



# Mark Scheme (Results)

Summer 2024

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

## **Edexcel and BTEC Qualifications**

Edexcel and BTEC qualifications are awarded by Pearson, the UK's largest awarding body. We provide a wide range of qualifications including academic, vocational, occupational and specific programmes for employers. For further information visit our qualifications websites at [www.edexcel.com](http://www.edexcel.com) or [www.btec.co.uk](http://www.btec.co.uk). Alternatively, you can get in touch with us using the details on our contact us page at [www.edexcel.com/contactus](http://www.edexcel.com/contactus).

## **Pearson: helping people progress, everywhere**

Pearson aspires to be the world's leading learning company. Our aim is to help everyone progress in their lives through education. We believe in every kind of learning, for all kinds of people, wherever they are in the world. We've been involved in education for over 150 years, and by working across 70 countries, in 100 languages, we have built an international reputation for our commitment to high standards and raising achievement through innovation in education. Find out more about how we can help you and your students at: [www.pearson.com/uk](http://www.pearson.com/uk)

Summer 2024

Question Paper Log Number P76927A

Publications Code 1MA1\_3H\_2406\_MS

All the material in this publication is copyright

© Pearson Education Ltd 2024

## **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**

**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

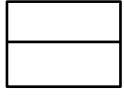
**dep** dependent (on a previous mark)

**indep** independent

**awrt** answer which rounds to

**isw** ignore subsequent working

Paper: 1MA1/3H				
Question	Answer	Mark	Mark scheme	Additional guidance
1	21	M1	<p>for a complete factor tree for 63 or 105 with no more than one arithmetic error</p> <p><b>or</b> for listing at least 4 correct factors (with no more than 1 incorrect) of 63 or 105, could be in factor pairs</p> <p><b>or</b> for the prime factors of 63 (3, 3, 7) or 105 (3, 5, 7)</p>	<p>Condone the inclusion of 1 for this mark</p> <p>May be seen in different ways, 1, 3, 7, 9, 21, 63 1, 3, 5, 7, 15, 21, 35, 105</p> <p>Prime factors may be seen in a diagram eg a Venn diagram</p>
		A1	<p>cao</p> <p>SCB1 for an answer of 3 or 7 or <math>3 \times 7</math> if M0 scored</p>	
2 (a)(i)	53 000	B1	cao	
(ii)	0.000 074	B1	cao	
(b)	$3.42 \times 10^7$	M1	<p>for <math>9700000 + 24500000 (= 34200000)</math></p> <p><b>or</b></p> <p><math>3.42 \times 10^n</math> (<math>n \neq 7</math>) oe</p> <p><b>or</b></p> <p><math>3.4 \times 10^7</math></p> <p><b>or</b></p> <p>correct answer in incorrect form eg <math>34.2 \times 10^6</math></p> <p><b>or</b></p> <p>both in a form ready for addition, eg <math>9.7 \times 10^6 + 24.5 \times 10^6</math></p>	
		A1	cao	

Paper: 1MA1/3H				
Question	Answer	Mark	Mark scheme	Additional guidance
3 (a)	Explanation	C1	<p>for explanation</p> <p><b>Acceptable examples</b></p> <p>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... / <math>\sqrt{7}</math>      She's drawn the slanted height / not used the perpendicular height      The height is smaller / not 4 cm / 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 4 cm 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</p> <p><b>Not acceptable examples</b></p> <p>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)</p>	
(b)		M1	<p>for a 7 cm by 6 cm rectangle</p> <p><b>or</b></p> <p>for a 7 cm by <math>n</math> cm or <math>m</math> cm by 6 cm rectangle <b>and</b> dividing line which is parallel to the 7 cm or the <math>m</math> cm side</p>	<p>Accept any orientation</p> <p>Accept a freehand drawing</p>
		A1	for a fully correct plan	

Paper: 1MA1/3H				
Question	Answer	Mark	Mark scheme	Additional guidance
4	29 775	P1 P1 P1 A1	for evidence of using a correct first step eg $25\ 000 \times 0.06 (= 1500)$ or $25\ 000 \times 1.06 (= 26\ 500)$  for evidence of a "compound interest" process eg "26 500" $\times 0.06 (= 1590)$ or "26 500" $\times 1.06 (= 28\ 090)$ <b>or</b> $25\ 000 \times 1.06^t, t \geq 2$  for a complete process eg $25\ 000 \times 1.06^3 (= 29\ 775.4)$  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	P3A0 is implied by 4775 or 4776 or 4780 or 4800
5	2	P1 P1 P1 A1	for process to find volume of tin eg $600 \div 0.6 (= 1000)$  for process to find volume of salt eg "1000" - 700 (= 300)  for a process to find density of the salt eg $600 \div "300"$ <b>or</b> $0.6 \times ("1000" \div "300")$ <b>or</b> $600 \div [\text{volume}]$  cao	Award P1 for $600 \div 0.6 (= 1000)$ even if not used  [volume] can be 700 or from a seen calculation using "1000", "300", 700 or identified as volume by label or formula or units  A correct answer with no supportive working gets 0 marks

Paper: 1MA1/3H				
Question	Answer	Mark	Mark scheme	Additional guidance
6 (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>B</b> in the correct place on the branches	
(b)	0.33	M1	for a correct method, eg $0.6 \times 0.55$ only	
		A1	for 0.33 oe	An answer of $\frac{0.33}{1}$ scores M1A0
7	63	P1	for process to find volume, eg $\pi \times 100^2 \times 30$ ( $= 300000\pi$ or 942477(.796...))	(volume =) 942478 implies P1
		P1	for process to find time in seconds, eg “942477(.796...)” $\div 250$ ( $= 1200\pi$ or 3769(.911...)) <b>or</b> [volume] $\div 250$	(time =) 3770 implies P2
		P1	for converting rate to minutes, eg $250 \times 60$ ( $= 15000$ )	[volume] $\neq 30, 60, 100, 250$
		A1	for complete process eg “3769(.911...)” $\div 60$ ( $= 20\pi$ ) <b>or</b> “942477(.796...)” $\div “15000”$ ( $= 20\pi$ )	
			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: 1MA1/3H				
Question	Answer	Mark	Mark scheme	Additional guidance
8	Vector $\begin{pmatrix} 5 \\ 8 \end{pmatrix}$ drawn	M1	for $2 \times 3 + -1 (= 5)$ or $2 \times 2 + 4 (= 8)$ seen as a calculation <b>or</b> for $\begin{pmatrix} 2 \times 3 \\ 2 \times 2 \end{pmatrix} + \begin{pmatrix} -1 \\ 4 \end{pmatrix}$ <b>or</b> for $\begin{pmatrix} 5 \\ b \end{pmatrix}$ or $\begin{pmatrix} a \\ 8 \end{pmatrix}$ <b>or</b> for $\begin{pmatrix} 3 \\ 2 \end{pmatrix}$ drawn or $\begin{pmatrix} 6 \\ 4 \end{pmatrix}$ drawn or $\begin{pmatrix} -1 \\ 4 \end{pmatrix}$ drawn  M1 for $\begin{pmatrix} 5 \\ 8 \end{pmatrix}$ <b>or</b> for $\begin{pmatrix} 5 \\ 8 \end{pmatrix}$ drawn with no arrow or incorrect arrow <b>or</b> for $\begin{pmatrix} 5 \\ b \end{pmatrix}$ drawn with arrow or $\begin{pmatrix} a \\ 8 \end{pmatrix}$ drawn with arrow, where $b \neq 8$ and $a \neq 5$  A1 cao	May be in the correct position in a column vector or coordinate.  Condone missing arrows  For this mark the drawn vector must include an arrow showing direction. Need not be labelled but do not award if there is any ambiguity

<b>Paper: 1MA1/3H</b>				
<b>Question</b>	<b>Answer</b>	<b>Mark</b>	<b>Mark scheme</b>	<b>Additional guidance</b>
9	10.125	P1	for process to find volume of at least one of the cube or the pyramid, eg $6 \times 6 \times 6 (= 216)$ oe or $k \times 8 \times 8 \times h (= \frac{64}{3}h)$ oe	Check diagram for working Throughout $0 < k \leq 1$
		P1	for process to form an equation, eg $6 \times 6 \times 6 = k \times 8 \times 8 \times h$ or “216” = $\frac{64}{3}h$ <b>or</b> for process to find $h$ eg “216” $\div 8^2 \div k$	
		A1	for 10.125 oe mixed number	

Paper: 1MA1/3H				
Question	Answer	Mark	Mark scheme	Additional guidance
10	Result shown	M1	<p>for method to find the number of yellow counters in bag <b>A</b>,</p> <p>eg <math>x \div 3 \times 5 (= \frac{5x}{3})</math></p> <p>or for method to find the total number of counters in bag <b>A</b></p> <p>eg <math>x \div 3 \times 8 (= \frac{8x}{3})</math></p> <p>or for starting to work with ratio using algebra eg <math>3y, 5y</math></p>	
		M1	<p>(dep) for method to find the total number of counters in bag <b>B</b>,</p> <p>eg <math>(x + \frac{5x}{3}) \div 2 (= \frac{4x}{3})</math> or <math>\frac{8x}{3} \div 2 (= \frac{4x}{3})</math></p> <p>or <math>(3y + 5y) \div 2 (= 4y)</math></p>	<p>Could use any letter other than <math>y</math> apart from <math>x</math></p> <p>For the method marks condone decimals that are rounded or truncated to 1dp</p>
		C1	<p>for complete method showing that total number of counters in bag <b>A</b> and bag <b>B</b> is <math>4x</math>,</p> <p>eg <math>\frac{8x}{3} + \frac{4x}{3} = 4x</math></p> <p>or <math>3y + 5y + 4y = 12y</math> <b>and</b> <math>12y \div 3y \times x = 4x</math></p>	<p>For the C mark only accept values that are shown to be recurring and allow <math>3.\dot{9}x = 4x</math></p>

Paper: 1MA1/3H																
Question	Answer	Mark	Mark scheme	Additional guidance												
11 (a)	Box plot drawn	M1 M1 A1	for method to find UQ (47) <b>or</b> greatest value (62) from the table for showing a box and at least 3 correctly plotted values from 25, 35, 40, 47, 62 for a fully correct box plot	May be implied by one of these values being correctly plotted.  Box can be any height. Accept ends that are marked (eg line, cross, dot) or defined by the end of the whiskers if clear												
(b)	Comparison	C1 C1	ft a correct comparison of medians from figures, eg the median speed for Sunday was greater than the median speed for Friday or the speed on Friday is generally lower as the median is lower  ft for a correct comparison of spread, eg the (interquartile) range of the speeds for Friday is smaller than the (interquartile) range of the speeds for Sunday, the (interquartile) range on Sunday is larger than the (interquartile) range on Friday Comparisons for this mark can relate to the range or the IQR	Simply quoting values is insufficient, they must be compared.  <table border="1" data-bbox="1605 698 2043 786"> <thead> <tr> <th></th><th>Median</th><th>Range</th><th>IQR</th></tr> </thead> <tbody> <tr> <td>Friday</td><td>40</td><td>37</td><td>12</td></tr> <tr> <td>Sunday</td><td>42</td><td>44</td><td>15</td></tr> </tbody> </table> Figures need not be stated but if they are they must be correct.  For 2 marks, at least one comparison must be in context (eg refers to speed or mph)		Median	Range	IQR	Friday	40	37	12	Sunday	42	44	15
	Median	Range	IQR													
Friday	40	37	12													
Sunday	42	44	15													
12	Correct enlargement	B2 (B1)	for correct enlargement $(-2, -4), (-2, -6), (-6, -4)$ for correct size and orientation but incorrect position <b>or</b> 2 out of 3 vertices correctly placed)	Award for clear intention, shading not needed.												

Paper: 1MA1/3H				
Question	Answer	Mark	Mark scheme	Additional guidance
13	435	M1  A1	<p>for start to method of finding the number of pairs, eg <math>30 \times 29 (= 870)</math> oe  <math display="block">\frac{30 \times 29}{2}</math>  or clear intention to sum the integers from 1 to 29  eg <math>29 + 28 + \dots + 2 + 1</math></p> <p>cao</p>	M1 for $\frac{1}{30} \times \frac{1}{29}$
14	4400	P1  P1  P1  A1	<p>for start to processes needed to find the investment,  eg <math>2937.14 + 1000 (= 3937.14)</math>  <b>OR</b>  starts to work with algebra, eg <math>P \times 1.035 - 750</math></p> <p>for process to find amount of money at the beginning of 2023 after the first withdrawal,  eg “<math>3937.14</math>” <math>\div 1.035 (= 3804)</math> or [value] <math>\div 1.035</math>  <b>OR</b>  writes down complete equation,  eg <math>(P \times 1.035 - 750) \times 1.035 - 1000 = 2937.14</math></p> <p>for complete process, eg (“<math>3804</math>” + 750) <math>\div 1.035</math>  <b>OR</b>  for a start to the process to solve the equation to find <math>1.035P - 750</math>  eg <math>P \times 1.035 - 750 = \frac{2937.14 + 1000}{1.035}</math> or <math>1.035P - 750 = 3804</math>  <b>or</b>  for a start to the process to solve the complete equation  eg <math>1.035^2P - 776.25 = 2937.14 + 1000</math>  or <math>1.035^2P - 1000 = 2937.14 + 776.25</math>  or <math>1.035^2P = 2937.14 + 776.25 + 1000</math></p> <p>cao</p>	<p>[value] can be 2937.14 or  <math>2937.14 + 750</math> or  <math>2937.14 + 1750</math></p> <p>A correct answer with no supportive working gets 0 marks</p>

Paper: 1MA1/3H				
Question	Answer	Mark	Mark scheme	Additional guidance
15 (a)	$\frac{a-3}{5}$	B1	for $\frac{a-3}{5}$ oe	
(b)	$(3k-1)(k+4)$	M1	for $(3k \pm 1)(k \pm 4)$ oe or for brackets which when expanded give 2 out of 3 terms correct	Accept $3k(k+4) - (k+4)$ Accept $k(3k-1) + 4(3k-1)$
(c)	$\frac{2-x}{x}$	A1	cao	Accept $(1-3k)(-k-4)$
		M1	for factorisation eg $(4-x^2) = (2-x)(2+x)$ <b>and</b> $(x^2+3x) = x(x+3)$ <b>or</b> for inversion and multiplication (condone incorrect factorising) eg $\frac{4-x^2}{x^2+3x} \times \frac{x+3}{x+2}$ oe	
		M1	for factorisation of both quadratics <b>and</b> inversion and multiplication, eg $\frac{(2-x)(2+x)}{x(x+3)} \times \frac{x+3}{x+2}$ allow sign errors in one bracket	
		A1	for $\frac{2-x}{x}$ or $\frac{2}{x} - 1$	

Paper: 1MA1/3H					
Question	Answer	Mark	Mark scheme	Additional guidance	
16	(a) -6	B1	cao		
		M1	for $g(1) = 5 - 3 \times 1 (= 2)$ <b>and</b> a clear intention to find $f(“2”)$ <b>or</b> for $\frac{12}{5-3\times 1+1}$	For reference $f(x) = \frac{12}{x+1}$ and $g(x) = 5 - 3x$	
	(b) 4	A1	<b>or</b> for stating $fg$ , eg $\frac{12}{5-3x+1}$ oe cao	Accept $\frac{4}{1}$	
		M1	for $g^{-1}$ as $\frac{5-x}{3}$ oe <b>or</b> for $5 - 3x = 4$ <b>or</b> $g\left(\frac{1}{3}\right) = 5 - 1 = 4$	Could be shown in the form of a flowchart, which must show correct inverse operations. Allow $g^{-1}$ and $g$ to be in terms of $y$ ie accept $\frac{5-y}{3}$ and $5 - 3y = 4$	
		A1	for $\frac{1}{3}$ oe eg 0.33(3...)		
	(c) $\frac{1}{3}$				
17		M1	for method to find height after 2nd bounce, eg $0.55 \times 8 (= 4.4)$		
		M1	for method to find height after 3rd bounce, eg $0.55 \times “4.4” (= 2.4(2))$ <b>or</b> for method to find height after 4th bounce, eg $0.55^3 \times 8$ <b>or</b> for method to find height after 5th bounce, eg $0.55^4 \times 8 (= 0.73(205))$	Award this mark for $0.55^n \times 8$ where $n > 1$	
		A1	for 1.331, accept 1.33, 1.3 oe mixed number	If a correct answer is shown and then incorrectly rounded award full marks	

Paper: 1MA1/3H				
Question	Answer	Mark	Mark scheme	Additional guidance
18	52.5	P1	<p>for start of process to find length of <math>AC</math>,</p> <p>eg <math>\frac{1}{2} \times 17 \times AC \times \sin 35 = 54</math> or <math>(AC =) 54 \div (\frac{1}{2} \times 17 \times \sin 35) (= 11.076\dots)</math></p>	Check diagram for working throughout

Paper: 1MA1/3H				
Question	Answer	Mark	Mark scheme	Additional guidance
19	1610	B1 M1 A1	for $5.875 \times 10^8$ or $5.885 \times 10^8$ or $3.55 \times 10^5$ or $3.65 \times 10^5$ or the digits 5875 or 5885 or 355 or 365  for method to find lower bound, $\frac{[LB]}{[UB]}$ eg $(5.875 \times 10^8) \div (3.65 \times 10^5)$ oe  for answer in range 1609 – 1610 from correct working	Accept 5.8849 for 5.885 Accept 3.649 for 3.65  $5.875 \times 10^8 \leq [LB] < 5.88 \times 10^8$ $3.6 \times 10^5 < [UB] \leq 3.65 \times 10^5$  If an answer is shown in the range in working and then incorrectly rounded award full marks
20 (a)	3.5	P1	for process to find the common difference between the first and second and the common difference between the third and second term eg $(3x + 1) - (x + 2) (= 2x - 1)$ <b>and</b> $(x + 2) - (x - 4) (= 6)$  <b>or</b> for process to write a correct equation in $x$ , eg $(3x + 1) - (x + 2) = (x + 2) - (x - 4)$ or $2x - 1 = 6$ oe	
(b)	-0.5, 8	A1	for 3.5 oe eg $\frac{7}{2}$	
		P1	for process to write a correct equation in terms of the common ratio and $y$ eg $r(y - 4) = y + 2$ or $r(y + 2) = 3y + 1$	$r$ can be any letter apart from $y$
		P1	for process to write a correct equation in $y$ eg $\frac{3y + 1}{y + 2} = \frac{y + 2}{y - 4}$ oe	
		P1	for process to write a correct equation without fractions eg $(3y + 1)(y - 4) = (y + 2)(y + 2)$ oe	
		P1	for process of writing a correct simplified equation eg $2y^2 - 15y - 8 (= 0)$	The quadratic does not have to equal 0, ie accept $2y^2 - 15y = 8$
		A1	cao	

Paper: 1MA1/3H				
Question	Answer	Mark	Mark scheme	Additional guidance
21	Result shown	P1	<p>for process to find the length of half a side or a side or the perimeter of the smaller hexagon <math>PQRSTU</math>,            eg <math>r\sin30 (= \frac{r}{2})</math> oe or <math>2r\sin30 (= r)</math> oe or <math>6 \times 2r\sin30 (= 6r)</math> oe</p> <p>for process to find the length of half a side or a side or the perimeter of the larger hexagon <math>ABCDEF</math>            eg Length of half side = <math>r \tan 30</math> or <math>\frac{r}{\tan 60} (= \frac{\sqrt{3}r}{3})</math> oe            or Length of side = <math>2r \tan 30</math> or <math>\frac{2r}{\tan 60}</math> or <math>\frac{r}{\sin 60}</math> or <math>\frac{r}{\cos 30} (= \frac{2\sqrt{3}r}{3})</math> oe            or Length of perimeter = <math>6 \times 2r \tan 30</math> or <math>6 \times \frac{2r}{\tan 60}</math> oe</p> <p>(dep P2) for process of forming a correct inequality,            eg using half lengths eg <math>\frac{r}{2} &lt; \frac{2\pi r}{12} &lt; r \tan 30</math> oe            or using lengths eg <math>r &lt; \frac{2\pi r}{6} &lt; 2r \tan 30</math> oe            or using perimeters eg <math>6 \times r &lt; 2\pi r &lt; 6 \times 2r \tan 30</math> oe</p> <p>(dep P2) correct algebra leading to given result, <math>3 &lt; \pi &lt; 2\sqrt{3}</math></p>	<p>May use Sine Rule or <math>\cos 60</math> instead of <math>\sin 30</math></p> <p>May use Sine Rule            Note this mark is not for just the sight of <math>\frac{\sqrt{3}r}{3}</math> or <math>\frac{2\sqrt{3}r}{3}</math> or <math>\frac{12\sqrt{3}r}{3}</math> oe, they need to be associated with the correct length            Perimeter = <math>4\sqrt{3}r</math> alone does not get this mark</p>

## **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:  $\pm 5^\circ$

Measurements of length:  $\pm 5$  mm

<b>PAPER: 1MA1_3H</b>		
<b>Question</b>	<b>Modification</b>	<b>Mark scheme notes</b>
3	<p>For MLP: wording added 'Look at the diagram for Question 3 in the separate Diagram Booklet. It shows a solid triangular prism. The diagram is NOT accurately drawn. You may also be given a model.'</p> <p>For Braille: wording added 'Ask for the model for Question 3. The model IS accurately made. The model is a solid triangular prism.'</p> <p>(a) Wording added 'Look at the diagram for Question 3 (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.'</p> <p>(b) Diagram Booklet has four shapes labelled shape A, shape B, shape C and shape D. Wording added 'Look at the diagram for Question 3 (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?'</p>	<p>Standard mark scheme</p> <p>B2 for C (B1 for B or D)</p>
6	(a) Diagram enlarged. Wording added 'Look at the diagram for Question 6 (a) in the separate Diagram Booklet. The diagram shows an incomplete probability tree diagram.'	Standard mark scheme
7	<p>For MLP: wording added 'Look at the diagram for Question 7 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.'</p> <p>For Braille: sentence added 'Ask for the model for Question 7. The model is NOT accurately made. The model represents a paddling pool in the shape of a cylinder.'</p>	Standard mark scheme

8		<p>Wording added ‘Look at the diagram for Question 8 in the separate Diagram Booklet. The diagram is a grid.’</p> <p>Demand now ‘On the grid, draw and label the vector <math>2a + b</math> when <math>a = \begin{pmatrix} 3 \\ 2 \end{pmatrix}</math> and <math>b = \begin{pmatrix} -1 \\ 4 \end{pmatrix}</math>,</p> <p>For Braille: sentence added ‘A spare tactile diagram, Wikki Stix, drawing film, vector arrows and sticky labels are available for this question.’</p>	Standard mark scheme												
9		<p>For MLP: diagram enlarged. Wording added ‘Look at the diagram for Question 9 in the separate Diagram Booklet. The diagram is NOT accurately drawn. The diagram shows a cube with sides <b>6 cm</b> and a square-based pyramid with an <b>8 cm</b> square base and perpendicular height <b>h cm</b>. You may also be given two models.’</p> <p>For Braille: sentence added ‘Ask for the models for Question 9. The models are NOT accurately made. Model A is a cube with sides 6 cm. Model B is a square – based pyramid with an 8 cm square base and a perpendicular height h cm.</p>	Standard mark scheme												
11	(a)	<p>Sentence changed to ‘She uses her results to work out the information in the table below.’</p> <p>Values in the table changed: Interquartile range from 12 to 10, Range from 37 to 35</p> <p>Wording added ‘On the grid provided for Question 11 (a) in the separate Diagram Booklet, draw a box plot to show the information in the table.’</p> <p>For Braille: sentence added ‘A spare tactile diagram and drawing film are available for this question.’</p>	<p>M1 for method to find UQ (45) or greatest value (60) from the table</p> <p>M1 for showing a box and at least 3 correctly plotted values from 25, 35, 40, 45, 60</p> <p>A1 for a fully correct box plot</p>												
	(b)	<p>Wording added ‘Look at the diagram for Question 11 (b) in the separate Diagram Booklet. The diagram shows a box plot.’</p> <p>Box plot data changed from 22, 33, 42, 48, 66 to 20, 30, 45, 50, 65</p>	<p>Standard mark scheme but note change in values</p> <table border="1" 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>Friday</td> <td>40</td> <td>35</td> <td>10</td> </tr> <tr> <td>Sunday</td> <td>45</td> <td>45</td> <td>20</td> </tr> </tbody> </table>		Median	Range	IQR	Friday	40	35	10	Sunday	45	45	20
	Median	Range	IQR												
Friday	40	35	10												
Sunday	45	45	20												
12		<p>Diagram enlarged. Triangle T with vertices at <math>(-2, -4)</math>, <math>(-2, -6)</math>, <math>(-6, -4)</math> added to grid.</p> <p>Wording added ‘Look at the diagram for Question 12 in the separate Diagram Booklet.</p> <p>The diagram shows triangle T and triangle S on a coordinate grid.’</p> <p>Demand changed to ‘Describe fully the single transformation that maps triangle T onto triangle S. You may be given a cut-out shape for this question.’</p>	<p>B2 for enlargement, scale factor <math>-2</math>, centre <math>(0, 0)</math></p> <p>(B1 for any 2 aspects)</p>												

15	(a)	Letter changed: a changed to p  (c) Letter changed: x changed to y	Standard mark scheme but note the change of letter  Standard mark scheme but note the change of letter
18		Diagram enlarged. Labels changed on the diagram (B changed to D and D changed to B) Wording added 'Look at the diagram for Question 18 in the separate Diagram Booklet. The diagram is NOT accurately drawn. The diagram shows a quadrilateral labelled ABCD.' 'In the diagram: $AD = 17 \text{ cm}$ Angle ABC = $57^\circ$ Angle ACB = $48^\circ$ Angle CAD = $35^\circ$ ' Demand amended 'The area of triangle ACD is $54 \text{ cm}^2$ Calculate the area of triangle ABC.'	Standard mark scheme but note the changes in the vertices
21		Diagram enlarged. Dashed line with label 'r cm' drawn from centre to midpoint of EF. Wording added 'Look at the diagram for Question 21 in the separate Diagram Booklet. The diagram is NOT accurately drawn. The diagram shows a circle, radius r cm and two regular hexagons.'	Standard mark scheme

