Mark Scheme (SPP)

Summer 2024

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

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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

Question		Answer	Mark	Mark scheme	Additional guidance
1		$\dfrac{23}{100}$	B1	oe	
2		8	B1	cao	
3		tens or 30	B1	for (3) tens **or** 30 **or** thirty	Condone incorrect spelling provided the intention is clear
4		3*a*	B1	for 3*a*	Allow *a*3
5		$\dfrac{1}{4}$ $\dfrac{1}{2}$ $\dfrac{2}{3}$	B1	for correct order	Accept any form Accept 0.6 or 0.66 or 0.67 or 0.7 or 60% or 66% or 67% or 70% or better for $\dfrac{2}{3}$
6	(a)	32	P1	for process to find length, eg 8 × 4	
			A1	cao	
	(b)	2.5 cm	P1	for process to find length, eg 10 ÷ 4 (= 2.5) oe eg 1 + 1 + 1 ÷ 2 (= 2.5)	
			A1	for 2.5 cm oe eg 25 mm, 0.025 m	Must include correct units
7	(a)	Bus	B1	cao	
	(b)	5	B1	cao	

Question	Answer	Mark	Mark scheme	Additional guidance
8	No from correct figures	P1	for process to find year of Aisha's 18th birthday, eg 1993 + 18 (= 2011) **or** for process to find Aisha's age in 2030, eg 2030 − 1993 (= 37)	
		P1	for process to find years of future elections, eg writes down 2011, 2016, 2021, 2026, 2031 **or** for 2011 + 4 × 5 (= 2031) oe **or** for process to find Aisha's age in years when there is an election, eg writes down 18 in 2011, 23 in 2016, 28 in 2021, 33 in 2026 and 38 in 2031 **or** for process to find years between 18th birthday and election eg 2030 − 2011 (= 19)	At least 3 correct values needed At least 3 correct values needed, condone years missing eg 18, 23, 28,… without 2011, 2016, 2021…
		A1	for No with correct figures eg 2011 **and** 2026 or 2031 **or** for No with eg 37 **and** 33 or 38 **or** for No with 2011 (2016, 2021, ...) **and** explanation that election years end in 1 or 6, not 0 **or** for No with 2011 **and** explanation that 19 is not divisible by 5	

Question		Answer	Mark	Mark scheme	Additional guidance
9		Shown	P1	for a start to process of finding the total cost, eg 5 × 26 (= 130) or 4 × 45 (= 180) or 8 × 23.50 (= 188) or 26 + 45 + 23.50 (= 94.5(0)) **or** for a start to process of finding money left after paying costs, eg 500 – 26 (= 474) or 500 – 45 (= 455) or 500 – 23.50 (= 476.5(0)) or 500 – 5 × 26 (= 370) or 500 – 4 × 45 (= 320) or 500 – 8 × 23.50 (= 312)	
			P1	for complete process, eg "130" + "180" + "188" (= 498) **or** 500 – "130" – "180" – "188" (= 2)	
			C1	Shown with a complete process and correct figures.	
10	(a)	radius drawn	B1	for radius drawn	May be drawn freehand provided intention is clear
	(b)	chord	B1	cao	
11		6	M1	for start to method, eg 45 × 8 (= 360) or (45 mins =) 0.75 oe (hours)	
			A1	cao	
12		3 of 23, 29, 31, 37	M1	for two correct and not more than one incorrect, eg 23, 27, 29	May be shown in working space. Ignore numbers less than 20 or greater than 40
			A1	for three correct and no incorrect	Accept 4 correct and no incorrect

Question	Answer	Mark	Mark scheme	Additional guidance			
13	Table completed	B3	for all 6 correct	(33)	**27**	(34)	**94**
				35	(45)	**33**	(113)
				68	**72**	(67)	(207)
		(B2	for 4 or 5 correct entries)				
		(B1	for 2 or 3 correct entries)				
14	Pie chart drawn and labelled	M1	for a method to calculate one angle eg $\dfrac{30}{30+10+50} \times 360$ (= 120) or $\dfrac{10}{30+10+50} \times 360$ (= 40) or $\dfrac{50}{30+10+50} \times 360$ (= 200) oe				
		A1	for all 3 angles correctly calculated **or** at least one correct and accurately drawn angle	Three angles correct in table is enough for this mark regardless of angles in the diagram.			
		A1	for a fully correct labelled pie chart	Each sector must be labelled with the associated drink, not angle size.			

Question		Answer	Mark	Mark scheme	Additional guidance
15		15% of 88 from correct figures	P1	for first step towards finding comparable figures, eg $\frac{15}{100} \times 88$ (= 13.2) oe **or** $\frac{20}{100} \times 62$ (= 12.4) oe **OR** 15×88 (= 1320) **or** 20×62 (= 1240)	
			P1	for process to find two comparable figures, eg $\frac{15}{100} \times 88$ (= 13.2) oe **and** $\frac{20}{100} \times 62$ (= 12.4) oe **OR** 15×88 (= 1320) **and** 20×62 (= 1240)	
			C1	15% of 88 from 13.2 oe **and** 12.4 oe **OR** 15% of 88 from 1320 **and** 1240	Must have correct figures. Ignore an incorrect difference after a correct decision from correct figures unless it contradicts.
16	(a)	m^4	B1	cao	
	(b)	$5x + 2y$	M1	for $5x$ **or** $2y$ **or** a linear expression in the form $ax + by$ where $a, b > 0$	Do not award M1 for $-5x$ or $-2y$
			A1	for $5x + 2y$ oe	
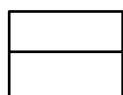
Question	Answer	Mark	Mark scheme	Additional guidance
17	180, 300, 75	M1	for complete method to find amount needed for 30 biscuits for one ingredient, eg 120 ÷ 20 × 30 (= 180) oe eg 120 + 120 ÷ 2 (= 180) **or** for method to find a scale factor, eg 30 ÷ 20 (= 1.5 oe) **or** for method to find amount needed for 10 biscuits for at least 2 ingredients eg 120 ÷ 2 (= 60) or 200 ÷ 2 (= 100) or 50 ÷ 2 (= 25) **or** for method to find amount needed for 1 biscuit for at least 2 ingredients eg 120 ÷ 20 (= 6) or 200 ÷ 20 (= 10) or 50 ÷ 20 (= 2.5)	
		M1	for complete method to find amount needed for 30 biscuits for at least 2 ingredients, eg at least 2 of 120 ÷ 20 × 30 (= 180) or 200 ÷ 20 × 30 (= 300) or 50 ÷ 20 × 30 (= 75) oe **or** eg at least 2 of 120 × "1.5" (= 180) or 200 × "1.5" (= 300) or 50 × "1.5" (= 75) **or** eg at least 2 of 120 + "60" (= 180) or 200 + "100" (= 300) or 50 + "25" (= 75) **or** eg at least 2 of 30 × "6" (= 180) or 30 × "10" (= 300) or 30 × "2.5" (= 75)	
		A1	for all quantities correct	

Question		Answer	Mark	Mark scheme	Additional guidance
18	(a)	Rotation drawn	B2	correct shape drawn at $(-4, -2)$, $(-2, -2)$, $(-1, -4)$, $(-5, -4)$	
			(B1	for rotation of the shape by 180° about any centre **or** for any 3 out of 4 vertices correct)	
	(b)	Explanation	C1	for explanation of why answer is wrong **Acceptable examples** he has reflected (in the line) $y = 3$ / he has used $y = 3$ he reflected shape **A** with equation $y = 3$ $x = 3$ is supposed to be vertical $x = 3$ means the line of reflection should go through 3 on the x-axis it should be on the right of **A**, not beneath it correct reflection in line $x = 3$ shown on diagram with supporting comment eg it should be here **Not acceptable examples** he has not reflected the shape (in the line $x = 3$) he has reflected in the wrong line / the reflection line isn't on $x = 3$ because the shape is the wrong way he drew it wrong he has used the y-axis instead of the x-axis	

Question	Answer	Mark	Mark scheme	Additional guidance
19	$y = 3x - 2$ drawn	B3	for a correct line between $x = -2$ and $x = 3$	<table><tr><td>x</td><td>−2</td><td>−1</td><td>0</td><td>1</td><td>2</td><td>3</td></tr><tr><td>y</td><td>−8</td><td>−5</td><td>−2</td><td>1</td><td>4</td><td>7</td></tr></table>
		(B2	for a correct straight line segment through at least 3 of (–2, –8), (–1, –5), (0, –2), (1, 1), (2, 4), (3, 7) **or** for all of these points plotted but not joined **OR** for a line drawn with positive gradient through (0, –2) **and** clear intention to use a gradient of 3, eg line through (0, –2) going across 2 squares and up 6 squares)	Ignore any incorrect points. Points need not be plotted for a correct line (segment) drawn
		(B1	at least 2 correct points stated or plotted **OR** for a line drawn with positive gradient through (0, –2) **OR** a line with gradient of 3)	Ignore any incorrect points Coordinates may be in a table or in working

Question		Answer	Mark	Mark scheme	Additional guidance
20		1 : 3	M1	for method to find angle *ABC*, eg $180 - 2 \times 81 \ (= 18)$ oe	
			M1	for method to find angle *BCD*, eg "18" $\times 4 \ (= 72)$	
			M1	for method to find angle *CBD*, eg $\dfrac{180 - "72"}{2} \ (= 54)$	Award first 3 marks for angles 18, 72, 54 marked on diagram provided not ambiguous
			M1	(dep M3) for writing as ratio, eg "18" : "54" **or** for an answer of 1 : 3*n* or 3 : 1	
			A1	(dep M3) for 1 : 3 from correct working	Accept *n* = 3 1 : 3 or *n* = 3 without working scores 0 marks
21	(a)	3(2*x* – 5)	B1	for 3(2*x* – 5)	
	(b)	*m*(*m* + 5)	B1	for *m*(*m* + 5)	
22		21	M1	for a complete factor tree for 63 or 105 with no more than one arithmetic error **or** for listing at least 4 correct factors (with no more than 1 incorrect) of 63 or 105, could be in factor pairs **or** for the prime factors of 63 (3, 3, 7) or 105 (3, 5, 7)	Condone the inclusion of 1 for this mark May be seen in different ways, 1, 3, 7, 9, 21, 63 1, 3, 5, 7, 15, 21, 35, 105 Prime factors may be seen in a diagram eg a Venn diagram
			A1	cao SCB1 for answer of 3 or 7 or 3 × 7 if M0 scored	

Question		Answer	Mark	Mark scheme	Additional guidance
23	(a)(i)	53 000	B1	cao	
	(ii)	0.000 074	B1	cao	
	(b)	3.42×10^7	M1	for $9\,700\,000 + 24\,500\,000$ (= $34\,200\,000$) **or** 3.42×10^n $(n \neq 7)$ oe **or** 3.4×10^7 **or** correct answer in incorrect form eg 34.2×10^6 **or** both in a form ready for addition, eg $9.7 \times 10^6 + 24.5 \times 10^6$	
			A1	cao	

Question		Answer	Mark	Mark scheme	Additional guidance
24	(a)	Explanation	C1	for explanation **Acceptable examples** The height of the rectangle / it should be less than 4 cm The 4 cm sides are wrong / too long The height of the rectangle should be 2.6… / $\sqrt{7}$ She's drawn the slanted height / not used the perpendicular height The height is smaller / not 4cm / wrong It should be shorter as the side is at an angle It should be on an angle, so the height is smaller The length / width / side is 4cm not the height She's drawn the face / the length and side / width of the rectangle She's drawn the length and side / width not the (length and the) height **Not acceptable examples** The rectangle should be wider The rectangle should be 6 squares high It doesn't tell us the height It should be smaller It's the front not the side It's not on a slant / it should be on a slant It goes up at an angle / it doesn't go straight up The length of the prism is 4 cm The length / width / side of the rectangle is 4 cm Side elevation is at a slant (not straight up)	
	(b)		M1	for a 7 cm by 6 cm rectangle **or** for a 7 cm by n cm or m cm by 6 cm rectangle **and** dividing line which is parallel to the 7 cm or the m cm side	
			A1	for a fully correct plan	Accept any orientation Accept freehand drawing

Question	Answer	Mark	Mark scheme	Additional guidance
25	29 775	P1	for evidence of using a correct first step eg 25 000 × 0.06 (= 1500) or 25 000 × 1.06 (= 26 500)	
		P1	for evidence of a "compound interest" process eg "26 500" × 0.06 (= 1590) or "26 500" × 1.06 (= 28 090) **or** 25 000 × 1.06^t, $t \geq 2$	
		P1	for a complete process eg 25 000 × 1.06^3 (= 29 775.4)	P3A0 is implied by 4775 or 4776 or 4780 or 4800
		A1	for 29 775 or 29 776 or 29 780 or 29 800 SCB1 for 3000 or 4500 or 28000 or 29500 seen if P0 scored	
26	2	P1	for process to find volume of tin eg 600 ÷ 0.6 (= 1000)	Award P1 for 600 ÷ 0.6 (= 1000) even if not used
		P1	for process to find volume of salt eg "1000" – 700 (= 300)	
		P1	for a process to find density of the salt eg 600 ÷ "300" **or** 0.6 × ("1000" ÷ "300") **or** 600 ÷ [volume]	[volume] can be 700 or from a seen calculation using "1000", "300", 700 or identified as volume by label or formula or units
		A1	cao	A correct answer with no supportive working gets 0 marks

Question		Answer	Mark	Mark scheme	Additional guidance
27	(a)	0.4	B1	for 0.4 in correct position	Accept equivalent fractions or percentages for probabilities
		0.45, 0.55, 0.45	B1	for the correct probabilities for coin **B** in the correct place on the branches	
	(b)	0.33	M1	for a correct method, eg 0.6×0.55 only	
			A1	for 0.33 oe	An answer of $\dfrac{0.33}{1}$ scores M1A0
28		63	P1	for process to find volume, eg $\pi \times 100^2 \times 30$ (= $300\,000\pi$ or $942\,477(.796...)$)	(volume =) 942 478 implies P1
			P1	for process to find time in seconds, eg "$942\,477(.796...)$" $\div 250$ (= 1200π or $3769(.911...)$) **or** [volume] $\div 250$ **or** for converting rate to minutes, eg 250×60 (= $15\,000$)	(time =) 3770 implies P2 [volume] $\neq$ 30, 60, 100, 250
			P1	for complete process, eg "$3769(.911...)$" $\div 60$ (= 20π) **or** "$942\,477(.796...)$" $\div$ "$15\,000$" (= 20π)	
			A1	for answer in the range 62 to 63	A correct answer with no supportive working gets 0 marks If an answer is shown in the range in working and then incorrectly rounded award full marks

Paper: 1MA1/3F				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
29 (a)	15	M1	for correct substitution, eg $40 - (-5)^2$	Condone missing brackets
		A1	cao	
(b)	$h = 3p + 5$	M1	for a correct first step, eg $3p = h - 5$ **or** for isolating the $\dfrac{h}{3}$ term, eg $p + \dfrac{5}{3} = \dfrac{h}{3}$	Award M1 for $3p + 5$ without seeing $h = 3p + 5$
		A1	for $h = 3p + 5$ oe eg $h = 3\left(p + \dfrac{5}{3}\right)$	

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: ±5º
Measurements of length: ±5 mm

PAPER: 1MA1_3F			
Question		**Modification**	**Mark scheme notes**
4		Letter changed: a changed to p	Standard mark scheme but note the change of letter
5		Word 'three' added 'Write the following three fractions in order of size.'	Standard mark scheme
6		Letters changed: A changed to T and changed B to U	Standard mark scheme but note the change of letters
7		Diagram enlarged. Additional digits added to right hand side of chart. Wording added 'Look at the diagram for Question 7 in the separate Diagram Booklet. The diagram shows a chart.'	Standard mark scheme
10	(a)	Diagram enlarged. Wording added 'Look at the diagram for Question 10 (a) in the separate Diagram Booklet. The diagram shows a circle.' Word 'above' removed 'On the diagram, draw a radius…' For Braille: sentence added 'A spare tactile diagram and drawing film are provided for this question.'	Standard mark scheme
	(b)	Diagram enlarged. Wording added 'Look at the diagram below. It shows another circle.'	Standard mark scheme
13		Two-way table changed to vertical layout. Wording added 'Look at the two-way table for Question 13 in the separate Diagram Booklet.'	Standard mark scheme
14		Diagram enlarged. Marks placed at 10° intervals on circumference of circle. Word 'below' added to the sentence 'The table below gives information …' Wording added 'On the diagram provided for Question 14 in the separate Diagram Booklet, draw an accurate pie chart for this information.' For Braille: sentence added 'A spare tactile diagram and drawing film are provided for this question.'	Standard mark scheme Allow ±2° for each sector

PAPER: 1MA1_3F			
Question		**Modification**	**Mark scheme notes**
17		For MLP only: g changed to grams	Standard mark scheme
18	(a)	Diagram enlarged. Wording added 'Look at the diagram for Question 18 (a) in the separate Diagram Booklet. The diagram shows a shape on a coordinate grid.' 'You may be given a cut-out shape for this question.'	Standard mark scheme
	(b)	Diagram enlarged. … and the shapes labelled 'shape A' and 'shape B' Wording added 'Look at the diagram for Question 18 (b) in the separate Diagram Booklet. The diagram shows shape $\mathbf{A}$ and shape $\mathbf{B}$ on a coordinate grid.' 'Mike's answer is shown on the grid as shape B.' 'You may be given a cut-out shape for this question.'	Standard mark scheme
19		Grid enlarged. Wording added 'Look at the diagram for Question 19 in the separate Diagram Booklet. The diagram shows a coordinate grid. On the grid, draw the graph…….' 'You may wish to complete the table below to help you.' Table for values inserted. For Braille: sentence added 'A spare tactile diagram, bumpons and Wikki Stix are provided for this question.'	Standard mark scheme
20		Diagram enlarged. Labelling changed to A, B, C, D clockwise from top vertex. Wording added 'Look at the diagram for Question 20 in the separate Diagram Booklet. The diagram is NOT accurately drawn. The diagram shows isosceles triangles labelled ABD and DBC.' Information now 'AD = DB = CB Angle DCB = 81° Angle BDA = 4 x angle CBD' Demand now 'Find the size of angle CBD : the size of angle DBA'	Standard mark scheme but note the changes in the vertices

PAPER: 1MA1_3F			
Question		**Modification**	**Mark scheme notes**
24		For MLP: wording added 'Look at the diagram for Question 24 in the separate Diagram Booklet. It shows a solid triangular prism. The diagram is NOT accurately drawn. You may also be given a model.' For Braille: wording added 'Ask for the model for Question 24. The model IS accurately made. The model is a solid triangular prism.'	
	(a)	Wording added 'Look at the diagram for Question 24 (a) in the separate Diagram Booklet. The diagram shows a square grid. Each square on the grid represents a 1 cm square.' Sentence changed to 'Her answer is shown on the grid.'	Standard mark scheme
	(b)	Diagram Booklet has four shapes labelled shape A, shape B, shape C and shape D. Wording added 'Look at the diagram for Question 24 (b) in the separate Diagram Booklet. The diagram shows shape A, shape B, shape C and shape D drawn on a square grid. Each square on the grid represents a 1 cm square.' Demand changed to 'Which shape A, B, C or D is the plan view of the solid prism?'	B2 for C (B1 for B or D)
27	(a)	Diagram enlarged. Wording added 'Look at the diagram for Question 27 (a) in the separate Diagram Booklet. The diagram shows an incomplete probability tree diagram.'	Standard mark scheme
28		For MLP: wording added 'Look at the diagram for Question 28 in the separate Diagram Booklet. The diagram is NOT accurately drawn. The diagram shows a paddling pool in the shape of a cylinder. You may also be given a model.' For Braille: sentence added 'Ask for the model for Question 28. The model is NOT accurately made. The model represents a paddling pool in the shape of a cylinder.'	Standard mark scheme
29	(b)	Letter changed: h changed to m Demand amended 'Make m the subject of the formula $p = \dfrac{m-5}{3}$	Standard mark scheme but note the change of letter