GCSE Mathematics (1MA1) – Foundation Tier Paper 2F

Spring 2017 mock paper (Set 2); Student-friendly 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. In some cases full marks can be given for a question or part of questions where no working is seen. However, it is wise to show working for one small slip could lead to all marks being lost if no working is shown. Some questions (such as QWC) 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).

Note that in some cases a correct answer alone will not score marks unless supported by working; these situations are made clear in the mark scheme. Examiners are prepared to award zero marks if the student's response is not worthy of credit according to the mark scheme.

Question 1 (Total 1 mark)

Part	Working or answer an examiner might expect to see	Mark	Notes
	300	B1	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
	Any even cube number, e.g. 8, 64, 216,…	B1	This mark is given for any even cube number

Question 3 (Total 1 mark)

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

Question 4 (Total 2 marks)

Part	Working an or answer examiner might expect to see	Mark	Notes
	$\frac{16}{a}$ where $a > 16$ or $\frac{b}{29}$ where $b < 29$ or $\frac{(29-13)}{c}$ where $c > 29 - 13$	P1	This mark is given for a process to start finding a fraction to represent the probability
	$\frac{16}{29}$	A1	This mark is given for the correct answer only

Question 5 (Total 2 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	AD, AE, AF BD, BE, BF CD, CE, CF	B2	These two marks are given for all 9 combinations with no extras or repeats (B1 is given for at least 6 correct combinations given; examiners will condone repeats but no more than two incorrect)

Question 6 (Total 3 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)		M1	This mark is given for either $7x$ or $-8y$ seen
	$7x - 8y$	A1	This mark is given for the correct answer only
(b)	$6x - 2x^2$	B1	This mark is given for the correct answer only

Question 7 (Total 4 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	10 – 4.61 (= 5.39)	P1	This mark is given for process to find total cost (5.39 or 539)
	5.39 – 0.65 (= 4.74)	P1	This mark is given for process to find cost of the coffees
	4.74 ÷ 0.79	P1	This mark is given for complete process to find the number of friends
	6	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
(i)	–1	B1	This mark is given for the correct answer only
(ii)	For example, sequence decreases –3 each time	C1	This mark is given for a correct explanation.

Question 9 (Total 4 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	Correct chart	C1	This mark is given for a key or suitable shading to identify pets or years
		C1	This mark is given for 3 correct year group labels or a linear scale
		C1	This mark is given for a bar chart correctly showing data for at least 1 year groups or 2 pets
		C1	This mark is given for a fully correct bar chart with axes correctly scaled and labelled

Question 10 (Total 2 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	500 ÷ 25	M1	This mark is given for a process to find the distance on the map
	20 (cm)	A1	This mark is given for the correct answer only

Question 11 (Total 2 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	Trapezium	B1	This mark is given for the correct answer only
(b)	For example, Yes, could be either rectangle or parallelogram or No, could be a rectangle, parallelogram, square or rhombus	C1	This mark is given for a correct explanation

Question 12 (Total 3 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	Using $y = mx + c$, gradient = 3, y-intercept = − 2	B1	One mark is given for at least two correct points stated or plotted or for a line drawn with a positive gradient through (0, − 2) or for a line drawn with gradient 3
	Table of values x = − 2 − 1 0 1 2 3 4 y = − 8 − 5 − 2 1 4 7 10	B1	Two marks are given for a correct straight line segment through at least three of the points (− 2,− 8), (− 1, − 5), (0, − 2), (1, 1), (2, 4), (3, 7), (4, 10) or for all of these points plotted but not joined or for a line drawn with a positive gradient through (0, − 2) and a clear intention to use a gradient of 3
	Correct line drawn between x = − 2 and x = 4, with gradient 3 and y-intercept = − 2	B1	All three marks are given for a fully correctly drawn line.

Question 13 (Total 4 marks)

Part	Working an or answer examiner might expect to see	Mark	Notes
(a)		B1	One mark is given for a reflection in a different line parallel to x = –1
	Correct reflection in the line x = –1	B1	Two marks are given for a fully correct reflection
(b)		B1	One mark is given for either an enlargement or scale factor 2 mentioned
	Enlargement with scale factor 2 and centre P	B1	Two marks are given for a fully corect enlargement

Question 14 (Total 2 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
(i)	For example, Tyrone has multiplied before squaring	C1	This mark is given for a correct explanation
(ii)	For example, Megan has evaluated $(-4)^2$ incorrectly, or has not correctly inserted brackets.	C1	This mark is given for a correct explanation

Question 15 (Total 5 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)		P1	This mark is given for process to find the amount of one ingredient for 60 gingerbread men
		P1	This mark is given for for correct amount needed for at least 3 ingredients for 60 gingerbread men
		P1	This mark is given for complete process to find amount extra of at least 3 ingredients needed
	50g flour 80g syrup 1 egg	A1	correct amounts for each ingredient
(b)	For example, Sue cannot buy half an egg and so will have to round up and buy more	C1	This mark is given for a correct explanation

Question 16 (Total 2 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	180×1.22	M1	This mark is given for a method to find the new selling price
	£219.60	A1	This mark is given for the correct answer only (examiners will accept £219.6)

Question 17 (Total 3 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	$\sqrt{99.05} = 9.9523866(4844)$, $43.2 + \sqrt{99.05} = 53.152386(64844)$	M1	This mark is given for one of 9.9523866 or 53.152386 seen (assume calculators show only 8 digits)
	275.40096(709035)	A1	This mark is given for a correct answer only
(b)	280	B1	This mark is given for the answer to part (a) given to 2 significant figures

Question 18 (Total 2 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	$5x + 3 = 7$ $5x = 4$	M1	This mark is given for isolating the x terms and the number terms
	$x = \frac{4}{5}$	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
	$42 \div 14$ (= 3)	M1	This mark is given for a method to find a scale factor
	3×17 or 3×9	M1	This mark is given for a method to find the ages of either Neil or Keith
	51 and 27	A1	This mark is given for the correct answers only

Question 20 (Total 2 marks)

Part	Working an or answer examiner might expect to see	Mark	Notes
	3.45, 3.55	B1	One mark is given for the numbers 3.45 and 3.55 seen
	$3.45 \leq x < 3.55$	B1	Two marks are given for the correct answer only

Question 21 (Total 3 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	45 ÷ 300 (= 0.15)	P1	This mark is given for a process to find the probability that a seed will grow into a yellow flower
	1 – (0.62 + 0.15)	P1	This mark is given for a process to find the probability that a seed will grow into a red flower
	0.23	A1	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
	<table><tr><td></td><td>G</td><td>R</td><td>C</td><td>Total</td></tr><tr><td>M</td><td></td><td></td><td>9</td><td></td></tr><tr><td>F</td><td>30</td><td></td><td></td><td>45</td></tr><tr><td>Total</td><td>52</td><td>35</td><td></td><td>100</td></tr></table>	P1	This mark is given for a process to arrange the given information in a two-way table
	100 – 52 –35 = **13** 13 – 9 = **4** <table><tr><td></td><td>G</td><td>R</td><td>C</td><td>Total</td></tr><tr><td>M</td><td></td><td></td><td>9</td><td></td></tr><tr><td>F</td><td>30</td><td></td><td>**4**</td><td>45</td></tr><tr><td>Total</td><td>52</td><td>35</td><td>**13**</td><td>100</td></tr></table>	P1	This mark is given for a process to find total number of adults cycling (13) or the number of females cycling (4)
	45 – 30 – 4 = **11** <table><tr><td></td><td>G</td><td>R</td><td>C</td><td>Total</td></tr><tr><td>M</td><td></td><td></td><td>9</td><td></td></tr><tr><td>F</td><td>30</td><td>**11**</td><td>4</td><td>45</td></tr><tr><td>Total</td><td>52</td><td>35</td><td>13</td><td>100</td></tr></table>	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
	$\frac{15}{16}$	P1	This mark is given for process to find the proportion of group that are students
	$\frac{15}{16} \times \frac{5}{12} = \frac{75}{192}$	P1	This mark is given for complete process to find the proportion of the students that are girls
	39%	A1	This mark is given for correctly converting the fraction to a percentage

Question 24 (Total 2 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
		B1	This mark is given for a pair of intersecting arcs centred on *A* and *B*
	Correct construction	B1	This mark is given for a fully correct construction

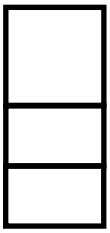
Question 25 (Total 3 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)		B1	This mark is given for one root correct
	– 1.2 and 3.2	B1	This mark is given for a second root correct
(b)	(1, – 5)	B1	This mark is given for the correct answer only

Question 26 (Total 5 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	$\pi \times 54$ (= 169.6460033) or ($\pi \times 54$) ÷ 2 (= 84.82300165)	P1	This mark is given for process to find the distance around one or both ends of the track
	40 × 2 + 169.6460033 (= 249.6460033)	P1	This mark is given for complete process to find the total length of the track
	e.g. $\pi \times 590$ (= 1853.539666 mm) or $\pi \times 0.59$ (= 1.8539666 m)	P1	This mark is given for process to find the circumference of wheel
	249.64… ÷ 1.85… or unrounded answer of 134.6860863	P1	This mark is given for complete process to find the number of revolutions in consistent units
	135	A1	This mark is given for the correct answer only

Question 27 (Total 2 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	Rectangle 4 high by 2 wide	B1	This mark is given for a correct rectangle
	Elevation 	B1	This mark is given for fully correct side elevation

Question 28 (Total 4 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	$(1.496 \times 10^{11}) \div (3 \times 10^{8})$ (= 498.666…)	M1	This mark is given for a method to find the number of seconds taken for light to reach the earth
	498.666… ÷ (60 × 60)	A1	This mark is given for converting the number of seconds into hours
	0.1385185185 = 0.139 to 3 significant figures	A1	This mark is given for showing the answer to be 0.139 hours as required
(b)	For example, Danesh has multiplied the indices rather than adding them	C1	This mark is given for a correct explanation

Question 29 (Total 2 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	Line drawn with gradient 3 passing through A	M1	This mark is given for a line drawn with gradient 3 passing through A
	$y = 3x - 1$	A1	This mark is given for the correct answer only

Question 30 (Total 3 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	$(x + 13)(x - 13)$	B1	This mark is given for the correct answer only
(b)	$6x^2$, $4x$, $3x$, 2 seen	M1	This mark is given for finding all 4 terms (and no additional terms) correct with or without signs or for finding 3 out of no more than 4 terms correct with signs
	$6x^2 - x - 2$	A1	This mark is given for the correct answer only