## Pearson 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.

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 I ncorrect 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 I gnoring 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.

## 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 | $-10,-7,-2,0,1,$ | 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 |  |
| $6 \quad \text { (a) }$ <br> (b) | Trapezium <br> Cylinder | B1 <br> B1 | for trapezium for cylinder | Accept incorrect spelling provided intention is clear <br> Accept incorrect spelling provided intention is clear |
| 7 | 14 | M1 <br> A1 | for $42 \div 3$ <br> cao |  |
| 8 | Error identified | C1 | error correctly identified <br> Acceptable examples <br> bar for brown is too high <br> 16 should be 15 <br> brown needs to be one less <br> brown is wrong <br> the graph does not match the table <br> Not acceptable examples <br> no title <br> the gaps between the bars are wrong |  |


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


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




| Paper: 1MA1/1F |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
| Question | Answer | Mark | Mark scheme | Additional guidance |
| 17 (a) | 42 | P1 | for a correct start to the process by finding the number of batches for one ingredient, $\text { eg } 500 \div 125(=4) \text { or } 700 \div 200(=3.5 \text { or } 3) \text { or } 250 \div 50(=5)$ <br> OR <br> 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) <br> OR <br> for a start to the process by finding the amount of one ingredient needed to make 1 biscuit, eg $125 \div 12\left(=10 \frac{5}{12}\right)$ or $200 \div 12\left(=16 \frac{8}{12}\right)$ or $50 \div 12\left(=4 \frac{2}{12}\right)$ <br> for a correct process to find the number of batches for all 3 ingredients, eg $500 \div 125(=4)$ and $700 \div 200(=3.5$ or 3$)$ and $250 \div 50(=5)$ <br> OR <br> 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) <br> OR <br> for a correct process to find the amount of each ingredient needed to make 1 biscuit, eg $125 \div 12\left(=10 \frac{5}{12}\right)$ and $200 \div 12\left(=16 \frac{8}{12}\right)$ and $50 \div 12\left(=4 \frac{2}{12}\right)$ |  |


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




| Paper: 1MA1/1F |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
| Question | Answer | Mark | Mark scheme | Additional guidance |
| 21 | Venn Diagram | $\begin{aligned} & \text { C1 } \\ & \text { C1 } \\ & \text { C1 } \end{aligned}$ | for one correct region for two correct regions for all regions correct | Ignore all entries except the region you are marking for each mark |
| 22 | $1 \frac{8}{15}$ | M2 <br> (M1 <br> A1 | for a complete method, eg $4-2+\frac{3}{15}-\frac{10}{15}$ condoning error with one numerator or for $\frac{21}{5}-\frac{8}{3}=\frac{63}{15}-\frac{40}{15}\left(=\frac{23}{15}\right)$ with no more than one error <br> 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 $\frac{21}{5}, \frac{8}{3}$ ) $1 \frac{8}{15} \text { ое }$ | At least one improper fraction must be correct <br> Any equivalents must be a mixed number |


| Paper: 1MA1/1F |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
| Question | Answer | Mark | Mark scheme | Additional guidance |
| 23 | Rahim (supported) | P1 <br> P1 <br> A1 <br> C1 | for start to the process to find 20\% for Tamara, eg $220000 \times 0.2$ oe $(=44000)$ <br> or $30 \%$ for Rahim, eg $160000 \times 0.3$ oe $(=48000)$ <br> OR <br> for $1-0.2(=0.8)$ or $100-20(=80)$ <br> or $1+0.3(=1.3)$ or $100+30(=130)$ <br> for a complete process to find at least one new value, eg 220000 - "44000" (= 176000 ) or $160000+$ " $48000 "(=208000)$ <br> OR <br> $220000 \times$ " 0.8 " (=176000) or $160000 \times$ "1.3" (=208000) <br> for one correct value, 176000 or 208000 <br> for correct conclusion supported by correct figures eg Rahim, 176000 and 208000 | Build up processes are acceptable but must be complete and correct <br> Award 0 marks for a correct answer with no supportive working. |
| 24 | 33 | P1 <br> P1 <br> A1 | ```for relating 24 to 8 parts, or (1 part \(=\) ) \(24 \div 8(=3)\) or 15-7(=8) or starts to use a build-up method, eg (8:) 14 : 30 for \((15-4)\) and \((24 \div 8)\) or \(15 \times 3(=45)\) and \(4 \times 3(=12)\) or for 12 (: 21) : 45 cao``` | 8 parts $=24$ |


| Paper: 1MA1/1F |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
| Question | Answer | Mark | Mark scheme | Additional guidance |
| 25 | 12 | P1 <br> P1 <br> A1 | 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 <br> 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 " $\times 2 \div 5$ cao <br> SC B1 for answer of 6 if P0 scored | May use any letter for $h$ or may use ? |
| 26 | Shown | M1 <br> M1 <br> M1 <br> A1 | 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 $6 \times x^{2}$ <br> for a correct expression for the surface area of the sphere, eg $4 \times \pi \times 3^{2}(=36 \pi)$ <br> for forming a suitable equation, eg $6 \times x^{2}=4 \times \pi \times 3^{2}$ or $6 x^{2}=" 36 \pi$ " <br> for completing the method to $x=\sqrt{6 \pi}$ or $k=6$ | No marks for $x=\sqrt{6 \pi}$ without any working. $\begin{aligned} & 6 \times x^{2}=4 \times \pi \times 3^{2} \\ & x^{2}=36 \pi \div 6 \\ & x=\sqrt{6 \pi} \end{aligned}$ |
| 27 | 7.15 and 7.25 | B1 <br> B1 | for 7.15 as the lower bound for 7.25 as the upper bound | Accept $7.24 \dot{9}$ oe or $7.2499 \ldots$ oe |
| $28 \quad \text { (i) }$ | $\begin{gathered} -4 \\ (0,3) \end{gathered}$ | $\begin{aligned} & \text { B1 } \\ & \text { B1 } \end{aligned}$ | $\begin{aligned} & \text { cao } \\ & \text { cao } \\ & \hline \end{aligned}$ |  |

## 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: $\pm 5$ 응
Measurements of length: $\pm 5 \mathrm{~mm}$

| 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 $A B C D$.' <br> Wording added ' $A B$ is parallel to $D C$. '; Wording 'this...' removed and replaced with 'the...' Diagram enlarged. Diagram labelled as $A B C D$. | 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.' <br> Wording 'this...' removed and replaced with 'the..' <br> 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...' <br> Table and diagram enlarged. <br> Axes labels moved to the left of the horizontal axis and above the vertical axis. <br> Shading changed to dotty shading. Open headed arrows. <br> 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.' <br> Wording 'The pictogram shows...' removed and replaced with 'It is an incomplete pictogram which shows information....'; Diagram enlarged. Key moved above the diagram. <br> 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...' <br> Braille: "Here are" removed. <br> 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 $2 p+2 q$ |
| 16 |  | Wording added 'Look at the diagram for Question 16 in the Diagram Booklet. It shows a kite $A B C D$.' And for Braille: "The diagram shows a kite, $A B C D . "$ <br> Wording ' $A B C D$ is a kite' removed. Diagram enlarged. <br> Part (b): Wording added 'Find the value of $x$, when $A D=3 A B$. 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.' <br> Wording 'this recipe' removed and replaced with 'the recipe in the Diagram Booklet.' Information enlarged. Tracking lines added. | Standard mark scheme |


| Question |  | Modification | Mark scheme notes |
| :---: | :---: | :---: | :---: |
| 18 |  | 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. <br> Braille: | Standard mark scheme |
| 21 |  | Wording added 'Look at the diagram for Question 21 in the Diagram Booklet. It shows an incomplete Venn diagram.' <br> Wording added 'in the Diagram Booklet...'. <br> Diagram enlarged. <br> Labels 'Set $A$ ' and 'Set $B$ ' moved above the circles. <br> Braille: In the diagram, add (i) for universal set, (ii) for Set $A$, (iii) for the overlap \& (iv) for Set $\mathbf{B}$. <br> Then add 'Ans: (i) $\qquad$ (ii) $\qquad$ (iii) $\qquad$ (iv) __, | Standard mark scheme |
| 24 |  | Wording added 'Look at the information for Question 24 in the Diagram Booklet.' Information enlarged. | Standard mark scheme |


| PAPER: 1MA1_1F |  |  |  |
| :---: | :---: | :---: | :---: |
| Question |  | Modification | Mark scheme notes |
| 25 |  | Wording ‘Look at Diagram 1 and Diagram 2 for Question 25 in the Diagram Booklet. You may be provided with a model.' <br> The triangle labelled $A B C$. <br> Diagram 1 to show the 3D prism. Diagram 2 to show the cross-section $A B C$. <br> Wording added 'Diagram 1 and the model show a prism'. <br> Wording added 'The cross section of the prism shown in Diagram 2 is a right-angled triangle labelled $A B C$.' <br> Wording added 'Angle $A B C$ is a right angle. The base of the triangle, $B C=5 \mathrm{~cm}$.' <br> Diagram enlarged. Right angle made more obvious. Dashed lines made longer and thicker. Model could be provided candidates. | Standard mark scheme |
| 26 |  | Model of the cube and sphere provided for all candidates. <br> Wording added 'Look at Diagram 1, Diagram 2 and the formula for Question 26 in the Diagram <br> Booklet. You may be provided with two models.' <br> Wording 'The diagram shows...' removed and replaced with 'Diagram 1 and Model A show a cube with edges of length $x \mathrm{~cm}$.' <br> Wording added 'Diagram 2 and Model B show a sphere of radius 3 cm .' <br> Diagrams enlarged and stacked vertically. Dashed lines made longer and thicker. <br> The ' 3 cm ' label and arrow moved to the left on the sphere diagram. <br> Formula moved above the surface area diagram. Open headed arrows. | Standard mark scheme |

