

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

November 2018 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
	0.02, 0.152, 0.2, 0.37. 0.4	B1	This mark is given for the correct numbers in order of size

Question 2 (Total 1 mark)

Part	Working or answer an examiner might expect to see	Mark	Notes
	$0.6 \times 100 = 60$	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
	5	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
	8000	B1	This mark is given for the correct answer only

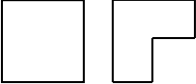
Question 5 (Total 3 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	$(3 \times 5) + 7 = 22$	B1	This mark is given for the correct answer only
(b)	$2 \times 2 \times 2 = 8$	B1	This mark is given for the correct answer only
(c)	$7 \times (2 + 3) = 35$	B1	This mark is given for the correct answer only

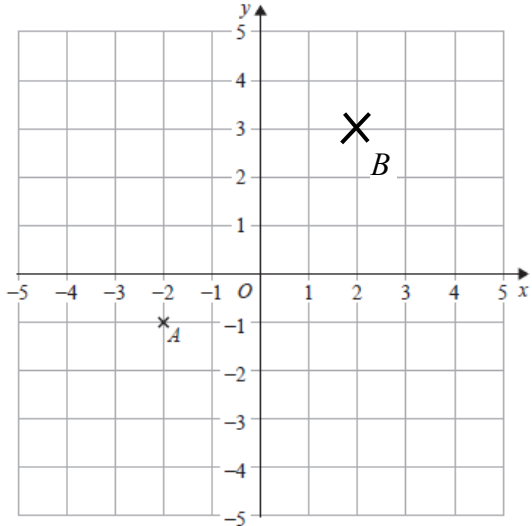
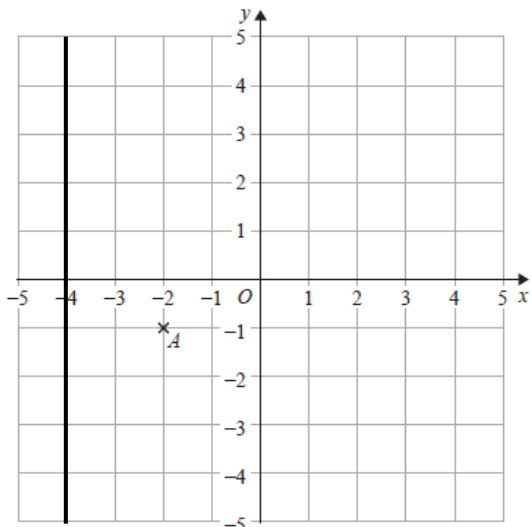
Question 6 (Total 3 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	$2 \times \frac{1}{4} = \frac{1}{2}$	P1	This mark is given for a process to find out how many tins of cat food are needed each day
	$8 \div \frac{1}{2} = 16$	P1	This mark is given for a process to find out how many days 8 tins will last
	$16 > 14$ Yes, Sue has bought enough cat food to last for 14 days	C1	This mark is given for a conclusion supported by working

Question 7 (Total 3 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	Apple = 12, Cherry = 5, Pear = 6	M1	This mark is given for method to find out how many of each tree there is
	$30 - (12 + 5 + 6) =$ $30 - 23 = 7$	M1	This mark is given for a method to find out how many plum trees are in the orchard
		C1	This mark is given for a completely correct pictogram

Question 8 (Total 3 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	$(-2, -1)$	B1	This mark is given for the correct answer only
(b)		B1	This mark is given for the correct answer only
(c)		B1	This mark is given for the line $x = -4$ drawn in the correct position

Question 9 (Total 2 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	$(2 \times 9) + (3 \times 4) = 18 + 12$	M1	This mark is given for a method to substitute values in the expression
	30	A1	This mark is given for the correct answer only

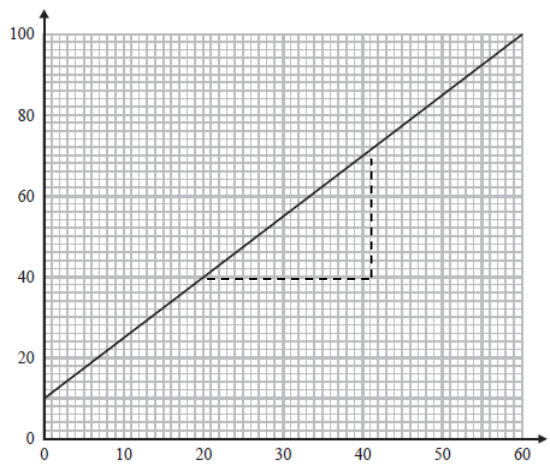
Question 10 (Total 2 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	Any one of $2 + 30$, $3 + 29$, $5 + 27$, $7 + 25$, $11 + 21$, $13 + 19$, $17 + 15$, $23 + 9$ seen	M1	This mark is given for finding two numbers with a sum of 32 (at least one of which is prime)
	3 and 29 or 13 and 19	A1	This mark is given for a correct answer only

Question 11 (Total 3 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	$\frac{10}{16}$	B1	This mark is given for the correct answer only
(b)	$\frac{2}{24} + \frac{20}{24} = \frac{22}{24}$	M1	This mark is given for finding a common denominator
	$\frac{11}{12}$	A1	This mark is given for the correct answer (or an equivalent fraction)

Question 12 (Total 3 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	10	B1	This mark is given for the correct answer only
(b)		M1	This mark is given for a method to use the graph to show the difference in costs of deliveries 20 miles apart
	£30	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
	4 : 1 or 1 : 2 seen	M1	This mark is given for a method to find a ratio
	4 : 1 : 2	A1	This mark is given for the correct answer only

Question 14 (Total 4 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	$\angle ADC = 180 - 75 = 105$ Angles on a straight line add up to 180	M1	This mark is given for a method to find the size of angle ADC with a reason
	$\angle BCD = 50$ Vertically opposite angles are equal	M1	This mark is given for a method to find the size of angle BCD with a reason
	$\angle ABC = 360 - 100 - 105 - 50 = 105$ Angles in a quadrilateral add up to 360	M1	This mark is given for a method to find the size of angle ABC with a reason
	$ABCD$ is a kite since angles ABC and ADC are both 105	C1	This mark is given for a correct conclusion supported by reasons given

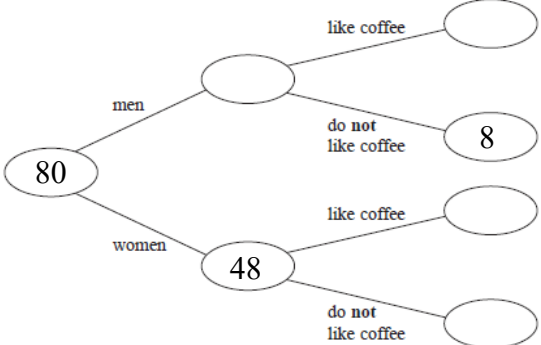
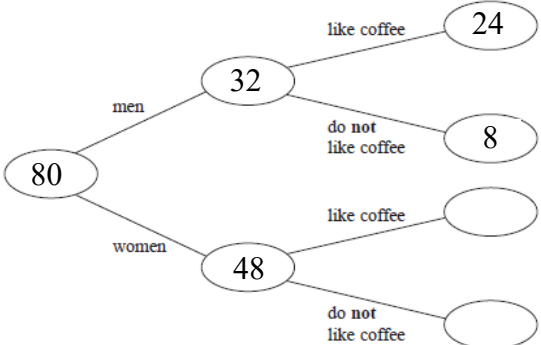
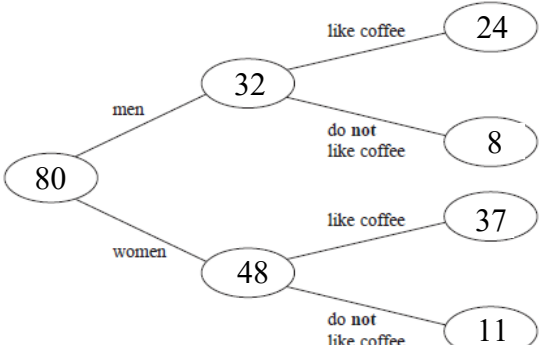
Question 15 (Total 4 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	$300 \div 5 = 60$ $200 \div 2 = 100$	P1	This mark is given for a start of a process to find solution
	$(60 \times 5) + (60 \times 2)$	P1	This mark is given for a complete process to find the greatest amount
	420	A1	This mark is given for the correct answer only
(b)	No, because Shahid uses only 120 ml of lemonade	C1	This mark is given for a correct explanation

Question 16 (Total 1 mark)

Part	Working or answer an examiner might expect to see	Mark	Notes
	No, because similar rectangles would have the same ratio of length and width	C1	This mark is given for a correct explanation

Question 17 (Total 5 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	 <p>A frequency tree diagram starting with a root node of 80. It branches into 'men' and 'women'. The 'men' branch leads to an empty node, which then branches into 'like coffee' (empty) and 'do not like coffee' (8). The 'women' branch leads to a node of 48, which then branches into 'like coffee' (empty) and 'do not like coffee' (empty).</p>	C1	This mark is given for placing 48 or 8 in the correct position on the frequency tree
	 <p>A frequency tree diagram starting with a root node of 80. It branches into 'men' and 'women'. The 'men' branch leads to a node of 32, which then branches into 'like coffee' (24) and 'do not like coffee' (8). The 'women' branch leads to a node of 48, which then branches into 'like coffee' (empty) and 'do not like coffee' (empty).</p>	C1	This mark is given for calculating $80 - 48 = 32$ and $32 - 8 = 24$ and placing them in the correct position on the frequency tree
	 <p>A frequency tree diagram starting with a root node of 80. It branches into 'men' and 'women'. The 'men' branch leads to a node of 32, which then branches into 'like coffee' (24) and 'do not like coffee' (8). The 'women' branch leads to a node of 48, which then branches into 'like coffee' (37) and 'do not like coffee' (11).</p>	C1	This mark is given for calculating $61 - 24 = 37$ and $48 - 37 = 11$ and placing them in the correct position on the fully complete frequency tree
(b)		M1	This mark is given for $\frac{a}{61}$ with $a < 61$ or $\frac{37}{b}$ with $b > 37$
	$\frac{37}{61}$	A1	This mark is given for the correct answer only (or an equivalent fraction)

Question 18 (Total 4 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	$5 \times 0.8 = 4$	P1	This mark is given for a process to reduce £5 by 20%
	$400 \times 1.3 = 520$	P1	This mark is given for a process to increase 400 by 30%
	$400 \div 4 = 100\text{g per } \pounds$ $520 \div 5 = 104\text{g per } \pounds$	P1	This mark is given for a process to find comparable values
	Cereal from Jan's Store gives the best value for money	C1	This mark is given for a correct conclusion supported by working

Question 19 (Total 2 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
		B2	<p>These marks are given for a correct shape with vertices at $(4, -3)$, $(5, -4)$, $(5, -5)$ and $(4, -5)$</p> <p>(B1 is given for a rotation of 180° about the wrong centre)</p>

Question 20 (Total 2 marks)

Part	Working an or answer examiner might expect to see	Mark	Notes
	$\frac{3^{7-2}}{3^3} = \frac{3^5}{3^3} = 3^{5-3} = 3^2$	M1	This mark is given for using the laws of indices to simplify the expression
	9	A1	This mark is given for the correct answer only

Question 21 (Total 4 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	$12^2 + (2 \times -3 \times 18) =$ $144 - 108 =$ 36	M1	This mark is given for a method to substitute values into the equation
	6 or -6	A1	This mark is given for the correct answer (accept ± 6)
(b)	$v^2 - u^2 = 2as$	M1	This mark is given for subtracting u^2 from both sides of the equation
	$\frac{v^2 - u^2}{2a} = s$	A1	This mark is given for the correct answer only

Question 22 (Total 5 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	$2100 \times 0.4 = 840$	P1	This mark is given for a process to find the three managers' share of the bonus
	$2100 - 840 = 1260$	P1	This mark is given for a process to find the seven salesmens' share of the bonus
	$1260 \div 7 = 180$	P1	This mark is given for a process to find one salesman's share of the bonus
	$2100 \div 10 = 210$ $\frac{210 - 180}{180} = 0.1666 = 16.66\%$	P1	This mark is given for a process to find the percentage difference between the actual bonus and the salesman's suggestion
	No, the salesman would only receive and extra 16.66%, not 25%	C1	This mark is given for a correct conclusion supported by correct working

Question 23 (Total 3 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	$120 \div \frac{3}{5} = 120 \times \frac{5}{3}$	M1	This mark is given for a method to find a solution
	200	A1	This mark is given for the correct answer only
(b)	Each tap fills the pool at the same rate Rate of filling does not change over time	C1	This mark is given for a correct explanation

Question 24 (Total 4 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	$\frac{1}{200}$	P1	This mark is given for using $\text{time} = \frac{\text{distance}}{\text{speed}}$
	$\frac{1}{200} \times 60 \times 60$	P1	This mark is given for a complete process to find a solution
	18 (seconds)	A1	This mark is given for a correct answer in the range 18–20
(b)	An overestimate, since the plane travels at more than 200 mph	C1	This mark is given for a correct explanation related to the response to part (a)

Question 25 (Total 3 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	$15x + 3y = 63$ $x - 3y = 9$	M1	This mark is given for a method to eliminate one variable
	$16x = 72$ $x = 4.5$	M1	This mark is given for a method to find the value of one variable
	$4.5 - 3y = 9$ $y = -1.5$	A1	This mark is given for both correct solutions

Question 26 (Total 4 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	$\pi \times 10^2 \div 2 = 50\pi$	M1	This mark is given for a method to find the area of the semicircle
	$\pi \times 20^2 \div 4 = 100\pi$	M1	This mark is given for a method to find the area of the quarter circle
	$100\pi - 50\pi = 50\pi$ $20 \times 20 = 400$	M1	This mark is given for a method to find the shaded area and the area of the square
	$\frac{50\pi}{400} = \frac{\pi}{8}$	A1	This mark is given for a correct conclusion supported by correct working.

Question 27 (Total 4 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	<p>first bag</p> <p>second bag</p> <p>$\frac{3}{10}$ red</p> <p>$\frac{7}{10}$ green</p> <p>$\frac{5}{9}$ red</p> <p>$\frac{4}{9}$ green</p> <p>$\frac{5}{9}$ red</p> <p>$\frac{4}{9}$ green</p>	B2	These marks are given for all four probabilities correct (1 mark is given for two or three probabilities correct)
(b)	$\frac{3}{10} \times \frac{5}{9}$	M1	This mark is given for a method to find a probability Amina takes two red balls
	$\frac{15}{90}$	A1	This mark is given for the correct answer only (or an equivalent fraction)

Question 28 (Total 3 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	$x + 11x = 180$ Exterior angle $x = \frac{180}{12} = 15$	P1	This mark is given for a process to find the exterior angle of the polygon
	$\frac{360}{15}$	P1	This mark is given for a complete process to find the number of sides
	24	A1	This mark is given for the correct answer only