GCSE Mathematics (1MA1) – Foundation Tier Paper 3F

Summer 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
	$\frac{35}{100}$	B1	This mark is given for a correct answer only (or equivalent)

Question 2 (Total 1 mark)

Part	Working or answer an examiner might expect to see	Mark	Notes
	7	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
	Two from 1, 2, 3, 4, 6, 12	B1	This mark is given for any two correct factors

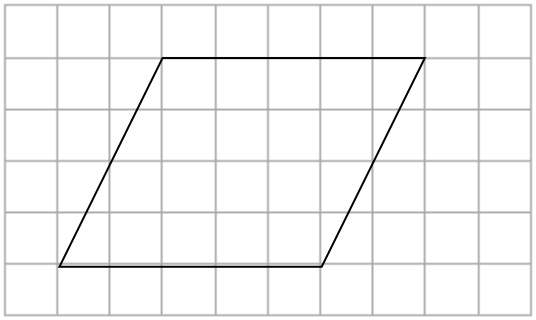
Question 4 (Total 1 mark)

Part	Working an or answer examiner might expect to see	Mark	Notes
	$6m$	B1	This mark is given for the correct answer only

Question 5 (Total 1 mark)

Part	Working or answer an examiner might expect to see	Mark	Notes
	1.3	B1	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
	For example: 	B2	These marks are given for an accurate drawing of a parallelogram (that is not a rectangle or a rhombus) (B1 is given for a quadrilateral with no lines of symmetry or with rotational symmetry of order 2)

Question 7 (Total 3 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	Apples: 86 + 75 + 92 = 253 Oranges: 68 + 80 + 76 = 224	P1	This mark is given for a process to work out the number of apples and oranges sold
	253 – 224	P1	This mark is given for a process to work out the difference between the number of apples and oranges sold
	29	A1	This mark is given for the correct answer only

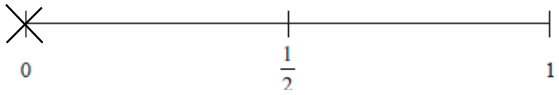
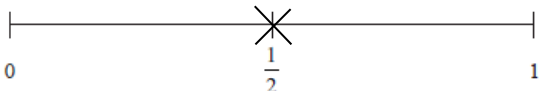
Question 8 (Total 2 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	28, 33	B1	This mark is given for the correct answer only
(b)	For example: All terms in the sequence end in 3 or 8 48 and 53 are two consecutive terms in the sequence $5n - 2 = 50$ would mean n is not a whole number	C1	This mark is given for a correct explanation

Question 9 (Total 2 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	5	B1	This mark is given for the correct answer only
(b)	9	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)		B1	This mark is given for a cross placed at 0
(b)		B1	This mark is given for a cross placed at $\frac{1}{2}$
(c)	$\frac{5}{8}$	M1	This mark is given for $\frac{5}{a}$ where $a > 5$ or $\frac{b}{8}$ where $b < 8$
		A1	This mark is given for the correct answer only (or equivalent)

Question 11 (Total 3 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	$35 \times 4 = 140$	M1	This mark is given for a method to find the number of nails Sinita needs
	$48 \times 3 = 144$	A1	This mark is given for a method to find the number of nails Sinita has
	For example: Yes, Sinita has 4 more nails than she needs Yes, Sinita can make one more frame	C1	This mark is given for a valid conclusion supported by correct working

Question 12 (Total 2 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	$\frac{60}{1000}$	M1	This mark is given for a method to find a correct fraction
	$\frac{3}{50}$	A1	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)	$AB = 4.4 \times 150 = 660$ $BC = 3.5 \times 150 = 525$ $AC = 6.2 \times 150 = 930$	M1	This mark is given for a method to measure and concert at least one line to a distance in metres (accept answers in the ranges 630–690, 495–555 and 900–960 respectively)
	$660 + 525 = 1185$ $1185 – 930 =$	M1	This mark is given for a method to find out the difference between how far Parveen walks and Susan walks
	255	A1	This mark is given for a fully correct table
(b)	288	B1	This mark is given for a correct answer in the range 286 to 290

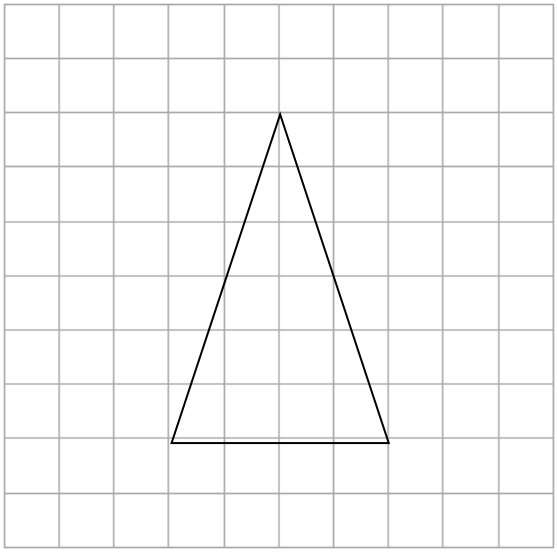
Question 14 (Total 4 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	7	B1	This mark is given for the correct answer only
(b)	$9 – 4 = 5$	B1	This mark is given for the correct answer only
(c)	For example: The median of the boys' shoe sizes is greater than the median of girls' shoe sizes The range of the boys' shoe sizes is greater than the median of girls' shoe sizes	C2	These marks are given for correct comparisons of both medians and ranges of girls' and boys' shoe sizes (C1 is given for one correct comparison)

Question 15 (Total 2 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	$\frac{40.15}{8.03}$	M1	This mark is given for either 40.15 or 8.03 seen
	5	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
		B2	These marks are given for an isosceles triangle drawn with the product of the base and height equal to 24 (B1 is given for any other isosceles triangle drawn or any other triangle with area 24)

Question 17 (Total 4 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	$12 - 6x$	B1	This mark is given for the correct answer only
(b)	$3y = 12 \times 4 = 48 \qquad y = \frac{48}{3}$	M1	This mark is given for a method to find the value of y
	16	A1	This mark is given for the correct answer only
(c)	$2(2p + 3)$	B1	This mark is given for the correct answer only

Question 18 (Total 2 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	2500	B1	This mark is given for the correct answer only
(b)	0.09	B1	This mark is given for the correct answer only

Question 19 (Total 4 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	$400 \times \frac{3}{8} = 150$	P1	This mark is given for a process to find the number of red counters
	$400 - 150 - 82 = 168$	P1	This mark is given for a process to find the number of green counters
	$\frac{168}{400} \times 100 =$	P1	This mark is given for a process to find the number of green counters as a percentage of the total
	42	A1	This mark is given for the correct answer only

Question 20 (Total 5 marks)

Part	Working an or answer examiner might expect to see	Mark	Notes
	$\angle QPR = 56$	M1	This mark is given for a method to find the angle *QPR*
	$\angle PQR = (180 - 56) \div 2 = 62$	M1	This mark is given for a method to find the angle *PQR*
	For example: allied angles / co-interior angles add up to 180 **or** corresponding angles are equal **or** alternate angles are equal	C1	This mark is given for the a valid reason given
	118	A1	This mark is given for the correct answer only
	For example: vertically opposite angles are equal **or** vertically opposite angles are equal **or** base angles of an isosceles triangle are equal	C1	This mark is given for the a valid reason given

Question 21 (Total 2 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	$24 = 3 \times 8$ $56 = 7 \times 8$	M1	This mark is given for a method to find the LCM
	$3 \times 7 \times 8 = 168$	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
(b)	$8.5^2 - 4^2 = 72.25 - 16 = 56.25$ $\sqrt{56.25} =$	M1	This mark is given for a method to use Pythagoras' theorem to find *x*
	7.5	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
(a)	$4 \times (-3)^2 - 11$ $= 36 - 11$	M1	This mark is given for a method to substitute –3 into the equation
	25	A1	This mark is given for the correct answer only
(b)	$d - 4 = 3p$ or $\frac{d}{3} - \frac{4}{3} = p$	M1	This mark is given for a first step to make p the subject of the formula
	$p = \frac{d-4}{3}$	A1	This mark is given for the correct answer only

Question 24 (Total 5 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	R = n, S = $2n$, T = $2n - 6$	P1	This mark is given for a process to develop three algebraic expressions (with at least two correct)
	$n + 2n + 2n - 6 = 54$	P1	This mark is given for a process to sum the three algebraic expressions to 54
	$5n - 6 = 54$ $n = 12$	P1	This mark is given for a process to solve the linear equation
	Ratio = 12: $(2 \times 12 - 6)$ = 12 : 18	P1	This mark is given for a process to find the ratio of the number of counters Rick and Tony have
	$p = 1.5$	A1	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
	$\frac{15}{3} \times 36 = £180$	P1	This mark is given for a process to find the cost of 15 rolls from Chic Decor
	$70 \times (15 \div 5) \times 0.12 = £25.20$	P1	This mark is given for a process to find the discount available at Style Papers
	$(3 \times 70) - 25.20 = £184.80$	P1	This mark is given for a process to find the cost of 15 rolls from Style Papers
	Jo should by the wallpaper from Chic Decor	C1	This mark is given for a valid statement supported by correct working

Question 26 (Total 2 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	For example: 40 is missing from the frequency scale	C1	This mark is given for a mistake identified on the frequency polygon
	For example: An incorrect point (50, 5) is mapped	C1	This mark is given for a mistake identified on the frequency polygon

Question 27 (Total 4 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	$6 \times \frac{15}{60} = 1.5 \qquad 9 \times \frac{40}{60} = 6$	P1	This mark is given for a process to find the distance of either of the two parts of Jessica's journey
	$1.5 + 6 = 7.5$	P1	This mark is given for a process to find the total distance of Jessica's journey
	45 minutes = 0.75 hours $\frac{75}{7.5} =$	P1	This mark is given for a process to find Amy's average speed
	10	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
	$A = \frac{1}{2}h(a + b)$ where $h = 4x$, $a = 5$ and $b = (3x + 5) - 2x = x + 5$	M1	This mark is given for a method to find an algebraic representation of the lengths used to work out the area of the trapezium *QUVR*
	$A = \frac{1}{2} \times 4x \times (5 + x + 5)$	M1	This mark is given for a method to find an algebraic representation of the area of the trapezium *QUVR*
	$A = 2x(x + 10) = 2x^2 + 20x$	C1	This mark is given for the correct expansion of brackets seen and simplification to the given answer

Question 29 (Total 2 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	$30 \times 60 \times 60 = 108\,000$ metres per hour $\frac{108\,000}{1000} =$	M1	This mark is given for a method to change from metres per second to kilometres per hour
	108	A1	This mark is given for the correct answer only

Question 30 (Total 2 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	$\frac{13\,600}{0.85}$	M1	This mark is given for a method to find the original value of Michelle's car
	$16\,000$	A1	This mark is given for the correct answer only