edexcel

Mark Scheme (Results)

Summer 2015

Pearson Edexcel GCSE
In Mathematics A (1MA0)
Higher (Non-Calculator) Paper 1H

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 or 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.

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

Summer 2015
Publications Code UG042062
All the material in this publication is copyright
© Pearson Education Ltd 2014

NOTES ON MARKING PRINCIPLES

1 All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.

2 Mark schemes should be applied positively.

3 All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e if the answer matches the mark scheme. Note that in some cases a correct answer alone will not score marks unless supported by working; these situations are made clear in the mark scheme. Examiners should be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.

4 Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.

5 Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.

6 Mark schemes will award marks for the quality of written communication (QWC).
The strands are as follows:

i) *ensure that text is legible and that spelling, punctuation and grammar are accurate so that meaning is clear*
Comprehension and meaning is clear by using correct notation and labelling conventions.

ii*) select and use a form and style of writing appropriate to purpose and to complex subject matter*
Reasoning, explanation or argument is correct and appropriately structured to convey mathematical reasoning.

iii) *organise information clearly and coherently, using specialist vocabulary when appropriate*.
The mathematical methods and processes used are coherently and clearly organised and the appropriate mathematical vocabulary used.

With working

If there is a wrong 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.
If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.
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, and discuss each of these situations with your Team Leader.
If there is no answer on the answer line then check the working for an obvious answer.
Partial answers shown (usually indicated in the ms by brackets) can be awarded the method mark associated with it (implied).
Any case of suspected misread loses A (and B) marks on that part, but can gain the M marks; transcription errors may also gain some credit. Send any such responses to review for the Team Leader to consider.
If there is a choice of methods shown, then no marks should be awarded, unless the answer on the answer line makes clear the method that has been used.

8 Follow through marks

Follow through marks which involve a single stage calculation can be awarded without working since you can check the answer yourself, 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.

9 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: e.g. incorrect cancelling of a fraction that would otherwise be correct
It is not appropriate to ignore subsequent work when the additional work essentially makes the answer incorrect e.g. algebra.

10 Probability

Probability answers must be given a fractions, percentages or decimals. 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 answer is given on the answer line using both incorrect and correct notation, award the marks.
If a probability fraction is given then cancelled incorrectly, ignore the incorrectly cancelled answer.

Linear equations

Full marks can be gained if the solution alone is given on the answer line, or otherwise unambiguously indicated 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).

12 Parts of questions

Unless allowed by the mark scheme, the marks allocated to one part of the question CANNOT be awarded in another.

13 Range of answers

Unless otherwise stated, when an answer is given as a range (e.g 3.5 – 4.2) then this is inclusive of the end points (e.g 3.5, 4.2) and includes all numbers within the range (e.g 4, 4.1)

14 The detailed notes in the mark scheme, and in practice/training material for examiners, should be taken as precedents over the above notes.

Guidance on the use of codes within this mark scheme
M1 – method mark for appropriate method in the context of the question A1 – accuracy mark B1 – Working mark C1 – communication mark QWC – quality of written communication oe – or equivalent cao – correct answer only ft – follow through sc – special case dep – dependent (on a previous mark or conclusion) indep – independent isw – ignore subsequent working

PAPER: 1MA0_1H					
Question		**Working**	**Answer**	**Mark**	**Notes**
1	(a)		15 | 6 9 16 | 4 5 7 7 8 9 17 | 2 3 6 6 8 9 18 | 0 2 3 8 19 | 0 2 with key	3	B2 for a correct ordered stem and leaf diagram (B1 for fully correct unordered or ordered with one error or omission) B1 (indep) for key (units not required)
	(b)		15	2	M1 for a method to find "3" as a percentage of the total number of men, eg $\frac{"3"}{"20"}\times 100$ oe $\frac{"3"\times 5}{100}$ or ft from their diagram A1 for 15 cao
2	(a)		36	1	B1 cao
	(b)		2.5 oe	2	M1 for collecting the terms in x or the number terms in an equation, eg. $5x - x + 4 = 14$ or $5x = 14 - 4 + x$ A1 for 2.5 oe (accept $\frac{10}{4}$)
3			Question	2	B1 for a question with a time frame for frequency of use B1 for at least 3 correctly labelled response boxes (non-overlapping and exhaustive) [Do not allow inequalities in response boxes]

PAPER: 1MA0_1H

Question		Working	Answer	Mark	Notes
*4		1195 4780 + 5975 2 3 9 0 4 / 0 6 / 1 8 2 5 1 0 / 1 5 / 4 5 5 9 7 5 | | 200 | 30 | 9 | | 20 | 4000 | 600 | 180 | | 5 | 1000 | 150 | 45 | 4000 + 1000 + 600 + 150 + 180 + 45 = 5975	Kirsty's Plants with correct calculations	5	M1 for complete method with relative place value correct. Condone 1 multiplication error, addition not necessary. M1 (dep) for addition of all the appropriate elements of the calculation or digits 5975 M1 for a complete method to find 120% of £52.50 A1 for 59.75 and 63(.00) C1 (dep on M2) for correct conclusion for their figures **OR** M1 for the start of a method to divide £52.50 by 25, eg. 2 rem 2 M1 for a complete method to divide £52.50 by 25, condone one arithmetic error, or digits 21 M1 for a complete method to find 120% of '£2.10' A1 for 2.52 C1 (dep on M2) for correct conclusion for their figures **OR** M1 for a complete method to find 120% of £52.50 M1 for the start of a method to divide '63' by 25, eg. 2 rem 13 M1 for a complete method to divide '63' by 25, condone one arithmetic error, or digits 252 A1 for 2.52 C1 (dep on M2) for correct conclusion for their figures

PAPER: 1MA0_1H					
Question		**Working**	**Answer**	**Mark**	**Notes**
5			12	3	M1 for a method to find volume of a cuboid, eg. $2 \times 10 \times 15$ (= 300) or $5 \times 5 \times x$ (= $25x$) M1 (dep) for "300" ÷ "25" oe A1 cao OR M1 for $10 \div 5$ (= 2) and $15 \div 5$ (= 3) or $10 \div 5$ (= 2) and $2 \div 5$ (= 0.4) M1 (dep) for $2 \times$ "2" $\times$ "3" or $15 \times$ "2" $\times$ "0.4" A1 cao
6	(a)		Relationship	1	B1 for a description of a dynamic relationship eg "The older the car the lower the price" or "The newer the car the greater the price" oe (accept negative correlation)
	(b)		6400 to 7000	2	M1 for a single straight line segment with negative gradient that could be used as a line of best fit or vert. line from 3.5 or a point plotted at (3.5, y), where y is in the range 6400 to 7000 A1 for 6400 - 7000
7	(a)		Triangle with vertices at (–3, 3), (–3, 4) and (–1, 4)	2	B2 for a triangle with vertices at (–3, 3), (–3, 4), (–1, 4) (B1 for triangle in correct orientation and size or rotated 90º clockwise about centre O or three correct vertices without joining)
	(b)		Reflection in line $y = x$	2	B1 for reflection B1 for (in the line) $y = x$ Note: award no marks if more than one transformation is given

PAPER: 1MA0_1H					
Question		**Working**	**Answer**	**Mark**	**Notes**
8	(a)		$2g - 3h$	2	M1 for $2g$ or $-3h$ A1 for $2g - 3h$ or $-3h + 2g$
	(b)		$y(y - 2)$	1	B1
	(c)		p^5	2	M1 for $\frac{p^{3+4}}{p^2}\left(=\frac{p^7}{p^2}\right)$ or $p^{3-2} \times p^4 (= p^1 \times p^4)$ or $p^3 \times p^{4-2}$ $(= p^3 \times p^2)$ A1 cao
9		40, 80, 120 15, 30, 45, 60, 75, 90, 105, 120 $40 = 2 \times 2 \times 2 \times 5$ $15 = 3 \times 5$	3 and 8 or any multiple of 3, 8	3	M1 for multiples of both 40 and 15 (at least 2 of each shown but condone errors if intention is clear) or for 40×15 M1 (dep on M1) for a complete method to find a common multiple of 40 and 15, eg. 120, 240, 600 condoning one arithmetic error in any lists of multiples shown A1 for 3, 8 or any multiple of 3, 8 OR M1 for factors 2,2,2,5 and factors 3,5 M1 (dep on M1) for a complete method to find a common multiple of 40 and 15 A1 for 3, 8 or any multiple of 3, 8

PAPER: 1MA0_1H					
Question		**Working**	**Answer**	**Mark**	**Notes**
*10			Has enough (with evidence)	5	M1 for splitting the shape (or showing recognition of the "absent" triangles) and using a method to find the area of one shape M1 for a complete method to find the total area, (= 9 m^2) M1 (dep on M1) for a method to find the number of packs required from their total area, eg. "9" ÷ 2 = 4.5 rounded up to 5 M1 for a method to find 75% of 24.80 or 75% of the cost of their total number of packs, eg. $24.80 \times$ "5" $\times \frac{75}{100}$ (= 93) or $24.80 \times \frac{75}{100}$ (= 18.6) C1 for a conclusion supported by fully correct answers, eg. showing 9 (m^2), 5 (packs) and 93 or 7 (from 100 – 93) OR M1 for method to find 75% of £24.80, eg. $24.80 \times \frac{75}{100}$ (= 18.6) M1 for method to find total number of packs Mary can buy, eg. 100 ÷ "18.60" = 5.3.... truncated to 5 or 10 (m^2) M1 for finding area of one relevant shape or showing how one pack (2 m^2) can fit in the diagram M1 (dep on previous M1) for complete method to show that 5 packs can cover the floor C1 for a conclusion supported by fully correct answers, showing the capacity (10) greater than total area (9)

PAPER: 1MA0_1H					
Question		**Working**	**Answer**	**Mark**	**Notes**
11	(a)		$\frac{2}{10}$	2	M1 for $\frac{2}{a}$ with a > 2 or $\frac{b}{10}$ with $b < 10$ A1 for $\frac{2}{10}$ oe
	(b)		£10 or 1000p	3	M1 for "$\frac{2}{10}$" × 100 (= 20) or 30(p) × 100 (= 3000p or £30) M1 (dep) for "30(p) × 100" – (£)1 × "20" oe A1 ft from (a), provided the answer is not negative. Units must be shown
*12			40° with reasons	4	M1 for finding one related angle using parallel lines A1 for $x = 40(^o)$ C2 for full reasons linked to appropriate method eg. alternate angles are equal **and** angles in a triangle add up to 180° eg. angles on a straight line add up to 180° **and** corresponding angles are equal **and** alternate angles are equal eg. co-interior (allied) angles add up to 180^o **and** exterior angle of a triangle is equal to sum of interior opposite angles Other solutions may include reasons such as: vertically opposite angles are equal the sum of angles at a point is equal to 360^o (C1 (dep on M1) for one appropriate reason linked to parallel lines)
13			48	5	M1 for 8 – 2 (= 6) M1 (indep) for $x^2 + 8^2$ (provided $x \leq 8$) M1 (dep on previous M1) fo $\sqrt{"x"^2 + 8^2}$ or $\sqrt{"100"}$ M1 (dep on M2) for 4 × 2 + 4 × "10" A1 cao

PAPER: 1MA0_1H					
Question		**Working**	**Answer**	**Mark**	**Notes**
14			54	3	M1 for any correct use of distance, speed, time formulae, eg.10 ÷ 40 (=0.25) or 15 min M1 (dep) for a complete method to find speed from G to H, eg.18 ÷ (35 – "15") × 60 oe. A1 cao
15	(a)		(3, 6.5)	2	M1 for a method to find either the x coordinate or the y coordinate of the midpoint or $x = 3$ or $y = 6.5$ oe A1 cao [SC: B1 for (6.5, 3)]
	*(b)		No and correct working	3	M1 for a method to work out a gradient between any relevant pair of points (ie 2 of points A, B, C or D), eg. $\frac{9-4}{8--2}\left(=\frac{5}{10}\right)$ M1(dep) for a method to work out the gradient between another pair of points which can be used for comparison; one gradient must be through D. C1 for "no" and a correct explanation based on two correct gradients OR M1 for a method to work out a gradient between any relevant pair of points (ie 2 of points A, B, C or D), eg. $\frac{9-4}{8--2}\left(=\frac{5}{10}\right)$ M1 (dep) for using their gradient to work out an equation of a straight line in the form $y = mx + c$ and substituting in an appropriate point C1 for "no" and a correct explanation based on correct working OR M2 for (100, 55) or (102, 56) C1 for "no" and a correct explanation based on correct coordinates.

PAPER: 1MA0_1H					
Question		**Working**	**Answer**	**Mark**	**Notes**
16	(a)		4, 20, 56, 80, 94, 100	1	B1 cao
	(b)		graph	2	M1 ft from their table for at least 5 points plotted correctly at the ends of the intervals provided table values are cumulative, condoning one arithmetic error, or if the shape of the graph is correct for 5 or 6 points plotted not at the ends but consistently within each interval and joined A1 cao for correct graph with points joined by curve or straight line segments
	(c)		47 to 49	1	B1 for 47 to 49 or ft their cf graph at cf = 50
	(d)		13 to 16	2	M1 for reading a value from their cf graph at time = 63 (84 to 87) A1 for answer in the range 13 to 16 or ft from their graph
17			18	4	M1 for a method to find the exterior angle of a pentagon eg. 360 ÷ 5 (=72) or the interior angle of a pentagon, eg. 180 – 360 ÷ 5 (= 108) A1 for 72 or 108 M1 (dep M1) for a fully complete method to find the required angle, *DCF* A1 for 18 or ft their interior or exterior angle

PAPER: 1MA0_1H					
Question		**Working**	**Answer**	**Mark**	**Notes**
18			Region identified	4	M1 for the graph of $x + y = 7$ or $y = 2x$ drawn M1 for the graphs of $x + y = 7$, $y = 2x$ and $y = 3$ drawn M1 for any correct shading (in or out), satisfying at least two correct inequalities where the shading must extend from the appropriate lines. A1 for correct region identified by either shading in, or shading out; the letter R is not required. Accept without shading only with the correct region indicated by R. NB accept lines that are solid or dotted/dashed etc or lines defined by unambiguous shading
19	(a)		Proof	3	M1 for $\frac{6}{n}$ or $\frac{5}{n-1}$ M1 for $\frac{6}{n} \times \frac{5}{n-1} \left(= \frac{1}{3}\right)$ A1 for fully correct algebra leading to $n^2 - n - 90 = 0$
	(b)		10	3	M1 for correct start to a solution, eg. $(n \pm 10)(n \pm 9)$ or substitution into the quadratic formula, condoning one sign error or $(n - 0.5)^2 - 0.25 - 90$ A1 for $(n - 10)(n + 9)$ or for 10 and –9 or $\frac{1 \mp 19}{2}$ oe A1 for 10 only
20			$a = \frac{4p - 5}{3 + p}$ or	4	M1 for multiplying both sides by $4 - a$ as the first step M1 (dep) for isolating their two terms in a M1 (dep) for factorising their two term expression in a A1 for $a = \frac{4p - 5}{3 + p}$ or $a = \frac{5 - 4p}{-p - 3}$

PAPER: 1MA0_1H					
Question		**Working**	**Answer**	**Mark**	**Notes**
21			Proof	3	M1 for (x =) 0.04545(...) or $1000x = 45.4545(...)$, accept $1000x = 45.\dot{4}\dot{5}$ or $100x = 4.54545(...)$, accept $100x = 4.5\dot{4}$ or $10x = 0.4545(...)$,accept $10x = 0.\dot{4}\dot{5}$ M1 for finding the difference between two correct, relevant recurring decimals for which the answer is a terminating decimal A1 (dep on M2) for completing the proof by subtracting and cancelling to give a correct fraction eg $\frac{45}{990} = \frac{1}{22}$ or $\frac{4.5}{99} = \frac{1}{22}$
22	(a)		$\frac{1}{8}$	1	B1 for $\frac{1}{8}$ oe
	(b)		1.5	1	B1 for 1.5 oe
	(c)		3	2	M1 for $\sqrt{12}\times\sqrt{12} - \sqrt{12}\times\sqrt{3} - \sqrt{3}\times\sqrt{12} + \sqrt{3}\times\sqrt{3}$ or $\sqrt{144} - \sqrt{36} - \sqrt{36} + \sqrt{9}$ oe. with no more than one sign error A1 cao OR M1 for writing $(\sqrt{12} - \sqrt{3})$ as $(2\sqrt{3} - \sqrt{3})$ $(= \sqrt{3})$ A1cao

PAPER: 1MA0_1H					
Question		**Working**	**Answer**	**Mark**	**Notes**
23			$\frac{14}{3}$	5	M1 for correct substitution into a volume formula for a cylinder or a cone, eg. $\frac{1}{3}\times\pi\times3^2\times4$ (= 12π) or $\pi\times3^2\times(6-4)$ (= 18π) or $\pi\times3^2\times h$ (= 9πh) or $\pi\times3^2\times(h-2)$ M1 for method to find volume after 5 hours, eg. "12π" + "18π" (= 30π) M1 (dep on M1) for use of a correct ratio, eg. "30π" × $\frac{9}{5}$ (= 54π) or "30π" × $\frac{4}{5}$ (= 24π) M1 for deriving an equation in h, eg. "54π" = "9πh" + "12π" A1 for $\frac{14}{3}$ or equivalent fraction
24	(a) (i)		(0, 5)	3	B1 cao
	(ii)		(3, 10)		B1 cao
	(iii)		(1, 5)		B1 cao
	(b)		Translation of $\begin{pmatrix}0\\-4\end{pmatrix}$ oe	1	B1 for a correct transformation, eg. translation of $\begin{pmatrix}0\\-4\end{pmatrix}$ or translation of 4 units in the negative y-direction, oe.

Modifications to the mark scheme for Modified Large Print (MLP) papers.

Only mark scheme amendments are shown where the enlargement or modification of the paper requires a change in the mark scheme.

The following tolerances should be accepted on marking MLP papers, unless otherwise stated below:
Angles: ±5º
Measurements of length: ±5 mm

PAPER: 1MA0_1H			
Question		**Modification**	**Notes**
Q1	(a)	An extra horizontal line has been added at the bottom of the diagram.	B2 for a correct ordered stem and leaf diagram (B1 for fully correct unordered or ordered with one error or omission) B1 (indep) for key (units not required)
Q1	(b)	An extra horizontal line has been added at the bottom of the diagram.	M1 for a method to find "3" as a percentage of the total number of men, eg $\frac{"3"}{"20"}\times 100$ oe $\frac{"3"\times 5}{100}$ or ft from their diagram A1 for 15 cao
Q2	(b)	MLP only: x changed to y	M1 for collecting the terms in y or the number terms in an equation, eg. $5y - y + 4 = 14$ or $5y = 14 - 4 + y$ A1 for 2.5 oe (accept $\frac{10}{4}$)

PAPER: 1MA0_1H			
Question		**Modification**	**Notes**
Q5		2 models provided for all candidates. MLP also have diagrams. In text, wording is added to give the dimensions of the first cheese.	M1 for a method to find volume of a cuboid, eg. $2 \times 10 \times 15$ (= 300) or $5 \times 5 \times x$ (= $25x$) M1 (dep) for "300" ÷ "25" oe A1 cao OR M1 for $10 \div 5$ (= 2) and $15 \div 5$ (= 3) or $10 \div 5$ (= 2) and $2 \div 5$ (= 0.4) M1 (dep) for $2 \times$ "2" $\times$ "3" or $15 \times$ "2" $\times$ "0.4" A1 cao
Q6	(a)	Diagram enlarged. Crosses changed to filled in circles. Label for horizontal axis left aligned. Label for vertical axis placed above the axis. Right axis is labelled.	B1 for a description of a dynamic relationship eg "The older the car the lower the price" or "The newer the car the greater the price" oe (accept negative correlation)
Q6	(b)	Diagram enlarged. Crosses changed to filled in circles. Label for horizontal axis left aligned. Label for vertical axis placed above the axis. Right axis is labelled.	M1 for a single straight line segment with negative gradient that could be used as a line of best fit or vert. line from 3.5 or a point plotted at (3.5, y), where y is in the range 6400 to 7000 A1 for 6400 - 7000
Q7	(a)	Grids enlarged. Triangles A, B and C have dotty shading.	B2 for a triangle with vertices at (–3, 3), (–3, 4), (–1, 4) (B1 for triangle in correct orientation and size or rotated 90º clockwise about centre O or three correct vertices without joinin
Q7	(b)	Grids enlarged. Triangles A, B and C have dotty shading.	B1 for reflection B1 for (in the line) $y = x$ Note: award no marks if more than one transformation is given

PAPER: 1MA0_1H			
Question		**Modification**	**Notes**
Q10		Diagram enlarged. Measurement lines for 1 metre and 2.2 metres are removed. Dashed measurement line for 3.4 metres.	M1 for splitting the shape (or showing recognition of the "absent" triangles) and using a method to find the area of one shape M1 for a complete method to find the total area, (= 9 m^2) M1 (dep on M1) for a method to find the number of packs required from their total area, eg. "9" ÷ 2 = 4.5 rounded up to 5 M1 for a method to find 75% of 24.80 or 75% of the cost of their total number of packs, eg. $24.80 \times$ "5" $\times \frac{75}{100}$ (= 93) or $24.80 \times \frac{75}{100}$ (= 18.6) C1 for a conclusion supported by fully correct answers, eg. showing 9 (m^2), 5 (packs) and 93 or 7 (from 100 – 93) OR M1 for method to find 75% of £24.80, eg. $24.80 \times \frac{75}{100}$ (= 18.6) M1 for method to find total number of packs Mary can buy, eg. 100 ÷ "18.60" = 5.3.... truncated to 5 or 10 (m^2) M1 for finding area of one relevant shape or showing how one pack (2 m^2) can fit in the diagram M1 (dep on previous M1) for complete method to show that 5 packs can cover the floor C1 for a conclusion supported by fully correct answers, showing the capacity (10) greater than total area (9)

PAPER: 1MA0_1H			
Question		**Modification**	**Notes**
Q12		Diagram enlarged. AC, DF and PS made the same length. Angle arc put inside the angle size.	M1 for finding one related angle using parallel lines A1 for $x = 40(^{o})$ C2 for full reasons linked to appropriate method eg. alternate angles are equal **and** angles in a triangle add up to 180° eg. angles on a straight line add up to 180° **and** corresponding angles are equal **and** alternate angles are equal eg. co-interior (allied) angles add up to 180^{o} **and** exterior angle of a triangle is equal to sum of interior opposite angles Other solutions may include reasons such as: vertically opposite angles are equal the sum of angles at a point is equal to 360^{o} (C1 (dep on M1) for one appropriate reason linked to parallel lines)
Q13		Diagrams enlarged. 8 cm moved above the diagram. In text, wording gives the dimensions.	M1 for 8 – 2 (= 6) M1 (indep) for $x^2 + 8^2$ (provided $x \leq 8$) M1 (dep on previous M1) fo $\sqrt{"x"^2 + 8^2}$ or $\sqrt{"100"}$ M1 (dep on M2) for 4 × 2 + 4 × "10" A1 cao

PAPER: 1MA0_1H			
Question		**Modification**	**Notes**
Q16	(a)	Frequencies changed to 5, 15, 35, 25, 25, 15, 5.	B1 cao
Q16	(b)	Frequencies changed to 5, 15, 35, 25, 25, 15, 5. Grid enlarged. Both axes 3 cm for 20 with an intermediate line. Label for horizontal axis left aligned. Label for vertical axis placed above the axis. Right axis is labelled.	M1 ft from their table for at least 5 points plotted correctly at the ends of the intervals provided table values are cumulative, condoning one arithmetic error, or if the shape of the graph is correct for 5 or 6 points plotted not at the ends but consistently within each interval and joined A1 cao for correct graph with points joined by curve or straight line segments
Q16	(c)	Frequencies changed to 5, 15, 35, 25, 25, 15, 5.	B1 for 47 to 49 or ft their cf graph at cf = 50
Q16	(d)	Frequencies changed to 5, 15, 35, 25, 25, 15, 5. 63 minutes changed to 65.	M1 for reading a value from their cf graph at time = 63 (85 to 90) A1 for answer in the range 10 to 15 or ft from their graph
Q17		Diagram enlarged.	M1 for a method to find the exterior angle of a pentagon eg. 360 ÷ 5 (=72) or the interior angle of a pentagon, eg. 180 – 360 ÷ 5 (= 108) A1 for 72 or 108 M1 (dep M1) for a fully complete method to find the required angle, *DCF* A1 for 18 or ft their interior or exterior angle

PAPER: 1MA0_1H			
Question		**Modification**	**Notes**
Q18		Grid enlarged.	M1 for the graph of $x + y = 7$ or $y = 2x$ drawn M1 for the graphs of $x + y = 7$, $y = 2x$ and $y = 3$ drawn M1 for any correct shading (in or out), satisfying at least two correct inequalities where the shading must extend from the appropriate lines. A1 for correct region identified by either shading in, or shading out; the letter R is not required. Accept without shading only with the correct region indicated by R. NB accept lines that are solid or dotted/dashed etc or lines defined by unambiguous shading
Q20		MLP only: a changed to m.	M1 for multiplying both sides by $4 - m$ as the first step M1 (dep) for isolating their two terms in m M1 (dep) for factorising their two term expression in m A1 for $m = \frac{4p-5}{3+p}$ or $m = \frac{5-4p}{-p-3}$
Q23		Model provided for all candidates. Diagram also for MLP.	M1 for correct substitution into a volume formula for a cylinder or a cone, eg. $\frac{1}{3} \times \pi \times 3^2 \times 4$ (= 12π) or $\pi \times 3^2 \times (6 - 4)$ (= 18π) or $\pi \times 3^2 \times h$ (= 9πh) or $\pi \times 3^2 \times (h - 2)$ M1 for method to find volume after 5 hours, eg. "12π" + "18π" (= 30π) M1 (dep on M1) for use of a correct ratio, eg. "30π" × $\frac{9}{5}$ (= 54π) or "30π" × $\frac{4}{5}$ (= 24π) M1 for deriving an equation in h, eg. "54π" = "9πh" + "12π" A1 for $\frac{14}{3}$ or equivalent fraction

PAPER: 1MA0_1H			
Question		**Modification**	**Notes**
Q24	(a) (i)	Diagram enlarged. Cross changed to filled in circle.	B1 cao
Q24	(a)(ii)	Diagram enlarged. Cross changed to filled in circle.	B1 cao
Q24	(a)(iii)	Diagram enlarged. Cross changed to filled in circle.	B1 cao
Q24	(b)	Diagram enlarged. Cross changed to filled in circle.	B1 for a correct transformation, eg. translation of $\begin{pmatrix} 0 \\ -4 \end{pmatrix}$ or translation of 4 units in the negative y-direction, oe.

Pearson Education Limited. Registered company number 872828
with its registered office at 80 Strand, London, WC2R 0RL, United Kingdom