Mark Scheme (Results)

Summer 2017

Pearson Edexcel GCSE (9 – 1)
In Mathematics (1MA1)
Foundation (Calculator) Paper 3F

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General marking guidance

These notes offer general guidance, but the specific notes for examiners appertaining to individual questions take precedence.

1. All candidates must receive the same treatment. Examiners must mark the last candidate in exactly the same way as they mark the first.

   Where some judgement is required, mark schemes will provide the principles by which marks will be awarded; exemplification/indicative content will not be exhaustive. When examiners are in doubt regarding the application of the mark scheme to a candidate's response, the response should be sent to review.

2. All the marks on the mark scheme are designed to be awarded; mark schemes should be applied positively. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme. If there is a wrong answer (or no answer) indicated on the answer line always check the working in the body of the script (and on any diagrams), and award any marks appropriate from the mark scheme.

   Questions where working is not required: In general, the correct answer should be given full marks.
   Questions that specifically require working: In general, candidates who do not show working on this type of question will get no marks – full details will be given in the mark scheme for each individual question.

3. **Crossed out work**
   This should be marked **unless** the candidate has replaced it with an alternative response.

4. **Choice of method**
   If there is a choice of methods shown, mark the method that leads to the answer given on the answer line.

   If no answer appears on the answer line, mark both methods **then award the lower number of marks.**

5. **Incorrect method**
   If it is clear from the working that the "correct" answer has been obtained from incorrect working, award 0 marks. Send the response to review for your Team Leader to check.

6   Follow through marks

Follow through marks which involve a single stage calculation can be awarded without working as you can check the answer, but if ambiguous do not award.

Follow through marks which involve more than one stage of calculation can only be awarded on sight of the relevant working, even if it appears obvious that there is only one way you could get the answer given.

7   Ignoring subsequent work

It is appropriate to ignore subsequent work when the additional work does not change the answer in a way that is inappropriate for the question or its context. (e.g.. an incorrectly cancelled fraction when the unsimplified fraction would gain full marks).

It is not appropriate to ignore subsequent work when the additional work essentially makes the answer incorrect (e.g.. incorrect algebraic simplification).

8   Probability

Probability answers must be given as a fraction, percentage or decimal. If a candidate gives a decimal equivalent to a probability, this should be written to at least 2 decimal places (unless tenths).

Incorrect notation should lose the accuracy marks, but be awarded any implied method marks.

If a probability fraction is given then cancelled incorrectly, ignore the incorrectly cancelled answer.

9   Linear equations

Unless indicated otherwise in the mark scheme, full marks can be gained if the solution alone is given on the answer line, or otherwise unambiguously identified in working (without contradiction elsewhere). Where the correct solution only is shown substituted, but not identified as the solution, the accuracy mark is lost but any method marks can be awarded (embedded answers).

10   Range of answers

Unless otherwise stated, when an answer is given as a range (e.g. 3.5 – 4.2) then this is inclusive of the end points (e.g. 3.5, 4.2) and all numbers within the range.

Guidance on the use of abbreviations within this mark scheme

M   method mark awarded for a correct method or partial method

P   process mark awarded for a correct process as part of a problem solving question

A   accuracy mark (awarded after a correct method or process; if no method or process is seen then full marks for the question are implied but see individual mark schemes for more details)

C   communication mark

B   unconditional accuracy mark (no method needed)

oe   or equivalent

cao   correct answer only

ft   follow through (when appropriate as per mark scheme)

sc   special case

dep   dependent (on a previous mark)

indep   independent

awrt   answer which rounds to

isw   ignore subsequent working

Question	Working	Answer	Mark	Notes
1 (a)		Don, Mersey, Trent, Thames, Severn	B1	accept 112, 113, 297, 346, 354
(b)		Shown	C1	shown with correct values eg (112 × 3 =) 336 (and 346) or 112 + 112 + 112 + 10 = 346 or 346 ÷ 3 = 115(.3..) (and 112) or 346 ÷ 112 = 3.089.. oe
2		$12p + 18b$	M1	$12p$ or $18b$ or $p + b$
			A1	$12p + 18b$
3 (i)		15	B1	cao
(ii)		196	B1	cao
4		40	M1	for 32 ÷ 4 (= 8) or 32 × 5 (= 160) or complete method eg 32 ÷ 4 × 5 oe (= 40)
			A1	cao
5 (a)		1 : 3	B1	oe
(b)		42	M1	ft 56 ÷ 4 (= 14) or complete method to find number of grey tiles eg 56 – (56 ÷ 4), 56 ÷ 4 × 3 oe (= 42)
			A1	for 42 or ft

Question	Working	Answer	Mark	Notes
6 (a)		Reason	C1	reason, eg must order numbers first
(b)		10	M1 A1	for 22 − 12 or 12 − 22 or 12 to 22 cao
(c)		16	M1 A1	for adding the numbers and dividing by 7 cao
7		SP, SR, SB, FP, FR, FB MP, MR, MB	B2 (B1)	all 9 combinations given with no extras or repeats at least 6 correct combinations given, condone repeats and incorrect combinations
8		84	M1 A1	for (372 – 36) ÷ 4 cao
9		No (supported)	P1 P1 C1	for finding a time difference e.g. length of day (=7 h or 420 min) or adding at least two of the five times on to 9 am or adding all the room times given (= 5 h 55 min or 355 min) or adding all five times given (=7 h 10 min or 430 min) for a complete process to inform final decision eg finds length of day (= 7 h) and total of all five times (=7 h 10 min) **or** starts at 9am and adds on all five times to find finishing time (= 4.10 pm) NO supported by correct values eg 4.10 pm **or** 7 h and 7 h 10 min **or** 420 min and 430 min

Question	Working	Answer	Mark	Notes
10		75	P1	for 90 ÷ 6 (= 15) or for connecting *AB* and *BC* by ratio or proportion eg 5 and 1 on the diagram
			P1	for a complete method to find the length *AB* eg 90 ÷ 6 × 5 (= 75)
			A1	cao
11 (a)		11	M1	substitutes *v* = 2 eg 4 × 2 + 3 or 8 + 3
			A1	cao
(b)		$v = \dfrac{T-3}{4}$	M1	correct first step to rearrange by isolating 4*v* or dividing each term by 4, eg *T* – 3 = 4*v*
			A1	fully correct answer
12 (a)		Yes (supported)	M1	method to find volume of one cube, eg 2 × 2 × 2 or 2^3 (= 8) or draws a solid of 6 cubes
			C1	Yes with supporting evidence eg 2 × 2 × 2 = 8, 8 × 6 = 48
(b) (i)		cuboid drawn	B1	either a 1 by 6 by 1 cuboid (2 cm by 12 cm by 2 cm) or a 2 by 3 by 1 cuboid (4 cm by 6 cm by 2 cm) drawn
(ii)		104 or 88	M1	ft for finding areas of 3 or more faces of their cuboid and adding
			A1	for 104 or 88

Question	Working	Answer	Mark	Notes
13		92, 65, 23	P1 P1 P1 P1 A1	for two of x, $4x$ and $4x - 27$ (where x is the smallest angle) (dep) for equation summing their three angles to 180, eg $x + 4x + 4x - 27 = 180$ (dep P1) for correct process to simplify their algebraic expression, eg $9x - 27$ (=180) for correct process to solve their equation of the form $ax + b = 180$ for three correct angles (order irrelevant)
14 (a)	$\begin{array}{ll} \$ & £ \\ 5 & 2.631... \\ 60 & 31.578... \\ 196 & 103.157... \\ 2744 & 1444.21... \\ 2804 & 1475.789... \end{array}$	2975.79	P1 P1 P1 P1 A1	for process to find total room cost eg 196 × 14 (= 2744) for process to find total wifi cost eg 5 × 12 (= 60) for using exchange rate appropriately (could be used earlier in the question), eg "2804" ÷ 1.90 (= (£)1475.789...) or 1500 × 1.90 (= ($)2850) for process to find the total cost in £, eg "1475.79(..)" + 1500 or in \$, eg "2850" + "2804" (= 5654) 2975 to 2976
(b)		Statement	C1	Statement about the total price rising May comment that flights will not change but the rest will rise

Question	Working	Answer	Mark	Notes
15 (a)		Venn Diagram	B1 M1 M1 C1	for labels on diagram for just 15 in the intersection for just 5 and 25 in only set B or just 3, 9, 21 and 27 in only set A or just 1, 7, 11, 13, 17, 19, 23, 29 in $(A \cup B)'$ for all numbers correctly placed in the Venn Diagram Ignore all entries except the region you are marking for each method mark
(b)		$\dfrac{7}{15}$	P1 A1	ft for $\dfrac{"7"}{a}$ where $a \geq$ "7" or $\dfrac{b}{"15"}$ where $b \leq$ "15" ft $\dfrac{7}{15}$ oe
16		$x = -\dfrac{2}{3}$ $y = -2$	M1 M1 A1	for a method to eliminate one variable (condone one arithmetic error) (dep) for substituting found value in one of the equations or appropriate method after starting again (condone one arithmetic error) $x = -\dfrac{2}{3}$ oe and $y = -2$
17 (a)		12	B1	cao
(b)		Explanation	C1	No with statement about not being mutually exclusive events eg a person could be in both categories

Question	Working	Answer	Mark	Notes
18		68	P1	for a process to find the number of vanilla cakes, eg $420 \times 2 \div 7$ oe (= 120)
			P1	for a process to find the number of banana cakes, eg 420×0.35 oe (= 147)
			P1	(dep P1) for a full process to find the number of lemon/chocolate cakes eg $420 -$ (vanilla cakes) $-$ (banana cakes) (= 153)
			P1	(dep on previous P1) for a process to find the number of lemon cakes eg "153" $\div 9 \times 4$ oe (= 68)
			A1	cao
				OR
			P1	for writing two proportions in the same format
			P1	for combining the proportions of vanilla and banana cakes eg $2/7 + 7/20$ (= 89/140)
			P1	(dep P1) for a full process to find the proportion or number of lemon/chocolate cakes eg $1 -$ "89/140" (= 51/140)
			P1	(dep on previous P1) for a process to find the number of lemon cakes eg "51/140" $\times 420 \div 9 \times 4$ (= 68)
			A1	cao
19		Shows polygon is a hexagon	M1	for a complete method to find the interior or exterior angle of the dodecagon eg $180 - \dfrac{360}{12}$, $\dfrac{180}{12}(12 - 2)$ oe (= 150), $360 \div 12$ (=30)
			M1	for a complete method to find the interior angle of polygon **P** eg at *B* or *C*: $360 -$ "150" $- 90$ (= 120) or "30" $+ 90$ (= 120) **or** for a complete method to find the interior or exterior angle of the hexagon eg $180 - \dfrac{360}{6}$, $\dfrac{180}{6}(6 - 2)$ oe (= 120), $360 \div 6$ (= 60)
			A1	for 30 and 120 **or** 30 and 60 **or** 120 and 150 **or** 60 and 150
			C1	complete solution, fully supported by accurate figures

Paper: 1MA1/3F				
Question	Working	Answer	Mark	Notes
20		1.01	P1	fruit syrup 15 × 1.4 (= 21) or water 280 × 0.99 (= 277.2) or apple juice 25 × 1.05 (= 26.25)
			P1	(dep P1) for complete process to find the total mass e.g. "277.2" + "26.25" + "21" (= 324.45) or a weighted density eg 15 × 1.4 ÷ 320 (= 0.065625) or 280 × 0.99 ÷ 320 (= 0.86625) or 25 × 1.05 ÷ 320 (= 0.08203125)
			P1	(dep P2) for complete process to find the density eg "324.45" ÷ 320 (=1.01..) or "0.065625" + "0.86625" + "0.08203125" (= 1.0139..)
			A1	1.01 to 1.014
21		Shown (supported)	M1	method to divide a pair of corresponding sides, eg 7.5 ÷ 3 (= 2.5) or 3 ÷ 7.5 (= 0.4), or states scale factor is 2.5 or 0.4 or method to work out the size of an angle, eg $\tan^{-1}\left(\dfrac{7.5}{10}\right)$ (= 36.8 to 36.9)
			C1	shows or states that all sides are enlarged by the same factor or works out a pair of corresponding angles and states that the two triangles have the same angles
22 (a)		12, 4, 2, 1.2, 1	B2 (B1)	for fully correct table (allow fractions or decimals) for 3 or 4 of 12, 4, 2, 1.2, 1
(b)		Correct curve	M1 A1	ft (dep on B1 in (a)) for plotting at least 6 points from their table correctly for a fully correct curve

Question	Working	Answer	Mark	Notes
23 (a) (i)		155 000	B1	cao
(ii)		165 000 or 164 999 or 164 999.99	B1	165 000 or 164 999 or 164 999.99
(b)		200 000	M1	for recognising that 210 000 = 105% or a full method to find the original price eg 210 000 ÷ 1.05 oe (= 200 000)
			A1	cao

Modifications to the mark scheme for Modified Large Print (MLP) papers.

Only mark scheme amendments are shown where the enlargement or modification of the paper requires a change in the mark scheme.

The following tolerances should be accepted on marking MLP papers, unless otherwise stated below:
Angles: ±5°
Measurements of length: ±5 mm

PAPER: 1MA1_3F			
Question		**Modification**	**Mark scheme notes**
6		Wording 'seven' added to the first line	Standard mark scheme
10		Diagram enlarged.	Standard mark scheme
12	(a)	Models provided for all candidates. Diagram enlarged and also provided for MLP. Question wording changed to 'Look at the diagram for Question 12 or at the six cubes provided. Each cube has a side length of 2 cm.	Standard mark scheme
12	(b)	Question wording changed to 'Remember: Each cube has a side length of 2 cm. Use the six cubes provided to make a cuboid. Write down the dimensions of your cuboid.' One answer line provided.	Standard mark scheme, but accept an answer without a drawing, but showing the dimensions of 2×2×12 or 4×6×2 (oe)
15		Diagram enlarged. Braille only: will label the circles 'Set A' and 'Set B' and will label all the places which need to be answered (i) to (iv).	Standard mark scheme accept for Braille award C2 for a fully correct diagram.
19		Diagram enlarged.	Standard mark scheme
21		Diagrams enlarged. The smaller triangle on the right has been rotated so it is facing the opposite triangle. Braille only: will give information about the triangles in written form.	Standard mark scheme

PAPER: 1MA1_3F			
Question		**Modification**	**Mark scheme notes**
22	(a)	The table has been turned to vertical format and left aligned. Wording added 'There are five spaces to fill.'	Standard mark scheme
22	(b)	Diagram has been enlarged.	Standard mark scheme with additional tolerance on plotting.