Mark Scheme (Results)

November 2022

Pearson Edexcel GCSE
In Mathematics (1MA1)
Foundation (Non-Calculator) Paper 1F

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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. (eg 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 (eg. 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 (eg 3.5 – 4.2) then this is inclusive of the end points (eg 3.5, 4.2) and all numbers within the range

11 Number in brackets after a calculation

Where there is a number in brackets after a calculation eg 2 × 6 (=12) then the mark can be awarded **either** for the correct method, implied by the calculation **or** for the correct answer to the calculation.

12 Use of inverted commas

Some numbers in the mark scheme will appear inside inverted commas eg "12" × 50 ; the number in inverted commas cannot be any number – it must come from a correct method or process but the candidate may make an arithmetic error in their working.

13 Word in square brackets

Where a word is used in square brackets eg [area] × 1.5 : the value used for [area] does **not** have to come from a correct method or process but is the value that the candidate believes is the area. If there are any constraints on the value that can be used, details will be given in the mark scheme.

14 Misread

If a candidate misreads a number from the question. eg uses 252 instead of 255; method or process marks may be awarded provided the question has not been simplified. Examiners should send any instance of a suspected misread to review.

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 awarded for a fully correct statement(s) with no contradiction or ambiguity
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

Paper: 1MA1/1F				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
1	$\frac{3}{10}$	B1	for $\frac{3}{10}$ oe	Accept equivalent fractions, eg $\frac{30}{100}$
2	9	B1	cao	
3	4	B1	cao	
4	10 or 12	B1	for 10 or 12	Accept both 10 and 12 given
5	15*tw*	B1	for 15*tw*	May be seen in different order
6	60	P3	for complete process to find the total costings eg 23 + 33 + 24.5(0) + 24.5(0) + 15 + 10 + 10 (= 140) **or** for a complete process to find the total money left, eg. 200 – 23 – 33 – 24.5(0) – 24.5(0) – 15 – 10 – 10 (= 60), condone one error, eg one omission or one additional cost	All processes may be seen as part of subtractions to find money left
		(P2	for process to find the total cost of all theme park tickets, eg 33 + 2 × 24.5(0) (= 33 + 49 = 82) **or** for process to find the total cost of all meals, eg 15 + 2 × 10 (= 15 + 20 = 35) **or** for process to find the total cost for the children, eg 2 × 24.5(0) + 2 × 10 (= 49 + 20 = 69) **or** for process to find total costs with just **one** child, eg 23 + 33 + 24.5(0) + 15 + 10 (= 105.5(0)))	Additions may include other elements for process marks, eg. 23 + 33 + 2 × 24.5(0)
		(P1	for a start to a correct process, considering at least 2 costs eg 33 + 24.5(0) (= 57.5(0)) or 2 × 24.5(0) (= 49) **or** for start to a process to find money left, eg 200 – 23 (= 177) or 200 – 33 (= 167))	May be any start to a correct process
		A1	cao	

Paper: 1MA1/1F				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
7 (a)	A	B1	cao	
(b)(i)	Cross at correct position	B1	for cross at $\frac{1}{4}$	Cross or other indication may be seen on or near line provided within tolerance
(b)(ii)	$\frac{1}{8}$	B1	for $\frac{1}{8}$ oe	Accept any equivalent fraction, decimal form 0.125 or percentage form 12.5% Do **not** accept 1 : 8 or 1 to 8 or 1 out of 8
8 (a)	7	B1	cao	
(b)	6	M1	for $4n$ (= 24) or 24 ÷ 4	
		A1	cao	
9 (a)	290	B1	cao	Accept 290°. May be seen on diagram provided no ambiguity
(b)	reason	C1	for correct reason: <u>Angles</u> at a <u>point</u> add to 360	The key words underlined must be present with the 360 implied if not stated by use in part (a)

Paper: 1MA1/1F				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
10 (a)	5	P1	for correct process, eg 23 ÷ 4 (= 5.75) **or** adds 4s up to at least 20 **or** repeatedly subtracts 4 up to a remainder of less than 4	
		A1	cao	
(b)	No (supported)	C1	for No with reason **Acceptable examples** Can buy 11 jars Can buy an extra jar (for the £3 extra) Can buy 10 jars for £20 He will have £3 left Because he can buy more than twice the number of jars Because 23 ÷ 2 = 11.5 **Not acceptable examples** Yes ….. Can buy 10 / Can buy 12	
11 (a)(i)	2	B1	for 2	Accept 2× or ×2 oe
(ii)	cross placed	B1	for cross correctly placed or indicated by intersection of construction lines	
(b)(i)	line drawn	B1	for line $y = x$ drawn	Accept line of any length, dotted or dashed and/or drawn freehand
(ii)	$y = x$	B1	for $y = x$ oe, eg. $x = y$ or $y – x = 0$ or $x – y = 0$ **or** ft their line drawn in (b)(i)	Accept labelled on the diagram

Paper: 1MA1/1F				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
12 (a)	26	P1	for process to find $\frac{1}{6}$ of 120 minutes, eg $\frac{1}{6} \times 120$ (= 20)	
		P1	for process to find 20 % of 120 minutes, eg $\frac{20}{100} \times 120$ (= 24)	
		P1	(dep on P2) for a complete process to find the time remaining, eg 120 – 50 – "20" – "24"	May be seen in stages
		A1	cao	
(b)	No (supported)	C1	for No with reason or ft (a) **Acceptable examples** she was (at least) 4 minutes late she did not arrive until (at least) 3 04 pm it took her more than 90 minutes doing the activities **Not acceptable examples** Yes ….. she arrived after 3pm	The 'No'(or 'Yes') may not be required if it is clear from the reasoning that Elena did not (did) get to the café by 3pm

Paper: 1MA1/1F				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
13 (a)	60	B1	cao	May be seen on diagram
(b)	50	B1	cao	May be seen on diagram
(c)	80 : 200	P1	for process to **use** the number of children, 80 or the total number of men and women, 200 in a ratio **or** for $\frac{80}{200}$	
		A1	for 80 : 200 oe	Award for a correct ratio even if subsequently incorrectly simplified.
14 (a)	81	M1	for 54 × [time] eg 54 × $1\frac{1}{2}$ oe, **or** 54 + 54 ÷ 2 oe	[time] could be $1\frac{1}{2}$ oe or any other time that has been changed from $1\frac{1}{2}$, eg 90 (mins) or 1.30 or 130
		A1	cao	
(b)	1.5	P1	for use of scale eg 6 × 25 000 (= 150 000) **or** for 25 000 ÷ 100 000 (= 0.25) or 25 000 ÷ 100 (= 250) or 25 000 ÷ 1000 (= 25)	
		P1	for "150 000" ÷ 100 000 (= 1.5) or "150 000" ÷ 100 (= 1500) or "150 000" ÷ 1000 (= 150) **or** for [0.25] × 6 (= 1.5)	[0.25] could be found by dividing 25 000 by 100 (= 250) or dividing 25 000 by 1000 (= 25)
		A1	for 1.5 oe	

Paper: 1MA1/1F				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
15	−0.5, 1	M1	for one correct coordinate **or** midpoint shown on diagram **or** correct method, eg $\frac{-3+2}{2}$ or $\frac{-2+4}{2}$ **or** for the coordinates reversed, eg 1, – 0.5	
		A1	for −0.5, 1 oe	
16	19	P1	for process of finding perimeter in terms of x, eg $2x – 5 + x + 1 + x – 1 + 2x$ oe	
		P1	for process to form equation, eg "$6x – 5$" = 52	This mark may be awarded for a correct but unsimplified equation, eg. $2x – 5 + x + 1 + x – 1 + 2x = 52$ oe
		P1	(dep on P2) for a correct process to find x, eg (52 + 5) ÷ 6 (= 9.5) **or** for a correct process to find $2x$, eg (52 + 5) ÷ 3 **or** ft an equation of the form $ax + b = c$,	Trial & Improvement attempts must be fully correct giving x = 9.5 before any credit given a, b and c must be clearly stated but need not be correct
		A1	cao	

Paper: 1MA1/1F				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
17 (a)	$\frac{70}{100}$	M1	for 100 – 30 (= 70) or $\frac{30}{100}$ oe	
		A1	for $\frac{70}{100}$ oe	Accept any equivalent fraction, decimal form 0.7 or percentage form 70%
(b)	45	P1	for start to process, eg 30 ÷ 2 (= 15)	
		A1	cao	
(c)	No with reason	C1	for No with reason **or** ft (b) **Acceptable examples** the number of red and yellow counters is an odd number 25 cannot be divided by 2 to give a whole number You can't have half a counter You can't split it evenly **Not acceptable examples** Yes ….. they are in the ratio 2 : 3 one must be more than the other	If the reason is supported by numerical evidence then that evidence must be accurate. can ft (b) Note: if the answer to part (b) is an even number then 'yes' with supporting evidence is an acceptable answer

Paper: 1MA1/1F				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
18	60	P1	for 240 ÷ (5 + 3 + 2) (= 24)	
		P1	for complete process to find the number of cans of each drink eg 5 × "24" (= 120) and 3 × "24" (= 72) and 2 × "24" (= 48)	
		P1	for process to find the number of cans removed eg "72" ÷ 2 (= 36) and "48" ÷ 12 (= 4)	
		P1	for process to find percentage eg $\frac{"120"}{240-("36"+"4")} \times 100$ or $\frac{"120"}{"120"+("72"-"36")+("48"-"4")} \times 100$	
		A1	cao	
			Alternative	
		P1	for process to find proportion of lemonade and orange cans removed, eg $3 \times \frac{1}{2}$ (= $1\frac{1}{2}$) and $2 \times \frac{1}{12}$ (= $\frac{1}{6}$)	
		P1	for process to find proportion of lemonade and orange cans remaining, eg $3 - "1\frac{1}{2}" + 2 - "\frac{1}{6}"$ (= $3\frac{1}{3}$)	
		P1	for $5 + "3\frac{1}{3}"$ (= $8\frac{1}{3}$)	
		P1	for process to find percentage eg $(5 \div "8\frac{1}{3}") \times 100$	
		A1	cao	

Paper: 1MA1/1F				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
19	$2^2 \times 5^3$	M1	for a complete method to find prime factors; could be shown on a complete factor tree with no more than one error or by division by prime factors with no more than one error	Condone the inclusion of 1 for the method marks
		M1	for complete factorisation, eg 2, 2, 5, 5, 5	Could be shown on a fully correct factor tree
		A1	for $2^2 \times 5^3$	
20 (a)	$3\frac{17}{20}$	M1	for finding two fractions with a correct common denominator (multiple of 20), with at least one correct corresponding numerator, eg. $\frac{12}{20}$, $\frac{5}{20}$ or $\frac{32}{20}$, $\frac{45}{20}$	May be from $\frac{3}{5}$ and $\frac{1}{4}$ or from $\frac{8}{5}$ and $\frac{9}{4}$
		A1	for $3\frac{17}{20}$ or an equivalent mixed number SC: B1 for 3.85 if M0 scored	
(b)	shown	M1	for $\frac{8}{3} \times \frac{1}{6}$ oe or $\frac{4}{9} \times \frac{6}{1}$ oe or $\frac{8}{3} \times \frac{9}{4}$ oe	
		A1	for unsimplified fraction which could lead to $\frac{4}{9}$, eg $\frac{8}{18}$ or for $\frac{4}{3} \times \frac{1}{3}$ or $\frac{24}{9} \div 6$ **or** for unsimplified fraction which could lead to $2\frac{2}{3}$, eg $\frac{24}{9}$ **or** for unsimplified fraction which could lead to 6, eg $\frac{72}{12}$	
21	2^6	M1	for the start of a method of simplification, eg 2^{-5+8} (= 2^3) or $2^{-5\times2}$ (= 2^{-10}) or $2^{8\times2}$ (= 2^{16})	
		A1	cao SC B1 for answer of 64 or 8^2 or 4^3 if M0 scored.	

Paper: 1MA1/1F				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
22	0.00128	M1	for digits 128 **or** for correct placement of the decimal point following one arithmetical error, eg. 32 × 4 = 138 with an answer of 0.00138	
		A1	for 0.00128 **or** 1.28×10^{-3}	
23	7500	M1	for method to find expected number of model B, eg $\frac{15}{80} \times 40000$ oe **or** $\frac{15}{"23+15+30+12"} \times 40000$ oe	
		A1	cao	

Paper: 1MA1/1F				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
24 (a)(i)	2 : 6 : 5	P1	for process to compare ratios, eg $a : b = 2 : 6$ or $b : c = 3 : 2.5$	Could use 3 or any common multiple of 3 and 6
		A1	for 2 : 6 : 5 oe	
(ii)	$\frac{2}{13}$	M1	for process to find fraction, eg $\frac{[2]}{[2+6+5]}$ or for $\frac{a}{a+b+c}$	
		A1	for $\frac{2}{13}$ oe or ft (a)(i)	
(b)	1 : 10	P1	for process to express all numbers in terms of one number, eg $p = 5 \times 2m$ (= $10m$) or $m = \frac{n}{2}$ **or** for $2m = \frac{p}{5}$ **or** for assigning values in the ratio given, eg $m = 1$, $n = 2$, $p = 10$ **or** for $n : m : p = 2 : 1 : 10$ oe **or** 10 : 1 oe	
		A1	for 1 : 10 oe	

Paper: 1MA1/1F				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
25	1250	P1	for process to use area of base in the formula, eg $\frac{10000}{2\times4}$	
		A1	cao	
26 (a)	$x > 6$	M1	for a correct first step, eg subtracts 3 from both sides or multiplies all terms by 2	Could be seen as an equation for both method marks, eg $5x + 6 = 36$ or $5x = 30$
		M1	(dep M1) for a correct second step, eg multiplies both sides by 2 **or** divides both sides by 5 **or** gives the critical value, 6.	First 2 marks may be awarded for critical value of 6, eg $x = 6$
		A1	for $x > 6$	
(b)	$(x + 9)(x + 1)$	M1	for $(x \pm 1)(x \pm 9)$ **or** for $(x + a)(x + b)$ where product of a and $b = 9$, eg $(x + 3)(x + 3)$ or $(x – 3)(x – 3)$ or the sum of a and $b = 10$, eg $(x + 5)(x + 5)$ or $(x + 6)(x + 4)$	
		A1	for $(x + 9)(x + 1)$	

Modifications to the mark scheme for Modified Large Print (MLP) papers: 1MA1 1F

Only mark scheme amendments are shown where the enlargement or modification of the paper requires a change in the mark scheme.
Notes apply to both MLP papers and Braille papers unless otherwise stated.

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

PAPER: 1MA1_1F			
Question		**Modification**	**Mark scheme notes**
6		Wording added 'Look at the table for Question 6 in the Diagram Booklet.' The wording 'These are' removed. Wording added 'are shown in the Diagram Booklet.' Information presented as a table.	Standard mark scheme
7		The wording 'Here' removed and replaced with 'Below'. Values changed: A to P, B to Q, C to R and letters left aligned and split on two rows. In part (b)(i) wording added 'Look at the diagram for Question 7(b)(i) in the Diagram Booklet. It shows a probability scale.'; The wording 'with a cross(x)' removed and diagram enlarged.	Standard mark scheme
9		Wording added 'Look at the diagram for Question 9 in the Diagram Booklet.' Diagram enlarged. Angles moved outside the angle arcs and angle arcs made smaller. Wording added 'in the Diagram Booklet'.	Standard mark scheme
11	(a)	Wording added 'Look at the diagram for Question 11(a) in the Diagram Booklet. It shows'. The wording 'Here are' removed. Wording added 'They are labelled Triangle A and Triangle B.' Diagram enlarged. Right column removed. Shading changed. Row added above. Shapes labelled 'Triangle A' and 'Triangle B' and moved above shapes.	Standard mark scheme
11	(a)ii	Wording added 'in the Diagram Booklet'; 'They are labelled Parallelogram C' and 'Parallelogram D'. Shapes relabelled 'Parallelogram C' and 'Parallelogram D' and moved above the diagram. The wording 'with a cross' removed.	Standard mark scheme
11	(b)	Wording added 'Look at the diagram for Question 11(b) in the Diagram Booklet. It shows'; 'They are labelled Parallelogram C and Parallelogram D.' The wording 'Here are' removed. Diagram enlarged. Open headed arrows. Axes labels moved above the vertical axis and right on the horizontal axis.	

PAPER: 1MA1_1F			
Question		**Modification**	**Mark scheme notes**
13		Wording added 'Look at the diagram for Question 13 in the Diagram Booklet' Wording added 'in the Diagram Booklet'. Diagram enlarged. Axes labels moved above the vertical axis and left on the horizontal axis. Open headed arrows. Shading changed. Key moved above the diagram and left aligned. Right axis labelled. Values changed: 2000 men now 0 to 50; 2010 children now 150 to 200; 2020 children now 200 to 300	(a) B1 cao for 50; check diagram (b) B1 cao for 50; check diagram (c) for process to use the number of children, 100 or the total number of men and women, 200 in a ratio **or** for 100/200 oe A1 for 100 : 200 oe Award for a correct ratio even if subsequently incorrectly simplified.
15		Wording added 'Look at the diagram for Question 15 in the Diagram Booklet.' Diagram enlarged. Axes labels moved above the vertical axis and right on the horizontal axis. Open headed arrows. Crosses changed to solid dots. Wording added 'in the Diagram Booklet.' Point at 'P' changed to (-4,-2).	M1 for one correct coordinate **or** midpoint shown on diagram **or** correct method, eg $\frac{-4+2}{2}$ or $\frac{-2+4}{2}$ **or** for coordinates reversed, eg 1, – 1 A1 for –1, 1 cao
16		Wording added 'Look at the diagram for Question 16 in the Diagram Booklet. It shows'. The wording 'Here is'. Removed. Letter x changed to y Diagram labels changed: $x + 1$ to $(y + 1)$cm; $x - 1$ to $(y - 1)$cm; $2x$ to $(2y)$cm; $2x - 5$ to $(2y - 5)$cm Wording added: AB = $(y + 1)$ cm; CB = $(y - 1)$ cm; DC = $(2y)$ cm; AD = $(2y - 5)$ cm Diagram enlarged and rotated with DC horizontal.	Standard mark scheme
17		Wording added 'Look at the table for Question 17 in the Diagram Booklet.' Wording added 'in the Diagram Booklet'. Table enlarged and turned vertical.	Standard mark scheme
18		Wording added 'Look at the information for Question 18 in the Diagram Booklet. It shows a ratio.'	Standard mark scheme

PAPER: 1MA1_1F			
Question		**Modification**	**Mark scheme notes**
23		Wording added ‘Look at the table for Question 23 in the Diagram Booklet.’ Wording added ‘in the Diagram Booklet’. Table enlarged.	Standard mark scheme
24	(a)	Text left aligned. Values changed: *a* to *p*; *b* to *q*; *c* to *r*	Standard mark scheme but note change of letter
24	(b)	Text left aligned. Values changed: *m* to *w*; *n* to *x*; *p* to *y*	Standard mark scheme but note change of letter
25		Wording added ‘Look at Diagram 1 and Diagram 2 for Question 25 in the Diagram Booklet. You may be provided with a model. It is not accurate.’ Wording added ‘Diagram 1 and the model show’. Wording added ‘that’. Diagram enlarged. Base view added with measurements. Wording added ‘Diagram 2 shows the base view.’ Frame removed from formula and moved above the diagram to the left	Standard mark scheme

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