Pearson Edexcel

Mark Scheme (Results)

November 2023

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.

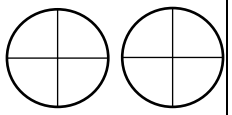
13 Word in square brackets

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

Paper: 1MA1/3F				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
1	0.35	B1	cao	
2	8100	B1	cao	
3	valid number	B1	for a valid number, eg −6, −7, −7.5	
4	$\frac{6}{21}$	B1	eg $\frac{2}{7}$ or any equivalent fraction	
5	tenths or $\frac{9}{10}$	B1	for (9) tenths or $\frac{9}{10}$ or 0.9	Condone incorrect spellings provided the intention is clear. Accept .9
6 (a)		C1	for showing diagrams that represent 24 pictorially	shapes can come from a combination of shapes but must sum to 24
(b)	Year 8 (supported)	M1	for beginning to work with the pictogram, eg counting symbols or finding the total for one type of cake	Chocolate = 60 Vanilla = 39 Lemon = 18
		M1	for a complete method to find the total number, eg 5 ×12 + $3\frac{1}{4}$ × 12 + $1\frac{1}{2}$ × 12 + 24 or 60 + 39 + 18 + 24 (= 141) **or** 5 + 3.25 + 1.5 + 2 (= 11.75) **or** 150 ÷ 12 (= 12.5)	For this M mark use 24 for banana or ft from their diagram, but do not award if banana has been omitted. If only totals are shown allow no more than one error in a total.
		C1	for selecting Year 8 with correct figures, eg Year 8 and 141 **or** Year 8 with 9 more **or** Year 8 with $11\frac{3}{4}$ **and** $12\frac{1}{2}$	

Paper: 1MA1/3F				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
7	144	P1	for process to begin to work with length, eg 8050 ÷ 25 (= 322) **or** 178 × 25 (= 4450)	
		P1	for full process to find number of lengths remaining, eg "322" – 178 **or** (8050 – "4450") ÷ 25 **or** 3600 ÷ 25	3600 implies the first P1 mark
		A1	cao	
8 (a)	Explanation	C1	for explanation, eg subtract 6, decrease by 6, going down by 6	
(b)	12	M1	for 73 – 61 **or** 6 × 2	At least one term must be correct and intention to subtract shown
		A1	cao	Accept −12
(c)	Explanation	C1	for explanation relating to odd and/or even numbers **Acceptable** 52 is even the sequence is odd numbers it goes to **55** (and you cannot reach 52) it goes to **49** (which has gone past 52) nth term is 103 − 6n = 52 which has no integer solutions 52 is between the 8^{th} and 9^{th} terms **Not acceptable** subtracting 6 each time will not lead to 52 it goes past 52	

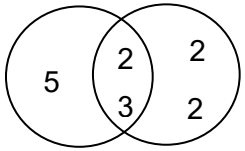
Paper: 1MA1/3F				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
9	5	P1	for process to work in consistent units, eg 12 × 1000 (= 12000) **or** 105 ÷ 1000 (= 0.105)	May be seen in subsequent calculations
		P1	for process to work with portion size, eg 105 × 3 (= 315) **OR** 12 ÷ [0.105] (= 114.285…)	For [0.105] allow use of 0.105, 1.05 or 10.5
		P1	for process to work with weight of food per week or number of days, eg "315" × 7 (= 2205) **or** "315" × 5 (= 1575) **or** "315" × 6 (= 1890) [12000] ÷ "315" (=38(.095…)) **OR** [114.285…] ÷ 3 (= 38(.095…)) or [114.285…] ÷ 7 (= 16.3…)	For [12000] accept use of 12000, 1200 or 120 For [114.285] allow continued use of incorrectly converted figure from previous mark.
		P1	(dep P2) for process to find number of weeks, eg "12000" ÷ "2205" (= 5.4…) **OR** "38.095…" ÷ 7 (= 5.4…) **OR** "16.3…" ÷ 3 (= 5.4…) **OR** "2205" × 5 (= 11025) **or** "2205" × 6 (= 13230) **OR** 975 **or** -1230	
		A1	cao	If a correct answer is given without supportive working award 0 marks.
10 (a)	Pentagon	B1	cao	
(b)	112.5	P1	for process to find total length using their edges eg 15 × 7.5 **or** [edges] × 7.5	[edges] must be unambiguously identified
		A1	for 112.5 oe	
11	$\frac{7}{25}$	M1	for $\frac{n}{2+16+7}$ where n is an integer < 25	
		A1	cao	

Paper: 1MA1/3F				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
12	10 55	M1	for starting a process of working with time eg for undertaking some time conversion eg 1 h = 60 min eg 3¼ hrs is 195 mins or ¼ hr = 15 mins or 3 h = 180 min **or** for an answer of 10 45 (am) or 10 40 (am) or 10 50 (am) **or** for an answer of 10 55 pm	
		A1	for 10 55 (am)	
13 (a)	$20h^3$	B1	cao	
(b)	$7y$	B1	cao	
14	$\frac{6}{11}$, 0.558, 0.56, 57%, $\frac{7}{12}$	M1	Converts numbers to common equivalent form, eg 0.58(33..), (0.56), 0.57(0), 0.54(54..), (0.558) **or** any 4 in correct order **or** all 5 in correct reverse order	Decimals converted to at least 2 d.p.
		A1	for correctly ordered list	May be given in converted format.
15 (a)	**57** 64 **7** **36** **25** 11	B3	for a fully correct frequency tree	If probabilities used instead of frequencies award a maximum of B2
		(B2	for at least 4 figures correctly placed)	
		(B1	for at least 1 figure correctly placed)	
(b)	$\frac{57}{64}$	M1	$\frac{a}{64}$ where $0 < a < 64$ and a is an integer (ft) **or** $\frac{57}{b}$ where $b > 57$ and b is an integer (ft)	Must be values from their diagram with numerator < denominator
		A1	(ft) for $\frac{57}{64}$ oe	Accept probabilities given as equivalent fractions, 0.89(06…) or 89(.06..)%

Paper: 1MA1/3F				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
16	−35	M1	for a correct first step, eg shows $\frac{x}{7}+9-9=4-9$ or $\frac{x}{7}=4-9$ or $\frac{7x}{7}+9\times7=4\times7$ or $x + 63 = 28$	
		A1	cao	
17	No (supported)		Working per week / Working per hour	Throughout units and trailing 0s need not be given. Accept rounded or truncated figures throughout unless ambiguous.
		M1	for 26.4 × 32 (= \$844.80) / for 473.28 ÷ 32 (= £14.79)	
		M1	for "844.8" ÷ 1.796 (= £470.37…) or for 473.28 × 1.796 (= \$850....) / for "14.79" × 1.796 (= \$26.56….) or for 26.4 ÷ 1.796 (= £14.699…)	
		C1	for No and correct figures (850… **and** 844.8) **or** 470.37… / for No and correct figures (14.79… **and** 14.699..) **or** 26.56…	"No" may be expressed in words eg "Australia pay is less"
18	4.8	P1	for finding missing length, eg 14 – 3.8 – 3.8 (= 6.4)	
		P1	for method to find area of triangle, eg [missing length] × 6 ÷ 2 (= 19.2)	Where [missing length] can be "6.4" or identified in working or on the diagram as the missing length
		P1	for method to find area of rectangle, eg [area of triangle] × 3.5 (= 67.2) **or** writes an expression for the area of rectangle eg 14*w* or 14*w* ÷ 3.5	[area of triangle] must be identified as the area of the triangle OR come from: [missing length] × 6 ÷ 2 or [missing length] × 6 or [decimal] × 6 ÷ 2
		P1	for method to link both areas eg 14*w* = [area of triangle] × 3.5 or [area of triangle] = 14*w* ÷ 3.5 or [area of triangle] × 3.5 ÷ 14	
		A1	cao	Award 0 marks for a correct answer without correct supportive working.

Paper: 1MA1/3F				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
19	7 cm by 8 cm rectangle drawn	M1 M1 C1	for interpreting the front elevation, eg length = 8 **or** height = 4 For beginning to draw plan, eg. rectangle drawn with one side length of 8 cm or one of 7cm **or** for interpreting front elevation to find missing dimension eg (224 ÷ "8") ÷ "4" (= 7) for correct plan drawn	May be seen on diagram or in part of a calculation May be drawn in any orientation
20 (a)	4.68×10^5	B1	cao	
(b)	0.000 503 7	B1	cao	
21	80	M1 A1	for complete method, eg 200×0.4 or for $\frac{80}{200}$ for the answer cao	
22 (a)	24.6	M1 M1 A1	for finding 5 products within intervals (including end points) with not more than one error, may be seen near table. eg 2×12.5 (= 25), 8×17.5 (= 140), 13×22.5 (=292.5), 21×27.5 (= 577.5), 6×32.5 (= 195) or for 1230 for $\Sigma fx \div \Sigma f$ eg ("25" + "140" + "292.5" + "577.5" + "195") ÷ "50" or "1230" ÷ "50" for 24.6 oe	<table><tr><td>Min *fx*</td><td>Max *fx*</td></tr><tr><td>20</td><td>30</td></tr><tr><td>120</td><td>160</td></tr><tr><td>260</td><td>325</td></tr><tr><td>525</td><td>630</td></tr><tr><td>180</td><td>210</td></tr></table> Σfx must come from 5 products, *fx* within intervals (including end points)

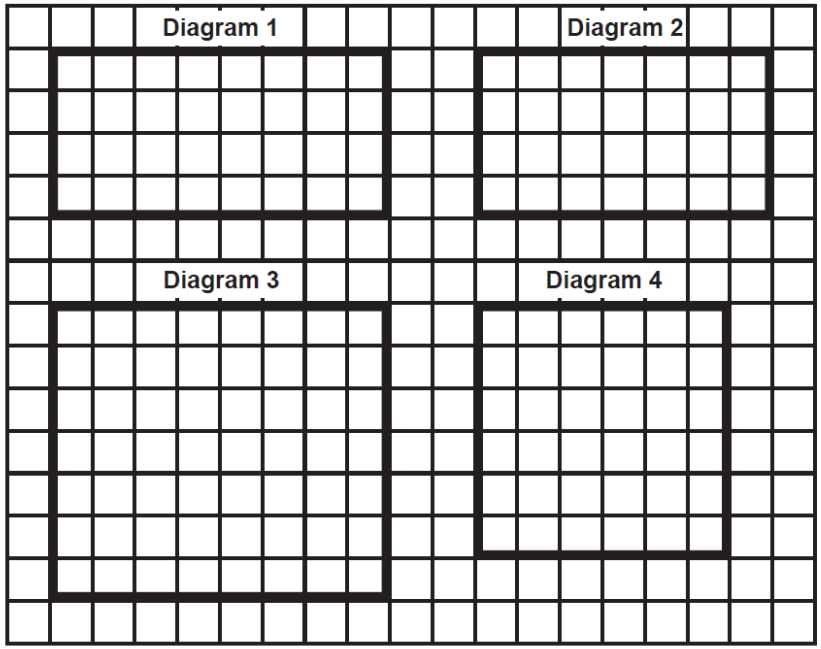
Paper: 1MA1/3F				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
22 (b)	No, with reason	C1	for No **and** reason **Acceptable** No, the median is in the interval $25 < T \leq 30$ No, the median is in the group containing the 25(.5)th temperature No, she did not take into account frequency No, the frequencies are not the same for each group. **Not acceptable** No, the median is 27.5 No, the median is higher than 22.5 $25 < T \leq 30$ Yes, …	Any incorrect statement as part of a correct response can be ignored unless it contradicts the statement,
23 (a)	Explanations	C2 (C1	for two different correct explanations **Acceptable examples** She should have a solid/full/shaded/coloured circle at 4 It does not show that x could be equal to 4 She should have marked/drawn a (clear/empty) circle at −3 The line should be drawn to –3 Jenna started from –2 not –3 **Not acceptable examples** Both circles should be black One circle should be filled in (needs to say which circle) She shouldn't have to reach number 4 Jenna has made no mistakes for one correct mistake described)	Any incorrect statement as part of a correct response can be ignored unless it contradicts the statement,

Paper: 1MA1/3F				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
(b)	4	M1	for a correct first step, eg for adding 7 to both sides $5y - 7 + 7 < 16 + 7$ or for dividing throughout by 5 eg $\frac{5y}{5} - \frac{7}{5} < \frac{16}{5}$ **or** for showing 4.6 (oe) as the critical value **or** for $5 \times 4 - 7$ with 13 seen as answer	Allow use of any inequality or as an equation for the first mark Award 1 mark for 4.6 oe, eg $y = \frac{23}{5}$ or $y < 4.6$
		A1	for 4 or $y = 4$ with no incorrect working	An answer of 4 from incorrect working can score 1 mark at most.
24	4 packs and 5 boxes,	P1	for start of a process to find common multiples of 30 and 24, eg writes down at least 3 multiples of 30 and at least 3 multiples of 24 **or** draws factor trees for both 30 and 24 with no more than 1 error in total **or** draws a correct Venn diagram	30, 60, 90, 120, 150, 180, 210, 240 … 24, 48, 72, 96, 120, 144, 168, 192, 216, 240, … Condone the inclusion of 1 in factor tress or Venn diagrams for this mark 
	or any multiple	P1	for identifying a common multiple eg 120 or 240 or $5 \times 3 \times 2 \times 2 \times 2$ oe	May use any common multiple, 120, 240, 360...
		A1	for 4 packs and 5 boxes or any multiple of this pairing eg 8, 10	Award 0 marks for a correct answer without correct supportive working.
25	20	M1	for $30 \times 4 \div 6$ oe	
		A1	cao	

Paper: 1MA1/3F				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
26	7 hours 56 minutes	P1	for process to begin to work with speed, eg 143 ÷ 55 (= 2.6)	May work in minutes or hours and minutes
		P1	for process to work in minutes, eg "2.6" × 60 (= 156 mins) **and** 5 × 60 + 20 (= 320 mins) **or** for 476 (mins) **or** for process to work in hours eg "2.6" **and** $5\frac{20}{60}$ (= 5.33...)...or for 7.93... **or** for process to work in hours and minutes, eg "2" + ("0.6" × 60) (= 2 hrs 36 mins)	Accept 2 or more decimal places for this mark
		A1	cao	
27	Shown	M1	for substitution to find area of face, eg 3.5 = $\frac{504}{\text{area}}$ or 3.5 × area = 504 or area = 504 ÷ 3.5 (= 144) **or** for working from surface area eg 900 ÷ 6 (= 150)	Other equivalent methods should be credited accordingly
		M1	for method to find comparable figures, eg "144" × 6 (= 864) or "150" × 3.5 (= 525) or 504 ÷ "150" (= 3.36…) **or** 504 ÷ 3.5 (= 144) **and** 900 ÷ 6 (= 150) **or** 900 ÷ 144 (= 6.25) **and** 6	
		C1	for correct comparable figures, eg 864 (and 900) **or** 144 and 150 **or** 525 (and 504) **or** 3.36… (and 3.5) **or** 6.25 and 6	Condone incorrect units given.

Paper: 1MA1/3F				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
28	$y = -2x + 3$	M1	for a correct method to find the gradient of the line, eg $\frac{-1-3}{2-0}$ (= −2) **or** uses 3 as the intercept in $y = mx + c$, eg $y = mx + 3$ oe, $y = 1.5x + 3$	
		M1	for $y = [-2]x + c$ or for (L=) $3 - 2x$ or uses their gradient and a point on the line, eg $y - -1 = [-2](x - 2)$	$[-2]$ must be identifiable as their gradient
		A1	for $y = -2x + 3$ oe	Any correct equation gets 3 marks
29	15.6	P1	for beginning process to use Pythagoras to find diameter or radius, eg $3.5^2 + 3.5^2$ (= 24.5) **or** $1.75^2 + 1.75^2$ (= 6.125)	Award P1 for a correct Pythagorean statement eg $3.5^2 + 3.5^2$ =diameter^2
		P1	for complete process to find diameter or radius, eg $\sqrt{3.5^2 + 3.5^2}$ or $\sqrt{24.5}$ (= 4.94..) or $\sqrt{1.75^2 + 1.75^2}$ or $\sqrt{6.125}$ (= 2.47…)	4.94.. or 2.47.. truncated or rounded can imply P2
		P1	for process to find circumference of circle, eg $\pi \times$ "4.94…" (= 15.55…) **or** $2 \times \pi \times$ "2.47…" (= 15.55…)	Accept use of 3.14 or better for π Accept use of truncated values for 4.94.. or 2.47..
		A1	for answer in range 15 to 16	If an answer is shown in the range in working and then incorrectly rounded award full marks. Award 0 marks for a correct answer without correct supportive working.

Question 19 exemplars



Question 19 exemplars

Diagram 1: M2

Diagram 2: M2

Diagram 3: M2 C1

Diagram 4: 0 marks

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		Wording added ‘Look at the diagram for Question 4 in the Diagram Booklet. It shows’. Wording removed ‘Here is’. Diagram enlarged. Shading changed.	Standard mark scheme
6		Wording added ‘Look at the diagram for Question 6 in the Diagram Booklet. It is an incomplete pictogram showing’. Wording removed ‘The pictogram shows’. Diagram enlarged. Frame removed from the key. Key moved above and left of the diagram. In (a) wording added ‘in the Diagram Booklet’.	Standard mark scheme
10	(a)	Diagram enlarged and left aligned.	Standard mark scheme
10	(b)	Wording added ‘Look at the diagram for Question 10(b) in the Diagram Booklet. You may be provided with a model. They show’. Wording removed ‘Here is’. Diagram enlarged. Model provided.	Standard mark scheme
13	(a)	Letter ‘h’ changed to ‘m’.	Standard mark scheme but note change of letter.
14		Wording added ‘five’.	Standard mark scheme
15		Wording added ‘Look at the diagram for Question 15 in the Diagram Booklet. It shows an incomplete frequency tree.’ Wording added ‘in the Diagram Booklet’. Diagram enlarged. Wording added ‘There are six spaces to fill.’ Braille: Blank ovals will have (i), (ii), (iii), (iv), (v), (vi) on diagram. For Braille also ‘Ans: (i)___ (ii)___ (iii)___ (iv) ___ (v) ___ (vi) _____	Standard mark scheme
18		Wording added ‘Look at the diagram for Question 18 in the Diagram Booklet. It shows shape ABCDEFG’. Wording removed ‘Here is a shape’. Diagram enlarged. Diagram labelled ABCDEFG and H. Dashed lines made longer and thicker. Arrows removed. Right angle made more obvious. Wording added ‘, FE’. Wording added ‘FG = 3.8 cm ED = 14 cm AH = 6 cm Angle AHB is a right angle.’	Standard mark scheme

PAPER: 1MA1_3F			
Question		**Modification**	**Mark scheme notes**
19		Wording removed 'The front elevation of a cuboid is shown on the centimetre grid below.' Wording added 'Look at the diagrams for Question 19 in the Diagram Booklet. You may be provided with a model. It is accurate. The model shows a cuboid. Diagram 1 shows the front elevation of the cuboid on a grid. 1 square length on the grid represents 1 cm.' Shading changed. Black grid lines. Wording added to the diagram '1 square length on the grid represents 1 cm'. Diagram enlarged. Diagrams 2 – 4 added. Diagram 2: 7 squares by 4 squares. Diagram 3: 8 squares by 7 squares. Diagram 4: 6 squares by 6 squares. Wording added 'Which of the four diagrams, Diagram 1, Diagram 2, Diagram 3 or Diagram 4 represents the plan view of the cuboid? You MUST show your working.'	Diagram 4 B0 Diagram 2 B2 Diagram 1 B2 Diagram 3 B3
21		Wording added 'Look at the diagram for Question 21 in the Diagram Booklet. It shows'. Wording removed 'Here is'. Spike removed. Spinner straightened up. Centre dot added. Spinner enlarged. Wording added 'below'. Table turned vertically, enlarged and left aligned.	Standard mark scheme
22		Wording added 'Look at the table for Question 22 in the Diagram Booklet.' Wording added 'in the Diagram Booklet'. Table enlarged.	Standard mark scheme
23		Wording added 'Look at the diagram for Question 23 in the Diagram Booklet. It shows a number line.' Wording 'a' removed and replaced with 'the'. Wording 'Here is her answer' removed and replaced with 'Her answer in shown in the Diagram Booklet.' Diagram enlarged. Open headed arrows.	Standard mark scheme
27		Wording added 'Look at the diagram for Question 27 in the Diagram Booklet. You may be provided with a model. They show'. Wording removed 'The diagram shows'. Diagram enlarged. Table added to the diagram. Frame removed from the formula.	Standard mark scheme
28		Wording added 'Look at the diagram for Question 28 in the Diagram Booklet. It shows'. Wording removed 'is shown'. Wording 'the' removed and replaced with 'a'. Axis labels moved to the top of the vertical axis and to the right of the horizontal axis. Diagram enlarged. Open headed arrows. L label moved up.	Standard mark scheme
29		Wording added 'Look at the diagram for Question 29 in the Diagram Booklet. It shows the points'. Wording removed 'are points'. Diagram enlarged. Shading changed.	Standard mark scheme

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