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

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
(a)	$360 - 70 = 290$	B1	This mark is given for the correct answer only
(b)	For example: Angles at a point add up to 360	C1	This mark is given for a valid reason stated

Question 3 (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 4 (Total 4 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	$50 \div 40 = 1.25$ hrs $= 1$ hr 15 mins	P1	This mark is given for a process to find the amount of time Savio spends driving
	07 30 + 1 15	P1	This mark is given for a process to add the start time to the driving time
	08 45	A1	This mark is given for a correct answer only (accept 8:45 or 8.45 a.m.)
(b)	For example: It will be earlier	C1	This mark is given for a correct explanation

Question 5 (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 6 (Total 5 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	$\dfrac{5}{5+3+2} \times 240$ $\qquad$ $\dfrac{3}{5+3+2} \times 240$ $\dfrac{2}{5+3+2} \times 240$	P1	This mark is given for a process to find the number of cans of each drink
	cola: $\dfrac{5}{10} \times 240 = 120$ lemonade: $\dfrac{3}{10} \times 240 = 72$ orange: $\dfrac{2}{10} \times 240 = 48$	P1	This mark is given for finding the number of cans of each drink
	$\dfrac{1}{2} \times 72 = 36$ $\quad$ $72 - 36 = 36$ $\dfrac{1}{12} \times 48 = 4$ $\quad$ $48 - 4 = 44$	P1	This mark is given for a process to find the number of cans removed and the cans remaining
	$\dfrac{120}{120+36+44} = \dfrac{120}{200}$	P1	This mark is given for a process to find the number of cans of cola as a percentage of the new total
	$\dfrac{120}{200} \times 100 = 60$	A1	This mark is given for the correct answer only

Question 7 (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 8 (Total 5 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	$54 \times 1\frac{1}{2}$	M1	This mark is given for a method to find the distance
	81	A1	This mark is given for the correct answer only
(b)	$6 \times 25\,000$ cm = 150 000 cm	P1	This mark is given for a process to use the scale
	$150\,000 \div (100 \times 1000)$	P1	This mark is given for a process to convert cm to km
	1.5 (km)	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)	0.00163	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
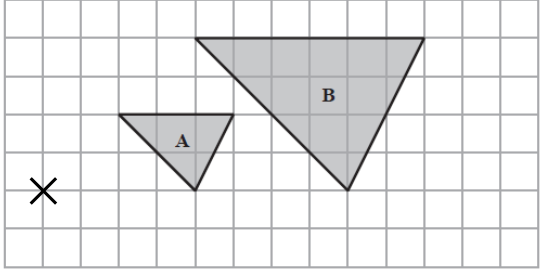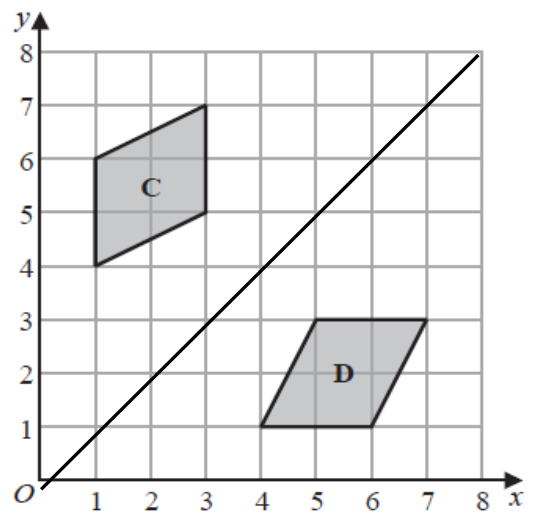
Question 10 (Total 4 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	$89\,198 - 88\,738 = 460$	M1	This mark is given for the number of kwH Fiona used in November
	460×16	M1	This mark is given for a method to show the cost of the electricity used in November
	$\begin{array}{r} 460 \\ \underline{16} \times \\ 2760 \\ 4600 \end{array}$	M1	This mark is given for a method to calculate the cost of the electricity used in November
	£73.60	A1	This mark is given for a correct answer only (accept £73.6 or 7360p)

Question 11 (Total 2 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	$(\dfrac{-3+2}{2},\ \dfrac{-2+4}{2})$	M1	This mark is given for a method to find the midpoint or for the correct point marked on the graph
	(–0.5, 1)	A1	This mark is given for the correct answer only

Question 12 (Total 4 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)(i)	2	B1	This mark is given for the correct answer only
(a)(ii)		B1	This mark is given for a cross correctly placed
(b)(i)		B1	This mark is given for the line $y = x$ correctly drawn
(b)(ii)	$y = x$	B1	This mark is given for the correct answer only

Question 13 (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 14 (Total 1 mark)

Part	Working or answer an examiner might expect to see	Mark	Notes
	0.5 or $\frac{1}{2}$	B1	This mark is given for a correct answer only

Question 15 (Total 3 marks)

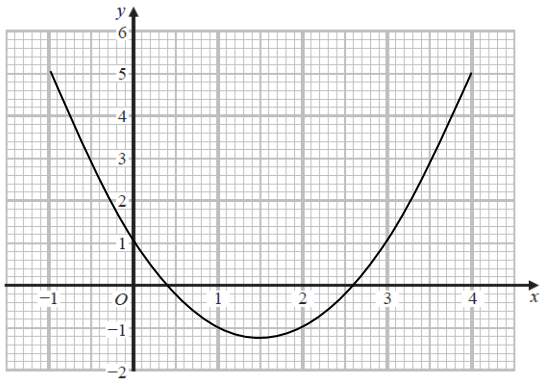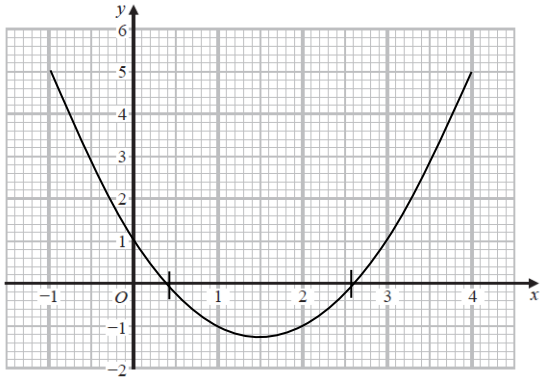| Part	Working or answer an examiner might expect to see	Mark	Notes
	$\pi \times 3^2 \times 5$	M1	This mark is given for a process to use the height 5 or the diameter 6 or the radius 3 in a formula
		M1	This mark is given for a full process to find the volume of the cylinder
	45π	A1	This mark is given for a correct answer only

Question 16 (Total 4 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	$(2x – 5) + (x + 1) + (x – 1) + 2x$	P1	This mark is given for a process to find the perimeter in terms of x
	$6x – 5$	P1	This mark is given for a process to find the perimeter in terms of x in its simplest form
	$6x – 5 = 52$ $6x = 57$ $x = 9.5$	P1	This mark is given for a process to find the value of x
	$DC = 2x = 19$	A1	This mark is given for the correct answer only

Question 17 (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 18 (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 19 (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 20 (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 21 (Total 5 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	$5x + 6 > 36$	M1	This mark is given for a correct first step (for example, multiplying all terms by 2)
	$5x > 30$	M1	This mark is given for a correct first step (for example, subtracting 6 from both sides of the inequality)
	$x > 6$	A1	This mark is given for the correct answer only
(b)	$(x + 9)(x + 1)$	M1	This mark is given for an answer in the form $(x \pm a)(x \pm b)$ where $ab = 9$ or $a + b = 10$
		A1	This mark is given for the correct answer only

Question 22 (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 23 (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 24 (Total 3 marks)

Part	Working an or answer examiner might expect to see	Mark	Notes
	$1 - \dfrac{5}{8} = \dfrac{3}{8}$ $1 - \dfrac{9}{11} = \dfrac{2}{11}$	M1	This mark is given for a method to find the unshaded parts of rectangle **B**
	$1 - \dfrac{3}{8} - \dfrac{2}{11} = 1 - \dfrac{33}{88} - \dfrac{16}{88} = 1 - \dfrac{49}{88}$	M1	This mark is given for a method to find the fraction of the rectangle **B** that is shaded
	$\dfrac{39}{88}$	A1	This mark is given for the correct answer only

Question	Skill tested	Mean score	Max score	Mean %	ALL	5	4	3	2	1	U
					Edexcel averages: mean scores of students who achieved grade						
Q24	Primes, factors, multiples	0.96	2	48	0.96	1.79	1.48	0.98	0.46	0.13	0.03
Q09	Properties of angles	0.95	2	48	0.95	1.41	1.21	1.00	0.73	0.46	0.40
Q25	Use compound units	0.83	2	42	0.83	1.69	1.20	0.86	0.52	0.26	0.21
Q16	Use standard units of measure and related concepts	1.67	4	42	1.67	2.93	2.21	1.63	1.12	0.67	0.34
Q23	Solve linear inequalities	0.65	2	33	0.65	1.61	1.03	0.51	0.20	0.06	0.02
Q18	Ratio in real context	1.35	5	27	1.35	4.07	2.51	1.29	0.45	0.34	0.17
Q22	Apply four operations	0.75	2	38	0.75	1.49	0.99	0.77	0.56	0.37	0.21
Q14	Change between standard units and compound units	1.77	5	35	1.77	3.70	2.47	1.83	1.16	0.72	0.69
Q26	Standard form	1.18	4	30	1.18	2.80	1.92	0.95	0.36	0.10	0.03
Q11	Apply four operations	1.41	4	35	1.41	2.48	1.88	1.41	0.96	0.49	0.20
Q15	Coordinates in all four quadrants	0.60	2	30	0.60	1.36	0.81	0.60	0.44	0.32	0.26
Q11	Transformations	1.17	4	29	1.17	2.41	1.59	1.19	0.83	0.60	0.57
Q20	Calculate exactly with fractions	0.97	4	24	0.97	2.98	1.56	0.95	0.51	0.27	0.22
Q30	Exact values of sin θ and cos θ and tan θ	0.24	1	24	0.24	0.60	0.38	0.19	0.08	0.03	0.01
Q22	Plans and elevations of 3D shapes	0.58	3	19	0.58	1.95	0.95	0.28	0.05	0.01	0.00
Q16	Translate situations or procedures into algebraic expressions, formulae or equations	0.59	4	15	0.59	3.18	1.23	0.48	0.18	0.09	0.04
Q27	Exterior and interior angles	0.57	3	19	0.57	2.05	0.91	0.24	0.05	0.01	0.00
Q28	Roots, intercepts, turning points of quadratic functions	1.05	6	18	1.05	3.41	1.75	0.56	0.12	0.03	0.01
Q23	Sampling	0.28	2	14	0.28	1.44	0.58	0.23	0.07	0.07	0.04
Q24	Proportion as equality of ratios	0.91	6	15	0.91	3.57	1.67	0.84	0.37	0.21	0.10
Q26	Factorise expressions	0.68	5	14	0.68	3.14	1.27	0.61	0.25	0.12	0.04
Q21	Index notation	0.28	2	14	0.28	1.20	0.47	0.25	0.13	0.09	0.05
Q29	Use compound units	0.45	3	15	0.45	1.82	0.65	0.14	0.03	0.01	0.00
Q20	Calculate exactly with fractions	0.41	3	14	0.41	1.24	0.60	0.26	0.11	0.06	0.03
		20.30	**80**		**20.30**	**54.32**	**31.32**	**18.05**	**9.74**	**5.52**	**3.67**

Suggested grade boundaries

Grade	5	4	3	2	1
Mark	43	25	14	8	5