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Edexcel

Mark Scheme (Results)

November 2021

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 $2 \times 6 (=12)$ 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: 1MA1/1F				
Question	Answer	Mark	Mark scheme	Additional guidance
1	30	B1	cao	
2	-10, -7, -2, 0, 1, 8	B1	Accept the reverse order, eg 8, 1, 0, -2, -7, -10	
3	0.09	B1	cao	Accept an answer of .09
4	330	B1	cao	
5	49	B1	cao	
6 (a)	Trapezium	B1	for trapezium	Accept incorrect spelling provided intention is clear Accept incorrect spelling provided intention is clear
(b)	Cylinder	B1	for cylinder	
7	14	M1 A1	for $42 \div 3$ cao	
8	Error identified	C1	error correctly identified Acceptable examples bar for brown is too high 16 should be 15 brown needs to be one less brown is wrong the graph does not match the table Not acceptable examples no title the gaps between the bars are wrong	

Paper: 1MA1/1F				
Question	Answer	Mark	Mark scheme	Additional guidance
9	No with correct figures	P1 P1 A1	for $1.20 + 0.70 + 2.30 + 2.30 (= 6.5(0))$ or for adding 3 correct costs or for 2 correct costs plus change or for $10 - 2$ correct costs for a complete correct method, eg $10 - "6.50"$ or $10 - 1.20 - 0.70 - 2.30 - 2.30 (=3.50)$ or $1.20 + 0.70 + 2.30 + 2.30 + 3.30 (=9.80)$ for No with correct figures, eg $3.5(0)$ or $9.8(0)$	Could work in £ or p for P marks Accept $2.30 + 2.30 (= 4.60)$ as 2 costs Accept absence of "0" in pence column
10	7	P1 A1	for process to find temperature on Wednesday, eg $5 - 10 + 3 (= -2)$ or $-10 + 3$ or $10 - 3$ for 7, accept -7	Be aware of correct use of a number line
11 (a)	16	B1	cao	If the scale is misread in part (a), allow ft marks in parts (b) and (c) for all marks provided consistently used. Some interpretation of shapes will be needed
(b)	12	M1 A1	for 22 or 10 or $(11 - 5) \times 2$ oe or 1.5×8 oe cao	
(c)	Pictogram	C3 (C2 (C1	for Thursday = 8 drawn oe and Friday = 24 drawn oe for Thursday = 8 drawn oe or for Friday = 24 drawn oe or Thursday = 8 and Friday = 24 or for Thursday = 24 drawn oe and Friday = 8 drawn oe) for $32 \div 4 (= 8)$ or $32 \div 4 \times 3 (= 24)$ or $32 \div 8$ or for a total of 32 drawn for Thursday and Friday)	

Paper: 1MA1/1F				
Question	Answer	Mark	Mark scheme	Additional guidance
12	Yes, supported by correct working	P1 P1 A1	<p>for 36 : 48 oe</p> <p>OR</p> <p>$\frac{36}{84}$ oe or $\frac{48}{84}$ oe</p> <p>for $\frac{4}{7}$ or 3 : 4 oe (for group 2)</p> <p>OR</p> <p>$(\frac{36}{84} = \frac{3}{7})$ or $(\frac{48}{84} = \frac{4}{7})$</p> <p>or $84 \times 3 \div 7 (= 36 \text{ boys})$ or $84 \times 4 \div 7 (= 48 \text{ girls})$</p> <p>or $N \times 3 \div 7$ and $N \times 4 \div 7$</p> <p>for Yes with both ratios 3 : 4 oe</p> <p>or for a correct pair of fractions and stating they are equivalent.</p>	<p>Relating to drama group 1</p> <p>Relating to drama group 2</p> <p>N can be any number (other than 84) of students in the 2nd group</p> <p>Both equivalent forms of the ratios (fractions) must be the same</p> <p>“Yes” may be implied from working</p>
13 (a)	Explanation	C1	<p>for explanation</p> <p>Acceptable examples</p> <p>the sequence is going +1, +2 so the next term is +3</p> <p>1 +1= 2, 2 +2= 4, 4 +3= 7</p> <p>add the current term position to the term to get the next term</p> <p>add the two previous terms and add 1</p> <p>Not acceptable examples</p> <p>you add 1 each time</p> <p>the number goes up by 3</p> <p>7 is wrong it should be 8 because you double each time</p>	The pattern may be just seen on the sequence given
(b)	36	M1 A1	<p>for finding the next term of $10 + 5 (=15)$ or for $\frac{1}{2} \times 8 \times (8 + 1)$ oe</p> <p>cao</p>	

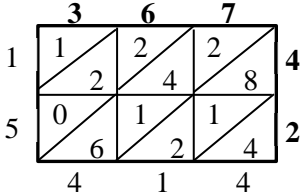
Paper: 1MA1/1F				
Question	Answer	Mark	Mark scheme	Additional guidance
14	3.3(0)	P1 P1 OR P1 A1	<p>for a process to find cost of 1 kg of carrots, eg $1.80 \div 3 (= 0.60)$</p> <p>for a start to a process to find cost of 1kg of potatoes, eg $3.45 - 2 \times "0.60" (= 2.25)$ or $(1.80 + 3.45) \div 5 (= 1.05)$</p> <p>OR</p> <p>for a process to find the cost of 4 kg of carrots, eg $"0.60" \times 4 (= 2.40)$</p> <p>(dep on P2) for a complete process to find the cost of 4 kg of carrots and the cost of 2 kg of potatoes,</p> <p>eg $"0.60" \times 4 (= 2.40)$ and $("2.25" \div 5) \times 2 (= 0.90)$ or $"0.60" \times 4 (= 2.40)$ and $("1.05 - "0.60") \times 2 (= 0.90)$</p> <p>cao</p>	<p>Could work in £ or p for P marks Condone incorrect money notation</p> <p>1 kg of potatoes = (£)0.45 or 45p</p> <p>Award 0 marks for a correct answer with no supportive working.</p>
15 (a)	$2a + 2d$	B1	cao	Accept $2 \times a + 2 \times d$
(b)	$y(6y - 5)$	B1	cao	Accept $y \times (6y - 5)$
(c)	11	M1 A1	<p>for isolating x terms, eg $4x = 37 + 7$ or $4x = 44$ or for $x - \frac{7}{4} = \frac{37}{4}$ or for $37 + 7 = 44$ followed by $"44" \div 4 (= 11)$</p> <p>cao</p>	

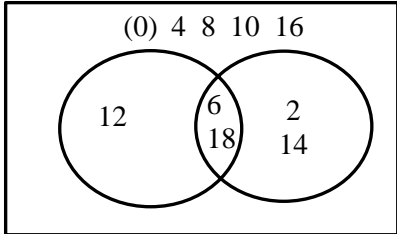
Paper: 1MA1/1F				
Question	Answer	Mark	Mark scheme	Additional guidance
16 (a)	Explanation	C1	for explanation, eg AB cannot be zero (cm) or shows AB to be zero, eg $4 \times 0.5 - 2 = 0$	Accept say ' AB would then be 0'
(b)	2.5	P1	for a correct expression for AD , eg $3(4x - 2)$ or $12x - 6$ OR $2(3AB + AB) = 64$ oe or $3AB + AB = 32$ oe or $AB = 8$ OR for an equation with mixed variables, eg. $6AB + 2(4x - 2) = 64$	May be seen on diagram
		P1	for forming a correct equation in x , eg $4x - 2 + 4x - 2 + 3(4x - 2) + 3(4x - 2) = 64$ or $4x - 2 = 8$ or $4x - 2 + 3(4x - 2) = 32$	
		A1	cao	

Paper: 1MA1/1F				
Question	Answer	Mark	Mark scheme	Additional guidance
17 (a)	42	P1	<p>for a correct start to the process by finding the number of batches for one ingredient, eg $500 \div 125 (= 4)$ or $700 \div 200 (= 3.5 \text{ or } 3)$ or $250 \div 50 (= 5)$</p> <p>OR</p> <p>for a correct start to building up number of batches of all ingredients, eg. (24 biscuits or 2 batches =) 250 (butter), 400 (flour) and 100 (sugar)</p> <p>OR</p> <p>for a start to the process by finding the amount of one ingredient needed to make 1 biscuit, eg $125 \div 12 (= 10 \frac{5}{12})$ or $200 \div 12 (= 16 \frac{8}{12})$ or $50 \div 12 (= 4 \frac{2}{12})$</p>	
		P1	<p>for a correct process to find the number of batches for all 3 ingredients, eg $500 \div 125 (= 4)$ and $700 \div 200 (= 3.5 \text{ or } 3)$ and $250 \div 50 (= 5)$</p> <p>OR</p> <p>for a build-up process reaching a point where there is not enough of one ingredient, eg. (36 biscuits or 3 batches =) 375 (butter), 600 (flour) and 150 (sugar) or (48 biscuits or 4 batches =) 500 (butter), 800 (flour) and 200 (sugar)</p> <p>OR</p> <p>for a correct process to find the amount of each ingredient needed to make 1 biscuit, eg $125 \div 12 (= 10 \frac{5}{12})$ and $200 \div 12 (= 16 \frac{8}{12})$ and $50 \div 12 (= 4 \frac{2}{12})$</p>	

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Paper: 1MA1/1F				
Question	Answer	Mark	Mark scheme	Additional guidance
(b)	Explanation	P1	(dep on P2) for a process to find the number of biscuits, eg "4" \times 12 (= 48) or "3.5" \times 12 (= 42) or "3" \times 12 (= 36) or "5" \times 12 (= 60) OR (dep on P2) for $(700 - 600) \div 200 \times 12 (= 6)$ or "3" \times 12 (= 36) OR (dep on P2) for a process to find the number of biscuits, eg $500 \div "10 \frac{5}{12}" (= 48)$ or $700 \div "16 \frac{8}{12}" (= 42)$ or $250 \div "4 \frac{2}{12}" (= 60)$	
		A1	cao	
		C1	(dep on P3) for a correct explanation, ft (a) for the critical ingredient identified Acceptable examples No, since flour is the critical value No, since flour gives you the least number of batches No since she needs more flour to make more biscuits. Not acceptable examples Yes ... No (no reason given) No, since we would need more of the other ingredients too	

Paper: 1MA1/1F																
Question	Answer	Mark	Mark scheme	Additional guidance												
20 (a)	15.414	M1	for a complete method with relative place value correct including an intention to add all the appropriate elements of the calculation eg, 2 lines of the 1st method, internal numbers of grids, or complete structure shown of partitioning methods.	14680 734 15414 												
		A1	for digits 15414	<table border="1" data-bbox="1579 638 2011 742"> <tr> <td></td> <td>300</td> <td>60</td> <td>7</td> </tr> <tr> <td>40</td> <td>12000</td> <td>2400</td> <td>280</td> </tr> <tr> <td>2</td> <td>600</td> <td>120</td> <td>14</td> </tr> </table> 12000 + 2400 + 280 + 600 + 120 + 14 = 15414		300	60	7	40	12000	2400	280	2	600	120	14
			300	60	7											
40	12000	2400	280													
2	600	120	14													
A1	(ft) dep on M1 for correct placement of the decimal point into their final answer															
(b)	37.4	M1	for a start to a method, eg $598.4 \div 16$ (or $59.84 \div 1.6$) = 3 (as a first digit)	A start to a repeated subtraction method or build-up method is acceptable if a correct first digit of 3 is found												
		A1	for digits 374													
		A1	(ft) dep on M1 for correct placement of the decimal point into their final answer													

Paper: 1MA1/1F				
Question	Answer	Mark	Mark scheme	Additional guidance
21	Venn Diagram	C1 C1 C1	for one correct region for two correct regions for all regions correct	 <p>Ignore all entries except the region you are marking for each mark</p>
22	$1\frac{8}{15}$	M2 (M1) A1	<p>for a complete method, eg $4 - 2 + \frac{3}{15} - \frac{10}{15}$ condoning error with one numerator or for $\frac{21}{5} - \frac{8}{3} = \frac{63}{15} - \frac{40}{15} (= \frac{23}{15})$ with no more than one error</p> <p>for finding two fractions with a correct common denominator, with at least one correct corresponding numerator, eg $\frac{3}{15}, \frac{10}{15}$ or for converting both to improper fractions, eg $(\frac{21}{5}, \frac{8}{3})$</p> <p>$1\frac{8}{15}$ oe</p>	<p>At least one improper fraction must be correct</p> <p>Any equivalent must be a mixed number</p>

Paper: 1MA1/1F				
Question	Answer	Mark	Mark scheme	Additional guidance
25	12	P1 P1 A1	<p>for a process to find the area of cross section, eg $750 \div 25 (= 30)$ oe or $\frac{1}{2} \times 5 \times h$ oe</p> <p>for a correct equation in h, eg $750 \div 25 = \frac{1}{2} \times 5 \times h$ oe or $\frac{1}{2} \times 5 \times h \times 25 = 750$ oe or for a complete process to find h, eg. $\frac{750}{25} \times \frac{2}{5}$ oe or “30” $\times 2 \div 5$</p> <p>cao</p> <p>SC B1 for answer of 6 if P0 scored</p>	May use any letter for h or may use ?
26	Shown	M1 M1 M1 A1	<p>for a correct expression for the area of one face of the cube, eg. x^2 or a correct expression for the surface area of the cube, eg $6 \times x^2$</p> <p>for a correct expression for the surface area of the sphere, eg $4 \times \pi \times 3^2 (= 36\pi)$</p> <p>for forming a suitable equation, eg $6 \times x^2 = 4 \times \pi \times 3^2$ or $6x^2 = “36\pi”$</p> <p>for completing the method to $x = \sqrt{6\pi}$ or $k = 6$</p>	<p>No marks for $x = \sqrt{6\pi}$ without any working.</p> <p>$6 \times x^2 = 4 \times \pi \times 3^2$ $x^2 = 36\pi \div 6$ $x = \sqrt{6\pi}$</p>
27	7.15 and 7.25	B1 B1	<p>for 7.15 as the lower bound</p> <p>for 7.25 as the upper bound</p>	Accept 7.249 oe or 7.2499... oe
28 (i)	-4	B1	cao	
(ii)	(0, 3)	B1	cao	

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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.

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_1F		
Question	Modification	Mark scheme notes
2	Wording added 'Write the following six numbers...'	Standard mark scheme
6	(a) Wording added 'Look at the diagram for Question 6(a) in the Diagram Booklet. It shows a quadrilateral labelled <i>ABCD</i> .' Wording added ' <i>AB</i> is parallel to <i>DC</i> .'; Wording 'this...' removed and replaced with 'the...' Diagram enlarged. Diagram labelled as <i>ABCD</i> .	Standard mark scheme
6	(b) Wording added 'Look at the diagram for Question 6(b) in the Diagram Booklet. You may be provided with a model. They show a 3-D shape.' Wording 'this...' removed and replaced with 'the..' Diagram enlarged. Dashed line made longer and thicker. Model may be provided.	Standard mark scheme
8	Wording 'Look at the diagram for Question 8 in the Diagram Booklet. It shows a bar chart.' Wording 'below...' removed and replaced with 'in the Diagram Booklet...' Table and diagram enlarged. Axes labels moved to the left of the horizontal axis and above the vertical axis. Shading changed to dotted shading. Open headed arrows. Wording 'this...' removed and replaced with 'the..'	Standard mark scheme

PAPER: 1MA1_1F

Question		Modification	Mark scheme notes
11		Wording 'Look at the diagram for Question 11 in the Diagram Booklet.' Wording 'The pictogram shows...' removed and replaced with 'It is an incomplete pictogram which shows information...'; Diagram enlarged. Key moved above the diagram. Part (c) Wording added 'Complete the pictogram in the Diagram Booklet...'; for Braille provide a spare diagram and drawing film.	Standard mark scheme
13	(a)	Wording added 'A number sequence starts with the three numbers shown below.'	Standard mark scheme
13	(b)	The wording 'Here are...' removed and replaced with 'Below are...' Braille: "Here are" removed. Sentence changed to: "The first four terms of the sequence of triangle numbers are given below."	Standard mark scheme
15	(a)	a changed to p . d changed to q .	Standard mark scheme except for the letter changes indicated to give $2p + 2q$
16		Wording added 'Look at the diagram for Question 16 in the Diagram Booklet. It shows a kite $ABCD$.' And for Braille: "The diagram shows a kite, $ABCD$." Wording ' $ABCD$ is a kite' removed. Diagram enlarged. Part (b): Wording added 'Find the value of x , when $AD = 3AB$. The kite has a perimeter of 64 cm.'	Standard mark scheme
17		Wording added 'Look at the information for Question 17 in the Diagram Booklet. It shows a recipe.' Wording 'this recipe' removed and replaced with 'the recipe in the Diagram Booklet.' Information enlarged. Tracking lines added.	Standard mark scheme

PAPER: 1MA1_1F

Question	Modification	Mark scheme notes
18	<p>Wording added ‘Look at the diagram for Question 18 in the Diagram Booklet. It shows a grid.’ Wording ‘below’ removed. Diagram enlarged. Open headed arrows. Grid cut at $y=6$. Axes labels moved to the right of the horizontal axis and above the vertical axis. Braille: x y Words added: ‘You may use the table if you wish...’ – 2 (i) Answer lines added: ‘Ans: (i) __ (ii) __ (iii) __ (iv) __ (v) __ (vi) __’ – 1 (ii) Diagram enlarged to a 2 cm grid cut at $y=6$. 0 (iii) Spare diagram provided. 14 round bumpons and Wikki Stix. 1 (iv) 2 (v) 3 (vi)</p>	Standard mark scheme
21	<p>Wording added ‘Look at the diagram for Question 21 in the Diagram Booklet. It shows an incomplete Venn diagram.’ Wording added ‘in the Diagram Booklet...’. Diagram enlarged. Labels ‘Set A’ and ‘Set B’ moved above the circles. Braille: In the diagram, add (i) for universal set, (ii) for Set A, (iii) for the overlap & (iv) for Set B. Then add ‘Ans: (i) __ (ii) __ (iii) __ (iv) __’</p>	Standard mark scheme
24	<p>Wording added ‘Look at the information for Question 24 in the Diagram Booklet.’ Information enlarged.</p>	Standard mark scheme

PAPER: 1MA1_1F

Question	Modification	Mark scheme notes
25	<p>Wording ‘Look at Diagram 1 and Diagram 2 for Question 25 in the Diagram Booklet. You may be provided with a model.’</p> <p>The triangle labelled ABC.</p> <p>Diagram 1 to show the 3D prism. Diagram 2 to show the cross-section ABC.</p> <p>Wording added ‘Diagram 1 and the model show a prism’.</p> <p>Wording added ‘The cross section of the prism shown in Diagram 2 is a right-angled triangle labelled ABC.’</p> <p>Wording added ‘Angle ABC is a right angle. The base of the triangle, $BC = 5$ cm.’</p> <p>Diagram enlarged. Right angle made more obvious. Dashed lines made longer and thicker.</p> <p>Model could be provided candidates.</p>	Standard mark scheme
26	<p>Model of the cube and sphere provided for all candidates.</p> <p>Wording added ‘Look at Diagram 1, Diagram 2 and the formula for Question 26 in the Diagram Booklet. You may be provided with two models.’</p> <p>Wording ‘The diagram shows...’ removed and replaced with ‘Diagram 1 and Model A show a cube with edges of length x cm.’</p> <p>Wording added ‘Diagram 2 and Model B show a sphere of radius 3 cm.’</p> <p>Diagrams enlarged and stacked vertically. Dashed lines made longer and thicker.</p> <p>The ‘3 cm’ label and arrow moved to the left on the sphere diagram.</p> <p>Formula moved above the surface area diagram. Open headed arrows.</p>	Standard mark scheme

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