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

November 2017 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
	4000	1	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
	$2y$	1	This mark is given for the correct answer only

Question 3 (Total 2 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	1, 2, 3, 6, 9, 18	2	These marks are given for all six factors with none incorrect (1 mark is given for at least 3 factors)

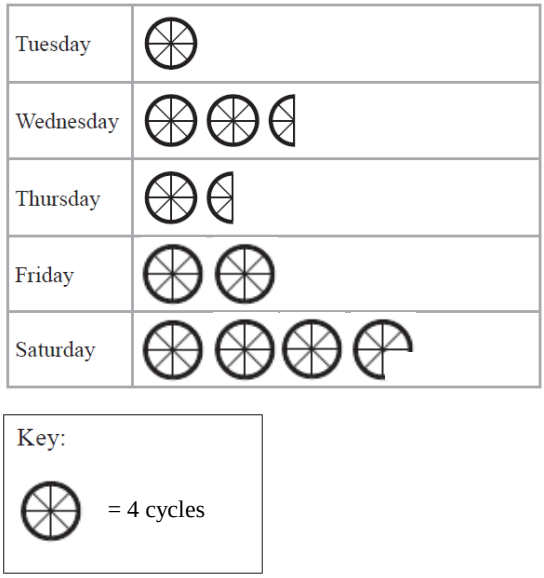
Question 4 (Total 5 marks)

Part	Working an or answer examiner might expect to see	Mark	Notes
(a)	$7.80 + 5.80 \times 3 = 25.20$	1	This mark is given for finding the cost of 4 separate tickets
	$25.20 – 24.30$	1	This mark is given for a method to find out how much cheaper the family ticket is
	90p or £0.90	1	This mark is given for the correct answer only
(b)	$6.45 + 60 = 7.45$ $7.45 + 42 = 7.45 + (15 + 27)$	1	This mark is given for a method to add 102 minutes to 6.45 p.m.
	8.27 p.m.	1	This mark is given for the correct answer only

Question 5 (Total 3 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	2 litres = 2000 ml	1	This mark is given for converting between ml and l
	2000 ÷ 150 = 13.3333	1	This mark is given for finding out how many small bottles can be filled
	13	1	This mark is given for the correct rounded answer only

Question 6 (Total 3 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	1 wheel = 4 cycles	1	This mark is given for deducing the one wheel = 4 cycles
		1	This mark is given for either 2 wheels shown for Friday or $3\frac{3}{4}$ wheels for Saturday
		1	This mark is given for a fully correct pictogram, including a key

Question 7 (Total 4 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	180 – 117 = 63 Angles on a straight line add up to 180	1	This mark is given for finding angle *ACB*
	180 – 63 – 54 = 63 Angles in a triangle add up to 180	1	This mark is given for finding angle *BAC*
	Angle *ACB* = angle *BAC*	1	This mark is given for stating that two angles in the triangle are equal
	Thus triangle is isosceles	1	This mark is given for stating that the triangle is isosceles, supported by correct reasons given

Question 8 (Total 2 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
		1	This mark is given for evidence of finding that the height of the building is 2.5 times the length of the bus
	30	1	This mark is given for an answer in the range 27 – 30

Question 9 (Total 2 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	Two from 2, 3, 5, 7, 11, 13, 17, 19, 23, 29 or one from 1, 4, 9, 16, 25	1	This mark is given for identifying any two prime numbers or a square number
	2, 7 or 3, 13 or 5, 11 or 2, 23	1	This mark is given for two correct prime numbers which add to a square number

Question 10 (Total 2 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	$\frac{3}{2} \times 48 = 72$	1	This mark is given for a method to fins Jim's number
	$\frac{5}{6} \times 72 = 60$	1	This mark is given for the correct answer only

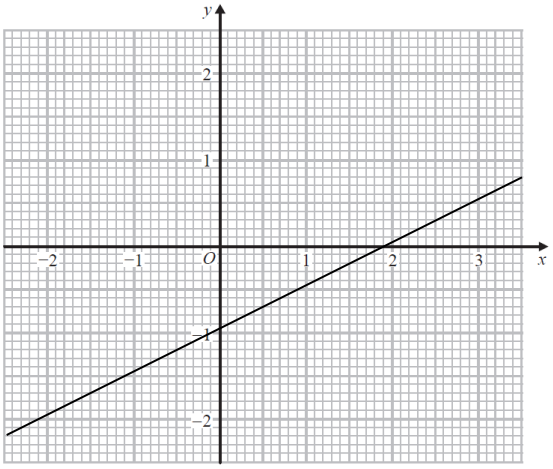
Question 11 (Total 3 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	$(12 - 1) \times 24 = 264$	1	This mark is given for finding the total cost of Offer 1
	$24 \times 0.05 = 1.20$ $24 - 1.20 = 22.80$ $12 \times 22.80 = 273.60$	1	This mark is given for finding the total cost of Offer 2
	Offer 1 is the cheapest	1	This mark is given for a correct conclusion supported by working

Question 12 (Total 2 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	$3.60 \div 2.5 = 1.44$	1	This mark is given for finding the cost of 1 kg of apples
	$3.4 \times 1.44 = 5.04$	1	This mark is given for the correct answer only

Question 13 (Total 5 marks)

Part	Working an or answer examiner might expect to see	Mark	Notes
(a)	1.5, –1, –0.5, 0.5	2	These marks are given for the correct values only (1 mark is given for 1, 2 or 3 correct values seen)
(b)		2	These marks are given for the correct line drawn through (0, –1) and (2, 0) (1 mark is given for any straight line with gradient $\frac{1}{2}$ or straight line through the point (0, –1))
(c)	2.6	1	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
	Reflection…	1	This mark is given for identifying a reflection
	…in the *x*-axis	1	This mark is given for identifying the line of reflection being the *x*-axis

Question 15 (Total 3 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	$6 \div 2 = 3$	1	This mark is given for showing a method to find a cost for 1 m of cotton fabric
	$6 \times 2.5 = 15$	1	This mark is given for showing a method to find the cost of silk fabric in comparison to cotton fabric
	<table><tr><td></td><td>2 m</td><td>6 m</td><td>8 m</td><td>9 m</td></tr><tr><td>cotton</td><td>6</td><td>18</td><td>24</td><td>27</td></tr><tr><td>silk</td><td>15</td><td>45</td><td>60</td><td>67.5</td></tr></table>	1	This mark is given for the correct answer only

Question 16 (Total 5 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	$0.40 \times 0.30 \times 0.35 = 0.042$	1	This mark is given for finding the volume of one box
	$2.4 \times 1.5 \times 1.4 = 5.04$	1	This mark is given for finding the volume of the van
	$5.04 \div 0.42 = 120$	1	This mark is given for finding how many boxes will fit in the van
	$120 \div 3 = 40$	1	This mark is given for finding how long it will take Chloe to put the boxes in the van
(b)	She will not be able to load as many boxes, so it will take less time	1	This mark is given for a correct statement

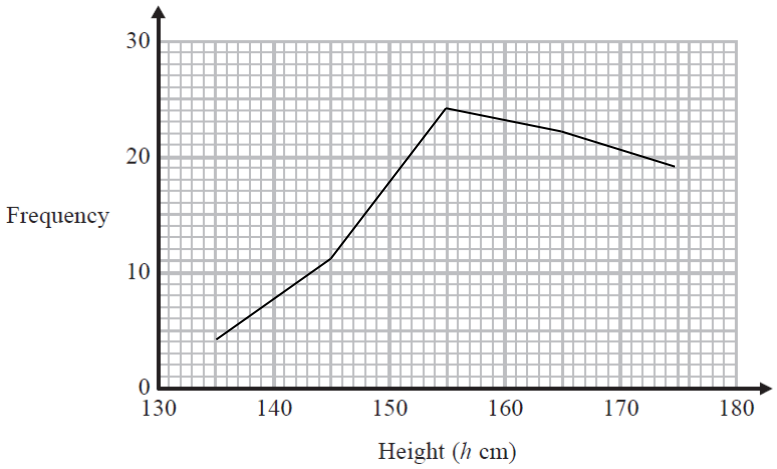
Question 17 (Total 3 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	$4(m + 3)$	1	This mark is given for the correct answer only
(b)	term	1	This mark is given for the correct answer only
	expression	1	This mark is given for the correct answer only

Question 18 (Total 4 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	4 7 10 3 3	1	This mark is given for a method to find the *n*th term
	$3n + 1$	1	This mark is given for the correct answer only
(b)	If $3n + 1 = 90$, then $n = 29.666…..$	1	This mark is given for showing that 89 is not divisible by 3
	No, the pattern can't be made.	1	This mark is given for a correct conclusion supported by argument

Question 19 (Total 3 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	$160 < h \leq 170$	1	This mark is given for the correct answer only
(b)		2	These marks are given for a fully correct frequency polygon with line segments joining the points (135, 4), (145, 11), (155, 24), (165, 22) and (175, 19) (1 mark is given if any points are incorrect)

Question 20 (Total 3 marks)

Part	Working an or answer examiner might expect to see	Mark	Notes
	Cost of 1 litre of petrol in New York = $\$\frac{2.83}{3.785} = \$0.7476…$	1	This mark is given for finding out the cost of a litre of petrol in New York in dollars
	Cost of 1 litre of petrol in New York = $\frac{0.7476..}{1.46}$p = 51.2p	1	This mark is given for finding out the cost of a litre of petrol in New York in pence
	Petrol is better value for money in New York (0.51.2p < 108.9p)	1	This mark is given for a correct conclusion supported by working

Question 21 (Total 3 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	12.5×1000	1	This mark is given for converting kg to g
	$12\,500 \div 19.3$	1	This mark is given for a method to find the density of the gold bar
	648	1	This mark is given for the correct answer only

Question 22 (Total 3 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	Ratio of blue pens : green pens : red pens is 8 : 20 : 5	1	This mark is given for a method to find ratios of the three colours of pens
	$\frac{5}{33}$ pens are red; greatest number of pens = 99	1	This mark is given for finding the fraction of red pens
	15	1	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
(a)	$\frac{1}{1.6} = 0.625$	1	This mark is given for the correct answer only
(b)		1	This mark is given for 9.75 and 9.85 seen
	$9.75 \leq x < 9.85$	1	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
	Width = x Length = $x + 7$	1	This mark is given for forming expressions for the length and width of the rectangle
	$x + x + 7 + x + x + 7 + 7 + x + x + 7 + x + x + 7 + 7 = 70$ $8x + 42 = 70$	1	This mark is given for forming an equation for the width of the shape
	$x = \frac{70 - 42}{8}$	1	This mark is given for finding an expression for x
	width = 3.5, length = 10.5	1	This mark is given for finding values for the width and the length of the shape
	$4 \times 3.5 \times 10.5 = 147$	1	This mark is given for finding the area of the shape

Question 25 (Total 2 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	$13.8 \times 5.4 \times 10^7 \times 10^{-12}$ $= 74.52 \times 10^{-5}$ $= 7.452 \times 10^{-4}$	1	This mark is given for the digits 7452 seen
	0.000 745 2	1	This mark is given for the correct answer only

Question 26 (Total 3 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	Mel's results will give the best estimate since she drops the greatest number of drawing pins	1	This mark is given for a correct comment
(b)	$\frac{100}{150} \times \frac{50}{150} = \frac{2}{3} \times \frac{1}{3}$	1	This mark is given for a probability of point down multiplied by the probability of point up
	$\frac{2}{9}$	1	This mark is given for the correct answer only

Question 27 (Total 3 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	$5x + 15y = 60$ $5x - y = 4$ $16y = 56$	1	This mark is given for a process to eliminate one variable
	$y = 3.5$ $x + (3 \times 3.5) = 12$ $x + 10.5 = 12$	1	This mark is given for using the value of y to find a value for x
	$x = 1.5, y = 3.5$	1	This mark is given for the correct answer only