Chhetri Academy

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GCSE MATHS

Algebra

Edexcel 1MA1 | Subtopic collection Topic 16

Changing the subject

Foundation tier

Answers and examiner comments

15	2012-2025	Foundation
question groups	available papers	tier

Using this booklet

1. Answer numbers match the companion question booklet.
2. Follow the original question number on marking tables.
3. Examiner comments are included where available.

Name _____ **Date** _____

Some entries use full source marking material in an appendix. Any unavailable mark schemes are identified beside the relevant answer.

Question		Working	Answer	Mark	Notes
25	(a)		$6y - 15$	1	B1 cao
	(b)		$4x(2x + y)$	2	B2 cao (B1 for $x(8x + 4y)$ **or** $2x(4x + 2y)$ **or** $4(2x^2 + xy)$ **or** $4x(ax + by)$ where a, b are positive integers **or** $ax(2x + y)$ where a is a positive integer **or** $4x(2x \quad y)$)
	(c)	$10t = gh$ $h = \frac{10t}{g}$	$\frac{10t}{g}$	2	M1 for clear intention to multiply both sides of the equation by 10 (eg. ×10 seen on both sides of equation) **or** clear intention to divide both sides of the equation by g (eg. ÷ g seen on both sides of equation) **or** $10t = gh$ **or** $\frac{t}{g} = \frac{h}{10}$ **or** fully correct reverse flow diagram eg. ← ×10 ← ÷g ← A1 for $\frac{10t}{g}$ oe

1MA0_1F

25			$h = \frac{x-8}{5}$	2	M1 for intention to either subtract 8 from both sides or divide each term by 5 as a first stage of working A1 for $h = \frac{x-8}{5}$ 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: ±5°
Measurements of length: ±5 mm

PAPER: 5MB3F_01			
Question		**Modification**	**Notes**
Q02		Shapes G, H and I removed	
Q03	(b)	six polygons with 3, 4, 5, 6, 7, 8 sides labelled A to F "Which polygon is a hexagon?"	
	(c)	5cm and 3cm changed to 10cm and 6cm. Base line given	
Q06		Bars: May up to 15, Jun and August up to 5, July up to 7.5 2cm squares	
Q08		2cm grids	
Q10	(c)	2cm grid 33 litres changed to 30	
Q15		5 shapes not 6 1 shape provided for all candidates last 2 columns removed from grid	

Original question 24

The full source mark scheme begins on page 40. Use the original paper code, tier and question number shown above.

17			$h = \frac{G+5}{3}$	2	M1 for intention to isolate the $3h$ or divide all terms by 3 as the first step A1 oe

PAPER: 5MB3F_01					
Question		Working	Answer	Mark	Notes
*18			Tymes shop	3	M1 for 80 – 18 (= 62) or for method to reduce 80 by 20% oe (= 80 − 16 = 64) A1 for 62 and 64 C1 for comparison using 62 and 64 OR M1 for method to find 20% of 80 (=16) A1 for 16 C1 for comparison using 16 and given 18 OR M1 for writing £18 as a % of £80 (= 22.5%) A1 for 22.5% C1 for comparison using 22.5% and 20%

11	(a)		11	M1 A1	substitutes $v = 2$ eg $4 \times 2 + 3$ or $8 + 3$ cao
	(b)		$v = \frac{T-3}{4}$	M1 A1	correct first step to rearrange by isolating $4v$ or dividing each term by 4, eg $T - 3 = 4v$ fully correct answer

28	$g = 2T^2 - 6$	M1	for $T^2 = \frac{g+6}{2}$ **or** $\sqrt{2} \times T = \sqrt{g+6}$	
		M1	(dep) for $T^2 \times 2 = g + 6$ **or** $\left(\sqrt{2} \times T\right)^2 = g + 6$ oe	Can only award this mark if the first M mark has been awarded.
		A1	for $g = 2T^2 - 6$ oe	

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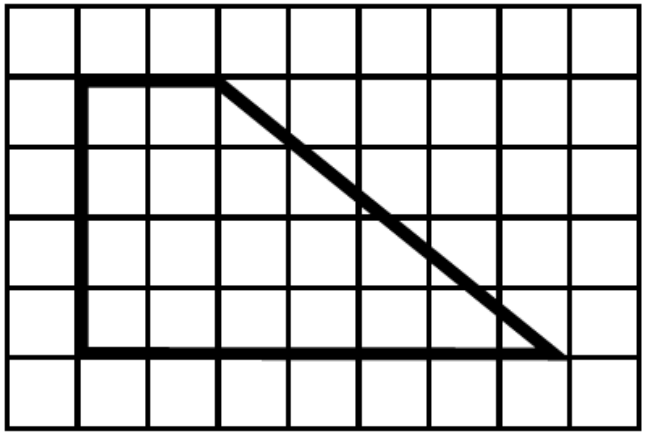
Measurements of length: ±5 mm

Paper: 1MA1/3F			
Question		**Modification**	**Mark scheme notes**
9		Last two columns have been removed from the table.	Standard mark scheme but ignore references to "34" since this bus no longer exists.
12		The height of the diagram has changed to 5.5 cm allow for use of specialist equipment.	B1 for a correct measurement of either length or width, eg. 11.5 (cm) or 5.5 (cm); allow measurements 11.0 to 12.0 and 5.0 to 6.0 P1 for process to find actual dimensions, eg. [length] × 200 (= 2300) or [width] × 200 (= 1100) – [length] in the range 11.0 to 12.0; [width] in the range 5.0 to 6.0 P1 (indep) for process to convert to metres, [length in cm] ÷ 100 eg. "2300" ÷ 100 (= 23) or "1100" ÷ 100 (= 11) P1 (indep) for complete process to find the perimeter, eg. "23" × 2 + "11" × 2 (= 68) A1 for an answer in the range 64 to 72

Paper: 1MA1/3F			
Question		**Modification**	**Mark scheme notes**
13		Diagrams enlarged. Diagram labels moved above the diagrams. Wording added 'There are three spaces to fill.'	Standard mark scheme
14		List of numbers stacked in 4 rows. Horizontal line added to the bottom row of the stem and leaf diagram	Standard mark scheme
17		Diagram enlarged. Wording added 'AB = 3x cm, BC = 3x cm, Angle ABC is a right angle.'	Standard mark scheme
19		Diagram enlarged. Axes labels moved to the left of the horizontal axis and above the vertical axis. Crosses changed to solid dots. Right axis has been labelled.	Standard mark scheme

Paper: 1MA1/3F			
Question		**Modification**	**Mark scheme notes**
21		Shape changed but the area is still the same. Wording changed to 'Look at the diagram for Question 21 in the Diagram Book. It shows a trapezium drawn on a grid of squares. Each square on the grid represents a 1 cm square. A triangle is going to be drawn that is equal in area to the trapezium. Write down the length of the base and the vertical height of a triangle that is equal in area to the trapezium.' Two answer lines have been provided. Each square on the grid represents a 1 cm square. 	M1 for a method to find area of trapezium, eg. $\frac{1}{2}(2+7)\times 4$ (=18) or $(2\times 4)+(0.5\times 5\times 4)$ or 8 + 10 (=18) or for two answers that would give a triangle of area ft their area of trapezium (if not 18) or for two answers that would give a triangle of area 36 or for a triangle that would give an area ft their area of trapezium A1 for two answers given that would give a triangle of area 18, eg. base = 6, height = 6 or base = 9, height = 4 oe Accept use of dimensions that are not whole numbers as long as the intention is clear
22		Diagram enlarged. Wording added 'It shows a probability tree diagram	Standard mark scheme
23		Diagram enlarged. Wording added 'AB = 11cm CB = 7cm Angle ACB is a right angle. Angle ABC is marked.'	Standard mark scheme
24		Table has been turned to vertical format. Order of the table changed round so it reads: blue, yellow, red and white.	Standard mark scheme

Paper: 1MA1/3F			
Question		**Modification**	**Mark scheme notes**
26		Diagram enlarged. Angles moved outside of the angle arcs, with smaller arcs. Wording added 'Angle EAB = 125° Angle AED = 115° Angle EDC is a right angle.'	Standard mark scheme
27		Diagram enlarged. Wording added 'In triangle ABC AB = 8.4 cm, AC = 6.4 cm In triangle DEF DE = 12.6 cm FE = 15 cm.' Braille have added wording 'Angle A = angle D, Angle B = angle E Angle C = angle F.'	Standard mark scheme
28		Braille only: *g* changed to *m*.	Standard mark scheme with *g* changed to *m*.

21 (a)	6 or –6	M1 A1	for $12^2 + 2 \times -3 \times 18$ (= 36) for 6 or –6, accept ±6	Terms may be partially evaluated. Only one value is required for full marks
(b)	$s = \frac{v^2 - u^2}{2a}$	M1 A1	for subtracting u^2 from both sides or dividing all terms by $2a$ as the first step $s = \frac{v^2 - u^2}{2a}$ oe	Must see this step carried out, not just the intention shown

Paper: 1MA1/1F

19	$x = \frac{y-4}{2}$	M1 A1	for correct first step to rearrange eg $y - 4 = 2x + 4 - 4$ or $\frac{y}{2} = \frac{2x+4}{2}$ or ambiguously shown eg $x = y - 4 \div 2$ or answer given as $\frac{y-4}{2}$ oe	May be seen in different equivalent forms but must be carried out, not just intention seen. Could be shown as a flow diagram but must have correct inverse operations

30 (a)	$q = \frac{p-7}{6}$	M1	for a correct first step, showing a method of subtraction of 7 from both sides or division of all terms by 6 eg $p - 7 = 6q + 7 - 7$ **or** $\frac{p}{6} = \frac{6q}{6} + \frac{7}{6}$ oe	
		A1	for $q = \frac{p-7}{6}$ **or** $q = \frac{p}{6} - \frac{7}{6}$	Allow $1\frac{1}{6}$ for $\frac{7}{6}$ Award for answer without "$q =$"
(b)	m^6	B1	cao	

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

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Angles: ±5°
Measurements of length: ±5 mm

PAPER: 1MA1/1F			
Question		**Modification**	**Mark scheme notes**
1		The wording "Write the following numbers…" removed and replaced by "Write the following four numbers…"	Standard mark scheme
2		The wording "Here is a list of numbers" removed and replaced by "Here is a list of five numbers."	Standard mark scheme
6		Wording added "Look at the diagrams for Question 6 in the Diagram Book. They show two probability scales." The spinner kept in the question paper and the spike removed. A dot added at the centre of the spinner. Spinner enlarged with the text. Wording added "On the probability scale for Question 6(a), mark…" Wording added "On the probability scale for Question 6(b), mark…" Probability scales kept on the same page in the Diagram Book but enlarged. Numbers moved above the probability scales. The wording "with a cross (x)" removed	Standard mark scheme

PAPER: 1MA1/1F			
Question		**Modification**	**Mark scheme notes**
7		Wording added Look at the diagram for Question 7 in the Diagram Book. It shows an incomplete pictogram which…" Diagram enlarged. Key moved above the pictogram. The ovals changed to circles.	Standard mark scheme
8		Wording added "Look at the diagram for Question 8 in the Diagram Book. It shows point A and point B on a coordinate grid." Diagram enlarged. Open headed arrows. Crosses changed to dots. The point B moved to (1,-1); difficult for the candidate to see as it currently lies on the axis. In part (c) the wording "with a cross (x)" removed.	Standard mark scheme for part (a) and (c), but part (b) is now (1, –1) B1 cao
11		Wording added "Look at the diagram for Question 11 in the Diagram Book. It shows a shaded shape on a grid. A cut out shape may be available if you wish to use it". Shape provided for all candidates. Diagram enlarged. Shading changed to dotty shading. Add wording "mirror line" to the other side of the line. "You do not need to shade your shape."	Standard mark scheme
12		Wording added "Look at the diagram for Question 12 in the Diagram Book." The wording "The diagram shows…" removed and replaced with "It shows…" Diagram enlarged. Open headed arrows.	Standard mark scheme

PAPER: 1MA1/1F			
Question		**Modification**	**Mark scheme notes**
13		North lines made 9 cm. A line added between points A and B and made 10cm long to allow them to measure the angle. The angle will be kept the same, but this will change the answer to Question 13(b). Wording added "Look at the diagram for Question 13 in the Diagram Book. It is accurately drawn." Open headed arrows. Scale to be moved above the diagram. Some enlarged scripts have distance *AB* measuring 7 cm For these scripts the scheme for 13(b) reads: **M1** for measurement of *AB* in the range 6.5 to 7.5 cm; accept 65 to 75 if identified as mm **M1** for "7" × 25000 (= 175000) or "7" ÷ 100000 (= 0.00007) or 25000 ÷ 100000 (= 0.25) "7" can be a figure in mm if previous M1 awarded but appropriate conversions to km then apply For the award of this mark, "7" or "70" can be any value in the range 5.5 to 8.5 or 55 to 85 **A1** for answer in the range 1.625 to 1.875 Note: If the length of AB differs from those exemplified, amend the ranges of acceptable values accordingly	Part (a): for angle in the range 20 to 30 Accept without the initial 0 Part (b): **M1** for measurement of *AB* in the range 9.5 to 10.5 cm; accept 95 to 105 if identified as mm **M1** for "10" × 25000 (= 250000) or "10" ÷ 100000 (= 0.0001) or 25000 ÷ 100000 (= 0.25) "10" can be a figure in mm if previous M1 awarded but appropriate conversions to km then apply For the award of this mark, "10" or "100" can be any value in the range 8 to 12 or 80 to 120 **A1** for answer in the range 2.375 to 2.625

<table>
<tr><th colspan="4">PAPER: 1MA1/1F</th></tr>
<tr><th colspan="2">Question</th><th>Modification</th><th>Mark scheme notes</th></tr>
<tr><td>14</td><td></td><td>Wording added “Look at the table for Question 14 in the Diagram Book.”
The wording “Complete the two-way table” removed and replaced by “Complete the two-way table in the Diagram Book.” Wording added “There are ten spaces to fill.” Table enlarged.
Braille only: Table labelled (i) to (x).
<table>
<tr><td></td><td>Cricket</td><td>Tennis</td><td>Swimming</td></tr>
<tr><td>Male students</td><td>(iv)</td><td>(ii)</td><td>(v)</td></tr>
<tr><td>Female students</td><td>(vii)</td><td>(viii)</td><td>(i)</td></tr>
<tr><td>Total</td><td>(iii)</td><td>(ix)</td><td>(x)</td></tr>
</table>
Sticky labels of all the answers provided for braille candidates. They will still have to work out the correct answers for 10 spaces and place them into the correct space.</td><td>Standard mark scheme</td></tr>
<tr><td>16</td><td></td><td>Wording added “Look at the table for Question 16 in the Diagram Book.” Table enlarged.
The wording “The table gives information…” removed and replaced by “It gives information…”</td><td>Standard mark scheme</td></tr>
<tr><td>19</td><td>(c)</td><td>The letter f changed to p.</td><td>Standard mark scheme except for the letter changes indicated.</td></tr>
</table>

PAPER: 1MA1/1F			
Question		**Modification**	**Mark scheme notes**
22		Wording added "Look at the diagram for Question 22 in the Diagram Book." The wording "The diagram shows four graphs" removed and replaced by "It shows four graphs labelled graph A, graph B, graph C and graph D." Diagrams enlarged. Graph lines made thicker. Open headed arrows. Headings moved above the graph.	Standard mark scheme
23		Wording added "Look at the diagram for Question 23 in the Diagram Book." The wording "The diagram shows four triangles" removed and replaced by "It shows four triangles." Diagram enlarged. Headings moved above the diagrams. Angles moved outside of the angle arcs and the angle arcs made smaller. Triangles straightened up so a 10 cm side lies horizontally. Braille only: Description added of the triangles.	Standard mark scheme
25		The wording "ADC is a triangle" removed. Diagram enlarged. Wording added "Look at the diagram for Question 25 in the Diagram Book. It shows the triangle ADC." Angles moved outside of the angles arcs and the angle arcs made smaller.	Standard mark scheme
26		Wording added "Look at the table and the diagram for Question 26 in the Diagram Book." Wording "This stem and leaf diagram shows…" removed and replaced with "The stem and leaf diagram shows…" The wording "…of a group of Year 9 girls" removed and replaced by "…of a group of girls in Year 9". The wording "…of a group of 15 Year 9 boys" removed and replaced by "…of a group of 15 boys in Year 9". Table enlarged and kept on the same page as the stem and leaf diagram. Diagram enlarged and a tracking line added. Key moved above the diagram.	Standard mark scheme

PAPER: 1MA1/1F			
Question		**Modification**	**Mark scheme notes**
27		Model provided for all candidates with a base added to represent the horizontal floor. Wording added "Look at the diagram for Question 27 in the Diagram Book. You may be provided with a model." The wording "The diagram shows a prism…" removed and replaced by "The diagram and the model show a prism…". Diagram enlarged. Dashed lines to be made thicker and longer. The pressure formula to be kept in the Question Paper and moved to the left of the diagram in the Diagram Book.	Standard mark scheme
28		The wording "Write these numbers in order of size" removed and replaced by "Write these four numbers in order of size."	Standard mark scheme
29		The letter a changed to w. The letter b changed to x. The letter c changed to y.	Standard mark scheme except for the letter changes indicated.

23	(a)	25	M1	for $(T =)\ 4 \times (-3)^2 - 11$ or $4 \times (-3)^2 = 36$	Can accept missing brackets
			A1	cao	
	(b)	$p = \frac{d-4}{3}$ oe	M1	for a correct first step, eg. $d - 4 = 3p$ or $\frac{d}{3} = p + \frac{4}{3}$ or for $\frac{d-4}{3}$ as answer	May be in unsimplified form, eg $d - 4 = 3p + 4 - 4$
			A1	for $p = \frac{d-4}{3}$ oe	

Paper: 1MA1/3F

21	$a = \frac{p+9}{3}$	M1 A1	for correct first step to rearrange eg $p + 9 = 3a - 9 + 9$ or $\frac{p}{3} = \frac{3a-9}{3}$ oe **or** answer ambiguously shown eg $a = p + 9 \div 3$ or given as $\frac{p+9}{3}$ oe oe	May be seen in different equivalent forms but must be carried out, not just intention seen.

Paper: 1MA1/3F

22	(a)	$13y - 1$	M1	for method to expand one bracket or collect like terms eg $3 \times 2y - 3 \times 5$ (= $6y - 15$) **or** $7 \times y + 7 \times 2$ (= $7y + 14$) **or** $3 \times 2y + 7 \times y$ (= $6y + 7y$) **or** $3 \times -5 + 7 \times 2$ (= $-15 + 14$)	May be implied by $13y$ **or** -1
			A1	oe	
	(b)	$3x(2x + 5)$	B2	oe	
			(B1	for $3(2x^2 + 5x)$ **or** $x(6x + 15)$ **or** $3x(ax + b)$)	
	(c)	$g = \frac{f - 11}{3}$	M1	for correct first step to rearrange eg $f - 11 = 3g + 11 - 11$ or $f - 11 = 3g$ **or** eg $\frac{f}{3} = \frac{3g}{3} + \frac{11}{3}$ **or** $-3g = 11 - f$ **or** answer ambiguously shown, eg $g = f - 11 \div 3$ **or** given as $\frac{f - 11}{3}$	May be seen in different equivalent form
			A1	oe	

Paper: 1MA1/2F

Question	Answer	Mark	Mark scheme	Additional guidance
29 (a)	15	M1	for correct substitution, eg $40 - (-5)^2$	Condone missing brackets
		A1	cao	
(b)	$h = 3p + 5$	M1	for a correct first step, eg $3p = h - 5$ **or** for isolating the $\frac{h}{3}$ term, eg $p + \frac{5}{3} = \frac{h}{3}$	Award M1 for $3p + 5$ without seeing $h = 3p + 5$
		A1	for $h = 3p + 5$ oe eg $h = 3\left(p + \frac{5}{3}\right)$	

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

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PAPER: 1MA1_3F			
Question		**Modification**	**Mark scheme notes**
4		Letter changed: a changed to p	Standard mark scheme but note the change of letter
5		Word 'three' added 'Write the following three fractions in order of size.'	Standard mark scheme
6		Letters changed: A changed to T and changed B to U	Standard mark scheme but note the change of letters
7		Diagram enlarged. Additional digits added to right hand side of chart. Wording added 'Look at the diagram for Question 7 in the separate Diagram Booklet. The diagram shows a chart.'	Standard mark scheme
10	(a)	Diagram enlarged. Wording added 'Look at the diagram for Question 10 (a) in the separate Diagram Booklet. The diagram shows a circle.' Word 'above' removed 'On the diagram, draw a radius…' For Braille: sentence added 'A spare tactile diagram and drawing film are provided for this question.'	Standard mark scheme
	(b)	Diagram enlarged. Wording added 'Look at the diagram below. It shows another circle.'	Standard mark scheme
13		Two-way table changed to vertical layout. Wording added 'Look at the two-way table for Question 13 in the separate Diagram Booklet.'	Standard mark scheme
14		Diagram enlarged. Marks placed at 10° intervals on circumference of circle. Word 'below' added to the sentence 'The table below gives information …' Wording added 'On the diagram provided for Question 14 in the separate Diagram Booklet, draw an accurate pie chart for this information.' For Braille: sentence added 'A spare tactile diagram and drawing film are provided for this question.'	Standard mark scheme Allow ±2° for each sector

PAPER: 1MA1_3F			
Question		**Modification**	**Mark scheme notes**
17		For MLP only: g changed to grams	Standard mark scheme
18	(a)	Diagram enlarged. Wording added 'Look at the diagram for Question 18 (a) in the separate Diagram Booklet. The diagram shows a shape on a coordinate grid.' 'You may be given a cut-out shape for this question.'	Standard mark scheme
	(b)	Diagram enlarged. … and the shapes labelled 'shape A' and 'shape B' Wording added 'Look at the diagram for Question 18 (b) in the separate Diagram Booklet. The diagram shows shape **A** and shape **B** on a coordinate grid.' 'Mike's answer is shown on the grid as shape B.' 'You may be given a cut-out shape for this question.'	Standard mark scheme
19		Grid enlarged. Wording added 'Look at the diagram for Question 19 in the separate Diagram Booklet. The diagram shows a coordinate grid. On the grid, draw the graph…….' 'You may wish to complete the table below to help you.' Table for values inserted. For Braille: sentence added 'A spare tactile diagram, bumpons and Wikki Stix are provided for this question.'	Standard mark scheme
20		Diagram enlarged. Labelling changed to A, B, C, D clockwise from top vertex. Wording added 'Look at the diagram for Question 20 in the separate Diagram Booklet. The diagram is NOT accurately drawn. The diagram shows isosceles triangles labelled ABD and DBC.' Information now 'AD = DB = CB Angle DCB = 81° Angle BDA = 4 x angle CBD' Demand now 'Find the size of angle CBD : the size of angle DBA'	Standard mark scheme but note the changes in the vertices

PAPER: 1MA1_3F			
Question		**Modification**	**Mark scheme notes**
24		For MLP: wording added 'Look at the diagram for Question 24 in the separate Diagram Booklet. It shows a solid triangular prism. The diagram is NOT accurately drawn. You may also be given a model.' For Braille: wording added 'Ask for the model for Question 24. The model IS accurately made. The model is a solid triangular prism.'	
	(a)	Wording added 'Look at the diagram for Question 24 (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.'	Standard mark scheme
	(b)	Diagram Booklet has four shapes labelled shape A, shape B, shape C and shape D. Wording added 'Look at the diagram for Question 24 (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?'	B2 for C (B1 for B or D)
27	(a)	Diagram enlarged. Wording added 'Look at the diagram for Question 27 (a) in the separate Diagram Booklet. The diagram shows an incomplete probability tree diagram.'	Standard mark scheme
28		For MLP: wording added 'Look at the diagram for Question 28 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.' For Braille: sentence added 'Ask for the model for Question 28. The model is NOT accurately made. The model represents a paddling pool in the shape of a cylinder.'	Standard mark scheme
29	(b)	Letter changed: h changed to m Demand amended 'Make m the subject of the formula $p = \frac{m-5}{3}$'	Standard mark scheme but note the change of letter

Question	Answer	Mark	Mark scheme	Additional guidance
25	$w = \frac{y + 10}{3}$	M1 A1	for $y + 10 = 3w$ **or** $\frac{y}{3} = w - \frac{10}{3}$ for $w = \frac{y+10}{3}$ oe	Accept $w = \frac{-y-10}{-3}$ for M1A1

Paper: 1MA1/3F

Question	Answer	Mark	Mark scheme	Additional guidance
23 (a)	Mistake identified	C1	for identifying the mistake **Acceptable examples** $p - 5$ should be multiplied by 3 $(-)5$ should be multiplied by 3 All of left side / everything should be multiplied by 3 He failed to multiply the 5 as well He should have / didn't put brackets around the $p - 5$ (The $3p - 5$) should be $3p - 15$ (The $- 5$) should be $- 15$ / (the 5) should be 15 (The answer should be) $m = 3p - 15$ / $m = 3(p - 5)$ He only times the p by 3 **Not acceptable examples** The first line should be $3p = m + 5$ He should have multiplied everything Ben didn't divide $p - 5$ by 3 He failed to multiply the $p - 5$ He failed to multiply the $(-)5$ He only times the p He should have multiplied by 3 first He only multiplied one side by 3 He needs to get rid of the fraction Should have used brackets Just circling the $3 \times p - 5$ and / or the $m = 3p - 5$ Needs to multiply the 5 by -3 He should have done $p - 5 \times 3$	

Paper: 1MA1/3F				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
(b)	$2xy(x^2 + 2y)$	B2	for $2xy(x^2 + 2y)$ oe eg $2(x^2 + 2y)xy$	
		(B1	for $2x(x^2y + 2y^2)$ **or** $2y(x^3 + 2xy)$ **or** $xy(2x^2 + 4y)$	
			or for correctly identifying the HCF in the factorisation of the form $2xy(ax^2 \pm ...)$ **or** $2xy(... \pm by)$ where a and b are integers	... can be numerical or algebraic but not equal to 0 or absent
			or $(x^2 + 2y)$ as a factor eg $2x(x^2 + 2y)$	

Paper: 1MA1/3F

PMT

edexcel

Mark Scheme (Results)

November 2014

Pearson Edexcel GCSE
In Mathematics A (1MA0)
Foundation (Non-Calculator) Paper 1F

PMT

Edexcel and BTEC Qualifications

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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_1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
1	(a)		Lhotse	1	B1 cao
	(b)		8200	1	B1 cao
	(c)		Seven thousand four hundred and twenty-eight	1	B1 for any unambiguous answer
	(d)		8051	1	B1 cao
2	(a)		4,8,3,3,2	2	M1 for at least 2 tallies or 2 frequencies correct A1 for 5 correct frequencies
	(b)		correct graph	3	M1 for bar chart or other suitable chart with at least 2 correct frequencies drawn for their scale (ft from (a)) M1 for all bars labelled and vertical axis correctly scaled A1 for accurately representing their data, with all labels, ft from (a)
3	(a)		56 000	1	B1 cao
	(b)		276	1	B1 cao
	(c)		6	1	B1 cao
	(d)		29	1	B1 cao
	(e)		13	1	B1 cao

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PAPER: 1MA0_1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
4			3	3	M1 for attempt to find number of bags needed eg 254 ÷ 20 oe (= 12.7) **or**12 **or** 13 M1 (dep) for "254 ÷ 20" ÷ 5 oe (= 2.4) A1 cao **OR** M1 for 5 × 20 (=100) M1 (dep) for intention to find how many "100" in 254 (= 2.54) A1 cao
5	(a)		B or C	1	B1 for B **or** C **or** B and C
	(b)		G, E	2	B1 for G; B1 for E
	(c)		Hexagon	1	B1 cao
	(d)		Parallelogram	1	B1 cao
6	(a)		$3m$	1	B1 cao
	(b)		$7e$	1	B1 cao
	(c)		$15g$	1	B1 cao
7	(a)		31	2	M1 for 3 × 5 + 2 × 8 **or** 15 and 16 A1 cao
	(b)		$6x + 8y$	2	M1 for $6x$ **or** $8y$ A1 for $6x + 8y$ oe as final answer

PAPER: 1MA0_1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
*8		Tables-R-Us 120 + (120 + 2 × 40) = 320 Fred's Furniture 120 + (32 × 6) = 312 Tables 'n Chairs 120 + (3 × 70) = 330	Fred's Furniture with working	4	M1 for correct method to find total cost of chairs (and table) for at least one shop M1 for correct method to find total cost of chairs (and table) for at least two shops A1 for 3 comparable totals (eg. chairs £200, £192, £210 **or** table and chairs £320, £312, £330) C1 (dep on M1) ft for correct statement with shop name from comparable figures
9			48	2	M1 for method to find 15% of 320 A1 cao
10	(a)		5	1	B1 cao
	(b)		evens	1	B1 cao
	(c)		$\frac{2}{6}$ oe	2	M1 for $\frac{a}{6}$ where $a < 6$ **or** $\frac{2}{b}$ where $b > 2$ A1 for $\frac{2}{6}$ oe
11	*(a)		No with working	2	M1 for 19.5 + 22.8 (= 42.3) **or** 40 − 19.5 − 22.8 (= −2.3) **or** 22 + 19 (= 41) C1 for statement with No and 42.3 **or** ±2.3 **or** 41 seen
	(b)		12 40	3	M1 for correct start eg. addition of two times **or** subtraction of one time from 1430 M1 for a complete method A1 for 12 40 (pm)

PAPER: 1MA0_1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
12			126 or 176	4	M1 for correct unit conversion of 2 m or 3 m or 20 cm M1 for method to find number in width or number in length **or** 14 or 9 or 16 or 11 M1 (dep on M1) for "number in length" × "number in width" eg 14 × 9 eg 16 × 11 A1 for 126 or 176
*13			Amsterdam with figures	3	B1 for a correct conversion from miles to km or km to miles eg 8 km = 5 miles eg 28 miles = 44 km M1 for a correct method to convert 280 miles to km or 500 km to miles **or** 420 – 460 (km) **or** 300 − 320 (miles) C1 (dep on M1) for statement with correct conclusion and correct conversions (420 – 460 km or 300 – 320 miles)
14			correct shape	2	M1 for at least 2 correctly enlarged sides A1 for correct shape **SC:** B1 for a fully correct enlargement scale factor 2 or 4
15	(a)		18	1	B1 cao
	(b)		56	1	B1 cao
	(c)		33	2	M1 for 23 and 56 identified A1 cao

PAPER: 1MA0_1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
*16			No with reason	3	M1 for 17, 20 .**or** + 3 **or** $3n + 2$ M1 for method to show that 34 is not in the sequence eg continue sequence to at least 32 eg attempt to solve $3n + 2 = 34$ C1 (dep on M2) for statement with conclusion eg No with 32, 35 shown eg $n = 32 \div 3$ which is not a whole number
17			700 cm^3	3	M1 for $20 \times 5 \times 7$ A1 for 700 B1 (indep) for cm^3
18			4	3	B1 for 11.8 − 12.2 (cm) or 1180 − 1220 (km) M1 for "12" × 100 ÷ 300 oe A1 for 3.9 – 4.1 from correct figures or ft from "12" × 100 ÷ 300 oe
19			1340	4	M1 for 500 × 4 (= 2000) M1 for 960 – 300 (= 660) or "2000" + 300 (= 2300) or "2000" – 960 (= 1040) M1 (dep on M2) for a fully correct method eg "2000" – "660" or "2300" – "960" or "1040" + 300 A1 cao

PAPER: 1MA0_1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
20	(a)		$\frac{5}{12}$	2	M1 for $\frac{150}{360}$ or equivalent fraction A1 cao
	(b)		42	2	M1 for 60 ÷ 12 (= 5) **or** 210 ÷ 60 (= 3.5) oe A1 cao
	(c)		not enough information	1	B1 for 'not enough information' ticked **and** appropriate explanation given
21			25	4	M1 for 600 ÷ 4 (= 150) M1 for 4500 ÷ "150" (= 30) M1 for 750 ÷ "30" A1 for 25 with supporting working **OR** M1 for 4500 ÷ 750 (= 6) M1 for 600 ÷ 4 (= 150) or 600 ÷ "6" (= 100) M1 for "150" ÷ "6" or "100" ÷ 4 A1 for 25 with supporting working **OR** M1 for 4500 ÷ 750 (= 6) or 750 ÷ 4500 (= $\frac{1}{6}$) M1 for $\frac{1}{4}\times"\frac{1}{6}"$ $\left(=\frac{1}{24}\right)$ M1 for $"\frac{1}{24}"\times 600$ A1 for 25 with supporting working

PAPER: 1MA0_1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
*22			130 + correct reasons	4	M1 for angle *BFG* = 65 (may be seen on diagram) M1 (dep) for correct method to calculate *x* eg (*x* =) 65 + 65 (= 130) **or** (*x* =) 180 − (180 − 2 × 65) (= 130) C2 for *x* =130 **and** full appropriate reasons related to method shown (C1 (dep on M1) for any one appropriate reason related to method shown) eg alternate angles are equal ; base angles in an isosceles triangle are equal; angles in a triangle add up to 180°; angles on a straight line add up to 180°; exterior angle of triangle = sum of two interior opposite angles co-interior angles (allied angles) add up to 180°
23	(a)		2 reasons	2	B2 for two different reasons (B1 for 1 reason) eg No units (of distance) eg Overlapping intervals (2 and/or 3 in two boxes) eg Missing box (no box for more than 6 (km/miles) or 'other' or 4.5 (km/miles))
	(b)		Question	2	B1 for a suitable question which includes a time frame (time frame could appear with response boxes) B1 for at least 3relevant non-overlapping **and** exhaustive response boxes [Do not allow inequalities in response boxes]

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PAPER: 1MA0_1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
24	(a)		$e(3e + 5)$	1	B1 for $e(3e + 5)$
	(b)		4	3	M1 for intention to expand brackets eg $7k - 21$ **or** division of all terms on RHS by 7 as a first step M1 for correct method to isolate terms in k in an equation A1 cao
	(c)		$a = 2f - 1$	2	M1 for a correct first step eg intention to multiply both sides by 2 A1 cao
25			$2 \times 2 \times 3 \times 3 \times 5$	3	M1 for continual prime factorisation (at least two consecutive steps correct) **or** at least two stages of a factor tree correct M1 for a fully correct factor tree **or** list 2, 2, 3, 3, 5 A1 for $2 \times 2 \times 3 \times 3 \times 5$ or $2^2 \times 3^2 \times 5$
26			9	4	M1 for method to find the area of one rectangle eg 15×8 (=120) or 15×11 (=165) M1 (dep) for subtraction from/by given area eg 138 − "120" (=18) or "165" – 138 (=27) M1 for final step from complete method shown eg 15 − "18"÷ 3 or for "27" ÷ 3 A1 cao **OR** M1 for a correct expression for the area of one rectangle eg $(8 + 3) \times (15 - x)$ or $8 \times x$ M1 (dep) for a correct equation eg $(8 + 3) \times (15 - x) + 8 \times x = 138$ M1 for correct method to isolate x eg $3x = 27$ A1 cao

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: ±5°
Measurements of length: ±5 mm

PAPER: 1MA0_1F			
Question		**Modification**	**Notes**
1		Take out Jannu	
2	(b)	Table layout modified 2 cm grid provided with 14 squares across and 12 squares up Space on left and at the bottom for labeling	
5		Shapes H and I removed	
7		*a* changed to *e* *c* changed to *f*	
10		Spinner straightened up,● at centre to represent spike	
13		2 cm grid provided	
14		1½ cm grid provided Enlargement given Question reversed – 'Describe fully the transformation that maps Shape A onto Shape B	

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PAPER: 1MA0_1F			
Question		**Modification**	**Notes**
15		Horizontal lines inserted to separate rows	
17		Model provided	

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Question 19

This was very challenging for many Foundation students. It was common to see the correct steps to rearrange written down but they were either not carried out or not completed correctly. A few stopped at $2x = y - 4$ In most cases the first rearrangement was -4 followed by division of 2, but many spoilt this by writing $4 - y$ instead of $y - 4$. This remains an area of content that is weak.

Question 30

Part (a) was answered correctly by only a small minority of students. Some demonstrated an intention to subtract 7 but never applied this to both sides of the formula. Many tried to subtract 6 from either/both sides and some simply swapped the p and q around to make q the subject.

In part (b), the usual incorrect answers of m^{-5} and m^{-6} were seen, but many did write correct answers.

Summary

Based on their performance on this paper, students should:

- read questions carefully.
- take care when presenting solutions. Too many students used the working out space for random calculations instead of an ordered, fully explained solution.
- ensure that they know how to find a fraction and/or percentage of a quantity.
- re-visit all aspects of bearings.
- know how to covert between metric units both of length and capacity.
- demonstrate algebraic processes in solving simple algebraic equations.
- fully revise angles on parallel lines.

Question 23

In part (a) most students failed to understand the algebraic meaning of $4m^2$. Fortunately, they were usually able to gain a mark for substituting −3 in the expression. Common errors for dealing with $4\times(-3^2)$ included: $4 \times -3 \times -3 = -36$ -11 with the answer of −47 being most popular. Also common was $4 \times 3 = 12^2 = 144$ which could not be awarded any marks. A successful answer of 25 was usually as a result of using brackets around −3.

Part (b) was poorly answered by most students. Many chose to try to simplify the expression, ending up with $7p$. Some felt they should simply swap the d with the p to get $p = 3d + 4$. Of those who realised it required inverse operations to rearrange, most were unable to perform these in the correct order. $p = \frac{4-d}{3}$ and $p = \frac{d}{3} - 4$ were common, or an answer written ambiguously such as $p = d - 4 \div 3$. Most frequently students obtained no marks on this question due to the error in their first step. Function machines were used by a small number of students but even when these were used correctly, the students could not then write the equation with p as its subject.

Question 21

Poorly attempted with many not completing a correct first step. $A = 3p - 9$ was a very common answer. Some were able to score 1 mark for the first step and showing the result of adding 9 to both sides getting $p + 9 = 3a$. Very few attempted dividing by 3 as a first step.

Question 22

Success in expanding and simplifying an expression in part (a) varied considerably. Many fully correct answers were seen, and of those not gaining full marks, a mark was often awarded for either expanding one bracket correctly or collecting like terms for one variable, often y, correctly. Many expanded the brackets correctly but then did not know how to simplify either ignoring the signs or adding all terms together to give a single term as an answer. The importance of adding / subtracting negative numbers correctly in algebra questions appears to be challenging for Foundation tier students. A small number of students confused this type of expansion with multiplying 2 brackets resulting in having a term in y^2 but this was less common than in previous similar style questions.

Part (b) was answered with moderate success with a pleasing number of students able to factorise the terms to identify the HCF of $3x$ in order to obtain their answer of $3x(2x+5)$. However, a large number of students appear to not know what the word 'factorise' means; with several students trying to add the terms together or attempting to solve and find a value for x. There were a few students who knew what factorising meant, but due to the x squared term, thought this was a two bracket factorisation and subsequently failed to achieve any marks.

Rearranging a formula proved to be challenging for the majority, with very few students being able to rearrange fully or partially. The most common errors included simply transposing the f and g in the original equation or stating the correct process but failing to apply this correctly to one or both sides, eg stating -11 and/or $\div 3$ but not applying this to both sides of the equals sign.

Question 29

Part (a) saw mixed results with a similar number of students awarded 0 or 1 or 2 marks. Of those that gained 1 mark, the most common error usually related to brackets around the −5, either omitting them or putting them in the wrong place, often leading to an answer of 65.

Part (b) saw little success with around most students gaining 0 marks. The majority of those that were able to provide a correct first step, e.g. multiplying both sides by 3 to reach $3p = h - 5$, generally went on to score 2 marks. $h = (p + 5) \times 3$ was the most common incorrect answer along with $h = p + 5 \times 3$. Other incorrect solutions included adding 5 first instead of multiplying by 3 and the interchange of h and p e.g. an answer of $h = \frac{p-5}{3}$, was often seen.

Summary

Based on the performance on this paper, students should:

- learn the names of the parts of the circle.
- practise drawing pie charts from a frequency table.
- check their answers, in particular when completing two-way tables.
- practise drawing graphs of linear functions.
- understand the geometrical rules for angles and practise using these to answer longer, multi-step problems.
- practise using their calculators to deal with questions involving substitution.
- use tables and diagrams to extract information from a question to enable them to navigate through a problem.
- understand the difference between simple and compound interest.
- come prepared with the necessary equipment, particularly a calculator of which they are familiar.
- show their workings out especially when calculating percentages rather than just writing 15% of ... or 15% × ...
- understand that the sum of the probabilities of all outcomes for an event is 1 and cannot be greater than 1.
- become more familiar with including appropriate units to answers.
- practise plans and elevations.
- practise articulating their mathematics competently, using the correct mathematical language. A regular practice of mathematical discussions would help in the writing of explanations.
- ensure incorrect working is properly crossed out and it is clear which response they wish the examiner to consider as their final workings/answer.

Question 25

This question proved very challenging with only a minority of learners able to correctly change the subject of the formula. It was common to see the unknowns being incorrectly combined in a variety of different ways such as $13w$ or $30w$. It was also common to see errors in attempts to rearrange when incorrect inverse operations were used. There were a few examples where '$w =$' was omitted giving just $\frac{y+10}{3}$ on the answer line. Many candidates made an incorrect first step, by either incorrectly subtracting 3, attempted to divide by three but did not divide 10 by 3 too, or subtracted 10 incorrectly. Many just swapped the y and w.

Question 23

In part (a), B1 was awarded for an answer of *2*. Common incorrect responses included *3*, *7*, and *9*.
In part (b), 2 marks were awarded for a correct factorised expression of $2xy(x^2 + 2y)$. One mark was awarded where two out of the three factors were correctly extracted, such as $2x(x^2y + 2y^2)$, $2y(x^3 + 2xy)$, or $xy(2x^2 + 4y)$. One mark could also be awarded for extracting $2xy$ and including one correct term within the bracket, for example $2xy(2x^2 + ...)$ or $2xy(... + 4y)$.
The most common incorrect response was $6x^4y^3$, which gained 0 marks. Responses that extracted only one factor from the expression also gained 0 marks.