GCSE Mathematics (1MA1) – Aiming for 5 Paper 2F

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.
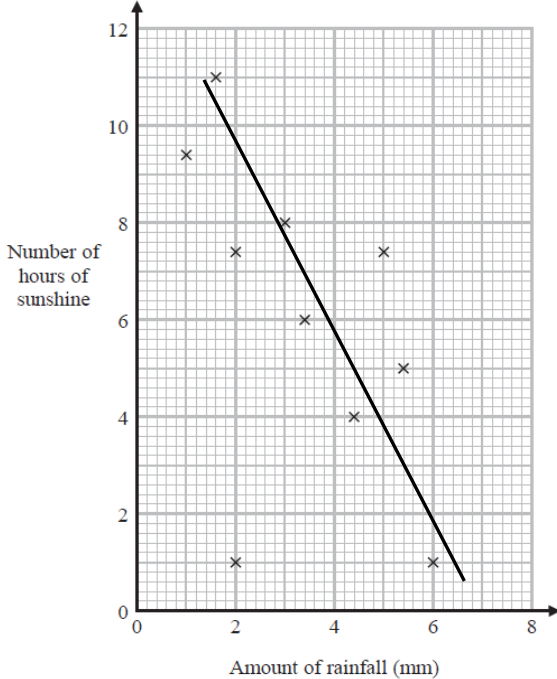
A1 – accuracy mark. This mark is generally given for a correct answer following correct working.

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 4 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	(2, 1)	B1	This mark is given for the correct answer only
(b)	For example: As the amount of rainfall decreases, the number of hours of sunshine increases	C1	This mark is given for a valid description of the relationship
(c)		M1	This mark is given for a suitable line of best fit drawn
	3.5	A1	This mark is given for an answer in the range 3 to 4

Question 2 (Total 5 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	$700 \times 2000 = 1\,400\,000$	P1	This mark is given for a process to find the area available at Festival B
	Festival A: $80\,000 \div 425 = 188.23\ldots$ Festival B: $1\,400\,000 \div = 6750 = 207.40\ldots$	P1	This mark is given a method to find the area available per person at (at least) one Festival
	$207.40\ldots - 188.23\ldots = 19.17\ldots$	P1	This mark is given for finding the difference in area per person
	19 (to the nearest whole number)	A1	This mark is given for the correct answer only
(b)	For example: 300 cm^2 is $0.3 \text{ m} \times 0.3 \text{ m} = 0.09 \text{ m}^2$ 3 m^2 is $300 \text{ cm} \times 300 \text{ cm} = 90\,000 \text{ cm}^2$	C1	This mark is given for a valid statement relating scale factor to area

Question 3 (Total 5 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	$3000 \div 150 = 20$	P1	This mark is given for a process to find out how many bags can be filled
	$17.60 \div 20 = 0.88$	P1	This mark is given for a process to find the cost of a small bag
	$0.88 \times 0.35 = 0.308$	P1	This mark is given for a process to work out 35% of the cost of a bag
	$0.88 + 0.308 = 1.188$	P1	This mark is given for a process to work out the lowest price to achieve a 35% profit per bag
	1.19	A1	This mark is given for the correct answer only

Question 4 (Total 4 marks)

Part	Working an or answer examiner might expect to see	Mark	Notes
	Offer 1 = 6 pints for £1.50	P1	This mark is given for a process to find the price of milk from offer 1
	Offer 2 = 8 pints for £1.92	P1	This mark is given for a process to find the price of milk from offer 2
	Offer 1: £1.50 ÷ 6 = 25p per pint Offer 2: £1.92 ÷ 8 = 24p per pint	P1	This mark is given for a process to find the price per pint for each offer
	Offer 2 (4 pints) gives the better value for money	A1	This mark is given for a valid answer supported by correct working

Question 5 (Total 5 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	$(x^3)^5 = x^{(3 \times 5)} = x^{15}$	B1	This mark is given for the correct answer only
(b)	$4x + 12 + 28 - 14x$	M1	This mark is given for a method to expand at least one bracket
	$40 - 10x$	A1	This mark is given for the correct answer only
(c)	$3(5x^3 + x^2y)$ **or** $3x(5x^2 + xy)$ **or** $x^2(15x + 3y)$	M1	This mark is given for a method to eliminate at least one factor
	$3x^2(5x + y)$	A1	This mark is given for the correct answer only

Question 6 (Total 4 marks)

Part	Working an or answer examiner might expect to see	Mark	Notes
(a)	$6n + 1$	B2	These marks are given for a fully correct answer (B1 is given for $6n + c$, where c is an integer $\neq 1$ or is missing)
(b)	$8 - 6n = -58$ $-6n = -66$ $-n = -11$	M1	This mark is given for a method to find whether or not n is an integer
	Yes, it is the 11th term	A1	This mark is given for valid explanation supported by correct working

Question 7 (Total 3 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	$679 \times 0.96 = 651.84$	M1	This mark is given for a method to find the decrease in value after one year (given also if $679 \times (0.96)^3$ seen)
	$651.84 \times 0.96 \times 0.96$ **or** $679 \times (0.96)^3$	M1	This mark is given for a method to find the decrease in value after three years
	600.74	A1	This mark is given for the correct answer only (accept 600.73)

Question 8 (Total 3 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	$25.3 \times 60 = 1518$ minutes	P1	This mark is given for a process to convert the number of hours to minutes
	$1518 \div 115$	P1	This mark is given for a process to find the mean length of time for each missed appointment
	13.2	A1	This mark is given for the correct answer only

Question 9 (Total 4 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	$(0 \times 3) + (1 \times 57) + (2 \times 84) + (3 \times 75) + (4 \times 81)$ $= 0 + 57 + 168 + 225 + 324$	M1	This mark is given for a method to find the total number of social media accounts
	774	A1	This mark is given for the correct answer only
(b)	$300 \div 2 = 150$ $3 + 57 + 84 = 144$ $3 + 57 + 84 + 75 = 219$	M1	This mark is given for a method to find the median number of social media accounts
	3	A1	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
	$4 \times 12 = 48$	P1	This mark is given for a process to find the number of 'pipe hours' to fill the lake
	$\frac{1}{4}(48 \div 6)$	P1	This mark is given for a process to find the number of 'pipe hours' taken by 6 pipes to fill a quarter of the lake
	2	A1	This mark is given for the correct answer only

Question 11 (Total 3 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	$7000 \times 1.03 = 7210$	M1	This mark is given for a method to find the value of the investment after one year
	7210×1.015	M1	This mark is given for a method to find the value of the investment after two years
	7318.15	A1	This mark is given for the correct answer only

Question 12 (Total 4 marks)

Part	Working an or answer examiner might expect to see	Mark	Notes
(a)		B2	These marks are given for three correct probabilities 0.87, 094 and 0.94 added to the tree diagram (B1 is given for 0.87 or 0.94 correctly placed)
(b)	0.13×0.06	M1	This mark is given for a method to work out the probability
	0.0078	A1	This mark is given for the correct answer only

Question 13 (Total 4 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	4	B1	This mark is given for the correct answer only
(b)	(3, −5)	B1	This mark is given for the correct answer only
(c)		M1	This mark is given for a method to mark the intercepts with the x-axis on the graph
	5.2, 0.8	A1	This mark is given for correct answers in the ranges 5.1 to 5.3 and 0.7 to 0.9

Question 14 (Total 1 mark)

Part	Working or answer an examiner might expect to see	Mark	Notes
	3476	B1	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
	$89.5 \leq$ length < 90.5	B1	This mark is given for 89.5 shown in the correct position
		B1	This mark is given for 90.5 shown in the correct position

Question 16 (Total 3 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	$10x + 4y = 54$ $6x + 4y = 28$ $4x = 26$ $(x = 6.5)$	M1	This mark is given for a method to eliminate one variable
	$(5 \times 6.5) + 2y = 27$ $32.5 - 27 = -2y$ $y = -\dfrac{5.5}{2}$	M1	This mark is given for substituting a found value into one of the equations
	$x = 6.5$, $y = -2.75$	A1	This mark is given for the correct answer only (or equivalent)

Question 17 (Total 3 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	$(155 \times 8) + (165 \times 14) + (175 \times 24) +$ $(185 \times 30) + (195 \times 4)$ $= 1240 + 3210 + 4200 + 5550 + 780$ $= 14080$	M1	This mark is given for a method to find height × frequency
	$14080 \div 80$	M1	This mark is given for a method to find an estimate for the mean height
	176	A1	This mark is given for the correct answer only

Question 18 (Total 5 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	ABCO: $11 \times 7 = 77$ *DEFO*: $9 \times 7 = 63$ *CDO*: $\frac{1}{2} \times 11 \times 9 = 49.5$ *AFO*: $\frac{1}{4} \times \pi \times 7^2 = 38.4845\ldots$	P1	This mark is given for a process to find at least three of the four areas
	$77 + 63 + 49.5 + 38.4845\ldots = 227.9845\ldots$	P1	This mark is given for a process to find the total area of the garden
	$227.9845\ldots \div 14 = 16.2846\ldots$	P1	This mark is given for a process to find out the number of bags of grass seed needed
	17×10.95	M1	This mark is given for a process to find out the cost of the bags of grass seed needed (the number of bags must be an integer)
	186.15	A1	This mark is given for the correct answer only

Question 19 (Total 3 marks)

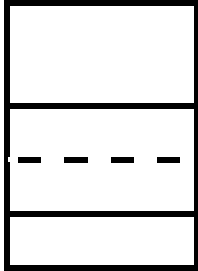| Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	$\dfrac{1}{0.8} = 1.25$	B1	This mark is given for the correct answer only
(b)	$4650 \leq x \leq 4750$	B1	This mark is given for 4650 in the correct position
		B1	This mark is given for 4750 in the correct position

Question 20 (Total 2 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	Translation $\begin{pmatrix} -5 \\ 6 \end{pmatrix}$	B1	This mark is given for translation stated
		B1	This mark is given for the vector $\begin{pmatrix} -5 \\ 6 \end{pmatrix}$

Question 21 (Total 2 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	$14.5 \times \cos 53°$	M1	This mark is given for a method to find the length x
	8.73	A1	This mark is given for a correct answer to three significant figures

Question 22 (Total 2 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
		B2	These marks are given for a fully correct elevation 5 squares high and 3 squares wide

Question 23 (Total 2 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	$\dfrac{165\,680}{1.09}$	M1	This mark is given for a method to find the population in 2018
	152 000	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
	$4 - -3 = 7$ $9 - 1 = 8$	P1	This mark is given for a process to use coordinates to find the translation of L to M
	$7 \div 2 = 3.5$ $8 \div 2 = 4$	P1	This mark is given for a process to use the ratio 2 : 3
	$5 \times 3.5 + -3$ $5 \times 4 + 1$	P1	This mark is given for a process to use coordinates to find the translation of L to N
	(14.5, 21)	A1	This mark is given for the correct answer only

Qn	Skill tested	Mean score	Max score	Mean %	Edexcel averages: mean scores of students who achieved grade:						
	1MA1 – Aiming for 5 Paper 2F				ALL	5	4	3	2	1	U
1	Correlation and causation	1.86	4	47	1.86	3.15	2.57	1.94	1.28	0.68	0.39
2	Change between standard units and compound units	1.61	5	32	1.61	4.54	3.14	1.46	0.50	0.13	0.03
3	Percentages and problems involving percentage change	1.92	5	38	1.92	3.95	3.05	1.85	0.72	0.18	0.05
4	Ratio in real context	2.17	4	54	2.17	3.03	2.44	2.20	1.99	1.55	0.92
5	Expand and factorise expressions	1.76	5	35	1.76	3.56	2.57	1.62	0.88	0.36	0.10
6	Generate terms of a sequence	1.40	4	35	1.40	2.89	1.96	1.43	0.95	0.47	0.15
7	Growth and decay, compound interest	0.93	3	31	0.93	2.17	1.43	0.82	0.32	0.08	0.02
8	Change between standard units and compound units	0.92	3	31	0.92	2.07	1.37	0.78	0.40	0.18	0.05
9	Measures of central tendency (median, mean, mode and modal class)	1.26	4	32	1.26	2.28	1.75	1.25	0.76	0.34	0.14
10	Solve problems involving direct and inverse proportion	1.02	3	34	1.02	2.03	1.30	1.04	0.78	0.49	0.34
11	Growth and decay, compound interest	0.84	3	28	0.84	2.18	1.28	0.84	0.48	0.17	0.06
12	Independent and dependent combined events	1.05	4	26	1.05	2.41	1.53	0.95	0.43	0.11	0.02
13	Roots, intercepts, turning points of quadratic functions	0.95	4	24	0.95	2.47	1.49	0.97	0.54	0.24	0.12
14	Order numbers	0.25	1	25	0.25	0.54	0.35	0.25	0.18	0.10	0.06
15	Rounding; Inequality notation to specify error interval	0.36	2	18	0.36	1.07	0.59	0.22	0.06	0.01	0.00
16	Solve two simultaneous equations	0.51	3	17	0.51	1.97	0.77	0.18	0.04	0.01	0.00
17	Measures of central tendency (median, mean, mode and modal class)	0.37	3	12	0.37	1.70	0.70	0.32	0.15	0.06	0.02
18	Areas of composite shapes	0.54	5	11	0.54	3.38	1.13	0.43	0.11	0.04	0.00
19	Rounding; Inequality notation to specify error interval	0.29	3	10	0.29	1.29	0.56	0.26	0.10	0.02	0.01
20	Transformations	0.22	2	11	0.22	0.69	0.32	0.13	0.05	0.01	0.00
21	Pythagoras's Theorem and Trigonometry	0.14	2	7	0.14	1.10	0.28	0.10	0.03	0.01	0.00
22	Plans and elevations of 3D shapes	0.13	2	7	0.13	0.49	0.22	0.13	0.06	0.03	0.05
23	Percentages and problems involving percentage change	0.10	2	5	0.10	0.98	0.20	0.07	0.02	0.00	0.01
24	Geometrical problems on coordinate axes	0.16	4	4	0.16	0.52	0.19	0.09	0.05	0.03	0.02
		20.76	**80**	**26**	**20.76**	**50.46**	**31.19**	**19.33**	**10.88**	**5.30**	**2.56**

Suggested grade boundaries

Grade	5	4	3	2	1
Mark	41	25	15	8	4