

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

### **November 2021 student-friendly mark scheme**

**Please note that this mark scheme is not the one used by examiners for marking 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**

<b>Guidance on the use of codes within this mark scheme</b>
<p>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.</p> <p>P1 – process mark. This mark is generally given for setting up an appropriate process to find a solution in the context of the question.</p> <p>A1 – accuracy mark. This mark is generally given for a correct answer following correct working.</p> <p>B1 – working mark. This mark is usually given when working and the answer cannot easily be separated.</p> <p>C1 – communication mark. This mark is given for explaining your answer or giving a conclusion in context supported by your working.</p> <p>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).</p>

**Question 1 (Total 1 mark)**

Part	Working or answer an examiner might expect to see	Mark	Notes
	$\frac{31}{100}$	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
	300	B1	This mark is given for the correct answer only

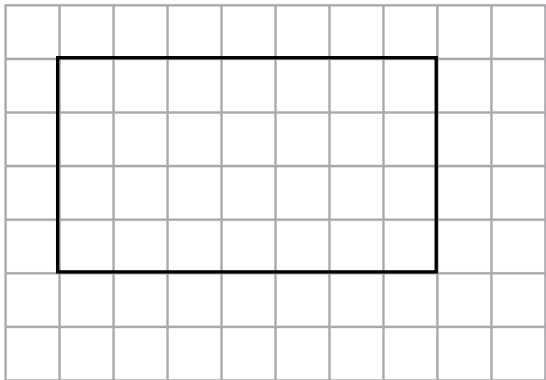
**Question 3 (Total 1 mark)**

Part	Working or answer an examiner might expect to see	Mark	Notes
	0.12, 0.21, 1.02, 1.20	B1	This mark is given for the correct answer only

**Question 4 (Total 2 marks)**

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	$4m$	B1	This mark is given for the correct answer only
(b)	$3p$	B1	This mark is given for the correct answer only

**Question 5 (Total 2 marks)**

Part	Working or answer an examiner might expect to see	Mark	Notes
	$35 \div 5 = 7$ $20 \div 5 = 4$ For example: 	B2	These marks are given for a fully correct 7 cm by 4 cm rectangle (B1 is given for a rectangle with one correct dimension)

**Question 6 (Total 2 marks)**

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	25	B1	This mark is given for the correct answer only
(b)	24	B1	This mark is given for the correct answer only

**Question 7 (Total 3 marks)**

Part	Working or answer an examiner might expect to see	Mark	Notes
	$2500 - 940 = 1560$	P1	This mark is given for a process to find the amount of flour in bags <b>A</b> and <b>B</b>
	$1560 \div 2$	P1	This mark is given for a process to find the amount of flour in bag <b>C</b>
	780	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
	$6 + 4 + 5 + 8 + 7 + 5 = 35$	P1	This mark is given for a process to find how often the dice was thrown
	$35 \div 5$	P1	This mark is given for a process to find how often each student throws the dice
	7	A1	This mark is given for the correct answer only

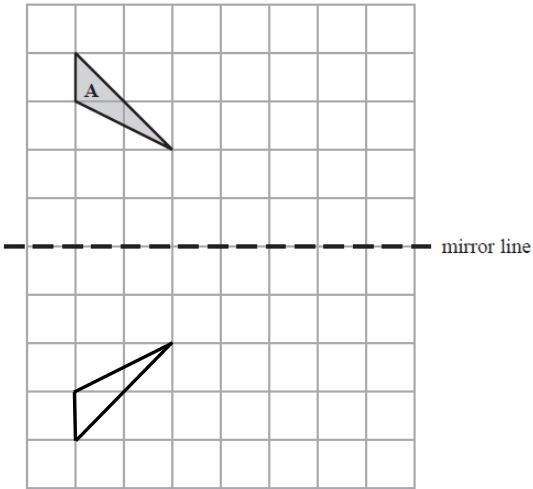
**Question 9 (Total 1 mark)**

Part	Working or answer an examiner might expect to see	Mark	Notes
	Alec should multiply $3 \times 4$ before adding 2	C1	This mark is given for a correct explanation

**Question 10 (Total 1 mark)**

Part	Working or answer an examiner might expect to see	Mark	Notes
	$\frac{17}{30}$	B1	This mark is given for the correct answer only (or any equivalent fraction)

**Question 11(Total 2 marks)**

Part	Working or answer an examiner might expect to see	Mark	Notes
		M1	This mark is given for a correct reflection of the shape in any line or a correct reflection of at least one vertex
		A1	This mark is given for a fully correct reflection

**Question 12 (Total 3 marks)**

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	$\frac{13.82}{4.06} = 3.4039409\dots$	M1	This mark is given for method to find a value for $13.82 \div 4.06$
	$\sqrt{3.4039409\dots} = 1.8449772\dots$	A1	This mark is given for the correct answer only
(b)	1.84	B1	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
(i)	$180 - 75 - 84$	M1	This mark is given for a method to find the value of $x$
	21	A1	This mark is given for the correct answer only
(ii)	Angles on a straight line add up to 180	C1	This mark is given for correct explanation

**Question 14 (Total 3 marks)**

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	15	B1	This mark is given for reading the correct answer from the graph
(b)	$36 \times 15$	M1	This mark is given for a method to find the total Nazima is paid
	540	A1	This mark is given for the correct answer only

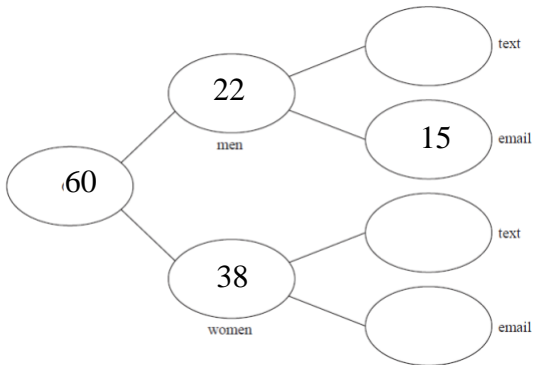
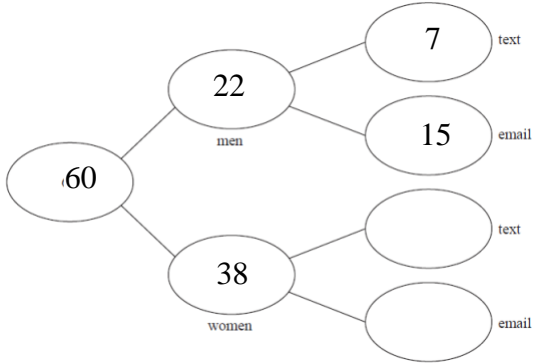
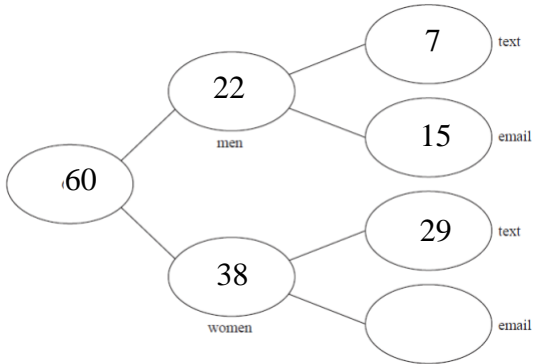
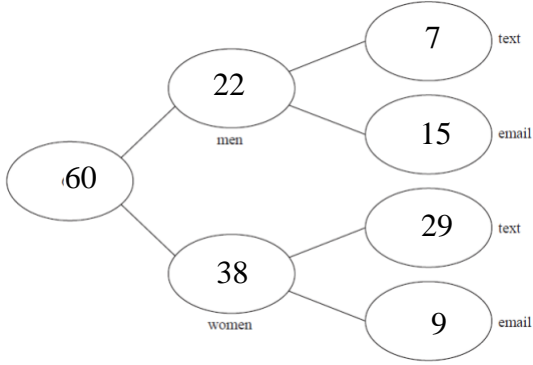
**Question 15 (Total 2 marks)**

Part	Working or answer an examiner might expect to see	Mark	Notes
	For example: 0.625, 0.666..., 0.444..., 0.6	M1	This mark is given for a method to write the fractions in order of size
	$\frac{4}{9}, \frac{3}{5}, \frac{5}{8}, \frac{2}{3}$	A1	This mark is given for the correct answer only

**Question 16 (Total 5 marks)**

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	$\frac{135}{90} = 1.5$	M1	This mark is given for a method to find the number of cars represented by $1^\circ$ in the pie chart
	$1.5 \times 80$	M1	This mark is given for a method to find the total number of white cars
	120	A1	This mark is given for a correct answer only
(b)	$135 \times \frac{360}{90} = 540$	M1	This mark is given for a method to find the total number of cars
	$\frac{50}{540}$	A1	This mark is given for a correct answer only (or equivalent fraction)

**Question 17 (Total 5 marks)**

Part	Working or answer an examiner might expect to see	Mark	Notes
	 <p>A frequency tree diagram. The root node is 60. It branches into 22 (men) and 38 (women). From 22 (men), it branches into 15 (email) and 7 (text). From 38 (women), it branches into 15 (email) and 23 (text).</p>	C1	This mark is given for adding 22 (men) in the correct part of the frequency tree
	 <p>A frequency tree diagram. The root node is 60. It branches into 22 (men) and 38 (women). From 22 (men), it branches into 15 (email) and 7 (text). From 38 (women), it branches into 15 (email) and 23 (text).</p>	C1	This mark is given for adding 7 (men texting) in the correct part of the frequency tree
	$60 \times 0.6 = 36$	M1	This mark is given for a method to find how many people in total prefer to text
	 <p>A frequency tree diagram. The root node is 60. It branches into 22 (men) and 38 (women). From 22 (men), it branches into 15 (email) and 7 (text). From 38 (women), it branches into 29 (text) and 9 (email).</p>	M1	This mark is given for adding 29 (women texting) in the correct part of the frequency tree
	 <p>A frequency tree diagram. The root node is 60. It branches into 22 (men) and 38 (women). From 22 (men), it branches into 15 (email) and 7 (text). From 38 (women), it branches into 29 (text) and 9 (email).</p>	A1	This mark is given for adding 9 (women emailing) in the correct part of the frequency tree

### Question 18 (Total 3 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes																					
	<table><tr><th>Length of plank (metres)</th><th>Number of planks</th><th>Total</th></tr><tr><td>3</td><td>5</td><td>15</td></tr><tr><td>2.5</td><td>8</td><td>20</td></tr><tr><td>2</td><td></td><td></td></tr><tr><td>1.5</td><td>14</td><td>14</td></tr><tr><td>1</td><td>10</td><td>10</td></tr><tr><td></td><td></td><td>66</td></tr></table>	Length of plank (metres)	Number of planks	Total	3	5	15	2.5	8	20	2			1.5	14	14	1	10	10			66	P1	This mark is given for a process to find the total length of all the other planks
Length of plank (metres)	Number of planks	Total																						
3	5	15																						
2.5	8	20																						
2																								
1.5	14	14																						
1	10	10																						
		66																						
	$92 - 66 = 26$	P1	This mark is given for a process to find the total length of all the 2 m planks																					
	$26 \div 2 = 13$	A1	This mark is given for a correct answer only																					

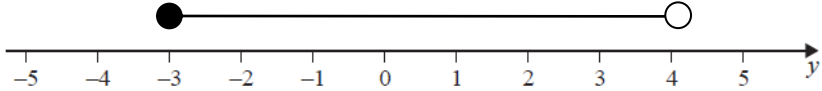
### Question 19 (Total 3 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	Rachel's share = $600 \times \frac{2}{5} = 240$	P1	This mark is given for a process to find Rachel's share
	Samina's share = $\frac{1}{4} \times (600 - 240) = 90$	P1	This mark is given for a process to find Samina's share
	Tom's share = $600 - 240 - 90 = 270$ If shared equally, each share = 200	P1	This mark is given for a process to find Tom's share and a comparison with equal shares
	No, Tom is not correct	C1	This mark is given for a correct conclusion supported by correct working

### Question 20 (Total 6 marks)

Part	Working an or answer examiner might expect to see	Mark	Notes
(a)	$c^{5-2} = c^3$	B1	This mark is given for the correct answer only
(b)	$d^{4 \times 3} = d^{12}$	B1	This mark is given for the correct answer only

**Question 21 (Total 3 marks)**

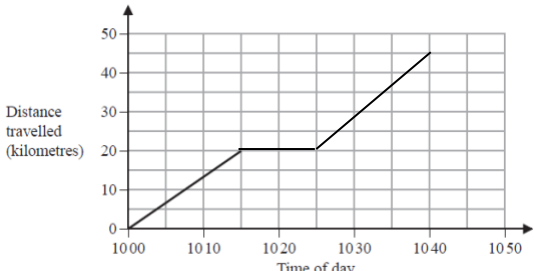
Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	$x > -1$	B1	This mark is given for the correct answer only
(b)		C2	These marks are given for a fully correct diagram (C1 is given for an open circle at 4 or a closed circle at -3)

**Question 22 (Total 4 marks)**

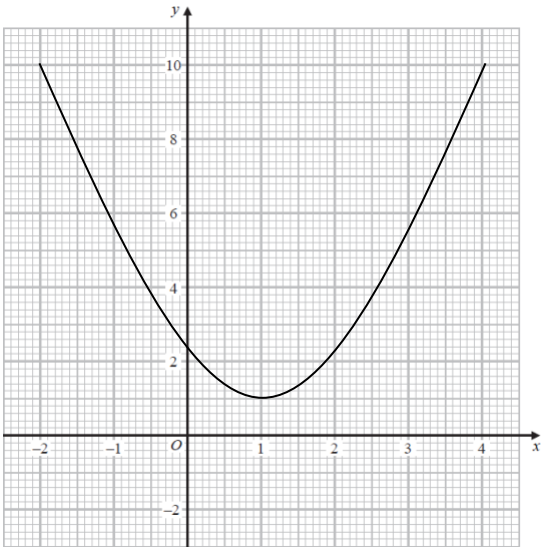
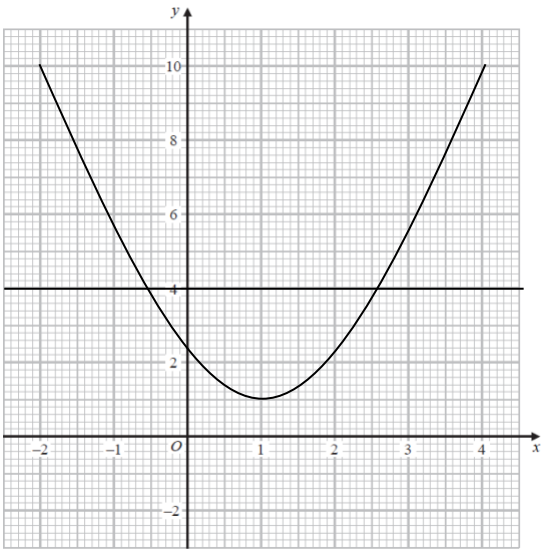
Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	For example: $60 = 2 \times 2 \times 3 \times 5$ $84 = 2 \times 2 \times 3 \times 7$	M1	This mark is given for a method to find the highest common factor (HCF)
	$HCF = 2 \times 2 \times 3 = 12$	A1	This mark is given for a correct answer only
(b)	For example: $24 = 2 \times 2 \times 2 \times 3$ $40 = 2 \times 2 \times 2 \times 5$	M1	This mark is given for a method to find the lowest common multiple (LCM)
	$LCM = 2 \times 2 \times 2 \times 3 \times 5 = 120$	A1	This mark is given for a correct answer only



**Question 23 (Total 5 marks)**

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	$\frac{20 \times 60}{15}$	M1	This mark is given for a method to find Sam's speed
	80	A1	This mark is given for a correct answer only
(b)	$\frac{75 \times 20}{60} = 25$	M1	This mark is given for a method to find the distance travelled in the final 20 minutes
		C2	This mark is given for a fully correct travel graph (C1 is given for one correct line added to the graph)

**Question 24 (Total 6 marks)**

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	5, 1, 2, 10	B2	These marks are given for all 4 values correct (B1 is given for 2 or 3 values correct)
(b)		M1	This mark is given for at least 5 marks plotted correctly
		A1	This mark is given for a fully correct curve drawn
(c)		M1	This mark is given for $y = 4$ drawn <b>or</b> intersections with $y = 4$ drawn <b>or</b> $y = x^2 - 2x - 2$ drawn
	2.7, -0.7	A1	This mark is given for answers in the ranges 2.65 to 2.8 and -0.65 to -0.8

**Question 25 (Total 4 marks)**

Part	Working or answer an examiner might expect to see	Mark	Notes
	$8^2 + 10^2 = 164$	P1	This mark is given for a process to find the length of the hypotenuse of the triangle
	$\sqrt{164} = 12.8\dots$	P1	This mark is given for finding the length of the hypotenuse of the triangle
	$8 + 8 + 12.8 + (12.8 - 10) + 10$	P1	This mark is given for a process to find the length of the perimeter of the shape
	41.6	A1	This mark is given for an answer in the range 41 to 42

**Question 26 (Total 4 marks)**

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	$BC = 12 \times \tan 56^\circ = 12 \times 1.482\dots$	M1	This mark is given for a method to find the length $BC$
	17.8	A1	This mark is given for an answer in the range 17.7 to 17.8
(b)	$\cos x = \frac{15}{18}$	M1	This mark is given for a method to find the size of angle $x$
	33.6	A1	This mark is given for an answer in the range 33.5 to 33.6

**Question 27 (Total 3 marks)**

Part	Working or answer an examiner might expect to see	Mark	Notes
	$(x - 9)(x + 2)$	M1	This mark is given for a method to factorise. e.g. $(x \pm 9)(x \pm 2)$ or use of the quadratic formula
		M1	This mark is given for a fully correct factorisation or $\frac{7 \pm \sqrt{121}}{2}$ found
	$x = -2, x = 9$	A1	This mark is given for a correct answer only

**Question 28 (Total 2 marks)**

Part	Working or answer an examiner might expect to see	Mark	Notes
	$272\,000 \div 0.85$	M1	This mark is given for a method to find the normal price of the boat
	320 000	A1	This mark is given for a correct answer only