GCSE Mathematics (1MA1) – Aiming for 7 Paper 1H

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 2 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	2, 2, 31	M1	This mark is given for a complete method to find the prime factors (for example, using a factor tree with no more than one error)
	$2 \times 2 \times 31$	A1	This mark is given for a correct answer (or equivalent)

Question 2 (Total 2 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	$7x < 35$	M1	This mark is given for a method to solve the inequality
	$x < 5$	A1	This mark is given for a correct answer only

Question 3 (Total 5 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	$160 \div (3 + 7) = 16$	P1	This mark is given for the first step in a process to find the number of cars
	$16 \times 3 = 48$	P1	This mark is given for a full process to find the number of cars
	$48 \times \dfrac{1}{8} = 6$	P1	This mark is given for a process to find the number of cars that use electricity
	$48 \times 0.25 = 12$	P1	This mark is given for a process to find the number of cars that use diesel
	$48 - 6 - 12 = 30$	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
(a)	$\dfrac{8}{5} + \dfrac{9}{4} = \dfrac{(4 \times 8) + (5 \times 9)}{20} = \dfrac{32 + 45}{20}$	M1	This mark is given for a method to find a suitable common denominator
	$\dfrac{87}{20} = 3\dfrac{17}{20}$		This mark is given for the correct answer only
(b)	$2\dfrac{2}{3} = \dfrac{8}{3}$	M1	This mark is given for find $2\dfrac{2}{3}$ as an improper fraction
	$\dfrac{8}{3} \div 6 = \dfrac{8}{3} \times \dfrac{1}{6} = \dfrac{8}{18} = \dfrac{4}{9}$	A1	This mark is given for an unsimplified fraction which equates to $\dfrac{4}{9}$

Question 5 (Total 3 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	Volume of cube **A** = 3^3 = 27 Volume of cube **B** = 4^3 = 64	P1	This mark is given a process to find the volume of at least one cube
	Density of cube **A** = $81 \div 27 = 3$ Density of cube **B** = $128 \div 64 = 2$	P1	This mark is given a process to find the density of at least one cube
	3 : 2	A1	This mark is given for the correct answer only (or equivalent)

Question 6 (Total 4 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	For example: $15x + 6y = 33$ $8x + 6y = 12$	M1	This mark is given for a method to eliminate y
	$7x = 21, \ x = 3$	A1	This mark is given for finding the correct value for x
	For example: $12 + 3y = 6$ $-6 = 3y$	M1	This mark is given for a method to find the value of y
	$y = -2$	A1	This mark is given for finding the correct value for x

Question 7 (Total 3 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	Hexagon: $360 \div 6 = 60$ or $180 \times 4 \div 6 = 120$ Pentagon: $360 \div 5 = 72$ or $180 \times 3 \div 5 = 108$	M1	This mark is given a method to find an exterior angle or an interior angle of one of the shapes
	$60 + 72$ or $360 - 120 - 108$	M1	This mark is given for a complete method to find the size of the angle x
	132	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
	$\dfrac{10\,000}{2 \times 4}$	P1	This mark is given for a process to use the area of the base in the formula
	1250	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
	For example: $250 \times 2 \to 125 \times 2 \to 25 \times 5 \to 5 \times 5$	M1	This mark is given for a complete method to find the prime factors (could be shown on a factor tree)
	$2 \times 2 \times 5 \times 5 \times 5$	M1	This mark is given for a method to find a complete factorisation
	$2^2 \times 5^3$	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
	$p \propto \dfrac{1}{t}$ or $p = \dfrac{k}{t}$ $1 = \dfrac{k}{100}$ so $k = 100$	M1	This mark is given for a method to find a value for the constant k
	$5 = \dfrac{100}{t}, \ t = 20$	A1	This mark is given for a method to find the missing value of t
	$p = \dfrac{100}{25} = 4, \ p = \dfrac{100}{2} = 50$	A1	This mark is given for a method to find the missing values of p

Question 11 (Total 6 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	<table><tr><td>x</td><td>−1</td><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td></tr><tr><td>y</td><td>**5**</td><td>1</td><td>**−1**</td><td>**−1**</td><td>**1**</td><td>**5**</td></tr></table>	B2	This mark is given for a fully correct table (B1 is given for two or three correct values)
(b)		M1	This mark is given for at least four of the points (−1, 5), (0, 1), (1, −1), (2, −1), (3, 1) and (4, 5) plotted correctly
		A1	This mark is given for a fully correct curve drawn
(c)		M1	This mark is given for showing marks indicating the interception of the curve with the x-axis
	$x = 0.4$ and $x = 2.6$	A1	Accept answers in the range 0.2 to 0.6 and 2.4 to 2.8

Question 12 (Total 3 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	$1000x = 117.1717\ldots$	M1	This mark is given for setting up an initial equation
	$10x = 1.1717\ldots$ $1000x - 10x = 117.1717\ldots - 1.1717\ldots$ $990x = 116$	M1	This mark is given for a method to find an equation which eliminates the recurring decimal
	$\dfrac{116}{990}$	A1	This mark is given for a correct answer (or equivalent, for example $\dfrac{58}{495}$)

Question 13 (Total 4 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	0.00163	B1	This mark is given for the correct answer only
(b)	4.38×10^5	B1	This mark is given for the correct answer only
(c)	$4 \times 6 \times 10^3 \times 10^{-5}$	M1	This mark is given for a method to find the answer
	2.4×10^{-1}	A1	This mark is given for the correct answer only

Question 14 (Total 2 marks)

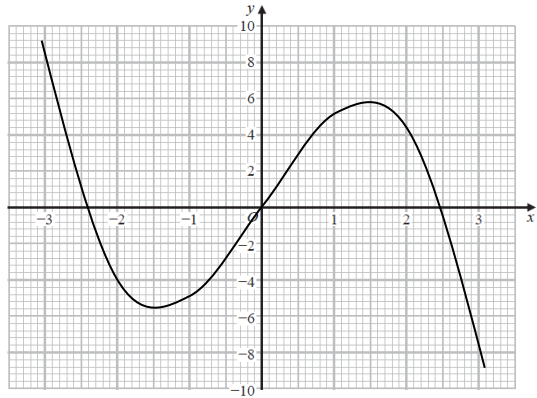| Part	Working or answer an examiner might expect to see	Mark	Notes
	For example: $4 \times 32 = 128$	M1	This mark is given for the digits 128 seen
	0.00128	A1	This mark is given for the correct answer only

Question 15 (Total 2 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	$\dfrac{15}{80} \times 40\,000$	M1	This mark is given for a method to find the expected number of model B
	7500	A1	This mark is given for the correct answer only

Question 16 (Total 2 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	$\left(\dfrac{8}{27}\right)^{\frac{1}{3}} = \left(\dfrac{2}{3}\right)$ or $\left(\dfrac{8}{27}\right)^{4} = \left(\dfrac{4096}{531441}\right)$ $\left(\dfrac{2}{3}\right)^{4} =$ or $\left(\dfrac{4096}{531441}\right)^{\frac{1}{3}} =$	M1	This mark is given for a method to find the cube root or find a power of 4
	$\dfrac{16}{81}$	A1	This mark is given for the correct answer only

Question 17 (Total 4 marks)

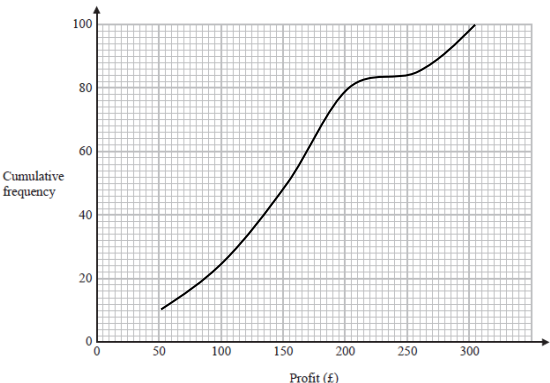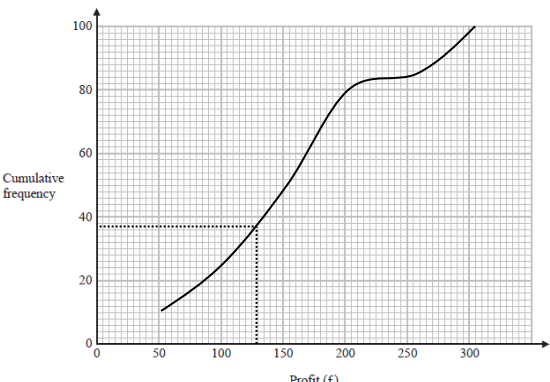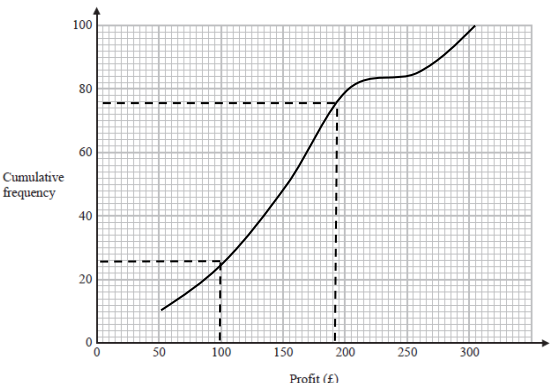| Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	–4, –5, 0, 5	B2	These marks are given for all values correct (B1 is given for 2 or 3 values correct)
(b)		B2	These marks are given for a fully correct graph drawn (B1 is given for at least five values plotted correctly)

Question 18 (Total 6 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)(i)	$a : b = 2 : 6$ or $a : b = 1 : 3$ $b : c = 6 : 5$ or $b : c = 3 : 2.5$	P1	This mark is given for a process to compare ratios
	$2 : 6 : 5$	A1	This mark is given for a correct answer only
(a)(ii)	$\dfrac{2}{2 + 6 + 5}$	P1	This mark is given for a process to find a as a fraction
	$\dfrac{2}{13}$	A1	This mark is given for a correct answer only
(b)	$n = 2m$ $p = 5 \times 2m = 10m$	P1	This mark is given for a process to express all numbers in terms of one number
	$1 : 10$	A1	This mark is given for a correct answer only

Question 19 (Total 2 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	$2^{-5 + 8} = 2^3$ $(2^3)^2 =$	M1	This mark is given for a method to simplify the powers
	2^6	A1	This mark is given for the correct answer only

Question 20 (Total 6 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	<table><tr><th>Profit £(x)</th><th>Cumulative frequency</th></tr><tr><td>0 ≤ x ≤ 50</td><td>10</td></tr><tr><td>0 ≤ x ≤ 100</td><td>25</td></tr><tr><td>0 ≤ x ≤ 150</td><td>50</td></tr><tr><td>0 ≤ x ≤ 200</td><td>80</td></tr><tr><td>0 ≤ x ≤ 250</td><td>85</td></tr><tr><td>0 ≤ x ≤ 300</td><td>100</td></tr></table>	B1	This mark is given for the correct answer only
(b)		M1	This mark is given for five or 6 points correctly plotted from the table in part (a)
		A1	This mark is given for a fully correct graph
(c)	 37	B1	This mark is given for a correct answer in the range 35 to 39
(d)	 185 – 95	M1	This mark is given for finding the difference between readings taken from the profit axis at cf 75 and cf 225
	90	A1	This mark is given for a correct answer in the range 85 to 95

Question 21 (Total 3 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	$4 \times 4 = 16$ $5 \times 6 = 30$ $5 \times 7 = 35$ $6 \times 7 = 42$	M1	This mark is given for working out at least three areas found on the solid
	$(2 \times 30) + (2 \times 35) + (2 \times 42) + (5 \times 16) - (4 \times 4)$ $= 60 + 70 + 84 + 80 - 16$	M1	This mark is given for a complete method to find the total surface area of the solid
	278	A1	This mark is given for the correct answer only

Question 22 (Total 4 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	 For example, gradient $= \dfrac{5}{5.5} = 0.9$	M1	This mark is given for drawing a tangent at $t = 2$
		M1	This mark is given for a method to find the gradient
		A1	This mark is given for a correct gradient
(b)	For example: distance travelled	C1	This mark is given for a correct statement

Question 23 (Total 2 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	$5 \times 7, 7 \times 2$	M1	This mark is given for a method to find possible values for m and n
	For example: $m = 35$ and $n = 14$	A1	This mark is given for a correct pair of values found

Question 24 (Total 3 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	$\dfrac{3}{7} = \dfrac{9}{9 + 4 + x}$	P1	This mark is given for a process to equate relative frequencies
	$9 + 4 + x = 3 \times 7 = 21$	P1	This mark is given for a process to set up an equation to be solved
	$x = 8$	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								
					ALL	9	8	7	6	5	4	3	U
1	Primes, factors, multiples	1.86	2	93	1.86	1.98	1.95	1.92	1.87	1.79	1.62	1.25	0.69
2	Solve linear inequalities	1.78	2	89	1.78	1.97	1.94	1.91	1.84	1.68	1.26	0.71	0.31
3	Ratio in real context	4.48	5	90	4.48	4.92	4.84	4.74	4.57	4.24	3.44	1.87	0.95
4	Apply four operations	2.60	4	65	2.60	4.00	3.78	3.77	3.63	3.11	2.21	1.32	0.44
5	Use compound units	2.39	3	80	2.39	2.92	2.87	2.80	2.55	1.93	0.96	0.30	0.10
6	Solve two simultaneous equations	2.11	4	53	2.11	4.00	3.94	3.73	3.44	2.50	1.47	0.51	0.00
7	Exterior and interior angles	2.32	3	77	2.32	2.93	2.84	2.70	2.41	1.83	0.98	0.32	0.15
8	Use compound units	1.38	2	69	1.38	2.00	1.87	1.80	1.72	1.53	1.28	0.93	0.23
9	Primes, factors, multiples	2.26	3	75	2.26	2.94	2.70	2.64	2.61	2.52	2.24	1.82	0.89
10	Solve problems involving direct and inverse proportion	1.14	3	38	1.14	2.91	2.83	2.63	1.95	1.06	0.48	0.27	0.04
11	Solve quadratic equations	4.47	6	75	4.47	5.84	5.58	5.17	4.45	3.45	2.28	0.94	0.39
12	Recurring decimals and their corresponding fractions	2.19	3	73	2.19	2.90	2.77	2.58	2.22	1.64	0.95	0.38	0.13
13	Standard form	3.20	4	80	3.20	3.85	3.64	3.43	3.18	2.84	2.30	1.49	0.68
14	Apply four operations	1.20	2	60	1.20	1.85	1.76	1.67	1.51	1.23	1.09	0.82	0.54
15	Sampling	1.07	2	54	1.07	2.00	1.81	1.67	1.53	1.41	0.77	0.39	0.16
16	Index notation	0.78	2	39	0.78	1.91	1.86	1.67	1.41	0.85	0.33	0.08	0.01
17	Graphs of simple cubic functions	2.34	4	59	2.34	3.70	3.53	3.33	3.25	2.78	2.04	1.11	0.00
18	Multiplicative relationship between two quantities	2.90	6	48	2.90	5.55	5.06	4.80	4.21	3.69	2.06	0.93	0.03
19	Index notation	0.98	2	49	0.98	2.00	1.79	1.56	1.41	1.15	0.70	0.43	0.20
20	Measures of spread (range, including consideration of outliers, quartiles and inter-quartile range)	4.11	6	69	4.11	5.46	5.11	4.64	4.06	3.21	2.26	1.20	0.48
21	Surface area and volume of spheres, pyramids, cones and composite solids	1.90	3	63	1.90	2.73	2.47	2.22	1.89	1.36	0.72	0.24	0.10
22	Distance-time graphs, velocity-time graphs	2.29	4	57	2.29	3.73	3.42	2.94	2.13	1.16	0.50	0.18	0.10
23	Primes, factors, multiples	1.20	2	60	1.20	1.91	1.70	1.45	1.35	1.24	1.16	0.89	0.01
24	Theoretical probability; appropriate language; 0-1 probability scale	1.50	3	50	1.50	2.81	2.36	1.74	1.21	0.84	0.48	0.15	0.10
		52.45	80	66	52.45	76.81	72.42	67.51	60.40	49.04	33.58	18.53	6.73

Aiming for 7 Paper 1H (Set 3)

Suggested grade boundaries

Grade	9	8	7	6	5	4	3
Mark	75	70	64	55	41	26	13