GCSE Mathematics (1MA1) – Aiming for 4 Paper 1F (Set 4)

Spring 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
	18	B1	This mark is given for the correct answer only

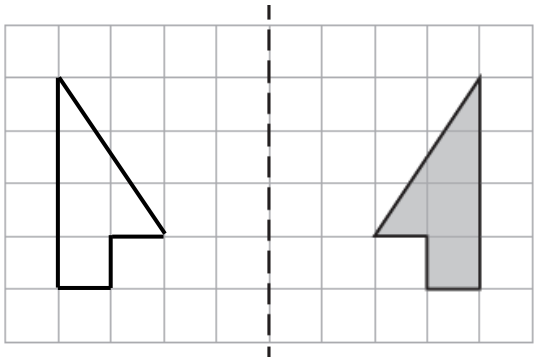
Question 2 (Total 1 mark)

Part	Working or answer an examiner might expect to see	Mark	Notes
	–10, –7, –2, 0, 1, 8	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
	The bar for brown has a frequency of 16, not 15	C1	This mark is given for a correct error identified

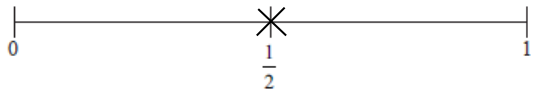
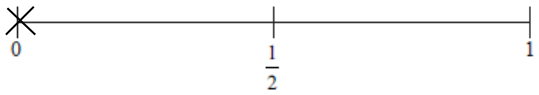
Question 4 (Total 2 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
		M1	This mark is given for a reflection of the shape in any line or a correct reflection of at least 3 vertices
		A1	This mark is given for a fully correct reflection

Question 5 (Total 2 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	42 ÷ 3	M1	This mark is given for a method to find the amount each friend gets
	14	A1	This mark is given for the correct answer only

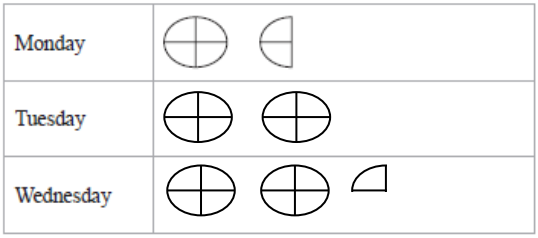
Question 6 (Total 2 marks)

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

Question 7 (Total 1 mark)

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

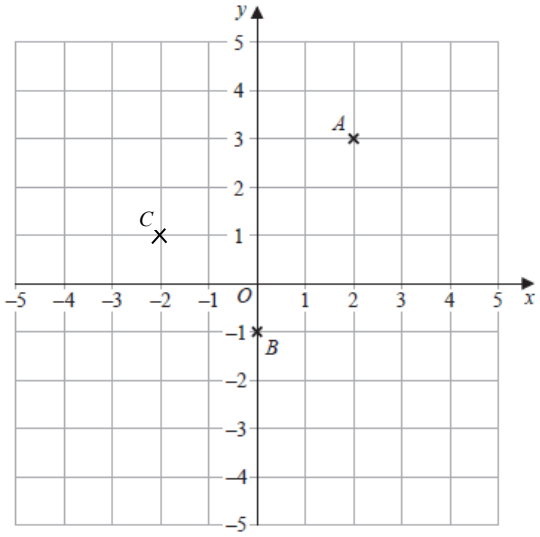
Question 8 (Total 4 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
		C1	This mark is given for deducing that each oval represents 12 eggs (may be seen outside diagram) or that each segment represents 3 plates
		C1	This mark is given for 2 ovals drawn for Tuesday
		C1	This mark is given for $2\frac{1}{4}$ ovals drawn for Wednesday
	Key: represents 12 eggs	C1	This mark is given for a correct key

Question 9 (Total 1 mark)

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

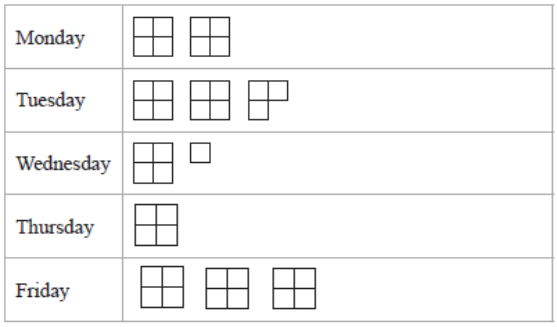
Question 10 (Total 3 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	(2, 3)	B1	This mark is given for the correct answer only
(b)	(0, –1)	B1	This mark is given for the correct answer only
(c)		B1	This mark is given for *C* marked at (–2, 1)

Question 11 (Total 3 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	1.20 + 0.70 + (2 × 2.30) = 6.50	P1	This mark is given for a process to find the total of Danny's purchases
	10.00 – 6.50 = 3.50	P1	This mark is given for a process to find the correct change from £10
	Danny is not correct; he should receive 3.50 in change	A1	This mark is given for a correct conclusion supported by correct working

Question 12 (Total 6 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	16	B1	This mark is given for the correct answer only
(b)	$(8 + 8 + 6) - (8 + 2) = 22 - 10$	M1	This mark is given for a method to find how many more video games were sold
	12	A1	This mark is given for the correct answer only
(c)	$\frac{1}{4} \times 32 = 8$	P1	This mark is given for a process to find the number of video games sold on Thursday
		A1	This mark is given for a correct entry in the pictogram for Thursday
		A1	This mark is given for a correct entry in the pictogram for Friday

Question 13 (Total 1 mark)

Part	Working or answer an examiner might expect to see	Mark	Notes
	$7 \times 7 = 49$	B1	This mark is given for the correct answer only

Question 14 (Total 3 marks)

<table>
<tr><th>Part</th><th>Working or answer an examiner might expect to see</th><th>Mark</th><th>Notes</th></tr>
<tr><td></td><td>
<table>
<tr><th></th><th>Cricket</th><th>Swimming</th><th>Tennis</th><th>Total</th></tr>
<tr><td>Male</td><td></td><td>2</td><td></td><td></td></tr>
<tr><td>Female</td><td></td><td></td><td>11</td><td>20</td></tr>
<tr><td>Total</td><td>5</td><td></td><td></td><td>30</td></tr>
</table>
</td><td>M1</td><td>This mark is given for entering 2, 11 and 5 in the correct places</td></tr>
<tr><td></td><td>$30 – 20 = 10$
$(10 – 2) \div 2 = 4$
<table>
<tr><th></th><th>Cricket</th><th>Swimming</th><th>Tennis</th><th>Total</th></tr>
<tr><td>Male</td><td>4</td><td>2</td><td>4</td><td>10</td></tr>
<tr><td>Female</td><td></td><td></td><td>11</td><td>20</td></tr>
<tr><td>Total</td><td>5</td><td></td><td></td><td>30</td></tr>
</table>
</td><td>M1</td><td>This mark is given for a method to complete the top row of the table</td></tr>
<tr><td></td><td>
<table>
<tr><th></th><th>Cricket</th><th>Swimming</th><th>Tennis</th><th>Total</th></tr>
<tr><td>Male</td><td>4</td><td>2</td><td>4</td><td>10</td></tr>
<tr><td>Female</td><td>1</td><td>8</td><td>11</td><td>20</td></tr>
<tr><td>Total</td><td>5</td><td>10</td><td>15</td><td>30</td></tr>
</table>
</td><td>A1</td><td>This mark is given for a fully correct table</td></tr>
</table>

Question 15 (Total 1 mark)

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

Question 16 (Total 4 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	$12 \times \frac{1}{4} = 3$ $12 – 3 = 9$	P1	This mark is given for a process to work out the number of large marbles and small marbles
	$3 \times 70 = 210$ $9 \times 50 = 450$	P1	This mark is given for a process to work out the weight of the large marbles or the small marbles
	$210 + 450$	P1	This mark is given for a process to find the total weight of the marbles
	660	A1	This mark is given for the correct answer only

Question 17 (Total 1 mark)

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

Question 18 (Total 3 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	$7 \times 2 - 3 = 11$	B1	This mark is given for a process to find the cost of three T-shirts
(b)	$x \times 2 - 3 = 41$ $2x - 3 = 41$ $2x = 44$	M1	This mark is given for a process to use an approximation to 0.749
	22	A1	This mark is given for a correct answer only

Question 19 (Total 1 mark)

Part	Working or answer an examiner might expect to see	Mark	Notes
	0.309, 0.32, 0.35, 0.4	B1	This mark is given for the correct answer only

Question 20 (Total 1 mark)

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

Question 21 (Total 1 mark)

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

Question 22 (Total 3 marks)

Part	Working an or answer examiner might expect to see	Mark	Notes
(a)	The sequence could be "add one, add two, add three, etc" in which case the next term could be 4 + 3 = 7	C1	This mark is given for a correct explanation
(b)	1, 3, 6, 10, 15, 21, 28…	M1	This mark is given for a method to find the 8th term of the sequence by adding one more each time
	36	A1	This mark is given for the correct answer only

Question 23 (Total 4 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	Temperature on Tuesday = 5 – 10 = –5 Temperature on Wednesday = –5 + 3 = –2	M1	This mark is given for a process to work out the temperatures on Tuesday and Wednesday
	The difference between the temperatures on Monday and Wednesday = 5 – (–2) = 7	A1	This mark is given for the correct answer only

Question 24 (Total 2 marks)

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

Question 25 (Total 4 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	1 kg of carrots = $1.80 \div 3 = 0.60$	P1	This mark is given for a process to find the cost of 1 kg of carrots
	5 kg of potatoes = $3.45 - 1.20 = 2.25$	P1	This mark is given for a process to find the cost of 5 kg of potatoes
	4 kg of carrots + 2 kg of potatoes $= (0.60 \times 4) + (2.25 \div 5) \times 2$ $= 2.40 + 0.90$	P1	This mark is given for a process to find the cost of 4 kg of carrots and 2 kg of potatoes
	$= 3.30$	A1	This mark is given for a fully correct answer

Question 26 (Total 2 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	$67.2 \times 10^{-4} = 6.72 \times 10^{-3}$ $672 \times 10^{4} = 6.72 \times 10^{6}$ $0.000672 = 6.72 \times 10^{-4}$	M1	This mark is given for converting each number into standard form
	0.000672, 67.2×10^{-4}, 6.72×10^{5}, 672×10^{4}	A1	This mark is given for all numbers in the correct order

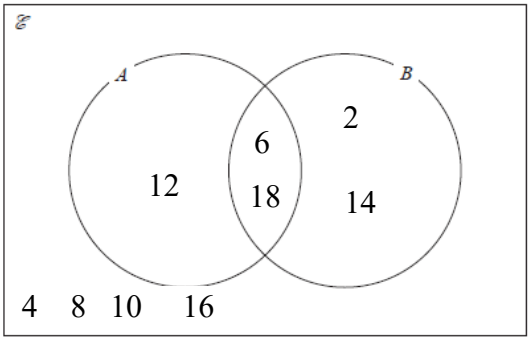
Question 27 (Total 4 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	$2a + 2d$	B1	This mark is given for the correct answer only
(b)	$y(6y - 5)$	B1	This mark is given for the correct answer only
(c)	$4x = 44$	M1	This mark is given for a method to find a solution for x
	$x = 11$	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
	$24 \times 50p = £12$ $£12 - £10 = £2$	M1	This mark is given for a process to find the overall profit
	$\frac{2}{10} \times 100$	M1	This mark is given for a method to find the percentage profit
	20%	A1	This mark is given for the correct answer only

Question 29 (Total 3 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
		M1	This mark is given for 6 and 18 correctly placed
		M1	This mark is given for 2 and 14 correctly placed
		C1	This mark is given for a fully correct Venn diagram

Question 30 (Total 5 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	$500 \div 125 = 4$ $4 \times 12 = 48$	P1	This mark is given for a process to find out how many biscuits Heidi could make with 500 g of butter
	$700 \div 200 = 3.5$ $3.5 \times 12 = 42$	P1	This mark is given for a process to find out how many biscuits Heidi could make with 700 g of flour
	$250 \div 50 = 5$ $5 \times 12 = 60$	P1	This mark is given for a process to find out how many biscuits Heidi could make with 50 g of sugar
	Heidi can make 42 biscuits	A1	This mark is given for a correct answer only
(b)	No; Heidi still only has enough flour to make 42 biscuits	C1	This mark is given for a correct conclusion

Question 31 (Total 2 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	For example: the number of points only goes up to 4	C1	This mark is given for a correct explanation
(b)	For example: $0 \times 1 = 0$ (not 1)	C1	This mark is given for a correct explanation

Question 32 (Total 4 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	$x^2 - 4x$	B1	This mark is given for the correct answer only
(b)	$5(3y - 2)$	B1	This mark is given for the correct answer only
(c)	$7f - 35 = 28$ $7f = 63$	M1	This mark is given for a method to expand brackets
	$f = 9$	A1	This mark is given for the correct answer only

Question 33 (Total 3 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	$80 - 56 = 24$	P1	This mark is given finding the loss (in £) selling the watch
	$\frac{24}{80} \times 100$	P1	This mark is given for a process to find the percentage loss
	30	A1	This mark is given for the correct answer only

Aiming for 4 - Paper 1F					Edexcel averages: mean scores of students who achieved grade						
Question	**Skill tested**	**Mean score**	**Max score**	**Mean %**	**ALL**	**5**	**4**	**3**	**2**	**1**	**U**
1	Primes, factors, multiples	0.96	1	96	0.96	0.99	0.99	0.98	0.95	0.87	0.77
2	Order numbers	0.95	1	95	0.95	0.98	0.98	0.97	0.95	0.89	0.76
3	Bar charts	0.94	1	94	0.94	0.97	0.97	0.96	0.94	0.91	0.87
4	Transformations	1.86	2	93	1.86	1.95	1.94	1.90	1.80	1.60	1.22
5	Apply four operations	1.84	2	92	1.84	1.97	1.96	1.92	1.81	1.57	1.23
6	Theoretical probability; appropriate language; 0-1 probability scale	1.79	2	90	1.79	1.95	1.92	1.85	1.69	1.44	1.15
7	Rounding; Inequality notation to specify error interval	0.89	1	89	0.89	0.98	0.97	0.94	0.82	0.64	0.48
8	Pictograms	3.52	4	88	3.52	3.88	3.85	3.70	3.23	2.46	1.75
9	Approximation and estimation	0.86	1	86	0.86	0.95	0.94	0.90	0.83	0.75	0.68
10	Coordinates in all four quadrants	2.56	3	85	2.56	2.89	2.81	2.64	2.34	1.97	1.55
11	Apply four operations	2.47	3	82	2.47	2.87	2.75	2.62	2.36	1.99	1.71
12	Pictograms	4.85	6	81	4.85	5.66	5.57	5.27	4.54	3.56	3.00
13	Roots and powers	0.80	1	80	0.80	0.98	0.93	0.87	0.75	0.59	0.42
14	Two way tables	2.37	3	79	2.37	2.78	2.69	2.48	2.09	1.66	1.17
15	Conversion between fractions, decimals and percentages	0.78	1	78	0.78	0.94	0.88	0.80	0.74	0.71	0.60
16	Units of mass, length, time, money and other measures (including standard compound measures)	3.10	4	78	3.10	3.89	3.72	3.39	2.48	1.44	0.77
17	Apply four operations	0.75	1	75	0.75	0.86	0.82	0.77	0.70	0.57	0.42
18	Inverse and composite functions; formal function notation	2.22	3	74	2.22	2.75	2.61	2.38	1.87	1.21	0.72
19	Order numbers	0.72	1	72	0.72	0.96	0.89	0.77	0.58	0.41	0.26
20	Conversion between fractions, decimals and percentages	0.67	1	67	0.67	0.94	0.84	0.73	0.60	0.49	0.36
21	Conversion between fractions, decimals and percentages	0.66	1	66	0.66	0.93	0.85	0.72	0.47	0.29	0.14
22	Generate terms of a sequence	1.91	3	64	1.91	2.44	2.25	2.08	1.80	1.36	0.98
23	Apply four operations	1.26	2	63	1.26	1.75	1.58	1.40	1.13	0.80	0.59
24	Conventional geometrical terms and notation	1.16	2	58	1.16	1.61	1.38	1.24	1.08	0.86	0.72
25	Solve problems involving direct and inverse proportion	2.21	4	55	2.21	3.69	3.33	2.67	1.66	0.93	0.63

26	Standard form	1.07	2	54	1.07	1.52	1.29	1.08	0.91	0.81	0.58
27	Solve linear equations	1.99	4	50	1.99	3.46	2.94	2.34	1.56	0.87	0.55
28	Percentages and problems involving percentage change	1.45	3	48	1.45	2.29	1.84	1.49	1.12	0.82	0.47
29	Enumerate sets and combinations of sets systematically; two-way tables, Venn diagrams and tree diagrams	1.45	3	48	1.45	2.39	2.02	1.65	1.21	0.85	0.56
30	Solve problems involving direct and inverse proportion	2.29	5	46	2.29	3.81	3.24	2.64	1.87	1.23	0.85
31	Frequency tables	0.88	2	44	0.88	1.38	1.19	0.94	0.63	0.42	0.22
32	Expressions and equations	1.72	4	43	1.72	3.54	2.73	1.77	0.90	0.46	0.20
33	Percentages and problems involving percentage change	1.29	3	43	1.29	2.57	1.93	1.39	1.04	0.86	0.68
		54.24	**80**	**68**	**54.24**	**71.52**	**65.60**	**58.25**	**47.45**	**36.29**	**27.06**

Aiming for 4 – Set 4 (Spring 2022)

Suggested grade boundaries

	Max	**5**	**4**	**3**	**2**	**1**
1F	80	69	62	53	42	32
2F	80	70	63	54	41	26
3F	80	69	63	55	43	27
Total	**240**	**208**	**188**	**162**	**126**	**85**

Grade boundaries are based on the average performance data for students answering these questions who gained grades 1-5 in the November 2020 & 2021 GCSE Mathematics examinations at Foundation tier.

Students did not answer these questions as 90-minute tests, of course; so there is some scope for adjustment. These boundaries are for guidance only.