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

November 2019 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
	Two factors from 1, 2, 3, 4, 6, 12	B1	This mark is given for two correct factors

Question 2 (Total 1 mark)

Part	Working or answer an examiner might expect to see	Mark	Notes
	10	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
	$\frac{7}{10}$	B1	This mark is given for the correct answer only

Question 4 (Total 1 mark)

Part	Working an or answer examiner might expect to see	Mark	Notes
	18	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
	4000	B1	This mark is given for the correct answer only

Question 6 (Total 1 mark)

Part	Working or answer an examiner might expect to see	Mark	Notes
	3 : 5	B1	This mark is given for the correct answer only

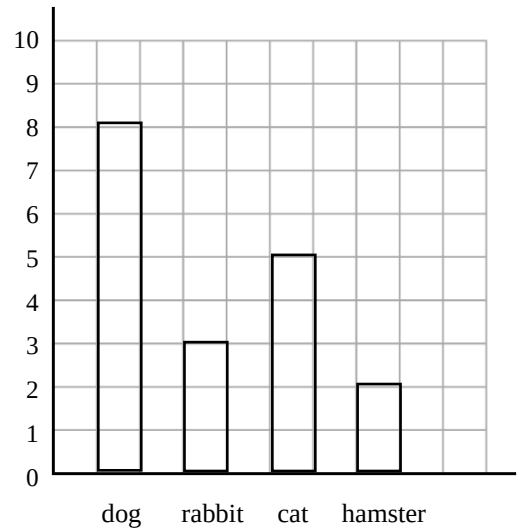
Question 7 (Total 2 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	$w = (4 \times 8) + 3$ $= 32 + 3$	M1	This mark is given for a method to find the value of w
	35	A1	This mark is given for the correct answer only

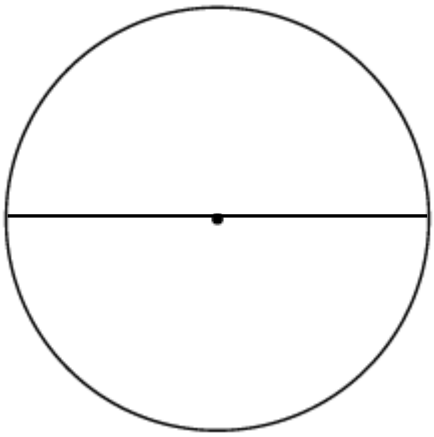
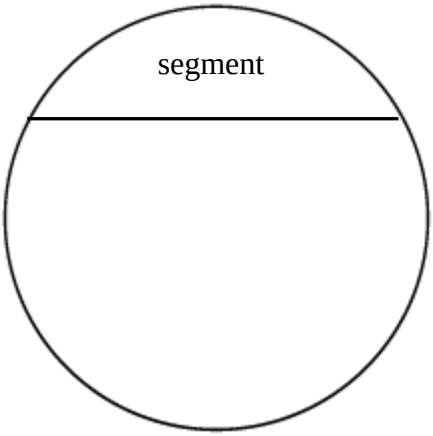
Question 8 (Total 2 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	15 + 6 = 21	B1	This mark is given for the 6th term of the sequence
	21 + 7 = 28	B1	This mark is given for the 7th term of the sequence

Question 9 (Total 6 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	**Pet** / **Tally** / **Frequency** dog / 𝍸 | | | / 8 rabbit / | | | / 3 cat / 𝍸 / 5 hamster / | | / 2	B2	This mark is given for a table with all frequencies correct (B1 is given for two tallies correct)
(b)		B1	This mark is given for labelling the horizontal axis with pets
		B1	This mark is given for labelling the vertical axis with frequency
		B1	This mark is given for data from the frequency table accurately represented
(c)	dog	B1	This mark is given for the most popular pet stated

Question 10 (Total 2 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)		P1	This mark is given for a diameter drawn correctly
(b)		P1	This mark is given for a segment drawn and labelled correctly

Question 11 (Total 5 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	$(5 \times 20) - (13 \times 7.50)$	P1	This mark is given for a process to find the cost of the bicycle lights
	$100 - 97.50$	P1	This mark is given for a process to find the amount of change Dylan should get
	2.50	A1	This mark is given for the correct answer only
(b)	$\frac{1}{5} \times 120 = 24$	M1	This mark is given for a method to find the amount of the price of the bicycle
	$120 - 24 = 96$	A1	This mark is given for the correct answer only

Question 12 (Total 3 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	$3 \times 450 = 1350$g	P1	This mark is given for a process to find the weight of the small boxes
	$\frac{5850-1350}{750}$	P1	This mark is given for a process to find the number of large boxes
	6	A1	This mark is given for the correct answer only

Question 13 (Total 2 marks)

Part	Working an or answer examiner might expect to see	Mark	Notes
	74 – 31	M1	This mark is given for identifying the ages of the youngest and oldest people in the social club
	43	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
(a)	Coby has carried out the calculation for the area, not the perimeter	P1	This mark is given for a correct explanation
(b)	The length of one side of the triangle cannot be negative	P1	This mark is given for a correct explanation

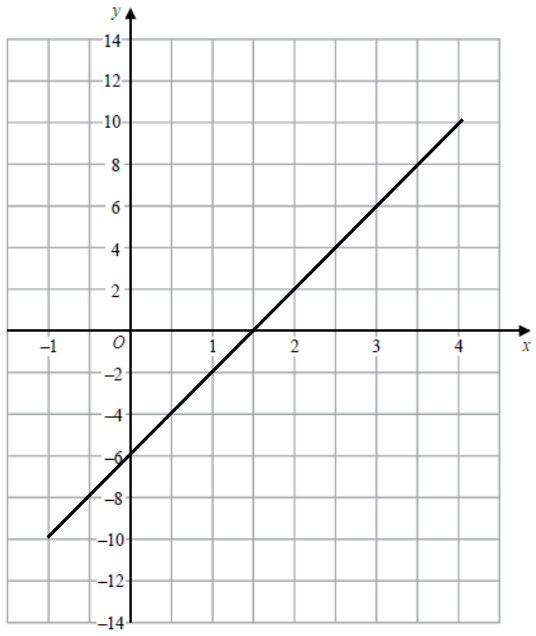
Question 15 (Total 4 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	$\frac{55}{100} \times 800 = 440$ $\frac{45}{100} \times 800 = 360$	P1	This mark is given for a process to find out the number of boys and girls at the school
	$\frac{31}{100} \times 800 = 248$	P1	This mark is given for a process to find the number of students who have packed lunches
	$\frac{40}{100} \times 440 = 176$	P1	This mark is given for a process to find the number of boys who have packed lunches
	$248 – 176 = 72$	A1	This mark is given for the correct answer only

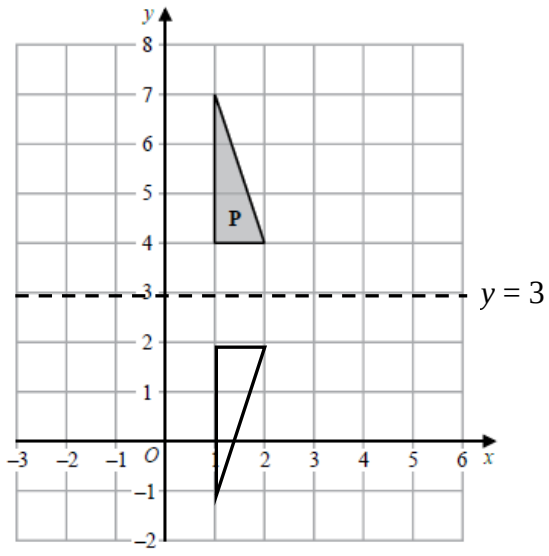
Question 16 (Total 4 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	$1 – 0.4 – 0.25 = 0.35$	P1	This mark is given for a process to find the combined probability of picking a blue or green counter
	$\frac{0.35}{3+4} = 0.05$	P1	This mark is given for a process to use the ratio to find the probability of picking a blue counter or picking a green counter
	3×0.05 4×0.05	P1	This mark is given for a process to use the ratio to find the probability of picking a blue counter or picking a green counter in the ratio 3: 4
	blue = 0.15 green = 0.2	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)	–10, –6, 2, 6	B2	These marks are given for four values correctly (B1 is given for 2 or 3 values correct)
(b)		M1	This mark is given for a at least five point correctly plotted
		A1	This mark is given for a correct graph from –1 to 4

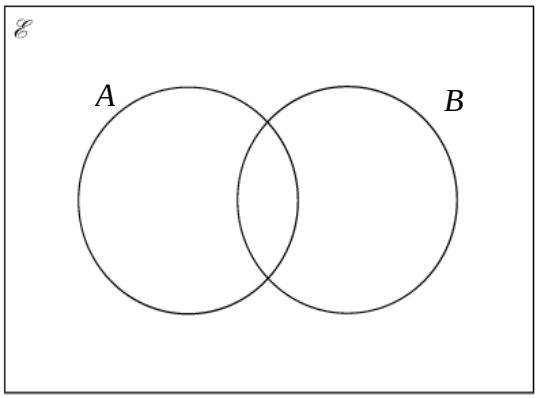
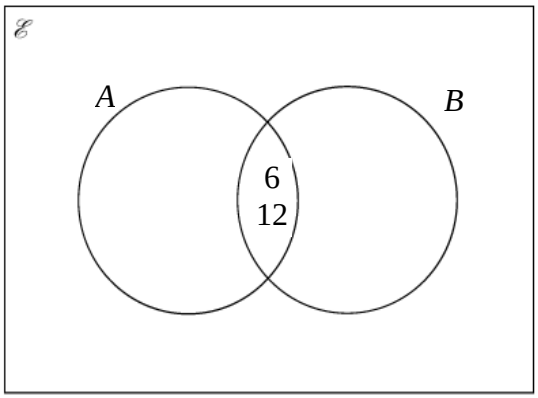
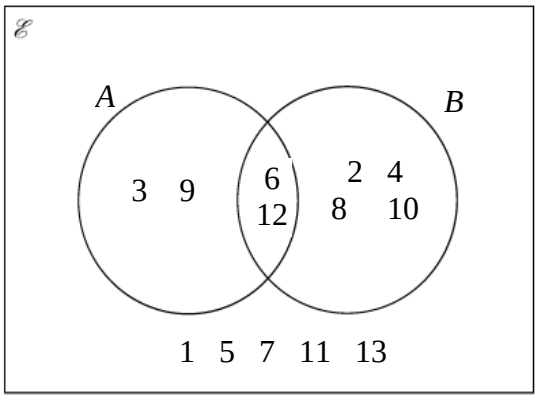
Question 18 (Total 2 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
		B2	These marks are given for a correctly drawn reflection (B1 is given for a correct reflection in any line other than $y = 3$)

Question 19 (Total 2 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	$4x - 24 = 44$ $4x = 68$	M1	This mark is given for a first step to find the value of x
	$x = 17$	A1	This mark is given for the correct answer only

Question 20 (Total 4 marks)

Part	Working an or answer examiner might expect to see	Mark	Notes
		B1	This mark is given for labelling sets A and B
		A1	This mark is given for 6, 12 placed in the intersection of A and B
		M1	This mark is given for one of 3, 9 only in set A or 2, 4, 8, 10 in set B only or 1, 5, 6, 11, 13 in $(A \cup B)'$ only
		C1	This mark is given for a completely correct Venn diagram

Question 21 (Total 3 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	158 220 – 146 500 = 11 720	M1	This mark is given for a method to find the amount of profit made
	$\frac{11720}{146500} \times 100$	M1	This mark is given for a method to find the percentage profit made
	8	A1	This mark is given for the correct answer only

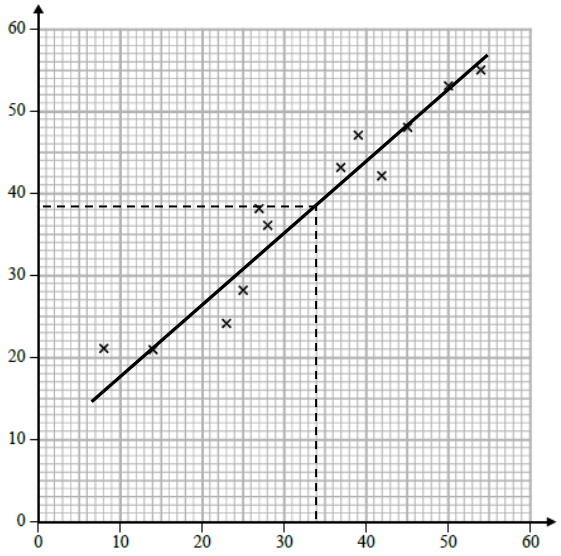
Question 22 (Total 4 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	$x^2 + 5x – 9x – 45$	M1	This mark is given for three terms correct
	$x^2 – 4x – 45$	A1	This mark is given for the correct answer only
(b)	$3(3x^2 + 2x)$	M1	This mark is given for a partial factorisation
	$3x(3x + 2)$	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
(a)	$\frac{836.4}{5.3048091}$	M1	This mark is given for 836.4 or 5.3048091 seen
	157.66825	A1	This mark is given for the correct answer only
(b)	157.7	B1	This mark is given for the correct answer only

Question 24 (Total 2 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
		M1	This mark is given for drawing a suitable line of best fit
		A1	This mark is given for an answer in the range 30 to 40

Question 25 (Total 3 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	$(1 \times 7.5) + (2 \times 12.5) + (7 \times 17.5) + (8 \times 22.5)$ $= 7.5 + 25 + 122.5 + 180$	M1	This mark is given for a method to find four products within the intervals
	$\frac{335}{18}$	M1	This mark is for a method to find $\sum ft \div 18$
	18.6	A1	This mark is given for a correct answer in the range 18.61 to 18.62

Question 26 (Total 1 mark)

Part	Working or answer an examiner might expect to see	Mark	Notes
	$1\ cm^3 = 1000\ mm^3$ $37\ cm^3 = 37\ 000\ mm^3$	B1	This mark is given for the correct answer only

Question 27 (Total 4 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	14 48 – 13 30 = 1 hour 18 minutes	P1	This mark is given for a process to find the time taken for Nimer to arrive at the hotel
	1 hour 18 minutes = $1\frac{18}{60}$ hours = 1.3 hours	P1	This mark is given for a process to find the number of hours taken
	$\frac{65}{1.3}$ =	P1	This mark is given for a process to find the average speed (distance/time)
	50 (mph)	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)	3.246×10^7	B1	This mark is given for the correct answer only
(b)	0.00496	B1	This mark is given for the correct answer only
(c)	No; *B* is bigger since the power of 10 is bigger	C1	This mark is given for a correct conclusion with a valid explanation given

Question 29 (Total 4 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	180 – 117 = 63	P1	This mark is given for a process to find the other angle in the parallelogram
	$180 - \frac{360}{5} = 108$	P1	This mark is given for a process to find the interior angle of the pentagon
	108 – 63	P1	This mark is given for a process to find the value of *x*
	45	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
	$\frac{\pi \times 15^2}{4} = 56.25\pi$	M1	This mark is given for a method to find the area of **A**
	$\frac{56.25\pi}{9} = 6.25\pi$	M1	This mark is given for a method to find the area of **B**
	$r^2 = \sqrt{\frac{6.25\pi}{\pi}} = \sqrt{6.25} = 2.5$	A1	This mark is given for a complete process to show the radius of **B** is 2.5 cm