PEARSON
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Mark Scheme (Results)

Summer 2022

Pearson Edexcel GCSE (9 – 1)
In Mathematics (1MA1)
Higher (Calculator) Paper 3H

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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: 1MA1/3H

Question	Answer	Mark	Mark scheme	Additional guidance
1	7.5	M1	for correct use of Pythagoras, eg. $8.5^2 - 4^2 (= 56.25)$ or $4^2 + x^2 = 8.5^2$	Must have values substituted Trigonometry may be used but M1 only awarded when complete method shown.
		A1	for 7.5 or $7\frac{1}{2}$ or $\frac{15}{2}$	
2 (a)	25	M1	for $(T =) 4 \times (-3)^2 - 11$ or $4 \times (-3)^2 = 36$	Can accept missing brackets.
		A1	cao	
(b)	$p = \dfrac{d-4}{3}$ oe	M1	for a correct first step, eg. $d - 4 = 3p$ or $\dfrac{d}{3} = p + \dfrac{4}{3}$ or for $\dfrac{d-4}{3}$ as answer	May be in unsimplified form, eg $d - 4 = 3p + 4 - 4$
		A1	for $p = \dfrac{d-4}{3}$ oe	
3	1.5	P1	for process to develop 3 algebraic expressions, eg. $(R =) n$, $(S =) 2n$, $(T =) 2n - 6$, oe, at least two must be correct. **or** for selecting 3 values satisfying the given criteria, eg. $(R =) 10$, $(S =) 20$, $(T =) 14$	
		P1	for process to sum 3 algebraic expressions and equating to 54, eg. $n + $ "$2n$" $+$ "$2n - 6$" $= 54$ **or** for finding the correct sum of their values eg. "10" + "20" + "14" = 44	
		P1	for start of process to solve the correct linear equation, eg. $5n = 54 + 6$ $(n = 12)$ **or** for 12, 24, 18	
		P1	for "12" : $2 \times$ "12" $- 6$ oe eg 12 : 18 oe or 18 : 12 linked to T, R	
		A1	for 1.5 or $\frac{3}{2}$ or $1\frac{1}{2}$	Accept 1 : 1.5 etc as answer

Paper: 1MA1/3H

Question	Answer	Mark	Mark scheme	Additional guidance
4	Chic Decor with correct supporting evidence	P1	for process to find cost of 15 rolls from Chic Decor, eg $\frac{15}{3} \times 36$ (= 180) or for process to find cost of 15 rolls from Style Papers at normal price, eg $\frac{15}{5} \times 70$ (= 210) or for process to find cost of 1 roll from Chic Decor, eg $36 \div 3$ (= 12) or for process to find cost of 1 roll from Style Papers, eg $70 \div 5$ (= 14) or for process to find the cost of 5 rolls from Chic Decor, eg $\frac{36}{3} \times 5$ (= 60)	Could compare the costs for any number of rolls
		P1	for any first step in using the discount at Style Papers, eg $0.12 \times$ "210" (= 25.2(0)) or $0.12 \times$ "14" (= 1.68) or 0.12×70 (= 8.4(0)) **or** $1 - 0.12$ (= 0.88)	
		P1	for full process to find cost from Style Papers, eg. "210" – "25.2" oe (=184.8(0)) or "0.88" × "210" or for "14" – "1.68" oe (= 12.32) or "0.88" × "14" or for 70 – "8.4(0)" oe (= 61.6(0)) or "0.88" × 70	
		C1	for Chic Decor with fully correct figures eg 180 and 184.8(0) or 12 and 12.32 or 60 and 61.6(0)	

Paper: 1MA1/3H				
Question	Answer	Mark	Mark scheme	Additional guidance

5	40 missing from frequency scale
	
	Incorrect point (50, 5)
		C2	Two different statements
			Acceptable
			eg (50, 5) / the last point is incorrect
			    the last point should be at (45,5)
			    the last point plotted was placed incorrectly
			    for his last point he has plotted by the end of the data and for the rest he has plotted by the middle
			    he did not use the midpoint, he used 50 instead of 45
			
			    40 missing (from vertical axis)
			    vertical scale is not linear
			    the frequency doesn't increase in the same intervals
			    the vertical axis is not right
			
			Not acceptable
			eg the last point should be at (40, 5)
			    bottom of the polygon should be connected
			    he didn't start the graph at the origin
			    he did not draw a polygon
			    he has plotted the first 4 points at midpoint
				Ignore additional statements provided no contradiction

		(C1	One acceptable statement)	
6	10	P1	for a process to use distance = speed × time for either of the parts of Jessica's journey, eg. $6 \times \dfrac{15}{60}$ (= 1.5) or $9 \times \dfrac{40}{60}$ (= 6) or 6×15 (= 90) or 9×40 (= 360)	
		P1	for a process to add the 2 distances for Jessica, eg $6 \times \dfrac{15}{60} + 9 \times \dfrac{40}{60}$ (= 7.5) or $6 \times 15 + 9 \times 40$ (= 450)	
		P1	for complete process to find Amy's average speed, eg. "7.5" ÷ "0.75" oe or "450" ÷ 45	Must be consistent units at this stage.
		A1	cao	

Paper: 1MA1/3H				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
7	Complete chain of reasoning	M1	for (area of trapezium $TQRS$ =) $0.5 \times 4x \times (2x + 3x)$ or for (area of rectangle $TUVS$ =) $4x \times (3x + 5)$ $(= 12x^2 + 20x)$	Evidence for the award of marks may be seen on the diagram
		M1	for (area of trapezium $QUVR$ =) $4x(3x + 5) - 0.5 \times 4x \times (2x + 3x)$	Alternative methods may be seen.
		C1	for correct algebraic processing and simplification to the given form	
		M1	**Alternative 1** for (QU =) $3x + 5 - 2x$ $(= x + 5)$	
		M1	for (area of trapezium $QUVR$ =) $0.5 \times 4x \times ((\text{“}x + 5\text{”}) + 5)$ or $0.5 \times 4x \times (x + 10)$	
		C1	for correct algebraic processing and simplification to the given form	
		M1	**Alternative 2** for (area of triangle =) $0.5 \times (3x - 2x) \times 4x$ or for (area of rectangle =) $4x \times 5$	Accept x for $(3x - 2x)$
		M1	for (area of trapezium $QUVR$ =) "$0.5 \times (3x - 2x) \times 4x$" + "$4x \times 5$"	
		C1	for correct algebraic processing and simplification to the given form	

Paper: 1MA1/3H					
Question		**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
8 (a)		0.14	M1	for a method to find the gradient, eg. 14 ÷ 100 using readings from the graph, at least one correct or for an answer of 0.14x	Must use the scales on the graph
			A1	for answer in the range 0.135 to 0.145 or ft correct readings from the graph	May be expressed as a fraction
	(b)	Cost per unit of electricity	C1	for a correct explanation **Acceptable examples** eg cost of each unit (of electricity) rate of change of cost with units of electricity used cost per unit of electricity each unit costs 14p average cost charged for each unit of electricity used **Not acceptable examples** cost of how many units used costs in pounds per number of units used how much the cost of electricity goes up the relationship of cost and number of units used how steep it is	

Paper: 1MA1/3H				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
9 (a)	10^{60}	M1	for a correct first step using one of the rules of indices, eg. $10^{150} \times 10^{90} = 10^{240}$ or $10^{360} \div 10^{150} = 10^{210}$ or $10^{360} \div 10^{90} = 10^{270}$ or $\sqrt{10^{360}} = 10^{180}$ or $\sqrt{10^{150}} = 10^{75}$ or $\sqrt{10^{90}} = 10^{45}$	
		M1	for correct use of rules of indices leading as far as $\sqrt{10^{120}}$ or $\frac{10^{180}}{10^{120}}$	
		A1	cao	
(b)	reason	C1	for correct reasoning

Acceptable examples
eg should do 50×2 (not 50^2)
    because $(12^{50})^2 = 12^{100}$
    because when you have a power inside and outside the bracket you times them
    because $\left(a^b\right)^c = a^{bc}$ (not a^{b^c})

Not acceptable examples
    because you need to multiply everything in the brackets by 2
    because he should have squared 12 as well
    you add the powers instead of timesing | |

Paper: 1MA1/3H				
Question	Answer	Mark	Mark scheme	Additional guidance
10	24000	P1	for use of either 0.9 or 0.875 or for 18900 (after 2 years)	
		P1	for using $0.9^2 \times 0.875$ (= 0.70875) oe or for 21000 (after 1 year)	
		A1	cao	
11	240	M1	for $16 \times 5 \times 3$	
		A1	cao	
12	23.4	M1	for stating that $AC = 8$ or for a relationship that may be used to find AC eg $(AC =)$ $8 \times \tan 45$ or $\tan 45 = \frac{AC}{8}$	May be seen on diagram May use the sine rule
		M1	for relationship that may be used to find AB, eg $\sin (20) =$ "8" $\div AB$ or $(AB =) \frac{"8"}{\sin 20}$	
		A1	for answer in the range 23.3 to 23.4	If an answer is given in the range in working and then rounded incorrectly award full marks.
			Alternative	
		M1	for a relationship that may be used to find AD eg $\cos (45) = 8 \div AD$ oe or $(AD =)$ 11.3(13...)	May be seen on diagram
		M1	for a relationship that may be used to find AB, eg $\frac{AB}{\sin 45} = \frac{"11.3"}{\sin 20}$	
		A1	for answer in the range 23.3 to 23.4	If an answer is given in the range in working and then rounded incorrectly award full marks.

Paper: 1MA1/3H

Question	Answer	Mark	Mark scheme	Additional guidance
13	$\begin{pmatrix} -1 \\ 4 \end{pmatrix}$	M1	for $3\begin{pmatrix} 2 \\ -3 \end{pmatrix} - 2\mathbf{b} = \begin{pmatrix} 8 \\ -17 \end{pmatrix}$ oe or for $\begin{pmatrix} 6 \\ -9 \end{pmatrix}$	
		M1	for $2\mathbf{b} = \begin{pmatrix} 3 \times 2 - 8 \\ 3 \times -3 - -17 \end{pmatrix} \left(= \begin{pmatrix} -2 \\ 8 \end{pmatrix}\right)$ oe or $-2\mathbf{b} = \begin{pmatrix} 8 - 3 \times 2 \\ -17 - 3 \times -3 \end{pmatrix} \left(= \begin{pmatrix} 2 \\ -8 \end{pmatrix}\right)$ oe or for one element correct, -1 or 4	Must see "2**b** = ..." or "–2**b** = ..." to award 2 marks One correct element scores 2 marks
		A1	cao (if M0 scored, SC B1 for $\begin{pmatrix} 1 \\ -4 \end{pmatrix}$)	
14 (a)	$4(p - 3)(p + 3)$	M1	for $4(p^2 - 9)$ or partial factorisation which includes the product of 2 linear factors eg. $(4p - 12)(p + 3)$ or $(p - 3)(4p + 12)$ or $(2p - 6)(2p + 6)$ or $2(2p - 6)(p + 3)$ or $2(2p + 6)(p - 3)$ or $2(p - 3)2(p + 3)$	
		A1	for $4(p - 3)(p + 3)$	
(b)	$6m^3 + 11m^2 - 57m - 20$	M1	for a method to find the product of two linear expressions, 3 correct terms out of 4 terms, eg. $6m^2 + 2m - 15m - 5 = 6m^2 - 13m - 5$ or $2m^2 + 8m - 5m - 20 = 2m^2 + 3m - 20$ or $3m^2 + 12m + m + 4 = 3m^2 + 13m + 4$	Note that, for example, $3m - 20$ is regarded as three terms in the expansion of $(m + 4)(2m - 5)$
		M1	for a complete method to obtain all terms, at least half of which are correct (ft their first product), eg. $6m^3 + 2m^2 - 15m^2 + 24m^2 + 8m - 60m - 5m - 20$	First product must be a 3 or 4 term quadratic but need not be simplified or may be incorrect.
		A1	for $6m^3 + 11m^2 - 57m - 20$	Accept $a = 6$, $b = 11$, $c = -57$, $d = -20$

Paper: 1MA1/3H				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
15	Proof	C1	for angle *PQX* = angle *SRX* as <u>angles</u> in the <u>same segment</u> are equal (or <u>angles</u> at the circumference <u>subtended</u> from the same <u>arc/chord</u> of a circle are equal) or angle *QPX* = angle *RSX* as <u>angles</u> in the <u>same segment</u> are equal (or <u>angles</u> at the circumference <u>subtended</u> from the same <u>arc/chord</u> of a circle are equal) or angle *PXQ* = angle *SXR* as vertically <u>opposite angles/</u> <u>vertically opposite</u> angles are equal **or** for identifying two pairs of corresponding equal angles with no reason given	Underlined words need to be shown; reasons need to be linked to their method. Could be shown on the diagram
		C1	for identifying two pairs of corresponding equal angles with correct reasons given	
		C1	for stating that the triangles are similar because all three pairs of corresponding angles are equal with complete reasons given.	Note that the students third/final reason may be: <u>Angles</u> in a <u>triangle</u> add up to 180
16	17.4	B1	for stating any correct bound, eg. 6.75 or 6.85 or 0.045 or 0.055	Accept 6.84$\dot{9}$ or 6.8499... for 6.85 and 0.054$\dot{9}$ or 0.05499.. for 0.055
		M1	using both UB of *e* and LB of *f* to work out value of 2*e* ÷ *f*, eg 2[UB of *e*] ÷ [LB of *f*] or $\frac{2 \times 6.85}{0.045}$	6.8 < UB(*e*) ≤ 6.85 0.045 ≤ LB(*f*) < 0.05
		A1	for answer in the range 17.4 to 17.5 from correct working	If an answer is given in the range in working and then rounded incorrectly award full marks. Award 0 marks for a correct answer with no (or incorrect) supportive working

Paper: 1MA1/3H					
Question	**Answer**	**Mark**	**Mark scheme**		**Additional guidance**
17 (a)	histogram drawn	B3	for fully correct histogram, eg. relative heights 90, 96, 44, 8, 6		
		(B2	for 4 correct bars **or** for frequency ÷ class interval for all 5 frequencies and 2 correct bars of different widths)		
		(B1	for 2 correct bars of different widths or for frequency ÷ class interval for at least 3 frequencies)		
(b)	$0.4n$	M1	for finding ratio of heights or widths of bars, eg $5:1$ or $\frac{1}{5}$, $1:2$ or $\frac{n}{5}$ oe or $2n$ oe as answer or compares areas of bars, eg 6 and 2.4 or 3 and 1.2 or 150 and 60		Evidence for this mark may be seen on the diagram Any 2 numbers in the ratio 2.5 : 1 score M1
		A1	for $0.4n$ oe		
18	30.6	P1	for process to find *TC*, eg. $(TC =)\ 14 \times \frac{3}{3+4}\ (= 6)$		Lengths of *TC*, *TD*, *SD* may be seen on the diagram
		P1	for process to find *TD*, eg. $(TD =)\ \sqrt{14^2 + "6"^2}$ or $\sqrt{232}$ or $2\sqrt{58}\ (= 15.2\ldots)$		
		P1	for process to find *SD*, using area of a trapezium, $147 = 0.5 \times (SD + 12) \times 14$, or $SD = 9$		
		P1	for $\tan^{-1}\left(\frac{"9"}{"15.2\ldots"}\right)$		A complete set of processes to find the angle is needed where an alternative route is involved with more than one stage in the working
		A1	for answer in the range 30.4 to 30.7		If an answer is given in the range in working and then rounded incorrectly award full marks.

Paper: 1MA1/3H

Question	Answer	Mark	Mark scheme	Additional guidance
19	$\dfrac{-11x+2}{x^2-4}$	M1	for writing at least one of the 3 terms with a denominator of (x^2-4) or $(x-2)(x+2)$ eg. $\dfrac{3x(x-2)}{x^2-4}$ oe or $\dfrac{(x+2)(2x+1)}{x^2-4}$ oe or $\dfrac{x^2-4}{x^2-4}$	Students may work with a denominator of $(x-2)(x+2)$ for the first 3 marks
		M1	for $\dfrac{3x(x-2)}{x^2-4} - \dfrac{(x+2)(2x+1)}{x^2-4} - \dfrac{x^2-4}{x^2-4}$ oe or for $\dfrac{x^2-11x-2}{x^2-4}\,(-1)$ or for $\dfrac{[x^2-11x-2]}{x^2-4} - \dfrac{x^2-4}{x^2-4}$	$[x^2-11x-2]$ denotes their expansion of $3x(x-2)-(x+2)(2x+1)$
		M1	for a numerator of $3x^2-6x-2x^2-5x-2-x^2+4$	May be simplified
		A1	for $\dfrac{-11x+2}{x^2-4}$	Accept $a=-11$ and $b=2$
20	44 384	P1	for process to find a, eg. $29\,600 = 24\,000a + 800$ or $(a=)$ 1.2 oe	
		P1	for $(P_{2020}=)$ "1.2" $\times 29\,600 + 800\ (= 36\,320)$	
		P1	for $(P_{2021}=)$ "1.2" $\times$ "36 320" $+ 800$	
		A1	cao	

Paper: 1MA1/3H

Question	Answer	Mark	Mark scheme	Additional guidance
21	$\dfrac{11}{21}$	P1	for any product of 3 probabilities of the form $\frac{a}{9} \times \frac{b}{8} \times \frac{c}{7}$ where $a < 9$, $b < 8$, $c < 7$	May see fraction with denominator 504 Students who indicate they are using the approach P(even) = 1 – P(odd) should be given credit as appropriate
		P1	for a product of 3 probabilities giving an even sum, eg. E,E,E $= \frac{4}{9} \times \frac{3}{8} \times \frac{2}{7}$ or E,O,O $= \frac{4}{9} \times \frac{5}{8} \times \frac{4}{7}$	
		P1	for summing the product of at least three correct triples, eg (E,E,E + E,O,O + O,O,E =) $\frac{4}{9} \times \frac{3}{8} \times \frac{2}{7} + \frac{4}{9} \times \frac{5}{8} \times \frac{4}{7} + \frac{5}{9} \times \frac{4}{8} \times \frac{4}{7}$ OR $3(\frac{4}{9} \times \frac{5}{8} \times \frac{4}{7})$	
		A1	for $\frac{11}{21}$ oe SCB1 for answer of $\frac{364}{729}$ (replacement)	Accept any equivalent fraction, decimal form 0.52(38...) or percentage form 52(.38…)%

Paper: 1MA1/3H

Question	Answer	Mark	Mark scheme	Additional guidance
22	$(-3, -11)$ and $(5.5, 6)$	M1	for method to eliminate one variable, eg $(2x - 5)^2 = 6x^2 - 25x - 8$ or $y^2 = 6\left(\frac{y+5}{2}\right)^2 - 25\left(\frac{y+5}{2}\right) - 8$	
		M1	for expanding the square to give, eg. $4x^2 - 20x + 25 = 6x^2 - 25x - 8$ or $y^2 = 6\left(\frac{y^2+10y+25}{4}\right) - 25\left(\frac{y+5}{2}\right) - 8$	
		M1	for method to solve equation $2x^2 - 5x - 33 \ (= 0)$, eg $(2x - 11)(x + 3) \ (= 0)$ or $x = \frac{--5\pm\sqrt{(-5)^2-4\times2\times-33}}{2\times2}$ or $-3, 5.5$ oe or for method to solve equation $2y^2 + 10y - 132 \ (= 0)$, eg. $(2y + 22)(y - 6) \ (= 0)$ or $y = \frac{-10\pm\sqrt{10^2-4\times2\times-132}}{2\times2}$ or $-11, 6$	
		A1	for $(-3, -11)$	
		A1	for $(5.5, 6)$ oe	

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

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_3H			
Question		**Modification**	**Mark scheme notes**
1		Wording added 'Look at the diagram for Question 1 in the Diagram Booklet. It shows a right-angled triangle, ABC.' Diagram enlarged. The diagram labelled ABC. Wording added: 'AB = 4 cm AC = 8.5 cm BC = x cm'. Wording added 'Angle ABC is a right angle.' The right angle made more obvious.	Standard mark scheme
2	(b)	The letter 'd' changed to 'n'	Standard mark scheme but note the change of letter
3		Wording added 'Look at the information for Question 3 in the Diagram Booklet.' Wording added 'as shown in the ratio.'	Standard mark scheme
4		Wording added 'Look at the information for Question 4 in the Diagram Booklet.' Wording added 'The information in the Diagram Booklet shows the cost…'. Diagram enlarged. The information stacked vertically.	Standard mark scheme
5		Wording added 'Look at the diagram for Question 5 in the Diagram Booklet. It shows a frequency polygon.' Wording added 'The table below…'. Wording added 'Amos draws the frequency polygon in the Diagram Booklet…'. Diagram enlarged. Open headed arrows. Change the crosses to dots. The axes labels moved to the top of the vertical axis and to the left of the horizontal axis.	Standard mark scheme
7		The letter x changed to y. Wording added 'Look at the diagram for Question 7 in the Diagram Booklet. It shows…'. Wording added: 'TQ = 2y cm, TS = 4y cm, SR = 3y cm, RV = 5 cm' Wording added 'The trapezium QUVR is shaded.' Diagram enlarged. Open headed arrows. The text moved out of the arrows. Shading changed.	Standard mark scheme
8		Wording added 'Look at the diagram for Question 8 in the Diagram Booklet. It shows a graph.' Wording added 'David uses the graph in the Diagram Booklet…'. Diagram enlarged. Right axes labelled. Open headed arrows. Remove the small squares. The axes labels moved to the top of the vertical axis and to the left of the horizontal axis.	Standard mark scheme

12		Wording added 'Look at the diagram for Question 12 in the Diagram Booklet.' Wording added '…are right-angled triangles with a common side AC.' Wording added 'Angle ACD and angle ACB are right-angles.' Diagram enlarged. The angles moved outside of the angle arcs and the angle arcs made smaller.	Standard mark scheme
15		Wording added 'Look at the diagram for Question 15 in the Diagram Booklet.' Diagram enlarged.	Standard mark scheme
16		Letter 'e' changed to 't'. Letter 'f' changed to 'u'.	Standard mark scheme but note change of letters.
17	(a)	The values changed: 48 changed to 50. 22 changed to 30. 8 changed to 20. 12 changed to 20. Wording added 'Look at the diagram for Question 17(a) in the Diagram Booklet. It shows a grid.' Wording added 'The table below…'. 'On the grid in the Diagram Booklet…'. Diagram enlarged. Small squares removed. Open headed arrows. Grid reduced in size. Axes labels moved to the top of the vertical axis and to the left of the horizontal axis.	Standard mark scheme but note change in values: relative heights: 90, 100, 60, 20, 10

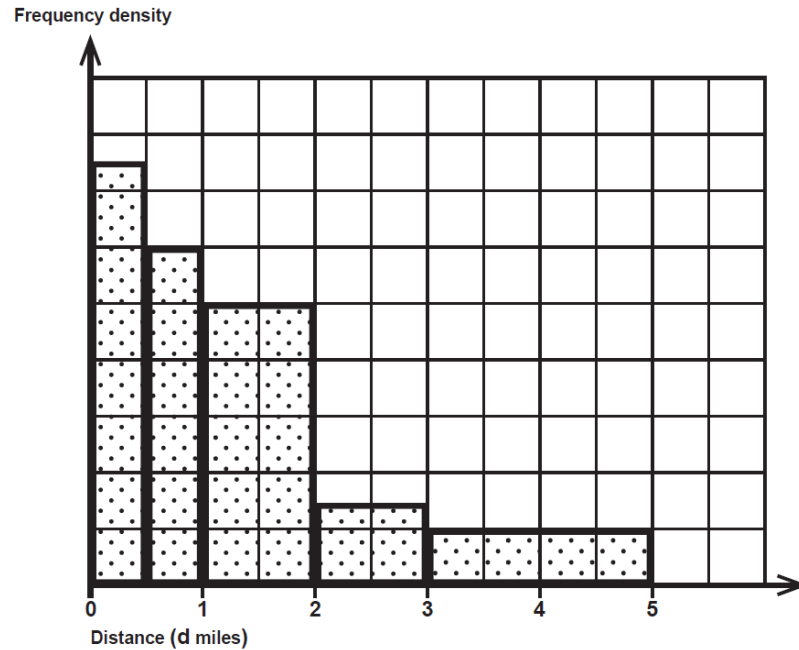| 17 | (b) | Wording added 'Look at the diagram for Question 17(b) in the Diagram Booklet. It is a histogram which shows…'.
The values changed: 0.5 – 1 moved up to 30 small squares (6 squares high);
1– 2 moved up to 25 small squares (5 squares high); 3 – 5 moved up to 5 small squares (1 square high)
Diagram enlarged. Small squares removed. Open headed arrows. Shading changed.
The axes labels moved to the top of the vertical axis and to the left of the horizontal axis. | **M1** for comparing the heights of the bars of the two intervals, showing them in the ratio 5 : 2, eg. height of 1 - 2 = 5 units and height of 3 - 5 = 1 unit
or compares areas of bars, eg 10 and 4
A1 for $0.4n$ oe |

Question 17(b)

Frequency density

Distance (**d** miles)

18		Open-fronted model provided with a dowel from S to T and D to T. A wedge placed at DTS. DC is labelled with 14 cm. Wording added 'Look at Diagram 1 and Diagram 2 for Question 18 in the Diagram Booklet. You may be provided with a model.' Wording added 'Diagram 1 and the model show a prism ABCDSPQR.' '…a trapezium of area 147 cm^2 as shown in Diagram 2'; 'CD = 14cm.' Diagram 1 to show the original diagram. The line 'DT' joined with a dotted line and an angle arc added. Diagram 2 to show SRCD with 12 cm, 14 cm and two right angles marked. Diagrams enlarged. The dashed lines made longer and thicker. Braille: For **ALL** candidates, provide a **simplified 2D diagram** of the cross section SRCD. Wording added: "Look at the diagram for Question 18 in the separate Diagram Booklet. The diagram is NOT accurately drawn. The diagram is a simplified 2D diagram of the cross section of the prism."	Standard mark scheme
20		Wording added 'Look at the table for Question 20 in the Diagram Booklet.' Wording added 'The table in the Diagram Booklet…'. Table turned vertical.	Standard mark scheme
21		Wording added 'Look at the diagram for Question 21 in the Diagram Booklet. It shows Ray's nine cards numbered 1 to 9.' Diagram enlarged. Braille: Text frames removed and the numbers listed. Words changed to "Ray has nine cards numbered 1 to 9, as listed below."	Standard mark scheme