16 (Total 2 marks)**

Part	Working or answer an examiner might expect to see	Mark	Notes
	For example: The labels are missing	C1	This mark is given for a valid comment about the labels
	For example: The pie chart is not drawn accurately The angles should be 108, 126 and 126	C1	This mark is given for a valid comment about the inaccuracy of the angles in the pie chart

**Question 17 (Total 3 marks)**

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	87 600	M1	This mark is given for a method to find height $\times$ frequency
(b)	$\frac{33.81}{2.5}$	M1	This mark is given for 33.81 or 2.5 seen
	13.524	A1	This mark is given for the correct answer only

**Question 18 (Total 2 marks)**

Part	Working or answer an examiner might expect to see	Mark	Notes
		B2	These marks are given for a correct shape drawn at (2, -1), (2, -4), (4 -2) and (4, -1)

**Question 19 (Total 4 marks)**

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	08 45 – 08 30 = 15	B1	This mark is given for the correct answer only
(b)	<p>4.6</p>	B1	This mark is given for correct answer in the range 4.4 to 4.8
(c)	$4 \div \frac{1}{3}$	M1	This mark is given for a method to use distance $\div$ time
	12	A1	



**Question 20 (Total 4 marks)**

Part	Working an or answer examiner might expect to see	Mark	Notes
	For 25 scones: $2.5 \times 80 = 200\text{g}$ butter	P1	This mark is given for a process to find the amount of at least one ingredient needed for 25 scones
	$2.5 \times 350 = 875\text{g}$ self-raising flour	P1	This mark is given for a process to find the amount of at least three ingredients needed for 25 scones
	$2.5 \times 30 = 75\text{g}$ sugar		
	$2.5 \times 2 = 5$ eggs		
	$200 - 100 = 100\text{g}$ butter $1 \text{ kg} > 875\text{g}$ self-raising flour, so no more required	P1	This mark is given for a process to find the extra amounts of the ingredients needed
	$75 - 50 = 25\text{g}$ sugar $5 - 4 = 1$ egg	C1	This mark is given for a fully correct answer showing the correct amounts of butter, sugar and eggs required

**Question 21 (Total 2 marks)**

Part	Working or answer an examiner might expect to see	Mark	Notes
	$p + 9 = 3a$	M1	This mark is given for a first step at a method to rearrange the formula
	$a = \frac{p+9}{3}$	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: Rob should have divided by 8	A1	This mark is given for a valid description of the error in Rob's working

**Question 23 (Total 3 marks)**

Part	Working or answer an examiner might expect to see	Mark	Notes																				
	<table border="1"> <thead> <tr> <th></th> <th>F</th> <th>S</th> <th>G</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td>Girls</td> <td></td> <td></td> <td>18</td> <td>110</td> </tr> <tr> <td>Boys</td> <td>60</td> <td></td> <td></td> <td>90</td> </tr> <tr> <td>Total</td> <td>104</td> <td>70</td> <td></td> <td>200</td> </tr> </tbody> </table>		F	S	G	Total	Girls			18	110	Boys	60			90	Total	104	70		200	P1	This mark is given for a process to add the information given into a two-way table
	F	S	G	Total																			
Girls			18	110																			
Boys	60			90																			
Total	104	70		200																			
	<table border="1"> <thead> <tr> <th></th> <th>F</th> <th>S</th> <th>G</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td>Girls</td> <td></td> <td></td> <td>18</td> <td>110</td> </tr> <tr> <td>Boys</td> <td>60</td> <td>22</td> <td>8</td> <td>90</td> </tr> <tr> <td>Total</td> <td>104</td> <td>70</td> <td>26</td> <td>200</td> </tr> </tbody> </table> <p> <math>200 - 104 - 70 = 26</math>  <math>26 - 18 = 8</math> </p>		F	S	G	Total	Girls			18	110	Boys	60	22	8	90	Total	104	70	26	200	P1	This mark is given for a process to use the information in the table to find out how many students chose German
	F	S	G	Total																			
Girls			18	110																			
Boys	60	22	8	90																			
Total	104	70	26	200																			
	<p> <math>90 - 60 - 8 = 22</math> </p>	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
	$\pi \times 40^2 \times 160 = 804\,247\dots \text{ cm}^3$	P1	This mark is given for a process to find the volume of one tank
	$4 \times 804\,247\dots = 3\,216\,990.2\dots \text{ cm}^3$	P1	This mark is given for a process to find the volume of all four tanks
	<p>                     32 litres = <math>32\,000 \text{ cm}^3</math>                      Amount of mixture  <math>= 101 \times 32\,000 = 3\,232\,000 \text{ cm}^3</math> </p>	P1	This mark is given for a process to find how much of the mixture 32 litres will make
	<p> <math>32\,320\,000 \text{ cm}^2 &gt; 3\,216\,990 \text{ cm}^3</math>                      Yes, Karina has enough fertiliser for the four tanks                 </p>	C1	This mark is given for a valid answer supported by correct working

**Question 25 (Total 4 marks)**

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	$\frac{20}{5} = 4$	M1	This mark is given for a method to find a ratio of the lengths of the triangles
	$4 \times 4 = 16$	A1	This mark is given for the correct answer only
(b)	$\frac{22}{4}$	M1	This mark is given for a method to find the length of $AB$
	5.5	A1	This mark is given for the correct answer only

**Question 26 (Total 4 marks)**

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	<p>                     Sports quiz                      Music quiz                      0.3                      win                      0.35                      win                      win                      do not win                      0.65                      do not win                      0.7                      do not win                      0.35                      win                      do not win                      do not win                      0.65                      do not win                 </p>	B1	This mark is given for 0.7 on the first branch
		B1	This mark is given for 0.65 and 0.65 on the second branches
(b)	$0.3 \times 0.35$	M1	This mark is given for a method to find the probability of winning both quizzes
	0.105	A1	This mark is given for the correct answer only

**Question 27 (Total 4 marks)**

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	$\frac{8000}{100 \times 100 \times 100} = 0.008$	B1	This mark is given for the correct answer only
(b)	180 km = 180 000 m 1 hour = 3600 seconds	M1	This mark is given for a method to convert km to m or hours to seconds
	$\frac{180\ 000}{3600}$	M1	This mark is given for a method to find the speed in metres per second
	50	A1	This mark is given for the correct answer only

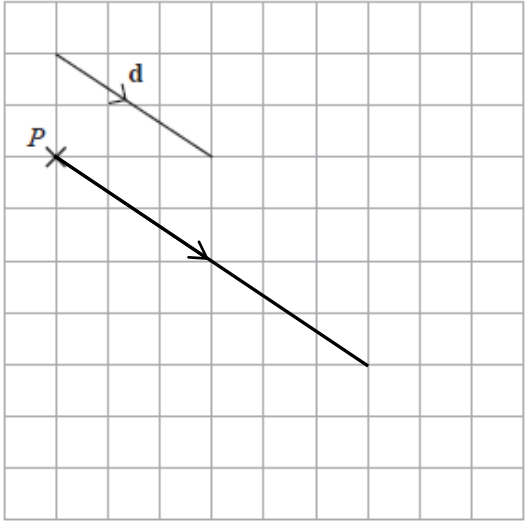
**Question 28 (Total 3 marks)**

Part	Working or answer an examiner might expect to see	Mark	Notes
	$50 \times 167.6 = 8380$ $20 \times 182 = 3640$	P1	This mark is given for a process to find the total heights of all 50 people or the total height of the 20 men
	$\frac{8380 - 3640}{30}$	P1	This mark is given for a process to find the mean height of the 30 women
	158	A1	This mark is given for correct answers in the ranges 5.1 to 5.3 and 0.7 to 0.9

**Question 29 (Total 3 marks)**

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	0.000675	B1	This mark is given for the correct answer only
(b)	$\frac{(2.56 \times 4.12) \times (10^6 \times 10^{-3})}{1.6 \times 10^{-2}} = \frac{10.5472 \times 10^3}{1.6 \times 10^{-2}}$ $\frac{10.5472}{1.6} \times 10^{3--2}$	M1	This mark is given for $10.5472 \times 10^3$ seen or $6.592 \times 10^n$ where $n \neq 5$ seen
	$6.592 \times 10^5$	A1	This mark is given for the correct answer only

**Question 30 (Total 4 marks)**

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)(i)	$\begin{pmatrix} 2-1 \\ 3+2 \end{pmatrix} = \begin{pmatrix} 1 \\ 5 \end{pmatrix}$	B1	This mark is given for the correct answer only
(a)(ii)	$\begin{pmatrix} 4 \\ 6 \end{pmatrix} - \begin{pmatrix} 4 \\ 1 \end{pmatrix}$	M1	This mark is given for a method to find the vector $2\mathbf{a}$ before subtracting $\mathbf{c}$
	$\begin{pmatrix} 0 \\ 5 \end{pmatrix}$	A1	This mark is given for the correct answer only
(b)		A1	This mark is given for a correct vector drawn from the point $P$