

Mark Scheme (Results)

November 2021

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 " $12'' \times 50$; 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] \times 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.

Guida	nce on the use of abbreviations within this mark scheme
м	method mark awarded for a correct method or partial method
Ρ	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)
с	communication mark awarded for a fully correct statement(s) with no contradiction or ambiguity
в	unconditional accuracy mark (no method needed)
oe	or equivalent
сао	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			
Quest	ion	Answer	Mark	Mark scheme	Additional guidance
1		$\frac{31}{100}$ oe	B1	for $\frac{31}{100}$ or any equivalent fraction	Ignore any attempt at simplification of $\frac{31}{100}$
2		300	B1	cao	
3		0.12, 0.21, 1.02, 1.20	B1	accept 1.20, 1.02, 0.21, 0.12	
4	(a)	4 <i>m</i>	B1	cao	
	(b)	3р	B 1	cao	
5		7cm by 4cm rectangle drawn	M1	for a rectangle drawn with one correct dimension or $35 \div 5$ (=7) and $20 \div 5$ (=4) for a fully correct 7cm by 4cm rectangle drawn	Correct calculations/measurements seen the method mark can be awarded even if the drawing is incorrect or not present Accept any orientation of a correct rectangle
		25	D1		
6	(a)	25	BI	cao	
	(b)	24	B1	cao	
7		780	P1	for 2500 – 940 (= 1560) or 2500 ÷ 2 (=1250) and 940 ÷ 2 (=470)	
			P1	for "1560" ÷ 2 or "1250" – "470"	
			A1	cao	

Paper: 1MA1	Paper: 1MA1/2F						
Question	Answer	Mark	Mark scheme	Additional guidance			
8	7	P1 P1	for 6 + 4 + 5 + 8 + 7 + 5 (= 35) for "35" ÷ 5	Working may be seen on the diagram Allow one error in the 6 readings; intention to add must be clear.			
		A1	сао				
9	Explanation	C1	for explanation, Acceptable examples Answer should be 14 Should work out 3×4 first Alec should times first instead of adding Not used BIDMAS/BODMAS BIDMAS/BODMAS He has done it in the wrong order Alec needs to use brackets so $2 + (3 \times 4)$ Because you always do multiplication or division first Not acceptable examples Because the answer is wrong It is $2 + (3 \times 4) = 15$ It needs brackets Because working out should only be one sum				
10	$\frac{17}{30}$	B1	for $\frac{17}{30}$ or any equivalent fraction				
11	Reflection	M1 A1	for a correct reflection of the shape in any horizontal line other than the given mirror line for a fully correct reflection	Allow free hand drawing			

Pape	r: 1MA1	per: 1MA1/2F						
Ques	tion	Answer	Mark	Mark scheme	Additional guidance			
12	(a)	1.844977205	M1	for 3.403(940887) or 3.717(526059) or 2.014(944168) or 1.84() or 1.8()	Accept consistent use of a comma to indicate a decimal point			
			A1	for 1.844(977205)	Answer must be given to at least 3 decimal places rounded or truncated			
	(b)	1.84	B 1	for 1.84 or ft from (a) provided answer to (a) has at least 3 dp				
13	(i)	21	M1	for 180 – 75 – 84				
			A1	сао	Angle may be indicated on the diagram			
	(ii)	Reason given	C1	for reason that <u>Angles</u> on a straight <u>line</u> add up to 180	The key words underlined must be present There should be no incorrect reasons given			
14	(a)	15	B1	14 to 16				
	(b)	540	M1	for a complete method, eg $30 \times (36 \div 2)$ or $45 \times (36 \div 3)$ or $60 \times (36 \div 4)$ or ft "hourly rate from (a)" $\times 36$	May be seen using a complete build up method for "45" allow 44 to 46 ft for accuracy			
			A1	for 540 or ft (a)	Condone use of mixed rates eg $75 \times 7 + 16 = 541$			
15		$\frac{4}{9}, \frac{3}{5}, \frac{5}{8}, \frac{2}{3}$	M1	converts into decimals or percentages or equivalent fractions, at least 2 conversions correct or for any 3 fractions in correct order	0.44(), 0.6, 0.625, 0.66()			
			A1	for $\frac{4}{9}, \frac{3}{5}, \frac{5}{8}, \frac{2}{3}$	Accept in reverse order for this mark Accept expressed in equivalent decimals or percentages or fractions or in mixed numerical form			

Paper: 1MA1	/2F			
Question	Answer	Mark	Mark scheme	Additional guidance
Question 16 (a)	Answer 120	Mark M1 M1	Mark scheme for sensible use of proportion eg $\frac{135}{90}$ (= 1.5) or $\frac{90}{135}$ (= $\frac{2}{3}$) or 135 × 4 (= 540) or 135 ÷ 9 (=15) or 80 ÷ 90 (= 0.888) for a complete method eg 80 × "1.5" or 80 ÷ " $\frac{2}{3}$ " or "540" × $\frac{80}{360}$ or "15" × 8 or "0.888" × 135 cao	Additional guidance ie 135 ÷ 9 but not 135 ÷ 10 without 80 ÷ 9
(b)	$\frac{50}{540}$	M1	for method to find total number of cars, eg $135 \times \frac{360}{90}$ (= 540) or for $\frac{50}{135} \times \frac{1}{4}$ oe or begins to work with probability by using a numerator of 50 eg $\frac{50}{a}$ where a >50 and an integer	Accept any equivalent fraction decimal
		AI	for $\frac{50}{540}$ oe ft "540" from part (a)	form 0.09(25) or percentage form 9(.25)%

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used instead of frequencies
of CIMIMIMIA0 can be
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5", "20", "21", "10"
4
final answer
, if awarded for 200, may be
warded
nnlied by a statement
ith no working, no marks

Paper	aper: 1MA1/2F						
Ques	tion	Answer	Mark	Mark scheme	Additional guidance		
20	(a)	c^3	B1	cao			
	(b)	d^{12}	B1	cao			
21	(a)	x > -1	B1	cao			
	(b)	Diagram drawn	C2	for a fully correct diagram, eg $-5 -4 -3 -2 -1 0 1 2 3 4 5$			
			(C1	for drawing a line from -3 to 4 or (indep) for an open circle at 4 or (indep) for a closed circle at -3)	Condone arrow heads or line ending to denote the 'end' of the line		
22	(a)	12	M1	for a correct factor tree for either 60 or 84 with no more than one arithmetic error or for listing factors of 60 or 84, at least 4 correct for either (with no more than 1 incorrect in either list), could be in factor pairs or for the prime factors of 60 (2, 2, 3, 5) or 84 (2, 2, 3, 7)	Condone the use of 1 in any factor tree 60: 1, 2, 3, 4, 5, 6, 10, 12, 15, 20, 30, 60 84: 1, 2, 3, 4, 6, 7, 12, 14, 21, 28, 42, 84		
			A1	for 12 or 2×2×3 oe SC B1 for answer of 4 or 6, if M0 scored	2,2,3 is not enough, it must be a product		
	(b)	120	M1	for a correct factor tree for either 24 or 40 with no more than one arithmetic error or for at least 3 multiples of both 24 and 40 (can include 24 and 40) or for the prime factors of either 24 (2, 2, 2, 3) or 40 (2, 2, 2, 5) or for a common multiple from their lists (\neq 120) for 120 or 2×2×2×3×5 oe	Condone the use of 1 in any factor tree 24: 24, 48, 72, 96, 120, 40: 40, 80, 120, For the list not containing 120, accept the first 3 correct multiples or one error in the first 4 multiples		

Owertian		aper: 1MA1/2F						
Question	Answer	Mark	Mark scheme	Additional guidance				
23 (a)	80	M1 A1	for a complete method eg $\frac{20}{15}$ × 60 or 20 × 4 or 20 ÷ $\frac{1}{4}$ cao					
(b)	Travel graph	M1	for method to find distance travelled in last 20 minutes, eg 75 × $\frac{20}{60}$ (= 25)	Can be implied by a distance of 25km drawn on the graph				
		C2	for a fully correct travel graph					
		(C1	for horizontal straight line from (10 15, 20) to (10 25, 20) or for a line of the correct length and gradient to indicate a speed of 75km/h eg straight line from (10 25, 20) to (10 45, 45))					
24 (a)	(10), 5, (2), 1, 2, (5), 10	B2	for all 4 values correct					
		(B1	for 2 or 3 correct values)					
(b)	Graph	M1	ft (dep on B1) for plotting at least 5 of their points correctly					
		A1	for a fully correct curve drawn	Accept a freehand curve drawn that is not made of line segments				
(c)	-0.65 to -0.8 and 2.65 to 2.8	M1	for $y = 4$ drawn or intersection with $y = 4$ or $y = x^2 - 2x - 2$ drawn or 1 correct value (ft a quadratic)	If answers stated as coordinates, award M1 for both coordinates and M0 for one coordinate				
		A1	ft a quadratic graph or for answers in the range 2.65 to 2.8 and -0.65 to -0.8					

Paper: 1MA1	/2F			
Question	Answer	Mark	Mark scheme	Additional guidance
25	41.6	P1 P1	for start of process to find the length of the hypotenuse, eg (hyp ² =) $8^2 + 10^2$ (= 164) for complete process to find hypotenuse,	Note lengths may be seen on the diagram
		P1	eg $\sqrt{8^2 + 10^2}$ or $\sqrt{64 + 100}$ or $2\sqrt{41}$ or $\sqrt{164}$ (= 12.8) (dep P2) for complete process to find the required perimeter, eg 8 + 8 + 10 + "12.8" + "12.8 - 10" or 16 + $4\sqrt{41}$	8 + 8+ "12.8" + "12.8" oe is acceptable for this mark
		A1	for answer in the range 41 to 42	If an answer in the range 41 to 42 is given in the working space then incorrectly rounded, award full marks.
26 (a)	17.8	M1	for $\tan 56 = \frac{x}{12}$ or $(BC) = 12 \times \tan 56$ oe or alternative method to find BC	For any alternative method candidates must arrive at an equation with BC as the only unknown
		A1	for an answer in the range 17.7 to 17.8	If an answer in the range 17.7 to 17.8 is given in the working space then incorrectly rounded, award full marks.
(b)	33.6	M1	for $\cos x = \frac{15}{18}$ or $\cos x = 0.83$ or $x = \cos^{-1} \frac{15}{18}$ or alternative method to find x	For any alternative method candidates must arrive at an equation with <i>x</i> as the only unknown
		Al	for an answer in the range 33.5 to 33.91	If an answer in the range 33.5 to 33.91 is given in the working space then incorrectly rounded, award full marks.

Paper: 1MA1	Paper: 1MA1/2F							
Question	Answer	Mark	Mark scheme	Additional guidance				
27	-2, 9	M1 M1 A1	for $(x \pm 2)(x \pm 9)$ or for $(x + a)(x + b)$ where either $ab = -18$ or $a + b = -7$ or one correct answer for $(x + 2)(x - 9)$ cao	Sight of one correct answer as the final answer can gain one mark with or without working				
28	320 000	M1 A1	for a complete method eg 272 000 ÷ $(\frac{100-15}{100})$ 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.

The following tolerances should be accepted on marking MLP papers, unless otherwise stated below: Angles: $\pm 5^{\circ}$ Measurements of length: ± 5 mm

PAPEI	PAPER: 1MA1_2F							
Question		Modification	Mark scheme notes					
3		Wording added 'Write the following four numbers'.	Standard mark scheme					
5		 Wording added 'Look at the diagram and the grid for Question 5 in the Diagram Booklet.' Wording added 'The diagram shows a rectangle with length 35 metres and width 20 metres.' Diagram enlarged. Wording 'On the centimetre grid below' removed and replaced with 'On the grid in the Diagram Booklet, draw an accurate scale drawing of the rectangle.' Wording 'Use a scale of 1 cm' removed and replaced with 'Use a scale of 1 square length on the grid represents 5 metres.' Braille has chosen to use some alternative wording: 'The diagram shows a rectangle and a grid of squares. The rectangle has a length of 35 m and a width of 20 m. Each square on the grid represents a one centimetre square.'; 'Use a scale of 1 cm to represent 5 m'; a spare diagram is also provided, with Wikki Stix and drawing film, 	Standard mark scheme					
6		Wording added 'Below is a list of ten whole numbers.' For Braille this is: 'Look at the list of ten whole numbers from 21 to 30 shown below.'	Standard mark scheme					
8		Wording added 'Look at the diagram for Question 8 in the Diagram Booklet. It shows a vertical line graph.' The number 5 changed to the word 'five'. Diagram enlarged. The graph lines made slightly thicker. Right axis labelled. Axes labels moved to the top of the vertical axis and to the left of the horizontal axis.	Standard mark scheme					

PAPER: 1	PAPER: 1MA1_2F						
Question	Modification	Mark scheme notes					
11	 Wording added 'Look at the diagram for Question 11 in the Diagram Booklet. It shows shape A on a grid.' The shape of the triangle changed to a 2 × 2 right-angled triangle. Diagram enlarged. Shading changed to dotty shading. 'mirror line' labelled on both sides of the diagram. A shape may be provided. Wording added 'A cut out shape may be available if you wish to use it.' 	Standard mark scheme					
13	Wording added 'Look at the diagram for Question 13 in the Diagram Booklet. It shows the straightline RST.' For Braille the levels U and V have been added to the ends of the unmarked lines.Wording added 'The angles x° , 75° and 84° are marked on the straight line.'Diagram enlarged. Angles moved outside of the angle arcs and the angle arcs made smaller.Also for Braille: 'In the diagram, angle $VST = 84^{\circ}$ angle $VSU = 75^{\circ}$ angle $USR = x^{\circ}$ '	Standard mark scheme					
14	 Wording added 'Look at the diagram for Question 14 in the Diagram Booklet. Nazima uses the graph'. Diagram enlarged. Right axis labelled. Small squares removed. Open headed arrows. Axes labels moved to the top of the vertical axis and to the left of the horizontal axis. 	Standard mark scheme					
15	Wording added 'Write the following four fractions'.	Standard mark scheme					
16	 Wording added 'Look at the diagram for Question 16 in the diagram book. It shows a pie chart which gives'. Wording added 'There are black cars, white cars and cars in other colours.' Diagram enlarged. Right angle made more obvious. Angle moved outside of the angle arc and the angle arc made smaller. Also for Braille: 'The black sector makes a right angle at the centre. The white sector makes an angle of 80° at the centre.' 	Standard mark scheme					

PAPER: 1MA1_2F					
Question		Modification	Mark scheme notes		
17		Wording added 'Look at the diagram for Question 17 in the Diagram Booklet. It shows an incomplete frequency tree.' Wording added 'Complete the frequency tree in the Diagram Booklet for this information. There are six spaces to fill.' Diagram enlarged. The labels moved above the circles. Braille: Alternative sentence "The diagram shows an incomplete frequency tree." Letters added: (i), (ii), (iii), (iv), (v) & (vi) in the blank spaces. 'Ans: (i)(ii)(iii)(iv)(v)(vi)'	Standard mark scheme.		
18		Wording added 'Look at the incomplete table for Question 18 in the Diagram Booklet. It gives'. The 'Number of planks' column widened if candidate wants to use it for working out space. Table enlarged. Braille: Alternative wording "The incomplete table below gives" Letters added: (i) in the blank space on the table. 'Ans: (i) planks'	Standard mark scheme		
20	(a)	The letter <i>c</i> changed to <i>p</i> .	Standard mark scheme but note change of letter		
20	(b)	The letter d changed to q .	Standard mark scheme but note change of letter		
21	(a)	Wording added 'Look at the diagram for Question 21(a) in the Diagram Booklet. It shows a number line.' Wording 'shown on this number line' removed and replaced with 'shown on the number line.' Diagram enlarged. The scale cut at -3, but -3 still marked. Axis label moved to the right. Scale markings moved above and below. Open headed arrows and shortened at the end of the scale.	Standard mark scheme		

PAPER: 1MA1_2F					
Question		Modification	Mark scheme notes		
21	(b)	Wording added 'Look at the diagram for Question 21(b) in the Diagram Booklet. It shows a blank number line.' Diagram enlarged. The scale cut at -4, but -4 still marked. Open headed arrow and shortened at the end of the scale. Axis label moved to the right. Scale markings moved above and below. Braille: a spare diagram is provided with 4 round bumpons, 4 square bumpons, Wikki Stix and drawing film.	Standard mark scheme		
23		 Wording added 'Look at the diagram for Question 23 in the Diagram Booklet.' Wording added 'The travel graph for the first 15 minutes of his journey is shown in the Diagram Booklet.' Diagram enlarged. Right axis labelled. Open headed arrows. Axes labels moved to the top of the vertical axis and to the left of the horizontal axis. In (b) Wording added 'On the grid in the Diagram Booklet,'. Braille: time shown with colons. Braille alternative wording: 'The diagram shows an incomplete travel graph for Sam's car journey.' 'The first 15 minutes of his journey is represented on the graph.' In part (b) for Braille a spare diagram is provided with 6 round bumpons and Wikki Stix. 	Standard mark scheme		
24	(a)	Table enlarged and turned vertical. Wording added 'There are four spaces to fill.' Braille: In the table (i), (ii), (iii), & (iv) in the blank spaces, then 'Ans: (i)(ii)(iii)(iv)'	Standard mark scheme		
24	(b)	Wording added 'Look at the diagram for Question 24(b) in the Diagram booklet. It shows a grid.' Diagram enlarged. Small squares removed. Open headed arrows. Axes labels moved to the top of the vertical axis and to the right of the horizontal axis. Braille: a spare diagram is provided with 16 round bumpons and Wikki Stix.	Standard mark scheme but in part (c) answers in the ranges 2.6 to 2.9 and -0.6 to -0.9		

PAPER: 1MA1_2F					
Question		Modification	Mark scheme notes		
25		 Wording added 'Look at Diagram 1 and Diagram 2 for Question 25 in the Diagram Booklet. Diagram 1 shows a right-angled triangle labelled shape A with a base length of 10 mm and a vertical height of 8 mm.' Diagrams enlarged. Right angles made more obvious. Wording added 'Diagram 2 is a shaded shape made from two shape A triangles.' 'shape A' wording added inside the triangles. Wording 'Work out the perimeter of the shaded shape in Diagram 2.' 	Standard mark scheme		
26	(a)	Wording added 'Look at the diagram for Question 26(a) in the Diagram Booklet. It shows a right- angled triangle, <i>ABC</i> .' Wording added: ' $AC = 12$ cm, Angle $BAC = 56^{\circ}$, Angle <i>CAB</i> is a right angle.' Diagram enlarged. Right angle made more obvious. Angle moved outside of the angle arc and the angle arc made smaller.	Standard mark scheme		
26	(b)	Wording added 'Look at the diagram for Question 26(b) in the Diagram Booklet. It shows a right- angled triangle, PQR .' Wording added: ' $PR = 18$ cm, $RQ = 15$ cm, Angle PQR is a right angle, Angle PRQ is marked x' Diagram enlarged. Right angle made more obvious. Angle moved outside of the angle arc and the angle arc made smaller.	Standard mark scheme		

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