



Mark Scheme (Results)

November 2022

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

Edexcel and BTEC Qualifications

Edexcel and BTEC qualifications are awarded by Pearson, the UK's largest awarding body. We provide a wide range of qualifications including academic, vocational, occupational and specific programmes for employers. For further information visit our qualifications websites at www.edexcel.com or www.btec.co.uk. Alternatively, you can get in touch with us using the details on our contact us page at www.edexcel.com/contactus.

Pearson: helping people progress, everywhere

Pearson aspires to be the world's leading learning company. Our aim is to help everyone progress in their lives through education. We believe in every kind of learning, for all kinds of people, wherever they are in the world. We've been involved in education for over 150 years, and by working across 70 countries, in 100 languages, we have built an international reputation for our commitment to high standards and raising achievement through innovation in education. Find out more about how we can help you and your students at: www.pearson.com/uk

November 2022

Question Paper Log Number P68724

Publications Code 1MA1_3F_2211_MS

All the material in this publication is copyright

© Pearson Education Ltd 2022

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 $2 \times 6 (=12)$ 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.

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: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
1	0.408, 0.41, 0.46, 0.5	B1	for 0.408, 0.41, 0.46, 0.5	Accept written in reverse order
2	2000	B1	cao	Accept two (2) thousand(s) or just thousand(s)
3	0.8	B1	cao	
4	19	B1	cao	
5	18	B1	cao	
6 (a)	6	B1	cao	
(b)	May, October	B1	cao	
7	145.60	P1	for a process to work out the value of the large bars eg $208 \div 4$ (=52 or 5200)	units may be ignored for the process marks work could be in pence or £
		P1	for a process to work out the value of the small bars eg $(208 - "52") \times 60$ or $(1 - \frac{1}{4}) \times 208 \times 60$ (=9360 or 93.6(0)) or for 145.6	
		A1	for 145.60 cao (must be correct money notation)	
8 (a)	102	B1	cao	
(b)	82	M1	for a method of extracting the correct 4 numbers from the table, adding all 4 numbers and then dividing by 4 eg $(143+121+45+19) \div 4$ or $"328" \div 4$	
		A1	cao	

Paper: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
9	(a)	B1	cao	
	(b)	B1	for the point (1, 4) unambiguously marked on the grid	need not be labelled if clear
	(c)	B1	for correct line unambiguously marked	need not be labelled if clear accept a line drawn freehand
10	(i)	B1	states two terms eg 11, 10 or 9, 6	May be written on the sequence with no contradiction elsewhere
	(ii)	C1	<p>explanation</p> <p>Acceptable examples Take away 2 then 1; take away 4 then 3 The difference goes down by 1 each time -4, -3; -2, -1 The differences are 4 and 3; the differences are 2 and 1</p> <p>Not acceptable examples It goes down by 1 each time An algebraic rule</p>	
11	160	M1	for $8 \times 5 \times 4$	
		A1	cao	
12	1 : 6 : 3	M1	for any two algebraic statements from x , $6x$, $6x/2$ oe	For any equivalent ratio.
		A1	<p>or any two numbers as a correct ratio eg 1 : 6 or 6 : 3 or 1 : 3 oe</p> <p>or any 3-term ratio using the numbers 1, 6 and 3</p> <p>oe</p>	

Paper: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
13 (a)(i)	40	B1	cao	Underlined words need to be shown.
(ii)	Reason	C1	Reason given <u>Angles</u> in a <u>quadrilateral</u> add up to 360. Accept “4-sided shape”	
(b)	Explanation	C1	Explanation Acceptable examples 190 > 180 It does not add up to 180 80+60+50=190 Angles in a triangle add up to 180 Not acceptable examples One of the angles needs to be less You cannot draw this triangle	
14 (a)	30	B1	cao	Condone some inaccuracy in reading from the graph, which should be given to within the nearest 50g
(b)	2238 to 2296	M1 A1	for a complete method eg attempts to read from the graph at a factor of 80 and scales up to 80 using a correct scale or attempts to read from the graph using numbers that sum to 80 and finds the sum of their readings or attempts to read from the graph a number that they then go on to scale up to 80 using a correct scaling factor for an answer in the range 2238 to 2296	

Paper: 1MA1/3F					
Question	Answer	Mark	Mark scheme		Additional guidance
15	Yes (supported)	P1	for finding the cost of 1 kg of carrots eg $1.74 \div 3 (= 0.58)$	for finding the cost of 1 kg onions eg $2.(00) \div 4 (= 0.5)$	for all P marks can work in pence or in £
		P1	for isolating the cost of 2.5 kg of onions eg $2.36 - (2 \times "0.58") (= 1.2(0))$	for finding the cost of 2.5 kg of onions eg $2.5 \times "0.5" (= 1.25)$	
		P1	for the cost of 1 kg of onions or 0.5 kg of onions, eg $"1.20" \div 2.5 (= 0.48)$ or $"1.20" \div 5 (= 0.24)$ or for $4 \div 2.5 (= 1.6)$	for finding the cost of 2 kg of carrots eg $2.36 - "1.25" (= 1.11)$	
		P1	for the cost of 4 kg of onions, eg $4 \times "0.48"$ or $8 \times "0.24" (= 1.92)$ or for $"1.6" \times "1.2(0)"$	for finding the cost of 3 kg of carrots eg $"1.11" \div 2 \times 3 (= 1.665)$ <i>for comparison with 1.74</i>	
		C1	Yes with correct figures shown eg 192 or 1.92 or "has 8p left" or 166.5		Allow comparison of mixed units eg 192 with £2

Paper: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
16	Comments	<p>C1</p> <p> makes some comment about the labels Acceptable examples states what labels should be (not angles) labels are missing The label in the table does not match the label with the pie chart Not acceptable examples angles not marked on the pie chart </p> <p>C1</p> <p> comments about the inaccuracy of the angles in the pie chart Acceptable examples pie chart is not accurate / should be 108, 126, 126 angles drawn inaccurately They haven't converted the number of potatoes to angles Need to scale the numbers in the table Not acceptable examples pie chart is wrong/ sectors are the wrong size (the angles) do not add up to 360 </p>		
17	(a) 87 600	B1	cao	
	(b) 13.524	<p>M1</p> <p> for 33.81 or 2.5 or $\frac{3381}{250}$ or digits 13524 </p> <p>A1</p> <p>cao</p>		
18	Rotation drawn	<p>B2</p> <p> correct shape drawn at (2, -1), (2, -4), (4, -2), (4, -1) </p> <p>(B1)</p> <p> for a correct shape drawn clockwise 90° about (0,0) or a shape drawn in the correct quadrant with the correct orientation or a shape with at least 3 vertices correct </p>		

Paper: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
19 (a)	15	B1	cao	Accept readings from the graph as an indication at this stage
(b)	4.6	B1	for an answer in the range 4.4 to 4.8	
(c)	12	M1	for a method to calculate speed eg distance $\div$ time (could be implied from figures used) eg $4 \div 20 (= 0.2)$ oe, $4 \div 0.33(\dots)$ oe or $4 \div 1/3$ oe	
		A1	cao	
20	100g butter 25g sugar 1 egg	P1 P1 P1 C1	for process to find the amount needed of one ingredient for 25 scones for process to find the amount needed for at least three ingredients for 25 scones or for process to find the correct amount more for at least two of butter, sugar, eggs for complete process to find amount more for each of butter, sugar, eggs for correct amounts more shown for butter, sugar, eggs	amount needed: 200g butter 875 flour 75 sugar 5 eggs Flour can be excluded, but no incorrect information about flour should be given.
21	$a = \frac{p+9}{3}$	M1 A1	for correct first step to rearrange eg $p + 9 = 3a - 9 + 9$ or $\frac{p}{3} = \frac{3a-9}{3}$ oe or answer ambiguously shown eg $a = p + 9 \div 3$ or given as $\frac{p+9}{3}$ oe oe	May be seen in different equivalent forms but must be carried out, not just intention seen.

Paper: 1MA1/3F																									
Question	Answer	Mark	Mark scheme		Additional guidance																				
22	Description	C1	Identifies a mistake in the working Acceptable examples Rob should divide by 8 He should have added the 3 and 5 first He divided 120 by 3 and 5 instead of 8 He did not do it as $120 \times \frac{3}{8}$ and $120 \times \frac{5}{8}$ He did not add the two ratios first Not acceptable examples He has done it in two parts but he should do it in one The answer should be 45 : 75 They do not add up to 120 He is supposed to add his numbers 40 + 24 does not equal 120																						
23	22	P1 P1 A1	for process to find total choosing German eg 200 – 104 – 70 (=26) for complete process to find boys choosing Spanish eg 90 – (60 + (“26” – 18)) cao	for process to find girls choosing French (44) or total number of girls (110) for complete process to find boys choosing Spanish eg 70 – (“110” – “44” – 18)	<table><tr><td></td><td>F</td><td>S</td><td>G</td><td>total</td></tr><tr><td>girls</td><td>44</td><td>48</td><td>18</td><td>110</td></tr><tr><td>boys</td><td>60</td><td>22</td><td>8</td><td>90</td></tr><tr><td>total</td><td>104</td><td>70</td><td>26</td><td>200</td></tr></table>		F	S	G	total	girls	44	48	18	110	boys	60	22	8	90	total	104	70	26	200
	F	S	G	total																					
girls	44	48	18	110																					
boys	60	22	8	90																					
total	104	70	26	200																					

Paper: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
24	Yes (supported)	P1	for a process to find the volume of 1 tank eg $\pi \times 40^2 \times 160$ (= 804247.7... or 804.2...or 256000 π)	Could be truncated or rounded
		P1	for complete process to find the volume of 4 tanks, [volume of tank] $\times$ 4 eg $\pi \times 40^2 \times 160 \times 4$ (= 3216990.8... or 3216.9... or 1024000 π) or for process to find volume of fertiliser available per tank eg $32 \times 1000 \div 4$ (= 8000)	For this mark [volume of tank] must come from a calculation involving π , r^2 , h
		P1	for a process to find the amount of mixture for 1 tank eg [volume of tank] $\div$ 101 (= 7962.8...) or 4 tanks (= 31851.3...) OR for a process to find volume of mixture that 32 litres of fertiliser will make eg 32000×101 (= 3232000) or 32×101 (= 3232)	For this mark [volume of tank] must come from a calculation involving π , r^2 , h or be stated as their volume
		C1	for Yes supported by correct figures shown eg a comparable figure in the range 31.8 to 31.9 (litres) or in the range 31800 to 31900 with 32000 (cm ³) or in the range 3216 to 3217 with 3232 (litres) or in the range 3216000 to 3217000 with 3232000 (cm ³) or in the range 7958 to 7963 with 8000 (cm ³)	There are other possible pairs of values which can be used in the comparison
25	(a)	16	for a ratio of $\frac{20}{5}$ or $\frac{5}{20}$ or 4 or 0.25 or $\frac{5}{4}$ or $\frac{4}{5}$ or 1.25 or 0.8 oe	
		M1		
	(b)	5.5		
		M1		
		A1	cao	
		M1	for $22 \times \text{“0.25”}$ or $22 \div \text{“4”}$ oe	
		A1	oe	

Paper: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
26 (a)	0.7	B1	for 0.7 on the first branch	Accept equivalent fractions or percentages for probabilities
	0.65, 0.65	B1	for 0.65, 0.65 on the second branches	
	0.105	M1	for 0.3×0.35	
		A1	oe	
27 (a)	0.008	B1	for 0.008 or 8×10^{-3}	May be awarded at any stage
27 (b)	50	M1	for conversion from km to m eg 180×1000 (= 180 000) or for conversion from hours to seconds eg $180 \div (60 \times 60)$ (= 0.05) or for conversion from km per hour to metres per second, eg $1000 \div (60 \times 60)$ (= 0.277...) (Accept $(60 \times 60) \div 1000$ (= 3.6))	
		M1	for a complete process eg $180 \times 1000 \div 3600$	
		A1	cao	
28	158	P1	for a first step in the process eg 50×167.6 (=8380) or 20×182 (=3640)	
		P1	for a complete process eg $(50 \times 167.6 - 20 \times 182) \div 30$ or $\frac{8380 - 3640}{30}$ or $4740 \div 30$	
		A1	cao	

Paper: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
29 (a)	0.000675	B1	cao	If the answer (for 2 marks) is seen in working and then rounded or truncated, award full marks.
(b)	6.592×10^5	M1	for 10.5472×10^3 oe or 1.6×10^8 oe or 2.575×10^{-1} oe or for 6.592×10^n where $n \neq 5$ or for 6.59×10^5 or for 6.6×10^5 or for 659200 oe	
		A1	cao	
30 (a)(i)	$\begin{pmatrix} 1 \\ 5 \end{pmatrix}$	B1	for $\begin{pmatrix} 1 \\ 5 \end{pmatrix}$	Need not be shown in brackets at this stage
(ii)	$\begin{pmatrix} 0 \\ 5 \end{pmatrix}$	M1	for substitution of values eg $\begin{pmatrix} 2 \times 2 - 4 \\ 3 \times 2 - 1 \end{pmatrix}$ oe OR for $\begin{pmatrix} 0 \\ b \end{pmatrix}$ or $\begin{pmatrix} a \\ 5 \end{pmatrix}$ where a, b are integer values.	
		A1	for $\begin{pmatrix} 0 \\ 5 \end{pmatrix}$	
(b)	correct vector drawn	C1	for a correct vector drawn from point P	Need not be labelled but do not award if there is any ambiguity.

Modifications to the mark scheme for Modified Large Print (MLP) papers: 1MA1 3F

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: $\pm 5^\circ$

Measurements of length: ± 5 mm

PAPER: 1MA1_3F		
Question	Modification	Mark scheme notes
1	Word added 'four'. Numbers left aligned.	Standard mark scheme
5	The wording 'Here is a list of numbers' removed and replaced with 'Below is a list of five numbers'. Numbers left aligned.	Standard mark scheme
6	Wording added 'Look at the diagram for Question 6 in the Diagram Booklet.' The wording 'The graph shows' removed and replaced with 'It shows a graph with'. Diagram enlarged. Axes labels moved to above the vertical axis and left on the horizontal axis. Crosses changed to dots. Right axis labelled. Open headed arrows. Small squares removed	Standard mark scheme
8	Wording added 'Look at the table for Question 8 in the Diagram Booklet.' Table turned vertical. Table enlarged	Standard mark scheme
9	Wording added 'Look at the diagram for Question 9 in the Diagram Booklet. The diagram shows point A on the grid.' Axes labels moved to above the vertical axis and right on the horizontal axis. Cross changed to a dot. Open headed arrows. Diagram enlarged. In part (b) the wording 'with a cross (X)' removed.	Standard mark scheme
11	Wording added 'Look at the diagram for Question 11 in the Diagram Booklet.' The wording 'Here is a cuboid' removed and replaced with 'The diagram shows a cuboid with length 8cm, width 4cm and height 5cm.' Diagram enlarged. '5cm' label moved to left side.	Standard mark scheme
12	Wording added 'Look at the information in the Diagram Booklet. It shows a ratio.' Left align the ratio.	Standard mark scheme
13	(a) Wording added 'Look at the diagram for Question 13(a) in the Diagram Booklet.' Diagram enlarged and rotated to make side CD horizontal. Wording added: 'Angle DAB = Angle ABC = 120°; Angle BCD = 80°; Angle CDA is marked x' Angles moved outside angle arcs. Angle arcs made smaller.	Standard mark scheme
13	(b) Wording added 'Look at the diagram for Question 13(b) in the Diagram Booklet.' The word 'below' removed. Wording added 'The three angles are marked 80°, 60° and 50°.' Diagram enlarged. Angles moved outside angle arcs. Angle arcs made smaller.	Standard mark scheme
14	Wording added 'Look at the diagram for Question 14 in the Diagram Booklet.' Axes labels moved to above the vertical axis and left on the horizontal axis. Open headed arrows. Diagram enlarged. Small squares removed. Right axis labelled. Graph line thickened. Part (b) changed from 80g to 75g	Standard mark scheme in (a) In (b) apply the standard mark scheme for M1 but for 75 instead of 80 A1 2000 to 2250

PAPER: 1MA1_3F

Question		Modification	Mark scheme notes
16		Wording added 'Look at the table and the diagram for Question 16 in the Diagram Booklet.' Wording added 'in the Diagram Booklet'. Table enlarged. Diagram enlarged. The word 'this' removed and replaced with 'the' twice. Wording added 'in the Diagram Booklet' twice.	Standard mark scheme
18		Shape labelled 'shape A' and another 'shape B' added. Shading changed. The wording 'Rotate the shaded shape 90° anticlockwise about (0,0)' removed and replaced with 'Describe fully the single transformation that maps shape A onto shape B.'	B2 for (i) rotation (ii) 90 (iii) anticlockwise (iv) (0,0) Accept 270 AND clockwise for (ii) & (iii) and "origin" for (0,0) (B1 for two of the above aspects) If there is any indication of any other transformation award 0 marks.
19		Wording added 'Look at the diagram for Question 19 in the Diagram Booklet.' Wording added 'In the Diagram Booklet'. Diagram enlarged. Small squares removed. Axes labels moved above the vertical axis and left on the horizontal axis. Right axis labelled. Open headed arrows. Graph line thickened.	Standard mark scheme
20		Wording added 'Look at the information for Question 20 in the Diagram Booklet.' The wording 'Here' removed and replaced with 'It shows'. Frame removed. Information left aligned	Standard mark scheme
21		Value changed: a to n	Standard mark scheme but note change of letter.
22		Equations stacked vertically and moved left with equals symbols aligned.	Standard mark scheme
24		Wording added 'Look at the diagram for Question 24 in the Diagram Booklet. You may be provided with a model. It is not accurate.' Diagram enlarged. Model provided. '160cm' label moved to left side.	Standard mark scheme
25		Wording added 'Look at the diagram for Question 25 in the DB.' Diagrams stack vertically and enlarged. Angle arcs made smaller. Arcs at C and F separated more. Wording added: AC = 5 cm; BC = 4 cm; DE = 20 cm; DF = 22 cm; 'Angle ABC = Angle DEF' ; 'Angle ACB = DFE'	Standard mark scheme
26		Wording added 'Look at the diagram for Question 26 in the DB.' Diagram enlarged.	Standard mark scheme
30	(b)	Wording added 'Look at the diagram for Question 30(b) in the DB.' Diagram enlarged. Cross changed to a dot.	Standard mark scheme

