Mark Scheme (Results)

November 2022

Pearson Edexcel GCSE
In Mathematics (1MA1)
Foundation (Calculator) Paper 2F

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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: 1MA1/2F				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
1	−7, −2, −1, 0, 7	B1	cao	Accept reverse order
2	$\frac{37}{100}$	B1	oe fraction	
3	13	B1	cao	
4	530	B1	cao	
5	3476	B1	cao	
6 (a)	4.5	B1	accept answer in the range 4.3 to 4.7	
(b)	110	B1	accept answers in the range 108 to 112	
7	49.01	P1	for process to work with the number of miles, eg 12845 – 12468 (= 377) **or** 12845 × 13 (= 166985) **or** 12468 × 13 (= 162084)	
		P1	for process to find the cost, eg "377" × 13 (= 4901) **or** "166985" – "162084" (= 4901)	
		B1	(indep) for converting from pence to pounds, eg "4901" ÷ 100 **or** 13 ÷ 100 **or** miles divided by 100 eg "377" ÷ 100 (= 3.77) or 12845 ÷ 100 (= 128.45) **and** 12468 ÷ 100 (= 124.68)	This mark can be awarded at any stage in the process
		A1	49 or 49.01	
8	315	M1	for 45 × 7	
		A1	cao	

Paper: 1MA1/2F				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
9	Chart	B1	for correct day labels or a linear scale	Accept key in place of labels
		M1	for correct bars showing information for at least 3 days	Condone bars of varying widths Condone no gaps or inconsistent gaps
		A1	for a fully correct bar chart	Labels of Day and Frequency not essential
10 (a)	49	M1	for attempt to find the difference between 07 20 and 08 09	May be seen in stages eg 10+30+9
		A1	cao	
(b)	Yes with correct working	P1	for a process shown to add a time to a departure time, eg 0800 + 7 or 0800 + 15 or 0800 + 7 + 15 **or** process for time at work after Bolton bus stop arrival, eg "0858" + 15 **or** find accumulated additional time, eg 7 + 15 (= 22) **or** starts to work backwards, eg 0920 − 15	
		P1	for a process to select correct bus time from Blackrod to Bolton eg 0809 to 0858	8 09 stated as bus start time or 7 40 (from Wigan) is enough for this mark
		C1	for conclusion of "yes" supported by correct comparable figures, eg states 0913 **or** 0858 and 22 (spare)	NOTE other comparisons may be seen
11	130	P1	process to find the total number of children, eg 214 – 14 (= 200)	
		P1	process to find the number of children wearing a hat, eg "200" × 35 ÷ 100 (= 70) **or** process to find the multiplier for the percentage of children not wearing a hat, eg (100 – 35) ÷ 100 (= 0.65)	
		P1	for full process to find the number of children not wearing a hat, eg "200" – "70" **or** "200" × "0.65" **or** 214 – "70" – 14	
		A1	cao	

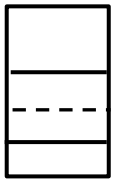
Paper: 1MA1/2F				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
12 (a)	82.5	M1	for a complete method, eg $132 \div 8 \times 5$	$132 - 82.5$ (= 49.5) M1 implied
		A1	cao	
(b)	$\frac{1}{4}, \frac{9}{32}, \frac{21}{64}, \frac{3}{8}$	M1	converts into decimals or percentages or equivalent fractions, at least 2 conversions correct **or** for any 3 fractions in correct order	0.25, 0.28(125), 0.32(8125), 0.37(5)
		A1	cao	Accept in reverse order for this mark Accept expressed in equivalent decimals or percentages or fractions or in mixed numerical form
13	4 pint with correct figures	P1	for a process to find the price for one deal, eg 6 pints on 1st deal, 75×2 (= 150) **or** 8 pints on 2nd deal, 128×1.5 (= 192) oe	
		P1	for a process to find the price for both deals, eg 6 pints on 1st deal, 75×2 (= 150) **and** 8 pints on 2nd deal, 128×1.5 (= 192) oe	
		P1	for a process to find the cost per pint for both deals, eg "150" ÷ 6 (= 25) **and** "192" ÷ 8 (= 24) **or** for prices for a consistent number of pints for both deals eg for 2 pints "1.5" ÷ 3 (=0.5) **and** "1.92" ÷ 4 (= 0.48) **or** a comparison using a unit price eg "150" ÷ 6 × 8 (= 200) **and** 128×1.5 (= 192) oe	Accept in mixed units of pence and pounds Might look at a price difference for a consistent number of pints
		C1	"4 pint" with two correct comparative costs calculated making full use of both offers	"4 pint" can be indicated in words or other indication

Paper: 1MA1/2F				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
14 (a)	$7c + 6d$	M1	for $7c$ **or** $6d$	
		A1	for $7c + 6d$	
(b)	7	M1	for correct method to expand, eg $5 \times 2m - 5 \times 6$, **or** divides both sides by 5 as a first step.	
		M1	for correct method to isolate terms in m, eg $10m - 30 + 30 = 40 + 30$	
		A1	cao	
(c)	$3x + 2y$	M1	for $3x$ or $2y$	Condone use of b and p
		A1	cao	
15 (a)	Diagram	B2	for a fully correct ordered diagram	
		(B1	for a complete unordered diagram or for an ordered diagram with at most one error or omission)	
		B1	for correct key eg 7 | 1 or 70 | 1 represents 71 Key must be consistent with the stem	
(b)	86	M1	for identifying the median, eg "6" circled or an answer of 6 **or** ft their list or diagram for selection of middle value (allow up to two errors or omission in listing)	
		A1	for 86 **or** ft their list or diagram for selection of middle value (allow up to two errors or omission in listing)	

7	1 1 4 5 7
8	2 4 5 6 7 8 9
9	1 4 7 8
10	3

Accept stem of 70, 80, 90, 100
Can be in reverse vertical order (with matching leaves) eg 10, 9, 8, 7
Errors can be omissions; one number in the wrong position is one error.

Paper: 1MA1/2F				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
16	2	P1	for a calculation from within the list $4 \times 12 \div 4 \div 6$ eg 4×12 (= 48) or $12 \div 4$ (= 3) or $6 \div 4$ (=1.5) or $4 \div 6$ (= 0.66..)	
		P1	for a complete process, eg ("48" ÷ 6) ÷ 4 **or** for "$0.\dot{6}$" × 12 ÷ 4	Accept 12 ÷ 6 as a full process
		A1	cao	
17	176	M1	for a method to find 5 products within intervals (including end points)	<table><tr><td>Min *fx*</td><td>Max *fx*</td></tr><tr><td>1200</td><td>1280</td></tr><tr><td>2240</td><td>2380</td></tr><tr><td>4080</td><td>4320</td></tr><tr><td>5400</td><td>5700</td></tr><tr><td>760</td><td>800</td></tr></table>
		M1	for Σ"*fx*" ÷ (8 + 14 + 24 + 30 + 4) **or** (155×8 + 165×14 + 175×24 + 185×30 + 195×4) ÷ (8 + 14 + 24 + 30 + 4) **or** ("1240" + "2310" + "4200" + "5550" + "780") ÷ "80" **or** "14080" ÷ "80"	Σ"*fx*" **must** come from 5 products *fx* within intervals (including end points)
		A1	cao	
18 (a)	(2, 1)	B1	cao	
(b)	Description	C1	correct description, eg as the amount of rainfall decreases the number of hours of sunshine increases	Accept negative correlation Ignore any comment about strength Any numbers used in the description must be within tolerance
(c)	3 to 4	M1	for a suitable line of best fit drawn, **or** for a point marked at (*x*, 7), **or** a horizontal line drawn from 7 across to (*x*, 7) where *x* is in the range 2.5 to 4	
		A1	answer in the range 3 to 4	

Paper: 1MA1/2F				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
19	Elevation	B2 (B1	fully correct side elevation 5 high and 3 wide for a rectangle 5 high and 3 wide or correct side elevation in the wrong orientation)	
20 (a)	$6n + 1$	B2 (B1	oe for $6n + c$ where c is an integer $\neq 1$ or is missing)	
(b)	Shown with supportive working	M1 A1	for $8 – 6n = -58$ or $8 - 6 \times 11 (= -58)$ **or** starts to list terms of the sequence, with at least 3 correct or any other valid method. shown with working or an explanation , eg Yes and 11 or 2, –4, –10, –16, ..., –52, –58	2, −4, −10, −16, −22, −28, −34, −40, −46, −52 May stop at −58 or ring if sequence continues
21	186.15	P1 P1 P1 P1 A1	for correctly finding the area of at least three sections, eg 3 of $11 \times 7 (= 77)$, **or** $9 \times 7 (= 63)$, **or** $\frac{1}{2} \times 11 \times 9 (= 49.5)$, **or** $\frac{1}{4} \times \pi \times 7^2 (= 38.4845..)$ for a method to find the number of bags required for one area or a combination of areas eg "77" ÷ 14 (= 5.5) **or** "227.9845.." ÷ 14 (= 16.2846…) for method to work out the total area for all four sections eg "77" + "63" + "49.5" + "38.4845…" (= 227.9845…) or adding the exact number of bags per section for all four sections eg "5.5" + "4.5" + "3.53.." + "2.74.." (= 16.28...) for method to find the cost, eg integer number of bags × 10.95 cao	Note a trapezium for the rectangle and triangle should be classed as two areas. Accept figures rounded or truncated to 1 dp or better throughout. This mark is dependent upon correct processes seen for all four sections. integer number of bags must come from area ÷ 14 rounded up

Paper: 1MA1/2F				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
22	8.73	M1	for a correct trig statement, eg 14.5 × cos 53 or cos 53 = x ÷ 14.5	Can use a combination of skills but must have only one unknown in x to score this mark
		A1	answer in the range 8.726 to 8.73	If an answer is given in the range in working and then rounded incorrectly award full marks.
23	7318.15	M1	for a correct first step eg working out increase for one year 7000 × (100 + 3) ÷ 100 (= 7210) oe **or** 7000 × 3 ÷ 100 (= 210) oe **or** find the multiplier for both years eg (100 + 3) ÷ 100 × (100 + 1.5) ÷ 100 (=1.04545)	7315 or 315 implies M1
		M1	for a compound method, eg 7000 × (100 + 3) ÷ 100 × (100 + 1.5) ÷ 100 oe **or** "7210" × 1.5 ÷ 100 or (= 108.15) oe	318.15 implies M1M1A0
		A1	cao	
24 (a)	4	B1	for 4	Condone (0,4) or 0,4
(b)	(3, −5)	B1	cao	
(c)	5.1 to 5.3 and 0.7 to 0.9	M1	for a correct method, eg marking both intercepts with x-axis **or** one correct solution	**Accept** both solutions given as a coordinate for M1 eg (5.2, 0.8) **or** (0.8, 5.2) **or** (5.2, 0) **and** (0.8, 0)
		A1	for answers in the range 5.1 to 5.3 and 0.7 to 0.9	
25 (a)	1.25	B1	for 1.25 or $\frac{5}{4}$ or $1\frac{1}{4}$	
(b)	4650 and 4750	B1	for 4650 in the correct position	
		B1	for 4750 in the correct position	Accept 4749.$\dot{9}$ or 4749.99(…)

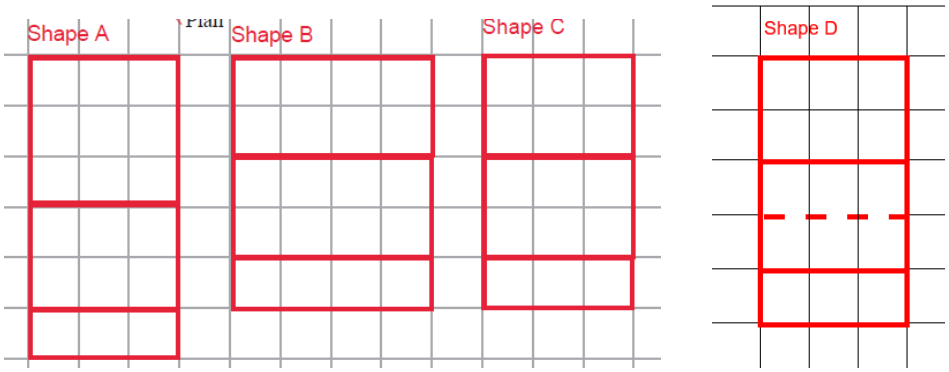
Paper: 1MA1/2F				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
26	152000	M1 A1	for a complete method eg 165680 ÷ 109 × 100 or 165680 ÷ 1.09 oe cao	

Modifications to the mark scheme for Modified Large Print (MLP) papers: 1MA1 2F

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_2F			
Question		**Modification**	**Mark scheme notes**
1		The wording 'following numbers' removed and replaced with 'five numbers below'. Numbers left aligned.	Standard mark scheme
5		Wording added 'Look at the diagram for Question 5 in the Diagram Booklet.' The wording 'Here are' removed and replaced with 'It shows'. Diagram enlarged.	Standard mark scheme
6		Wording added 'Look at the diagram for Question 6 in the Diagram Booklet. It is accurately drawn.' The wording 'Here is' removed and replaced with 'It shows'. Wording added 'Angle ADC is marked *x*.' Diagram enlarged to allow for use of specialist equipment. Angle moved outside the arc. Angle arc made smaller.	(a) accept answers in the range 8.0 to 9.0 (b) accept answers in the range 105 to 115
7		The word 'Here' removed and replaced with 'Below'. Boxes removed and information presented as statements.	Standard mark scheme
8		Frame removed and information left aligned	Standard mark scheme
9		Wording added 'Look at the diagram for Question 9 in the Diagram Booklet.' Table enlarged. Wording added 'in the Diagram Booklet'. Diagram enlarged and cut on top row and right column.	Standard mark scheme
10		Wording added 'Look at the table for Question 10 in the Diagram Booklet.' The wording 'Here is' removed and replaced with 'It shows'. Table enlarged. The fifth row and third column removed.	Standard mark scheme
12	(b)	The wording 'following fractions' removed and replaced with 'four fractions below'. Fractions left aligned.	Standard mark scheme
13		Diagrams removed. Wording added 'Offer 1: 2 pints cost 75p. Pay for 2 bottles, get 1 free. Offer 2: 4 pints cost £1.28. Pay for 1 bottle, get 1 bottle half price.'	Standard mark scheme
14		Values changed: *c* to *p*; *d* to *q*	Standard mark scheme but note change of letters
15		Wording added 'Look at the diagram for Question 15(a) in the Diagram Booklet.' The word 'her removed and replaced with 'seventeen'; 'Here' removed and replaced with 'Below'. Line added to the top of the diagram. Then in part (a): Wording added 'in the Diagram Booklet'. Diagram enlarged. Key box enlarged, moved above the diagram and left aligned. Bottom line added to the diagram.	Standard mark scheme
17		Wording added 'Look at the table for Question 17 in the Diagram Booklet.' Diagram enlarged. Frequency information left aligned and column widened.	Standard mark scheme

PAPER: 1MA1_2F			
Question		**Modification**	**Mark scheme notes**
18		Wording added 'Look at the diagram for Question 18 in the Diagram Booklet.' Diagram enlarged and intermediates marked. Crosses changed to dots. Axes labels moved above the vertical axis and left on the horizontal axis. Open headed arrows. Small squares removed.	Standard mark scheme but in part (c) widen the range to consider 2.5 to 4.5
19		Wording added 'Look at the diagram for Question 19 in the Diagram Booklet. It shows a grid with shapes.' The wording 'and the plan of a solid are shown on the grid' removed and replaced with 'of a solid is shown in the Diagram Booklet.' The wording 'On the grid, draw the' removed and replaced with 'Choose which of the shapes A to D shows the side elevation of the solid from the direction of the arrow. 'Front elevation' and 'Plan' labels moved above. Shapes labelled 'Shape A' to 'Shape D'. Grid and diagrams enlarged. Shape outlines made thicker. Open headed arrow. Arrow made thicker. Model provided. 	As Shape D was omitted from the exam paper, 2 marks were awarded to all candidates who sat modified print papers.

PAPER: 1MA1_2F			
Question		**Modification**	**Mark scheme notes**
20		The wording ‘Here’ removed and replaced with ‘Below’. Terms left aligned.	Standard mark scheme
21		Wording added ‘Look at the diagram for Question 21 in the Diagram Booklet.’ Diagram enlarged. Dashed lines made longer and thicker. Right angles made more obvious. Wording added: ‘All the marked angles are right angles.’ ‘AB = 11 metres’; ‘BC = 7 metres’; ‘DE = 7 metres’; ‘EF = 9 metres’	Standard mark scheme
22		Wording added ‘Look at the diagram for Question 22 in the Diagram Booklet. It shows shape ABC.’ Shape labelled with A, B and C. Wording added: ‘ABC is the right angle’; ‘AC = 14.5 cm’; ‘BC = x cm’; ‘angle ACB = 53º Diagram enlarged. Right angle made more obvious. Angle moved outside smaller angle arc.	Standard mark scheme
24		Wording added ‘Look at the diagram for Question 24 in the Diagram Booklet.’ The wording ‘Here is’ removed and replaced with ‘It shows’. Diagram enlarged and intermediates marked. Axes labels moved above the vertical axis and right on the horizontal axis. Open headed arrows. Small squares removed.	Standard mark scheme

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