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# Mark Scheme (Results)

Summer 2022

Pearson Edexcel GCSE  
In Mathematics (1MA1)  
Higher (Calculator) Paper 2H

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## General marking guidance

These notes offer general guidance, but the specific notes for examiners appertaining to individual questions take precedence.

- 1** All candidates must receive the same treatment. Examiners must mark the last candidate in exactly the same way as they mark the first. Where some judgement is required, mark schemes will provide the principles by which marks will be awarded; exemplification/indicative content will not be exhaustive. When examiners are in doubt regarding the application of the mark scheme to a candidate's response, the response should be sent to review.
- 2** All the marks on the mark scheme are designed to be awarded; mark schemes should be applied positively. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme. If there is a wrong answer (or no answer) indicated on the answer line always check the working in the body of the script (and on any diagrams), and award any marks appropriate from the mark scheme.

**Questions where working is not required:** In general, the correct answer should be given full marks.

**Questions that specifically require working:** In general, candidates who do not show working on this type of question will get no marks – full details will be given in the mark scheme for each individual question.

- 3** **Crossed out work**  
This should be marked **unless** the candidate has replaced it with an alternative response.
- 4** **Choice of method**  
If there is a choice of methods shown, mark the method that leads to the answer given on the answer line.  
If no answer appears on the answer line, mark both methods **then award the lower number of marks.**
- 5** **Incorrect method**  
If it is clear from the working that the "correct" answer has been obtained from incorrect working, award 0 marks. Send the response to review for your Team Leader to check.
- 6** **Follow through marks**  
Follow through marks which involve a single stage calculation can be awarded without working as you can check the answer, but if ambiguous do not award.  
Follow through marks which involve more than one stage of calculation can only be awarded on sight of the relevant working, even if it appears obvious that there is only one way you could get the answer given.

**7 Ignoring subsequent work**

It is appropriate to ignore subsequent work when the additional work does not change the answer in a way that is inappropriate for the question or its context. (eg an incorrectly cancelled fraction when the unsimplified fraction would gain full marks).

It is not appropriate to ignore subsequent work when the additional work essentially makes the answer incorrect (eg. incorrect algebraic simplification).

**8 Probability**

Probability answers must be given as a fraction, percentage or decimal. If a candidate gives a decimal equivalent to a probability, this should be written to at least 2 decimal places (unless tenths).

Incorrect notation should lose the accuracy marks, but be awarded any implied method marks.

If a probability fraction is given then cancelled incorrectly, ignore the incorrectly cancelled answer.

**9 Linear equations**

Unless indicated otherwise in the mark scheme, full marks can be gained if the solution alone is given on the answer line, or otherwise unambiguously identified in working (without contradiction elsewhere). Where the correct solution only is shown substituted, but not identified as the solution, the accuracy mark is lost but any method marks can be awarded (embedded answers).

**10 Range of answers**

Unless otherwise stated, when an answer is given as a range (eg 3.5 – 4.2) then this is inclusive of the end points (eg 3.5, 4.2) and all numbers within the range

**11 Number in brackets after a calculation**

Where there is a number in brackets after a calculation eg  $2 \times 6 (=12)$  then the mark can be awarded **either** for the correct method, implied by the calculation **or** for the correct answer to the calculation.

**12 Use of inverted commas**

Some numbers in the mark scheme will appear inside inverted commas eg "12"  $\times$  50 ; the number in inverted commas cannot be any number – it must come from a correct method or process but the candidate may make an arithmetic error in their working.

**13 Word in square brackets**

Where a word is used in square brackets eg [area]  $\times$  1.5 : the value used for [area] does **not** have to come from a correct method or process but is the value that the candidate believes is the area. If there are any constraints on the value that can be used, details will be given in the mark scheme.

**14 Misread**

If a candidate misreads a number from the question. eg uses 252 instead of 255; method or process marks may be awarded provided the question has not been simplified. Examiners should send any instance of a suspected misread to review.

### **Guidance on the use of abbreviations within this mark scheme**

<b>M</b>	method mark awarded for a correct method or partial method
<b>P</b>	process mark awarded for a correct process as part of a problem solving question
<b>A</b>	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)
<b>C</b>	communication mark awarded for a fully correct statement(s) with no contradiction or ambiguity
<b>B</b>	unconditional accuracy mark (no method needed)
<b>oe</b>	or equivalent
<b>cao</b>	correct answer only
<b>ft</b>	follow through (when appropriate as per mark scheme)
<b>sc</b>	special case
<b>dep</b>	dependent (on a previous mark)
<b>indep</b>	independent
<b>awrt</b>	answer which rounds to
<b>isw</b>	ignore subsequent working

Paper: 1MA1/2H				
Question	Answer	Mark	Mark scheme	Additional guidance
1 (a)	$x^{15}$	B1	cao	
(b)	$40 - 10x$	M1	for method to expand one bracket, or collect like terms eg $4 \times x + 4 \times 3 (= 4x + 12)$ <b>or</b> $7 \times 4 - 7 \times 2x (= 28 - 14x)$ <b>or</b> $4 \times x - 7 \times 2x (= 4x - 14x)$ <b>and</b> $4 \times 3 + 7 \times 4 (= 12 + 28)$	
(c)	$3x^2(5x + y)$	A1	oe	
		M1	for $3(5x^3 + x^2y)$ <b>or</b> $x(15x^2 + 3xy)$ <b>or</b> $3x(5x^2 + xy)$ <b>or</b> $x^2(15x + 3y)$ <b>or</b> $3x^2(ax + by)$	Where $a \geq 1$ and $b \geq 1$
		A1	cao	
2	translation $\begin{pmatrix} -5 \\ 6 \end{pmatrix}$	B1	for translation	Award no marks if more than one transformation is given
		B1	for vector $\begin{pmatrix} -5 \\ 6 \end{pmatrix}$	Do not accept as a coordinate $(-5, 6)$
3	89.5 and 90.5	B1	for 89.5 in the correct position	
		B1	for 90.5 in the correct position	Accept 90.49 or 90.499(...)

Paper: 1MA1/2H				
Question	Answer	Mark	Mark scheme	Additional guidance
4 (a)	19	P1	for process to find area available at festival B, eg $700 \times 2000 (=1\ 400\ 000)$	Accept either number rounded eg 207 or 188  Accept either number rounded eg 207 or 188
		P1	for process to find the area available per person at one festival, eg $80\ 000 \div 425 (= 188.23\dots)$ <b>or</b> [area] $\div 6750 (= 207.40\dots)$	
		P1	for process to find the area available per person at both festivals, eg $80\ 000 \div 425 (= 188.23\dots)$ <b>and</b> [area] $\div 6750 (= 207.40\dots)$	
		A1	for an answer in the range 18.7 to 19.5	
(b)	explanation	C1	<p>for a valid statement relating to scale factor for area,</p> <p><b>Acceptable examples</b>            There are 10000 (cm<sup>2</sup>) in 1 (m<sup>2</sup>)            Because 1 m<sup>2</sup> is the same as <math>100 \times 100 = 10000\text{ cm}^2</math>            There are 2 side lengths that change from 1 m to 100 cm  <math>300 \div 3</math> is 100 should use 100<sup>2</sup>  <math>300 \div 100 \div 100 = 0.03</math>  <math>3 \times 100 \times 100 = 30000</math>            Because it's area not length.            Because it's in m<sup>2</sup> not just metres            He hasn't taken the squared sign into account</p> <p><b>Not acceptable examples</b>            There are 1000 cm in 1 m            Callum is correct because .....</p> <p><math>300 \div 3</math> is 100  <math>3^2 = 9</math>  <math>300 \times 300 = 90000</math>            You have to square the number</p>	

Paper: 1MA1/2H				
Question	Answer	Mark	Mark scheme	Additional guidance
5	14.5, 21	P1	for process to work with coordinates, eg $4 - (-3) (= 7)$ <b>or</b> $9 - 1 (= 8)$	Accept in reverse order eg $-3 - 4 (= -7)$ and negative distances throughout  This mark is implied by 10.5 or 12 or 17.5 or 20
		P1	for process to use ratio, eg $"7" \div 2 (= 3.5)$ <b>or</b> $"8" \div 2 (= 4)$ <b>or</b> $"7" \times 3 (= 21)$ <b>or</b> $"8" \times 3 (= 24)$	
		P1	for complete process to find $x$ or $y$ coordinate of $N$ , eg $"3.5" \times 3 + 4$ <b>or</b> $"4" \times 3 + 9$ <b>or</b> $"3.5" \times 5 - 3$ <b>or</b> $"4" \times 5 + 1$ <b>OR</b> to find both the required distances eg $"3.5" \times 3 (= 10.5)$ <b>and</b> $"4" \times 3 (= 12)$ <b>or</b> $"21" \div 2 (= 10.5)$ <b>and</b> $"24" \div 2 (= 12)$ <b>or</b> $"3.5" \times 5 (= 17.5)$ <b>and</b> $"4" \times 5 (= 20)$	
		A1	oe	



Paper: 1MA1/2H				
Question	Answer	Mark	Mark scheme	Additional guidance
6	600.74	M1  M1  A1	works out decrease for one year eg $679 \times 4 \div 100 (= 27.16)$ oe <b>or</b> $679 \times (100 - 4) \div 100 (= 651.84)$ oe  for compound method, eg $679 \times "0.96"^{t}, t \geq 2$ <b>or</b> $"651.84" \times "0.96" (= 625.76..)$ <b>or</b> $"651.84" \times 0.04 (= 26.07)$ <b>or</b> for answers in the range 600.71 to 600.74  for 600.71 <b>or</b> 600.72 <b>or</b> 600.73 <b>or</b> 600.74	Implied by $679 \times 0.12 (= 81.48)$ or $679 \times 0.88 (= 597.52)$  Values may be rounded or truncated  If correct answer seen, and then difference found award M1M1A0
7	No (supported)	P1  P1  P1  C1	for a conversion with litres and gallons, eg $18 \div 4.5 (= 4)$ <b>or</b> $8 \times 4.5 (= 36)$  for a conversion with £ and euros, eg $27 \times 0.85 (= 22.95)$ <b>or</b> $40.8 \div 0.85 (= 48)$  for finding the unit price, eg $27 \div 18 (= 1.5)$ <b>OR</b> finding proportionality for fuel eg $("36" \div 18) (= 2)$  for No with comparative figures, eg No with 20.4 <b>and</b> 22.95 <b>OR</b> No with 1.275 <b>and</b> 1.133...	See page at end of mark scheme   May compare cost per gallon or cost in euros May be seen in a calculation or given in a description  Accept comparative figures rounded or truncated No is implied by eg Wales is cheaper

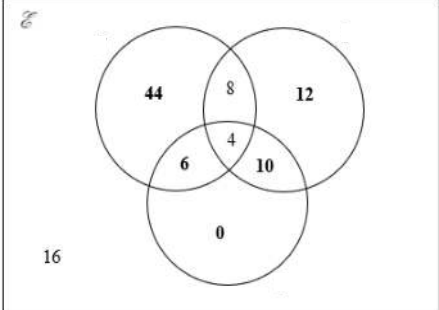
Paper: 1MA1/2H				
Question	Answer	Mark	Mark scheme	Additional guidance
8	0.739	M1  A1	for partial evaluation, eg 6.07(5732...) <b>or</b> $\sqrt{7.2}$ (= 2.68(328...)) <b>or</b> 7.80(778...) <b>or</b> $\sqrt[3]{7.80(7782818...)}$ (= 1.98(3851871...))  for an answer in the range 0.739 to 0.747	If an answer is given in the range in working and then rounded incorrectly award full marks.
9	0.8	P1  P1  A1	for process to find the area, eg $187.5 = \frac{180}{A}$ <b>or</b> $180 \div 187.5 (= 0.96)$ <b>or</b> $\frac{180}{1.2x} = 187.5$ <b>or</b> $1.2x = \frac{180}{187.5}$  for complete process to find width, eg “0.96” $\div 1.2$ <b>or</b> $180 \div 225$  cao	Ignore units for P marks only

Paper: 1MA1/2H																
Question	Answer	Mark	Mark scheme	Additional guidance												
10 (a)	Explanation	C1	<p>for explanation, eg</p> <p><b>Acceptable examples</b></p> <p>The IQR is half the data</p> <p>This is half the data</p> <p><math>\frac{3}{4}</math> of the data is less than 350(000)</p> <p><math>\frac{3}{4}</math> of the data is more than 160(000)</p> <p><math>\frac{3}{4}</math> of the data is lies between 60(000) and 350(000)</p> <p><math>\frac{1}{2}</math> of the data lies between 160(000) and 350(000)</p> <p><b>Not acceptable examples</b></p> <p>The data lies between 160 and 350</p> <p>The IQR is 190 (000)</p> <p><math>IQR = UQ - LQ</math></p> <p>The upper and lower quartiles represent half the data</p>	Zeros can be present or missing, but must be consistent.												
(b)	box plot drawn	B2  (B1)	<p>for fully correct box plot</p> <p>for showing a box and at least 3 correctly plotted values)</p>	Box can be of any height. Accept ends that are marked (eg line, cross, dot) or defined by the end of the whiskers if clear												
(c)	decision and comparisons	C1  C1	<p>(ft) for correct comparison of medians eg the median for online is greater than the median for the shop, the shop takes less money from sales in general as the median is lower</p> <p>(ft) for a correct comparison of a measure of spread, eg the interquartile (range) of sales for the online store is greater than the IQR for the sales of the shop</p> <p>Comparisons for this mark can relate to the range or the IQR.</p> <p>For the award of both marks at least one comparison must be in the context of the question.</p>	<p>Simply quoting values for median, range and IQR is insufficient, they must be compared</p> <table border="0"> <tr> <td></td> <td>Median</td> <td>Range</td> <td>IQR</td> </tr> <tr> <td>Online</td> <td>200</td> <td>360</td> <td>190</td> </tr> <tr> <td>Shop</td> <td>170</td> <td>320</td> <td>180</td> </tr> </table> <p>Also accept figures as 000s as long as consistent.</p> <p>Figures need not be seen but if given they must be correct.</p>		Median	Range	IQR	Online	200	360	190	Shop	170	320	180
	Median	Range	IQR													
Online	200	360	190													
Shop	170	320	180													

Paper: 1MA1/2H				
Question	Answer	Mark	Mark scheme	Additional guidance
11	Shown	M1  M1  C1	for $6 \times 14.5 (= 87)$ <b>or</b> $13 \times 7 (= 91)$ <b>or</b> $13 \div 6 (= 2.16(666\dots))$  for “87” $\div 7 (= 12.428\dots)$ <b>or</b> “87” $\div 13 (= 6.692\dots)$ <b>or</b> $6 \times 14.5 (= 87)$ <b>and</b> $13 \times 7 (= 91)$ <b>or</b> $14.5 \div “2.16” (= 6.692\dots)$  (dep M2) for 12.(428...) (workers) <b>or</b> 6.69(2...) (days) <b>or</b> 87 <b>and</b> 91	May work in hours or other units of time  Accept figure rounded or truncated to 1dp  Figures must be correct and supported by working. Accept value in range 6.69 to 6.72 for number of days
12	comparison shown	M1  A1	for starting to manipulate equation, eg $5y = 10x + 15$ <b>or</b> $5y = 10x - 4$ <b>or</b> $y - 2x + \frac{4}{5} = 0$ <b>or</b> $y - 2x = 3$  for statement and equation(s) which can be used to show that the gradients of the two lines are the same, eg $5y = 10x + 15$ <b>and</b> $5y = 10x - 4$ <b>and</b> both have the same $x$ coefficient <b>OR</b> $y = 2x - \frac{4}{5}$ <b>and</b> both have a gradient of 2	Ignore constant terms for both marks
13	enlargement	B2  (B1)	for correct enlargement at (4, 8) (6, 4) (10, 4) (12, 8)  for correct size <b>and</b> orientation in the wrong position <b>OR</b> 3 of 4 vertices correct)	

Paper: 1MA1/2H				
Question	Answer	Mark	Mark scheme	Additional guidance
14	1220	P1  P1  A1	for $\frac{45}{305}$ (= 0.147...) or $\frac{180}{45}$ (= 4) or $\frac{305}{45}$ (= 6.77...) or $\frac{45}{180}$ (= 0.25) for $\frac{45}{305} = \frac{180}{n}$ or $\frac{45}{180} = \frac{305}{n}$ or $\frac{180 \times 305}{45}$ cao	Decimal values truncated or rounded to 2 dp or more

Paper: 1MA1/2H				
Question	Answer	Mark	Mark scheme	Additional guidance
15	(M) 18, (K) 15	P1	<p>for start of process, eg <math>(6x + 1.5)</math> <b>and</b> <math>(5x + 1.5)</math>  <b>or</b> <math>(6x + 1.5)</math> <b>and</b> <math>(11x + 3)</math>  <b>or</b> <math>a + 1.5</math> <b>and</b> <math>b + 1.5</math></p> <p><b>OR</b> starts to work with ratio, eg <math>6 : 5 = 12 : 10</math></p>	
		P1	<p>for setting up an equation,  eg <math>\frac{6x+1.5}{5x+1.5} = \frac{13}{11}</math> <b>or</b> <math>66x + 16.5 = 65x + 19.5</math>  <b>or</b> <math>\frac{6x+1.5}{11x+3} = \frac{13}{24}</math> <b>or</b> <math>144x + 36 = 143x + 39</math>  <b>or</b> <math>\frac{a}{b} = \frac{6}{5}</math> <b>and</b> <math>\frac{a+1.5}{b+1.5} = \frac{13}{11}</math></p> <p><b>or</b> <math>5a = 6b</math> <b>and</b> <math>11a + 16.5 = 13b + 19.5</math> oe</p> <p><b>OR</b> for comparing <math>12 : 10</math> to <math>13 : 11</math> <b>and</b> deducing 1 part = 1.5</p>	
		P1	<p>for isolating in terms of <math>x</math>, eg <math>66x - 65x = 19.5 - 16.5</math>  <b>or</b> <math>144x - 143x = 39 - 36</math> <b>or</b> <math>x = 3</math></p> <p><b>or</b> for eliminating <math>a</math> or <math>b</math>, eg <math>55a = 66b</math> <b>and</b> so <math>66b = 65b + 15</math></p> <p><b>OR</b> for process to find values for M <b>and</b> K, eg <math>12 \times 1.5</math> <b>and</b> <math>10 \times 1.5</math></p>	
		A1	cao	

Paper: 1MA1/2H				
Question	Answer	Mark	Mark scheme	Additional guidance
16 (a)	Venn diagram	C4  (C3  (C2  (C1	fully correct Venn diagram  6 or 7 of the 8 regions correct )  4 or 5 of the 8 regions correct)  2 or 3 of the 8 regions correct)	 <p>If all other regions correct, accept blank region for 0 Additional digits in the diagram should be counted as 2 elements</p> <p>Need not be written in correct form at this stage eg could be a ratio 12 : 62</p> <p>Accept any equivalent fraction, decimal form 0.19(35...) or percentage form 19(.35...)%</p>
(b)	$\frac{12}{62}$	M1  A1	(ft their Venn diagram) for $\frac{"8 + 4"}{b}$ where $b > "8 + 4"$  or $\frac{a}{"44 + 8 + 4 + 6"}$ where $a < "44 + 8 + 4 + 6"$ oe ft oe	

Paper: 1MA1/2H				
Question	Answer	Mark	Mark scheme	Additional guidance
17 (a)	25.9	P1	<p>for process to find volume of hemisphere,  eg <math>\frac{1}{2} \times \frac{4}{3} \times \pi \times 3.5^3</math> (=89.797...) <math>\left(\frac{343\pi}{12}\right)</math></p> <p><b>or</b> for a correct expression for the volume of the cone,  eg <math>\frac{1}{3} \times \pi \times 3.5^2 (y - 3.5)</math> or <math>\frac{1}{3} \times \pi \times 3.5^2 \times h</math></p>	<p>'y - 3.5' may be seen as a new variable, but cannot be just y  Condone missing brackets  Accept decimals rounded or truncated to 1 dp</p> <p><math>120\pi - "89.797..." = 287.193...</math> or <math>\frac{1097\pi}{12}</math></p> <p><math>\pi</math> may be missing throughout  Award of this mark implies award of the previous  May be seen in multiple steps</p>
		P1	<p>for setting up an equation linking all three aspects,  eg <math>\frac{1}{2} \times \frac{4}{3} \times \pi \times 3.5^3 + \frac{1}{3} \times \pi \times 3.5^2 (y - 3.5) = 120\pi</math></p> <p><b>or</b> "89.797..." + "12.828..."(y - 3.5) = "376.99 ..."  <b>or</b> "28.5833..." <math>\pi</math> + "4.0833..." <math>\pi(y - 3.5) = 120\pi</math></p>	
		P1	<p>for process to isolate y or (y - 3.5) or h in their equation,  <math>120\pi - \frac{1}{2} \times \frac{4}{3} \pi 3.5^3 + \frac{1}{3} \pi 3.5^3</math>  eg <math>\frac{\frac{1}{3} \pi 3.5^2}{\frac{1}{3} \pi 3.5^2}</math></p> <p><b>or</b> <math>\frac{"376.99..." - "89.797..." + "44.898..."}{"12.828..."}</math></p> <p><b>or</b> <math>\frac{120\pi - "28.583..." \pi + "14.291..." \pi}{"4.083..." \pi}</math> oe</p>	
		A1	<p>for answer in range 25.8 to 26.3</p> <p>SCB3 for an answer in the range 22.3 to 22.8 or <math>\frac{1097}{49}</math></p>	<p>If an answer is given in the range in working and then rounded incorrectly award full marks.</p>



Paper: 1MA1/2H				
Question	Answer	Mark	Mark scheme	Additional guidance
(b)	explanation	C1	for explanation, eg <b>Acceptable examples</b> the height would decrease the height would be 0 at 14.227 y would be smaller it would decrease <b>Not acceptable examples</b> the height would increase	
18	7.63	M1  M1  M1  A1	for process to use the cosine rule to find $QR$ , eg $(QR^2 =) 11^2 + 9.4^2 - 2 \times 11 \times 9.4 \cos(27)$  for correct order of operations, eg $QR = \sqrt{209.36 - 206.8 \times \cos 27}$ (= 5(.009...)) <b>or</b> $QR = \sqrt{25(.09...)}$ <b>or</b> $\sqrt{25.1}$  (dep on M1) for process to use the sine rule, eg $\frac{QS}{\sin 88} = \frac{[QR]}{\sin 41}$ <b>oe or</b> $QS = \frac{[QR] \times \sin 88}{\sin 41}$ (= 7.631...) <b>oe</b>  for answer in range 7.61 to 7.632	[ $QR$ ] could be written as “5.009...” or could be a different figure, as long as this is clearly associated with the side $QR$  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: 1MA1/2H					
Question	Answer	Mark	Mark scheme		Additional guidance
19 (a)	3	B1	cao		[g <sup>-1</sup> (x)] must be their inverse function and cannot be $\sqrt[3]{2x-5}$
(b)	$\frac{2}{x^3+5}$	M1	for finding $(g^{-1}(x) = \frac{x^3+5}{2})$ oe		
		M1	for $(hg^{-1}(x) = \frac{1}{g^{-1}(x)})$ oe		
		A1	Accept $\left(\frac{x^3+5}{2}\right)^{-1}$		
20	98	M1	for $BAD = 132 \div 2 (= 66)$		Angles may be seen on diagram
		M1	eg $BCD = 180 - "66" (= 114)$ or $ABE = 180 - "66" - 16 (= 98)$	M2 for reflex $BOD = 360 - 132 (= 228)$ and $BCD = "228" \div 2 (= 114)$	
		A1	for finding $CDE = 98$		
		C1	(dep on at least M2) for one circle theorem relevant to their method eg The <u>angle</u> at the <u>centre</u> of a circle is <u>twice</u> the <u>angle</u> at the <u>circumference</u> or <u>Opposite angles</u> of a <u>cyclic quadrilateral</u> add up to 180		
					Underlined words need to be shown; reasons need to be linked to their method.

Paper: 1MA1/2H				
Question	Answer	Mark	Mark scheme	Additional guidance
21 (a)	Sketch	B1	for an appropriate sketch, ie reflection in y axis	Must go through $(-2, -4)$ $(0, 0)$ $(1, 1)$ $(3, 0)$ $(5, 4)$
(b)	$\tan(x + 270)^\circ - 5$	M1	for describing one part of the translation, eg $360 - 90 (= 270)$ or $\tan(x + 270)$  <b>or</b> $(y =) \tan(kx + a) - 5$ where $k$ and $a$ are numbers and $k \neq 0$	
		A1	cao	Condone missing degree symbol
22	$x < -7, x > 8$	M1	for method to solve $x^2 - 49 > 0$ eg $(x + 7)(x - 7)$ <b>or 7 and -7</b>	accept use of = or incorrect inequality symbol for both the M marks  This may be implied by a suitable diagram
		A1	for $x < -7$ <b>and</b> $x > 7$	
		M1	for method to solve $5x^2 - 31x - 72 > 0$  eg $(5x \pm 9)(x \pm 8)$ <b>or</b> $\frac{- -31 \pm \sqrt{(-31)^2 - 4 \times 5 \times (-72)}}{2 \times 5}$	This may be implied by a suitable diagram
			<b>or 8 and -1.8 oe</b>	
		A1	for $x < -1.8$ <b>and</b> $x > 8$	
		A1	cao	

**QUESTION 7 – Additional information NOT Exhaustive**

<p><b><u>Cost per litre in £:</u></b>  <math>27 \times 0.85 (=22.95)</math>  <math>"22.95" \div 18 (=1.275)</math>  <math>8 \times 4.5 (=36)</math>                      No <b>and</b> <math>40.8 \div "36" = 1.133..</math> (cost per litre in £ in Wales) compared to 1.275 (cost per litre in £ in Spain).</p>	<p><b><u>Cost per litre in euros:</u></b>  <math>27 \div 18 (=1.5)</math>  <math>8 \times 4.5 (=36)</math>  <math>40.8 \div 0.85 (= 48)</math>                      No <b>and</b> <math>"48" \div "36" = 1.333..</math> (cost per litre in euros in Wales) compared to 1.5 (cost per litre in euros in Spain).</p>
<p><b><u>Cost per gallon in £:</u></b>  <math>40.8 \div 8 (=5.1)</math>  <math>27 \times 0.85 (=22.95)</math>  <math>18 \div 4.5 (= 4)</math>                      No <b>and</b> <math>"22.95" \div "4" = 5.7375</math> (cost per gallon in £ in Spain) compared to 5.1(0) (cost per gallon in £ in Wales).</p>	<p><b><u>Cost per gallon in euros:</u></b>  <math>40.8 \div 0.85 (=48)</math>  <math>"48" \div 8 (= 6)</math>  <math>18 \div 4.5 (=4)</math>                      No <b>and</b> <math>27 \div "4" = 6.75</math> (cost per gallon in euros in Spain) compared to 6 (cost per gallon in euros in Wales).</p> <p><b><u>Note:</u></b>  <math>"2"</math> comes from <math>8 \div "4"</math> or <math>"36" \div 18</math></p>
<p><b><u>Cost of 8 gallons in £:</u></b>  <math>18 \div 4.5 (= 4)</math>  <math>27 \times 0.85 (=22.95)</math>  <math>"22.95" \times "2" (=45.90)</math>                      No <b>and</b> 45.90 (total cost in £ in Spain) compared to 40.80 (total cost in £ in Wales given).</p>	<p><b><u>Cost of 8 gallons in euros:</u></b>  <math>18 \div 4.5 (=4)</math>  <math>40.8 \div 0.85 (=48)</math>  <math>27 \times "2" (= 54)</math>                      No <b>and</b> 54 (cost for 8 gallons in euros in Spain) compared to 48 (cost of 8 gallons in euros in Wales).</p>
<p><b><u>Cost of 18 litres in £:</u></b>  <math>8 \times 4.5 (= 36)</math>  <math>40.8 \div "2" (= 20.4)</math>  <math>27 \times 0.85 (= 22.95)</math>                      No <b>and</b> 22.95 (cost for 18 litres in £ in Spain) compared to 20.40 (cost of 18 litres in £ in Wales).  <b>OR</b>  <math>18 \div 4.5 (= 4)</math>  <math>27 \times 0.85 (= 22.95)</math>  <math>40.8 \div "2" (= 20.4)</math>                      No <b>and</b> 22.95 (cost for 18 litres in £ in Spain) compared to 20.40 (cost of 18 litres in £ in Wales).</p>	<p><b><u>Cost of 18 litres in euros:</u></b>  <math>18 \div 4.5 (=4)</math>  <math>40.8 \div 0.85 (=48)</math>  <math>"48" \div "2" (= 24)</math>                      No <b>and</b> 24 (cost for 18 litres in euros in Wales) compared to 27 (cost of 18 litres in euros in Spain given).  <b>OR</b>  <math>8 \times 4.5 (= 36)</math>  <math>40.8 \div "2" (= 20.4)</math>  <math>"20.4" \div 0.85 (= 24)</math>                      No <b>and</b> 24 (cost for 18 litres in euros in Wales) compared to 27 (cost of 18 litres in euros in Spain given).</p>

## **Modifications to the mark scheme for Modified Large Print (MLP) papers: 1MA1 2H**

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:  $\pm 5^\circ$

Measurements of length:  $\pm 5$  mm

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PAPER: 1MA1_2H															
Question		Modification	Mark scheme notes												
1	(b)	The letter $x$ changed to $y$ .	Standard mark scheme but note change of letter.												
2		Wording added 'Look at the diagram for Question 2 in the Diagram Booklet. It shows shape S and shape T on a grid. A cut out shape may be available if you wish to use it.' Cut out shape provided. Diagram enlarged. Shading changed. The axes labels moved to the top of the vertical axis and to the right of the horizontal axis. Open headed arrows. The shapes labelled as 'shape T' and 'shape S'.	Standard mark scheme												
9		The frame removed from the formula.	Standard mark scheme												
10	(a)	Wording added 'Look at the diagram for Question 10(a) in the Diagram Booklet. It is a box plot which shows...'. The values changed so that they can be on grid lines. The least value changed to 50; lower quartile changed to 150; greatest value changed to 450. Diagram enlarged. Small squares removed. The horizontal axis label moved to the left of the horizontal axis. The grid cut at 500. The wording '...lies between 160 000 and 350 000' removed and replaced by '...lies between 150 000 and 350 000'.	Standard mark scheme but explanation should reference the adjusted figures. 160 now 150 350 still 350 IQR now 200 (000)												
10	(c)	Wording added 'The table below shows...'. Wording added 'Look at the diagram for Question 10(b) in the Diagram Booklet.' The wording 'On the grid below,' removed and replaced by 'On the grid in the Diagram Booklet,'. The values changed so that they can be plotted on grid lines. The least value changed to 50; LQ changed to 100; median changed to 150; UQ changed to 250. Diagram enlarged. Small squares removed. The horizontal axis label moved to the left of the horizontal axis. The grid cut at 500.	Standard mark scheme but explanation should reference the adjusted figures.  <table style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th></th> <th>Median</th> <th>Range</th> <th>IQR</th> </tr> </thead> <tbody> <tr> <td>Online</td> <td>190</td> <td>400</td> <td>200</td> </tr> <tr> <td>Shop</td> <td>150</td> <td>300</td> <td>150</td> </tr> </tbody> </table>		Median	Range	IQR	Online	190	400	200	Shop	150	300	150
	Median	Range	IQR												
Online	190	400	200												
Shop	150	300	150												

PAPER: 1MA1_2H		
Question	Modification	Mark scheme notes
13	<p>The question reversed and the candidate asked to describe the transformation instead of drawing.</p> <p>The shape drawn on the grid at the points (4, 8), (6, 4), (10, 4) and (12, 8) and labelled 'shape B'.</p> <p>The original shape labelled 'shape A'.</p> <p>Wording added 'Look at the diagram for Question 13 in the Diagram Booklet. It shows shape A and shape B on a grid. Shape A has been mapped onto shape B. Describe fully the single transformation that maps shape A onto shape B'.</p> <p>The grid cut at <math>x = -7</math> and <math>x = 13</math>. The grid cut at <math>y = -6</math> and <math>y = 9</math>.</p> <p>Diagram enlarged. Open headed arrows. Shading changed.</p> <p>The axes labels moved to the top of the vertical axis and to the right of the horizontal axis.</p> <p>3 answer lines provided.</p>	<p>B2 for a complete answer containing all three aspects: enlargement, (scale factor) <math>-2</math>, (centre of enlargement) origin or (0,0)</p> <p>(B1 for a partial answer containing two of the three aspects listed above).</p> <p>Award no marks if more than one transformation is given.</p>
16	<p>Wording added 'Look at the diagram for Question 16 in the Diagram Booklet. It shows an incomplete Venn diagram.'</p> <p>In part (a) wording added 'Complete the Venn diagram in the Diagram Booklet for this information.' Diagram enlarged. The circles relabelled as 'type A', 'type B' and 'type C'.</p> <p>Braille: In the Venn diagram, add (i), (ii), (iii), (iv), (v), (vi), (vii) &amp; (viii) in the blank spaces.</p> <p>Also add "Ans: (i) __ (ii) __ (iii) __ (iv) __ (v) __ (vi) __ (vii) __ (viii) __"</p>	Standard mark scheme

PAPER: 1MA1_2H		
Question	Modification	Mark scheme notes
17	<p>Wording added ‘Look at Diagram 1, Diagram 2 and the formulas for Question 17 in the Diagram Booklet. You may be provided with a model for the question and additional formula models.’</p> <p>The wording ‘...to make the solid T shown below’ removed and replaced by ‘...to make the solid T as shown by Diagram 1 and the model’.</p> <p>Model provided. Formula models provided. Diagram 2 to show a 2D diagram of solid T.</p> <p>Diagrams enlarged. Open headed arrows. The dashed lines made longer and thicker.</p> <p>The frame removed from the formulas.</p> <p>Wording added ‘You may be provided with a model.’ below the formulas.</p> <p>Wording added ‘Diagram 2 is a simplified 2D diagram of solid T. ‘The total vertical height...’</p> <p>Braille: Add the sentence “Separate models are provided to accompany these formulae.”</p>	Standard mark scheme
18	<p>Wording added ‘Look at the diagram for Question 18 in the Diagram Booklet. It shows triangles PQR and QRS which have a common side QR.’</p> <p>Wording added: ‘PQ = 11 cm PR = 9.4 cm angle QPR = 27° angle QRS = 88° angle RSQ = 41°’.</p> <p>Diagram enlarged. The angles moved outside of the angle arcs and the angle arcs made smaller.</p>	Standard mark scheme
20	<p>Wording added ‘Look at the diagram for Question 20 in the Diagram Booklet.’</p> <p>Wording added: ‘Angle BOD = 132° Angle CED = 16°’ Diagram enlarged.</p> <p>The angles moved outside of the angle arcs and the angle arcs made smaller.</p>	Standard mark scheme



**PAPER: 1MA1\_2H**

<b>Question</b>		<b>Modification</b>	<b>Mark scheme notes</b>
21	(a)	Wording added 'Look at the diagram for Question 21(a) in the Diagram Booklet. It shows the graph of $y = f(x)$ on a grid.' Wording removed 'The graph of $y = f(x)$ is shown on the grid below.' Diagram enlarged. The axes labels moved to the top of the vertical axis and to the right of the horizontal axis. Wording added 'On the grid in the Diagram Booklet,'.	Standard mark scheme
21	(b)	Wording added 'Look at the diagram for Question 21(b) in the Diagram Booklet. It shows a sketch...'. Diagram enlarged. The axes labels moved to the top of the vertical axis and to the right of the horizontal axis. The dashed lines made longer and thicker. The wording 'shown on the graph above' removed and replaced by 'shown on the graph in the Diagram Booklet'.	Standard mark scheme

