Chhetri Academy

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GCSE MATHS

Algebra

Edexcel 1MA1 | Subtopic collection Topic 24

Graphs of functions

Foundation tier

Answers and examiner comments

88	2010-2025	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
11 (a)		-2, (1), 4, 7, 10, (13)	2	B2 for 4 values correct (B1 for 2 or 3 values correct)
(b)		Single line from (-2, -2) to (3, 13)	2	M1 for plotting at least 5 of their points correctly **OR** single straight line with positive gradient passing thro' (0,4) from $x = -2$ to $x = 3$ **OR** single straight line of gradient 3 from $x = -2$ to $x = 3$ **OR** correct straight line that passes through 3 correct points A1 cao for correct straight line from at least (-2,-2) to (3,13)

5MB2F_01

5MB2F/01

Question	Working	Answer	Mark	Notes
12 (a)	$10+45+20+25=10$ 1 hour 40 minutes	07 10	3	M1 for $10+45+20+25$ or 100 seen M1 for correct attempt to convert to hours and minutes A1 cao **OR** M2 for clear attempt to subtract all times from 08 50 (may be seen as working backwards) (M1 for clear attempt to take at least one time away from 08 50) A1 cao
(b)		11 20	1	B1 for 11 20 **or** twenty past eleven oe
(c)		12	1	B1 cao
(d)		Straight line from $(12\ 20, 12)$ to $(13\ 50, 12)$ and from $(13\ 50, 12)$ to $(14\ 30, 0)$	3	M1 for straight line segment on graph M1 for straight line with negative segment A1 for correct graph **or** M1 for straight line segment on graph M1 for 12 ÷ 18 oe or 40 minutes seen A1 for correct graph SC: B2 for the correct straight line translated to left or right

5MB2F_01

5MB2F/01

Question	Working	Answer	Mark	Notes
9 (a)		48	1	B1 for an answer in the range 47.5 to 48.2
(b)		25	1	B1 cao
(c)	32 × 5 16 × 10 100 × 1.6	155 to 165	2	M1 for complete method reading from graph then multiplying by a suitable scale factor. Eg 1.6 × 100, 8 × 20, 16 × 10, 32 × 5, 40 × 4, 48 × $3\frac{1}{3}$ or valid use of answer to (a) or (b) A1 for answer in the range 155 to 165 or ft on their answers to either (a) or (b)

Original question 14

The full source mark scheme begins on page 142. Use the original paper code, tier and question number shown above.

18	Table of values x = -1 0 1 2 3 y = -2 2 6 10 14 OR Using $y = mx + c$, gradient = 4, y intercept = 2	Line from (-1,-2) to (3,14)	3	**(Table of values)** M1 for at least 2 correct attempts to find points by substituting values of x. M1 ft for plotting at least 2 of their points (any points plotted from their table must be correct) A1 for correct line between -1 and 3 **(No table of values)** M2 for at least 2 correct points (and no incorrect points) plotted OR line segment of $y = 4x + 2$ drawn (ignore any additional incorrect segments) (M1 for at least 3 correct points with no more than 2 incorrect points) A1 for correct line between -1 and 3 **(Use of $y = mx + c$)** M2 for at least 2 correct points (and no incorrect points) plotted OR line segment of $y = 4x + 2$ drawn (ignore any additional incorrect segments) (M1 for line drawn with gradient 4 OR line drawn with a y intercept of 2) A1 for correct line between -1 and 3

5MB2F_01				
Question	**Working**	**Answer**	**Mark**	**Notes**
19*	$24 \times 2 = 48$ $56 \div 8 \times 5 = 35$ OR $24 \times 2 = 48$ $48 \div 5 \times 8 = 7.68$	Monday	4	M1 for a correct method to obtain two comparable time periods or speeds. eg 24×2 (= 48 miles), $56 \div 2$ (= 28 km) M1 for a correct method to convert between miles and km or mph and km/h eg $24 \times \frac{8}{5}$, $48 \times \frac{8}{5}$, $56 \times \frac{5}{8}$, $28 \times \frac{5}{8}$ A1 for two correct values (using same units) for comparison C1 for day identified from a clear attempt to use comparable time periods and speeds/distances Note: day alone scores zero

Question		Working	Answer	Mark	Notes
10	(a)		16	1	B1for answer in range 15.5 to 16.5
	(b)		2.4	1	B1for answer in range 2.3 to 2.5
	(c)(i)		Debbie	1	B1 for Debbie
	(c)(ii)		Correct reason	1	C1for Debbie in Part (i) with a valid explanation e.g. It is higher **or** with a correct conversion ± 1 sq or Stefan in part (i) with an incorrect conversion but valid explanation Note: 6 mph = 9.6 km/h (accept 9-10) 10.5 km/h = 6.5625 mph (accept 6.4 – 6.8)

6	(a)(i)		12	2	B1 cao
	(ii)		450		B1 cao
	(b)	£12 ÷ 200	6p	2	M1 for correct use of cost ÷ number of units (eg £12 ÷ 200 or '6' or '0.06') A1 for 6p or £0.06 [units important] oe or ft "12"
	(c)	1300 × 6p	£78	2	M1 for 1300 × "b" or correct use of graph with suitable multiplier or '78' or '7800' A1 ft for £78 oe (accept £78 to £80) NB: penalise a lack of monetrary units once (at the first error)

5MB1F_01

Question		Working	Answer	Mark	Notes
11	(a)		**0**, 1.20, 6, **12, 18**, 24, 30, **36**	2	B2 for a fully correct table [B1 for 2 correct entries]
	(b)		Single line from (0, 0) to (30, 36)	2	B2 for a fully correct graph [B1 for at least 4 points plotted correctly or for a single line from (0,0) or for a short straight line segment joinning any two correct points]
	(c)	250 × 1.2 OR 30 × 10 from table Or for values read from the graph and used	300	2	M1 for correct use of any point the table or any point on the graph, eg 250 × 1.2 or 30 × 10 oe A1 **ft** for 300
*12		630 ÷ 3 = 210 630 – 210 = 420 100 + 30 × 12 = 100 + 360 = 460	Arnold's Computers (since it is £40 cheaper there)	4	M1 for 630 – 630 ÷ 3 oe or 420 seen M1 for 100 + 30 × 12 oe or 460 seen A1 for 420 and 460 C1 (dep on m1) for drawing a correct conclusion from their two computer prices

5MB2F_01

Question		Working	Answer	Mark	Notes
18 (contd)					**OR** M1 for correct method to work out Ed's delivery cost for at least 2 values of n miles where $0 < n \leq 50$ **or** for correct method to work out Ed and Bill's delivery cost for n miles where $0 < n \leq 50$ C2 (dep on M1) for 20 miles linked with £30 for Ed and Bill with correct full statement eg. Ed cheaper up to 20 miles **and** Bill cheaper for more than 20 miles (C1 (dep on M1) for a correct conclusion eg. cheaper at 10 miles with Ed; eg. cheaper at 50 miles with Bill eg. same cost at 20 miles; eg for £5 go further with Bill **or** A general statement covering short **and** long distances eg. Ed is cheaper for shorter distances **and** Bill is cheaper for long distances) SC: B1 for correct full statement seen with no working eg. Ed cheaper up to 20 miles **and** Bill cheaper for more than 20 miles QWC Decision and justification should be clear with working clearly presented and attributable

1MA0_1F

12	(a)		4.8	1	B1 for answer in range 4.6 – 5
	(b)		37.5	2	M1 for a valid method eg reading from graph for 6 km then ×10 A1 for answer in range 35 – 40 **OR** M1 for use of conversion factor $60 \times {}^{5}/_{8}$ oe A1 for answer in range 35 – 40

1MA0_2F

Question		Working	Answer	Mark	Notes
21		<table><tr><td>x</td><td>-1</td><td>0</td><td>1</td><td>2</td><td>3</td></tr><tr><td>y</td><td>-5</td><td>-2</td><td>1</td><td>4</td><td>7</td></tr></table>	Straight line from (–1, –5) to (3, 7)	3	**(Table of values)** M1 for at least 2 correct attempts to find points by substituting values of x. M1 ft for plotting at least 2 of their points (any points plotted from their table must be correctly plotted) A1 for correct line between –1 and 3 **(No table of values)** M2 for at least 2 correct points (and no incorrect points) plotted **OR** line segment of $y = 3x–2$ drawn (ignore any additional incorrect segments) (M1 for at least 3 correct points plotted with no more than 2 incorrect points) A1 for correct line between –1 and 3 **(Use of y=mx+c)** M2 for line segment of $y = 3x–2$ drawn (ignore any additional incorrect segments) (M1 for line drawn with gradient of 3 OR line drawn with a y intercept of –2 and a positive gradient) A1 for correct line between –1 and 3

1MA0_2F

Original question 6

The full source mark scheme begins on page 157. Use the original paper code, tier and question number shown above.

Question		Working	Answer	Mark	Notes
16		Table of values x | –2 | –1 | 0 | 1 | 2 y | –7 | –5 | –3 | –1 | 1 OR Using $y = mx + c$ Gradient 2 intercept –3	Single line drawn from (–2, –7) to (2, 1)	3	**(Table of values)** M1 for at least 2 correct attempts to find points by substituting values of x. M1 (dep) ft for correctly plotting at least 2 of their points (any points plotted from their table must be plotted correctly) A1 for the correct line from (-2, -7) to (2, 1) OR **(No table of values)** M2 for at least 2 correct points (and no incorrect points) correctly plotted or for a line segment of the graph of $y = 2x – 3$ drawn (ignore any additional incorrect line segments) [M1 for at least 3 correct points plotted with no more than 2 incorrect points] A1 for the correct line from (-2, -7) to (2, 1) OR **(Use of $y = mx + c$)** M2 for a single straight line of gradient 2, passing through (0, -3) [M1 for a single straight line of gradient 2 or for a single straight line passing through (0, -3)] A1 for the correct line from (-2, -7) to (2, 1)

5MB2F_01

11	(a)		Graph drawn	2	B2 for a correct straight line from \$0 to \$60 (B1 for at least 4 points plotted accurately or line through at least 4 of the points from the table)
	(b)		37.50 33.33	2	B1 for value in the range 37 – 38 or ft from (a) (±1sq) B1 for value in the range 33 – 34 or ft from (a) (±1sq)

5MB3F_01

Question		Working	Answer	Mark	Notes
15	(a)		32	1	B1 cao
	(b)	e.g. $20 = £12.50 $100 = 5×£12.50 = £62.50 £62.50 – 60 = £2.50	£2.50 OR $4	3	M1 for a correct method to convert $100 to £, e.g. 5× '12.50' (= 62.50) ('12.50' is their reading from the graph at $20) M1 (dep) for '62.50' – 60 A1 for £2.5(0) (units must be stated) **OR** M1 for correct method to convert £60 to $, e.g. 3×32 (=96) or ft their answer to part (a) M1 (dep) for 100 – '96' A1 for $4 (units must be stated)

<table>
<tr><th colspan="2">Question</th><th>Working</th><th>Answer</th><th>Mark</th><th>Notes</th></tr>
<tr><td>11</td><td>(a)</td><td></td><td>10</td><td>1</td><td>B1 cao</td></tr>
<tr><td></td><td>(b)</td><td></td><td>15</td><td>1</td><td>B1 14.8 - 15.2</td></tr>
<tr><td></td><td>(c)</td><td>(a) ÷ 6 × 64 or
Read from graph and ×</td><td>103 to 110</td><td>2</td><td>M1 for valid method eg Read from £8 and × answer by 8
<table><tr><td>£</td><td>£</td><td>Calc</td><td>CHF</td></tr><tr><td>8</td><td></td><td>8 × 13</td><td>(104)</td></tr><tr><td>6</td><td>4</td><td>6 × 16.5 + 6.5</td><td>(104.5)</td></tr><tr><td>16</td><td></td><td>4 × 26.5</td><td>(106)</td></tr><tr><td>20</td><td>4</td><td>3 × 33 + 6.5</td><td>(105.5)</td></tr></table>
A1for 103 - 110</td></tr>
</table>

Question		Working	Answer	Mark	Notes
14	(a)		8	1	B1 for 8 (.00)
	(b)		550	4	M1 for 600 – 200 (= 400) M1 for correct method to convert '$400' to £ M1 (dep on the previous M1) for 800 – '$400' in £s A1 for value in the range 540 –560 OR M1 for correct method to convert $600 **and** $200 to pounds M1 for '375'–'125' M1 (dep on the previous M1) 800 –'250' A1 for a value in the range 540-560 OR M1 for correct method to convert £800 to dollars M1 for '1280' + 200 – 600 M1 (dep on the previous M1) for attempt to convert '$880' back to £ A1 for value in the range 540 – 560

8	(a)		46 − 49	1	B1 for 46 − 49
	(b)		43 − 46	1	B1 for 43 − 46
	*(c)		Comparative statement	3	M1 for 54 – 58 or 90×5÷8 (=56.25) M1 for '56' × 3 (=168) C1 (dep on M1) for No and eg only 162 − 174 miles OR M1 for 3×90 (=270) M1 for changing '270' to miles (=162 – 174) C1 (dep on M1) for No and eg only 162 – 174 miles OR M1 for 180÷ 3 (=60) M1 for changing '60' to kph (=94 – 98) or 54 – 58 C1 (dep on M1) for No and eg 94 − 98 kph which is above speed limit or No and eg can't go faster than 54 – 58 mph OR M1 for changing 180 miles to km (=284 – 292) M1 for '288'÷90 (=3.2 hours) or 3 × 90 (=270) C1 (dep on M1) for No and eg more than 3 hours

5MB2F_01

Question		Working	Answer	Mark	Notes
18	(a)		x: −2, −1, 0, 1, 2, 3, 4 y: −2, **0**, **2**, **4**, 6, **8**, **10**	2	B2 cao (B1 for any 2 correct values)
	(b)		Correct graph	2	B2 for a correct line through at least two correct points (B1 for correct points plotted ft their table if at least B1 earned in part a)

24	(a)		5, −4, −3	2	B2 for 5, −4 and −3 (B1 for 5 or −4 or −3)
	(b)		correct curve	2	B2 for fully correct curve (B1 ft for at least 5 points plotted correctly)

Original question 21

The full source mark scheme begins on page 171. Use the original paper code, tier and question number shown above.

Original question 29

The full source mark scheme begins on page 191. Use the original paper code, tier and question number shown above.

13			60	3	M1 for 9 × 14 + 6 (=132) M1 (dep) for full method to convert '132' from lbs to kg using the graph **or** for '132'÷2.2 (=60) A1 for 59 – 62 OR M1 for reading off 14 lbs (= 6.2−6.5) and 6 lbs (=2.4−2.9) M1 (dep) for 9 × '6.4' + '2.75' A1 for 59 – 62 [SC B2 for 66]

PAPER: 1MA0_2F					
Question		**Working**	**Answer**	**Mark**	**Notes**
*14			Correct statement	4	M1 for 6.50 × 8 + 12 or 6.50 × 7 + 15 M1 for 6.50 × 8 + 12 and 6.50 × 7 + 15 A1 for 64 and 60.5(0) C1 (dep on first M1) for correct statement ft their figures OR M1 for 6.50 × (8−7) or 15−12 M1 for 6.50 × (8−7) and 15−12 A1 for 6.5(0) and 3 C1 (dep on first M1) for correct statement ft their figures [SC If no working shown B1 for 64 and 60.5(0) **or** B1 for 6.5(0) and 3]

12	(a) (b)		5 60	1 2	B1 for 5 M1 for converting £ to Euros on the graph and multiplying appropriately e.g. £10 = 12euros and 5 × 12 A1 for 60

PAPER: 5MB2F_01

Question		Working	Answer	Mark	Notes
18		<table><tr><td>x</td><td>–2</td><td>–1</td><td>0</td><td>1</td><td>2</td><td>3</td></tr><tr><td>y</td><td>–5</td><td>–3</td><td>–1</td><td>1</td><td>3</td><td>5</td></tr></table> OR Using $y = mx + c$, gradient = 2, y intercept = – 1	Line $y = 2x – 1$ drawn	3	**(Table of values)** M1 for at least 2 correct attempts to find points by substituting values of x M1 (dep) ft for plotting at least 2 of their points (any points plotted from their table must be correct) A1 for correct line between $x = – 2$ and $x = 3$ **(No table of values)** M2 for at least 2 correct points (and no incorrect points) plotted OR line segment of $y = 2x – 1$ drawn (ignore any additional incorrect segments) (M1 for at least 3 correct points with no more than 2 incorrect points) A1 for correct line between $x = – 2$ and $x = 3$ **(Use of $y = mx + c$)** M2 line segment of $y = 2x – 1$ drawn (ignore any additional incorrect segments) (M1 for line drawn with gradient of 2 OR line drawn with y intercept of – 1 and a positive gradient) A1 for correct line between $x = – 2$ and $x = 3$

PAPER: 5MB2F_01

PAPER: 1MA0_1F

Question		Working	Answer	Mark	Notes
26		$y = 3x + 2$ drawn x : –2, –1, 0, 1, 2 y : –4, –1, 2, 5, 8	$y = 3x + 2$ drawn	4	B1 for axes scaled and labelled **(Table of values)** M1 for at least 2 correct attempts to find points by substituting values of x M1 ft for plotting at least 2 of their points (any points from their table must be correctly plotted) A1 for correct line between $x = –2$ and $x = 2$ **(No table of values)** M1 for at least 2 correct points with no more than 2 incorrect points M1 for at least 2 correct points (and no incorrect points) plotted OR line segment of $y = 3x + 2$ drawn A1 for correct line between $x = –2$ and $x = 2$ **(Use of $y = mx + c$)** M1 for line drawn with gradient of 3 **OR** line drawn with y intercept at 2 M1 for line drawn with gradient of 3 **AND** with y intercept at 2 A1 for correct line between $x = –2$ and $x = 2$ [SC B2 (indep of B1) for correct line segment between $x=0$ and $x=2$ – ignore any additional incorrect line segment(s)]

PAPER: 1MA0_1F

18	80 litres ≈ 18 gallons or 16 gallons ≈ 72 litres	A with correct figures	3	M1 for reading from the graph eg. 8 gallons = 36 litres; 20 litres = 4.4 gallons M1 for a complete method to convert either 80 litres into gallons or 16 gallons into litres e.g. 80 litres = "4.4" × 4 gallons or 16 gallons = "36" × 2 litres A1 for car A with correct figures in range 17.5 –18.5 gallons or 64 – 72 litres

PAPER: 1MA0_2F				
Question	**Working**	**Answer**	**Mark**	**Notes**
*19		Small with correct figures for comparison	4	M1 for one calculation e.g. 6.5 ÷ 30 (=0.216...) **or** 8.95 ÷ 40 (=0.22375) **or** 10.99 ÷ 50 (=0.2198) M1 for all three calculations e.g. of 6.5 ÷ 30 (=0.216...) **and** 8.95 ÷ 40 (=0.22375) **and** 10.99 ÷ 50 (=0.2198); A1 for 0.216... **and** 0.22375 **and** 0.2198... can be rounded or truncated as long as they remain different C1 (dep on M1) for conclusion ft from three comparable figures [could use different figures relating to 30, 40, 50] **OR** M1 for one calculation e.g 6.5 × 20 (=130) **or** 8.95 × 15 (=134.25) **or** 10.99 × 12 (=131.88) M1 for three calculations e.g. 6.5 × 20 (=130) **and** 8.95 × 15 (=134.25) **and** 10.99 × 12 (=131.88) A1 for 130 **and** 134.25 **and** 131.88 can be rounded or truncated as long as they remain different C1 (dep on M1) for conclusion ft from three comparable figures [or any other calculations leading to comparable figures e.g. cost of 600 plants or comparing small and medium and small and large e.g. 120 plants and 150 plants separately] **Or** M1 for one calculation e.g 30 ÷ 6.5 (= 4.615…) **or** 40 ÷ 8.95 (= 4.469…) **or** 50 ÷ 10.99 (= 4.549…) M1 for three calculations e.g. 30 ÷ 6.5 (= 4.615…) **and** 40 ÷ 8.05 (= 4.469…) **and** 50 ÷ 10.99 (= 4.549…) A1 for 4.615… **and** 4.469… **and** 4.549… can be rounded or truncated as long as they remain different C1 (dep on M1) for conclusion ft from three comparable figures [or any other calculations leading to comparable figures]

Question		Working	Answer	Mark	Notes
9	(a)		Graph drawn	2	B2 for correct straight line from (0,0) to (10,25) (B1 for at least 3 points plotted correctly or a line through at least 3 of the points from the table)
	*(b)		Kate with comparison	3	M1 for an attempt to convert 62 inches to cm (eg 15×10 + 5) or convert 150 cm into inches (eg 10 × 6) A1 for 60 (inches) or 155 (cm) C1 (dep M1) for Kate with comparison eg '62' > 60 or '155' > 150 ft from a straight line segment

18	(a)		2600	1	B1 for 2600
	*(b)	£100 1300 rand 3700 rand £285 Computer 4680 rand Watch 5200 rand Camera 4875 rand	computer, camera	3	M1 for method to convert 3700 rand into £ or for changing one amount in pounds into rand M1for a complete method to compare total money Simon has with the cost of each item C1 (dep M2) for correct conclusion with correct figures e.g.£383 - £386 or 4950 rand to 5050 rand

PAPER: 1MA0_2F

PAPER: 1MA0_2F

Question		Working	Answer	Mark	Notes
22			Graph completed	2	B1 for line from (2.5, 45) to (3.5, 45) B1 ft line of correct gradient to axis (after 1½ hour)

Paper: 5MB2F_01

Question		Working	Answer	Mark	Notes
9	(a)		25	1	B1 cao
	(b)		56	1	B1 cao
	*(c)		Yes 200>180 oe	4	M1 for converting using figures from the graph or for 5 miles = 8 km oe M1 for correct method to convert 240 km into miles (=150 miles) or to convert 350 miles into km (= 560 km) or to convert 180 miles into km (= 288 km) M1 (dep on M2) for correct method for comparison eg 180 miles with 350 − 150 (= 200) miles eg 288 km with 560 − 240 (= 320) km C1 for a correct statement that she will have to stop oe with appropriate supporting evidence eg Yes and 200 miles is to far eg Yes and 330 < 350 eg Yes and 20 miles under" oe eg Yes and 320 > 288

Paper: 5MB3F_01

Question		Working	Answer	Mark	Notes
10	(a)		graph drawn	2	B2 for correct straight line from 0 to 8 gallons (B1 for at least 4 points plotted accurately or line through at least 4 of the points from the table)
	(b)		22 – 24	1	B1 for 22 – 24 or ft from graph in (a)
	(c)		7.0– 7.4	1	B1 for 7.0 – 7.4 or ft from graph in (a)

10		1½ cm grid. Inside measurements of squares are 1.4 cm. Right axis labelled	

PAPER: 5MB3H_01

Original question 13

The full source mark scheme begins on page 211. Use the original paper code, tier and question number shown above.

10	(a)		5.8 to 6	1	B1 for an answer in the range 5.8 to 6
	*(b)		No (supported)	3	M1 for a correct conversion of any amount (lb to kg or kg to lb) excepting that in (a) M1 (dep M1) for a complete method to convert 100 kg (from 25×4) to lb (to compare with 200 lb) or to convert 50 lb (from 200÷4) to kg (to compare with 25 kg) C1 for "no" and a comparison with a converted weight of 212 - 228 pounds or 88 - 94 kg

PAPER: 1MA0_1F

20	(a)		7, -2, -1	2	B2 for all three correct values 7, -2, -1 (B1 for 2 correct values 7, -2 or -1)
	(b)		Correct curve	2	B2 for fully correct curve (B1 ft for at least 5 points plotted correctly)

14	(a)		28 – 29	1	B1 answer in range 28 – 29
	(b)		8 – 8.5	1	B1 answer in range 8 – 8.5
	(c)		250 – 259	3	M1 for use of conversion graph to change 250 km to miles (eg 140 – 160 miles) or 100 miles to km (eg 150 – 170 km) M1 (dep) for addition of 100 miles or 250 km in consistent units A1 for answer in the range 250 – 259 (miles)

1MA0 1F November 2015					
Question		**Working**	**Answer**	**Mark**	**Notes**
15*		Common partitioning: 1. 14 + 9 + 9 +12 (=44) 2. 14 + 14 + 8 + 8 (=44) 3. 12 + 10 + 12 + 10 (=44) 4. 9 + 14 + 8 + 13 (=44) 5. 12 + 12 + 8 + 8 + 4 (=44)	No supported by working	4	**Method 1 (partitioning)** M1 for method to find paving stones for 2 (or more) rectangles M1 (dep) for addition of paving stones for complete path A1 for 44 (tiles) C1 (dep on M1) ft for correct decision supported by working **Method 2 (area 1)** M1 for $7\times5 - 6\times4$ (=11) oe M1 (dep) for "11" $\div 0.5^2$ (=44) A1 for 44 (paving stones) C1 (dep on M1) ft for correct decision supported by working **Method 3 (area 2)** M1 for $7\times5 - 6\times4$ (=11) oe M1 for $0.5^2 \times 35$ (=8.75) A1 for 11 and 8.75 C1 (dep on M1) ft for correct decision supported by working **Method 4 (using perimeter)** M1 for (6 + 4 + 6 + 4) ÷ 0.5 (=40) M1 for "40" + 4 A1 for 44 (tiles) C1 (dep on M1) ft for correct decision supported by correct working

1MA0 1F November 2015

5MB2F_01 November 2015

Question		Working	Answer	Mark	Notes
21		$y = \frac{1}{2}x + 3$ x: −2, −1, 0, 1, 2, 3, 4 y: 2, 2.5, 3, 3.5, 4, 4.5, 5	Correct line from (−2, 2) to (4, 5)	3	**(Table of values / calculation of values)** M1 for at least 2 correct attempts to find points by substituting values of x. M1 ft for plotting at least 2 of their points (any points plotted from their table must be correctly plotted) A1 for correct line between $x = -2$ and $x = 4$ **(No table of values)** M1 for at least 2 correct points with no more than 2 incorrect points plotted M1 for at least 2 correct points (and no incorrect points) plotted **OR** line segment of $y = \frac{1}{2}x + 3$ drawn A1 for correct line between $x = -2$ and $x = 4$ **(Use of $y = mx + c$)** M1 for line drawn with gradient of $\frac{1}{2}$ **OR** line drawn with a y intercept of 3 M1 for line drawn with gradient of $\frac{1}{2}$ **AND** line drawn with a y intercept of 3 A1 for correct line between $x = -2$ and $x = 4$ **SC** : B2 for correct line from $x = 0$ to $x = 4$

Question		Working	Answer	Mark	Notes
24	(a)		0, 4, 3, −5	2	M1 for one correct value, could be taken from graph A1 cao
	(b)		correct curve	2	M1 for at least 4 points plotted correctly from table A1 for correct curve drawn

Original question 14

The full source mark scheme begins on page 227. Use the original paper code, tier and question number shown above.

PAPER: 1MA0/1F

Question		Working	Answer	Mark	Notes
17	(a)		3 (5) 7 (9) 11, 13	2	B2 for 3, 7, 11, 13 (B1 for 2 or 3 correct values)
	(b)		Graph drawn	2	M1 (may ft from (a) if B1 awarded) for at least 5 points correctly plotted A1 for correct graph from $x = 0$ to $x = 5$

11	(a) (b)	 eg 15 lbs = 6.8 kg So, 150 lbs = 68 kg 68 + 64 = 132 kg	10.5 − 11 132	1 3	B1 for 10.5 − 11 M1 for converting 150 lbs to kg M1 for addition of 150 pounds and 64 kg in consistent units A1 for 130 − 134 kg
*12			Patterned and Textured	5	M1 for 5 + 7 + 5 + 7 (= 24) M1 for (“24” ÷ 3) × 20 (= 160) or (“24” ÷ 2) × 11 (= 132) or (“24” ÷ 2.4) × 14.5 (= 145) M1 for two of the above. A1 for 160 and 132 and 145 C1 ft (dep on M3) for Patterned and Textured from a comparison of 3 costs

PAPER: 5MB2F/01

17	(a)		30 minutes or ½ hour	1	B1 for 30 minutes or ½ hour
	(b)		4	1	B1 cao
	(c)		5 30 pm	1	B1 for 5 30(pm) or 17 30

15	(a)		66	1	B1 for 65 – 67
	(b)		125	2	M1 for complete method using graph eg 50 euros = £42; 42 × 3 A1 for 122 – 128

20	(a)		10, 8, (6), 4, 2, (0)	2	B2 for fully correct table (B1 for 2 or 3 entries correct)
	(b)		line drawn	2	B2 for correct straight line between $x = -1$ and $x = 4$ (B1 for a single straight line which passes through (0, 8) or for a single straight line with negative gradient –2 or for at least 5 points from their table plotted correctly)

PAPER: 1MA0/2F

Original question 6

The full source mark scheme begins on page 246. Use the original paper code, tier and question number shown above.

9	(a)		8	1	B1 7.8 – 8.2
	*(b)		No with working	3	M1 for complete method to change 90 gallons to litres e.g. 10 gallons = "45" litres **and** 9 × "45" = 405 (litres) or 9 gallons = "40" litres **and** 10 × "40" = 400 (litres) A1 for answer in range 396 - 414 (litres) **or** room for 36 – 54(litres) C1 (dep on M1) for conclusion ft their answer. **or** M1 for complete method to change 450 litres to gallons e.g. 50 litres = "11" gallons **and** 9 × "11" (= 99 (gallons)) **or** 45 litres = "10" gallons **and** "10" × 10 (= 100 (gallons)) A1 for answer in range 99 to 100 (gallons) **or** room for 9 or 10 (gallons) C1 (dep on M1) for conclusion ft their answer.

Paper: 1MA0/1F

21	(a)		5, 4, (3), 2, 1, (0)	2	M1 for 1 or 2 or 3 correct entries A1 cao
	(b)		Line drawn	2	M1 plots 5 of their points correctly or a straight line with gradient –1 or a straight line through (0, 4) A1 correct line between $x = -1$ and $x = 4$

Original question 11

The full source mark scheme begins on page 257. Use the original paper code, tier and question number shown above.

22	(a)		12, 4, 2, 1.2, 1	B2 (B1)	for fully correct table (allow fractions or decimals) for 3 or 4 of 12, 4, 2, 1.2, 1
	(b)		Correct curve	M1 A1	ft (dep on B1 in (a)) for plotting at least 6 points from their table correctly for a fully correct curve

Paper: 1MA1/3F

29		Comment	B1	for correct mathematical comment eg line segments not a curve **or** should draw freehand **or** should not use a ruler, **or** should be a curve NB Do not accept statements about scale or plotting accuracy.

13	(a)		(–2) **–1.5** **–1** **–0.5** (0) **0.5**	B2 [B1	for a fully correct table for 2 or 3 correct entries]
	(b)		Correct line	M1 A1	for correctly plotting at least 5 of their points (provided B1 scored in part (a)) or for a straight line with gradient 0.5 or for a straight line through (0,–1) with a positive gradient for a correct line between $x = –2$ and $x = 3$
	(c)		2.6	B1	for answer in the range 2.5 to 2.7 or ft a single straight line with positive gradient

Paper: 1MA1/3F

25		Diagram enlarged. Y axis has been cut to go from -14 to 14.	Standard mark scheme

24	(a)	0, –4, –6, –4, 0	B2 (B1	fully correct figures At least 2 correct figures)	
	(b)	Graph	M1 A1	(dep B1) for at least 5 points correctly plotted ft from (a) fully correct graph	Must be a curve
	(c)	2.6 and –1.6	M1	for $y = -2$ drawn **or** intersections with $y = -2$ **or** $y = x^2 - x - 4$ drawn **or** 1 correct value	If answers stated as coordinates, award M1 for both coordinates and M0 for one coordinate
			A1	ft a quadratic graph **or** for answers in the range 2.5 to 2.7 **and** –1.5 to –1.7	

Paper: 1MA1/2F

Question	Answer	Mark	Mark scheme	Additional guidance
13	D, F, A	C2 (C1	for all 3 correct for 1 or 2 correct)	

Paper: 1MA1/1F

Question	Answer	Mark	Mark scheme	Additional guidance
12 (a)	10	B1	cao	
(b)	30	M1	for using the graph to take one correct reading	May be shown on graph
		A1	30 or ft from correct use of graph	

Question	Answer	Mark	Mark scheme	Additional guidance
22 (a)	2, −4, 2, 8	B2	all 4 values correct	
		(B1	for 2 or 3 correct values)	
(b)	Graph	M1	(dep B1) for at least 5 points plotted correctly ft from part a	
		A1	for a fully correct curve drawn	Accept freehand curves drawn that are not line segments; there must be some attempt to draw the minimum point below $y = -4$.
(c)	−2.6 or 1.6	B1	for 1 correct value, ft a non linear graph	Award for −2.6 or 1.6 or both values but do not award the mark if a correct value is given with an incorrect value. Accept 1.56 or −2.56 Note for ft to be applied the graph may be joined by line segments.

Paper: 1MA1/3F

29	(a)	1, –4	B1	cao	Brackets are given on the answer line, ignore any extra brackets seen
	(b)	–1 and 3	B2	for both correct answers	
			(B1	for one correct solution or $(x + 1)(x – 3)$ or $(–1, 3)$)	

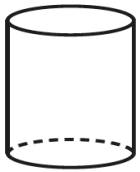
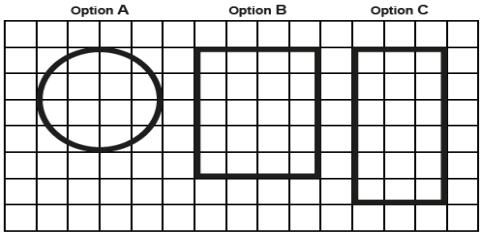
Modifications to the mark scheme for Modified Large Print (MLP) papers: 1MA1 1F

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: 1MA1/1F			
Question		**Modification**	**Mark scheme notes**
6		Horizontal lines added underneath the information.	Standard mark scheme
7		Diagram enlarged. Right axis labelled. Graph lines made thicker. Axes labels moved to the left of the horizontal axis and above the vertical axis.	Standard mark scheme
8		Wording 'five' added.	Standard mark scheme
12(a)		Diagram enlarged. Wording added 'Two angles are marked 25°. One angle is marked x°.' Angles moved outside of angle arcs and angle arcs made smaller. Wording added 'Find the value of the angle marked x°.'	Standard mark scheme
12(b)		Diagram enlarged. Angles a, b, c, d, e changed to v, w, x, y, z. Wording added 'Angles v, w, x, y and z are marked on the diagram.' Angles moved outside of angle arcs and angle arcs made smaller. (ii) changed to "Explain why $v + w + x = 235$°"	Standard mark scheme with a, b, c, d, e changed to v, w, x, y, z.
18		Diagram enlarged. Measurements moved above/to the left of diagram. Wording changed to 'It shows a rectangular path, 600 cm long and 120 cm wide'. Braille only: Path labelled 'rectangular path' inside the shape.	Standard mark scheme

PAPER: 1MA1/1F			
Question		**Modification**	**Mark scheme notes**
20		Diagram enlarged. Shapes labelled ‘square A’ and ‘square B’. Labels moved above diagrams. Shading changed to dotty shading.	Standard mark scheme
22(a)		Wording added ‘There are two spaces to fill.’	Standard mark scheme

PAPER: 1MA1/1F			
Question		**Modification**	**Mark scheme notes**
25		Question changed. Model should be provided. Diagram 1  Diagram 2  Look at the diagrams for Question 25. You may be provided with a model. Diagram 1 and the model show a solid cylinder. They are not accurate. Look at Diagram 2 below Diagram 1. Diagram 2 shows three options labelled Option A, Option B and Option C on a grid of squares. Each square on the grid represents a one centimetre square. The cylinder is placed with its flat face on a surface. (a) Which of the options, A, B or C, shows the plan of the cylinder? (1 mark) (b) Remember: Each square on the grid represents a one centimetre square. Using Diagram 2, (i) write down the diameter of the cylinder. (ii) write down the height of the cylinder. (1 mark)	Mark scheme: (a) B1 for Option A Could indicated on the diagram eg by circling etc. Accept a description eg circle (b) B1 for (i) as 4 **or** (ii) as 3, 4, 5 or 6

PAPER: 1MA1/1F			
Question		**Modification**	**Mark scheme notes**
26		Diagram enlarged. Grid cut to make the axes from −7 to 7. Shading changed to dotty shading. Labels removed from inside the shapes. Shapes labelled as 'shape **A**' and 'shape **B**'. Wording added 'It shows shape **A** and shape **B** on a coordinate grid.' Question changed to: (a) Reflect shape **A** in the x-axis. Label the new shape **X**. (1 mark). (b) Shape **X** can be transformed to shape **B** by a translation $\begin{pmatrix} c \\ d \end{pmatrix}$ Find the value of c and the value of d. (2 marks)	Apply the standard mark scheme but in two stages: (a) B1 for showing the reflected shape **X** (need not be labelled if there is only one shape drawn). (b) B2 for $c = -6$ or $d = -1$ (B1 for one correct value or reverse order)
28		Diagram enlarged. Wording changed to 'It shows two rectangles, *ABCD* and *PQRS*.' Rectangle *PQRS* moved to lie landscape below *ABCD*. *PQRS* relabelled to follow clockwise vertex labelling convention prescribed in *ABCD*. Wording changed to 'PQ = 10cm', '$AD = PS$'. Braille only: rectangles labelled 'Rectangle 1' and 'Rectangle 2'.	Standard mark scheme but note the change in vertex labelling.
29		Diagram enlarged. Graph line made thicker.	Standard mark scheme

<table>
<tr>
<td>21</td>
<td>Graph</td>
<td>B3

(B2

(B1</td>
<td>for a correct line between $x = -2$ and $x = 4$

for a correct straight line segment through at least 3 of
$(-2, -7)$, $(-1, -5)$, $(0, -3)$, $(1, -1)$, $(2, 1)$, $(3, 3)$, $(4, 5)$

or for all of these points plotted but not joined

OR for a line drawn with a positive gradient through $(0, -3)$ and clear intention to use a gradient of 2, eg line through $(0,-3)$ going across 2 squares and up 4 squares)

for at least 2 correct points stated or plotted

OR for a line drawn with a positive gradient through $(0, -3)$

OR a line with gradient 2)</td>
<td>

Ignore any incorrect points. Points need not be plotted for a correct line (segment) drawn

Table of values
<table><tr><td>x</td><td>–2</td><td>–1</td><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td></tr><tr><td>y</td><td>–7</td><td>–5</td><td>–3</td><td>–1</td><td>1</td><td>3</td><td>5</td></tr></table>

Ignore any incorrect points
Coordinates may be in a table or in working</td>
</tr>
</table>

Paper: 1MA1/2F

Question	Answer	Mark	Mark scheme	Additional guidance
11 (a)	19	B1	cao	
(b)	12.4 to 12.8	M1	for a complete method, eg attempts to read from the graph at a factor of 80 **and** scales up to 80 **or** attempts to read from the graph at two numbers that sum to 80 **and** finds the sum of their readings **or** 1 stone = "6"kg **and** 80 ÷ "6"	
		A1	for an answer in the range 12.4 to 12.8 **or** ft correct reading from graph	

Paper: 1MA1/2F

Question	Answer	Mark	Mark scheme	Additional guidance
25 (a)	F	B1	cao	
(b)	D	B1	cao	

17	(a)	−10, −6, 2, 6	B2 (B1	for 4 values correct −10, −6, (−2), 2, 6, (10) for 2 or 3 values correct)	
	(b)	Graph drawn	M1 A1	(ft from (a) if B1 awarded) for at least 5 points correctly plotted. correct graph drawn from $x = -1$ to 4	

22	B C D A	B2 (B1	cao for two or three correct)	

Paper: 1MA1/2F

Question	Answer	Mark	Mark scheme	Additional guidance
24 (a)	13, (6), 5, 4, –3	B2 (B1	for all 4 values correct for 2 or 3 correct values)	
(b)	Correct graph	M1	ft (dep on B1) for plotting at least 4 of the points from their table correctly	
		A1	for a fully correct curve drawn	Accept a freehand curve drawn that is not made of line segments Line sections outside the required range can be ignored.

28	(a)	−2, 4	B1	cao	
	(b)	0.55 to 0.65, 3.35 to 3.45	M1	for correct method, eg marking intercepts with *x*-axis or one correct answer or both solutions given as a coordinate eg (0.6, 3.4) or (0.6, 0) (3.4, 0)	If answers are stated as coordinates, award M1 for both coordinates and M0 for one coordinate.
			A1	for answers in the ranges 0.55 to 0.65 and 3.35 to 3.45	With no extras

Question	Answer	Mark	Mark scheme	Additional guidance
18	Line Drawn	B3	for a correct line drawn between $x = -2$ and $x = 3$	Accept freehand line drawn
		(B2	for a correct straight-line segment through at least 3 of (–2, –6), (–-1, –4), (0, –2), (1, 0), (2, 2), (3, 4) **or** for all of the above points plotted but not joined **or** for a single line drawn with a positive gradient through (0, –2) **and** clear intention to use a gradient of 2, eg a line through (0, –2) and (0.5, 0)	Ignore any incorrect points Table of values x | –2 | –1 | 0 | 1 | 2 | 3 y | –6 | -4 | –2 | 0 | 2 | 4
		(B1	for at least 2 correct points stated or plotted **or** a single line drawn with positive gradient through (0, –2) **or** a single line with gradient 2)	Ignore any incorrect points Coordinates may be in a table or working Do not accept $y = -2$ drawn

14	(a)	15	B1	14 to 16	
	(b)	540	M1	for a complete method, eg 30 × (36 ÷ 2) **or** 45 × (36 ÷ 3) **or** 60 × (36 ÷ 4) **or** ft "hourly rate from (a)" × 36	May be seen using a complete build up method for "45" allow 44 to 46 ft for accuracy
			A1	for 540 **or** ft (a)	Condone use of mixed rates eg 75×7 + 16 =541

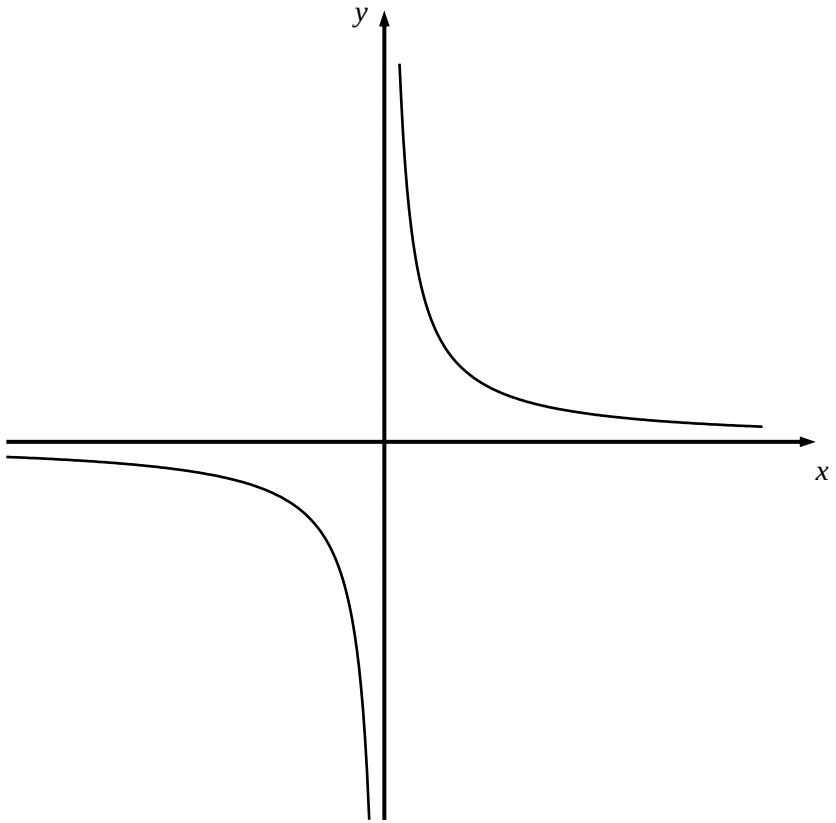
Question	Answer	Mark	Mark scheme	Additional guidance
23 (a)	80	M1	for a complete method eg $\frac{20}{15} \times 60$ **or** 20×4 **or** $20 \div \frac{1}{4}$	
		A1	cao	
(b)	Travel graph	M1	for method to find distance travelled in last 20 minutes, eg $75 \times \frac{20}{60}$ (= 25)	Can be implied by a distance of 25km drawn on the graph
		C2	for a fully correct travel graph	
		(C1	for horizontal straight line from (10 15, 20) to (10 25, 20) **or** for a line of the correct length and gradient to indicate a speed of 75km/h eg straight line from (10 25, 20) to (10 45, 45))	

24	(a)	(10), 5, (2), 1, 2, (5), 10	B2 (B1	for all 4 values correct for 2 or 3 correct values)	
	(b)	Graph	M1	ft (dep on B1) for plotting at least 5 of their points correctly	
			A1	for a fully correct curve drawn	Accept a freehand curve drawn that is not made of line segments
	(c)	–0.65 to –0.8 and 2.65 to 2.8	M1	for $y = 4$ drawn **or** intersection with $y = 4$ **or** $y = x^2 - 2x - 2$ drawn **or** 1 correct value (ft a quadratic)	If answers stated as coordinates, award M1 for both coordinates and M0 for one coordinate
			A1	ft a quadratic graph **or** for answers in the range 2.65 to 2.8 **and** –0.65 to –0.8	

Paper: 1MA1/2F

28	Sketch	M1 A1	correct shape in one of the required quadrants **or** correct graph where the lines touch the axes fully correct shape	 Lines do not need to extend to the ends of the axes if the intention is clear

Qu 28 Example



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

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: 1MA1_3F			
Question		**Modification**	**Mark scheme notes**
5		Wording added 'Look at the diagram for Question 5 in the Diagram Booklet.' Wording 'AB is a straight line' removed and replaced with 'It shows a straight line *AB*.' The line made exactly 12 cm. Labels moved above the line. Braille: Wording 'with a cross (×)' removed, a spare diagram provided with 2 round bumpons and drawing film.	Standard mark scheme but note the change in line length.
6	(a)	Change *a* to *m*, *b* to *n*.	Standard mark scheme but note the change in letters.
6	(b)	Change *x* to *y*.	Standard mark scheme but note the change in letters.
7		Wording added 'In bag **A**, the three cards have the letters *E*, *F* and *G* written on them.' Wording added 'In bag **B**, the two cards have the letters *J* and *K* written on them.' Braille: diagram removed.	Standard mark scheme

<table>
<tr><th colspan="3">PAPER: 1MA1_3F</th></tr>
<tr><th colspan="2">Question</th><th>Modification</th><th>Mark scheme notes</th></tr>
<tr><td>8</td><td></td><td>Wording added ‘Look at the table for Question 8 in the Diagram Booklet. It shows information about prices.’ ;
Table enlarged.
Braille: Change table to information:
“These details are shown below:
• Each plane ticket costs 600 dollars
• Each night in a hotel costs 120 dollars
• Each theme park ticket costs 250 dollars”</td><td>Standard mark scheme</td></tr>
<tr><td>9</td><td></td><td>Wording added ‘Look at the two-way table for Question 9 in the Diagram Booklet.’
Wording added ‘in the Diagram Booklet.’
Table enlarged.
Wording added ‘There are twelve spaces to fill.’
Braille: Wording added ‘There are seven spaces to fill.’
Diagram amended as shown:
<table>
<tr><td></td><td>Plastic</td><td>Not plastic</td><td>Total</td></tr>
<tr><td>Red</td><td>(ii)</td><td>8</td><td>12</td></tr>
<tr><td>Blue</td><td>5</td><td>(iii)</td><td>14</td></tr>
<tr><td>Black</td><td>(vii)</td><td>(vi)</td><td>(iv)</td></tr>
<tr><td>Total</td><td>(i)</td><td>(v)</td><td>56</td></tr>
</table>
In the table, add (i), (ii), (iii), (iv), (v), (vi) & (vii) in the blank spaces.
For Braille add “Ans: (i) __ (ii) __ (iii) __ (iv) __ (v) __ (vi) __ (vii) __</td><td>Standard mark scheme for MLP.
For Braille:
B3 for a fully correct table, or values given: (i) 32 (ii) 4 (iii) 9 (iv) 30 (v) 24 (vi) 7 (vii) 23
B2 for at least 3 figures correctly given)
B1 for the value of 32 given for (i) or one correct row or column
B2</td></tr>
</table>

PAPER: 1MA1_3F			
Question		**Modification**	**Mark scheme notes**
12		Wording added 'Look at the diagram for Question 12 in the Diagram Booklet.' Wording 'The diagram shows…' removed and replaced with 'It shows two places, Shelton and Trilby, on a map.' The diagram enlarged × 2 so the distance between Shelton and Trilby will be 5 cm exactly. The scale changed to 1 centimetre represents 10 kilometres. Wording added 'It has the scale: 1 cm represents 10 kilometres.' Trilby moved to the right of Shelton so that the candidate can measure horizontally. Crosses changed to solid dots. The town names moved above the dots. Scale moved above the diagram. The outside frame made wider.	Standard mark scheme but the M mark in part (a) is now: M1 [5]* × 10 (=50) *accept [5] in the range 4.5 to 5.5 (=45 to 55) For the A mark accept an answer in the range 45 to 55
16		Wording added 'Look at the diagram for Question 16 in the Diagram Booklet.' Wording 'Here is…' removed and replaced with 'It shows two right-angled triangles on a grid. The triangles are labelled *BAC* and *DAE*.' Wording added 'Point *A* for each of the triangles is in the same position on the grid.' Wording added 'Angle *BAC* and angle *DAE* are right angles.' Diagram enlarged. Open headed arrows. Shading removed. The grid cut at $x = -1$ and $y = -1$. Axes labels moved to the right of the horizontal axis and above the vertical axis. The wording '…that maps triangle *ABC* onto triangle *ADE*' removed and replaced by '…that maps triangle *BAC* onto triangle *DAE*.'	Standard mark scheme
17	(b)	Change *a* to *m*.	Standard mark scheme but note the change in letter
17	(d)	Change *e* to *p*. Change *f* to *q*.	Standard mark scheme but note the change in letters

PAPER: 1MA1_3F			
Question		**Modification**	**Mark scheme notes**
19		Wording added 'Look at the diagram for Question 19 in the Diagram Booklet.' Wording 'This diagram shows…' removed and replaced with 'It shows two squares, *ABCD* and *EFGH*.' The larger square labelled *ABCD* and the shaded square labelled *EFGH*. Wording added 'The square *EFGH* is shaded. *EFGH* is inside *ABCD*.' Wording added: '*AE* = *BF* = *CG* = *DH* = 3 cm; *EB* = *FC* = *GD* = *HA* = 5 cm ; All the marked angles are right angles.' Diagram enlarged. Right angles made more obvious. Shading changed.	Standard mark scheme
20		Wording added 'Look at the diagram for Question 20 in the Diagram Booklet. It shows an incomplete stem and leaf diagram.' Wording 'Here…' removed and replaced with 'Below..'; Wording added 'in the Diagram Booklet.' Diagram enlarged. Key moved above the diagram. Extra horizontal line added. Braille: Remove "Here are" and change to "The list below shows…" Change "Draw…" to "On your paper, make…" ; No diagram in Braille.	Standard mark scheme
21		Wording added 'Look at the diagram for Question 21 in the Diagram Booklet. It is a scatter graph which shows…' Diagram enlarged. Open headed arrows. Right axis has been labelled. Axes labels moved to the left of the horizontal axis and above the vertical axis. Crosses changed to solid dots. Small squares removed. Braille: There will be a spare diagram and Wikki Stix	Standard mark scheme but in part (b) use a range of 11 to 13
25		Change *a* to *n*.	Standard mark scheme but note the change in letter.
26		Wording added 'Look at the table for Question 26 in the Diagram Booklet.' Wording added 'The table in the Diagram Booklet…'; Table enlarged and turned vertical. In part (a) Wording added 'in the Diagram Booklet.'; Wording added 'There are two spaces to fill.' Braille: In the table letters (i) & (ii) placed in the blank spaces with an answer line: 'Ans: (i) __ (ii) __'	Standard mark scheme

PAPER: 1MA1_3F			
Question		**Modification**	**Mark scheme notes**
27		Wording added 'Look at the diagram for Question 27 in the Diagram Booklet.' Wording 'The diagram shows…' removed and replaced with 'It shows…' Wording added '$OP = OR = 8$ cm.' Wording added 'The marked angle is a right angle.' Diagram enlarged. Right angle made more obvious. Shading changed.	Standard mark scheme
28		Wording added 'Look at the diagram for Question 28 in the Diagram Booklet. It shows a set of axes.' Wording added 'on the axes in the Diagram Booklet.' Diagram enlarged. Open headed arrows. Axes labels moved to the right of the horizontal axis and above the vertical axis. Braille: there will be a spare diagram, Wikki Stix and drawing film.	Standard mark scheme

28	(a)	5,(1),(-1),-1,1,5	B2 (B1	for all 4 values correct for 2 or 3 correct values)	
	(b)	Graph drawn	B2 (B1	for a fully correct graph ft (dep on B1in (a)) for plotting at least 5 of the points from their table correctly)	Accept a freehand graph drawn that is not made of line segments Ignore anything drawn outside the required range
	(c)	0.3 to 0.5 and 2.5 to 2.7	M1 A1	for a correct method, eg marking intercepts with *x*-axis **or** one correct solution **or** both solutions given as a coordinates, eg (0.4, 2.6) **or** (0.4, 0) **and** (2.6, 0) for answers in the range 0.3 to 0.5 and 2.5 to 2.7 **or** ft their graph with at least 2 solutions	ft their graph for this mark Accept these coordinates reversed

Paper: 1MA1/1F

<table>
<tr>
<td>17</td>
<td>Line Drawn</td>
<td>B3

(B2

(B1

</td>
<td>for a correct line between $x = -2$ and $x = 4$

for a correct straight-line segment through at least 3 of
(–2, 6), (–1, 5), (0, 4), (1, 3), (2, 2), (3, 1), (4, 0)

or for all of these points plotted but not joined

or for a line drawn with a negative gradient through (0, 4) and clear intention to use a gradient of −1, eg a line through (0, 4) going across 1 square and down 1 square)

for at least 2 correct points stated or plotted

or a line drawn with negative gradient through (0, 4)

or a line with gradient −1)</td>
<td>Accept freehand line drawn

Ignore any incorrect points

Table of values
<table>
<tr><td>x</td><td>–2</td><td>–1</td><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td></tr>
<tr><td>y</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr>
</table>

Ignore any incorrect points
Coordinates may be in a table or working

Do not accept $y = 4$ drawn</td>
</tr>
</table>

Paper: 1MA1/2F

24	(a)	4	B1	for 4	Condone (0,4) or 0,4
	(b)	(3, −5)	B1	cao	
	(c)	5.1 to 5.3 and 0.7 to 0.9	M1	for a correct method, eg marking both intercepts with *x*-axis **or** one correct solution	**Accept** both solutions given as a coordinate for M1 eg (5.2, 0.8) **or** (0.8, 5.2) **or** (5.2, 0) **and** (0.8, 0)
			A1	for answers in the range 5.1 to 5.3 and 0.7 to 0.9	

14	(a)	30	B1	cao	
	(b)	2238 to 2296	M1	for a complete method eg attempts to read from the graph at a factor of 80 **and** scales up to 80 using a correct scale **or** attempts to read from the graph using numbers that sum to 80 **and** finds the sum of their readings **or** attempts to read from the graph a number that they then go on to scale up to 80 using a correct scaling factor	Condone some inaccuracy in reading from the graph, which should be given to within the nearest 50g
			A1	for an answer in the range 2238 to 2296	

Paper: 1MA1/3F

28	$x = 6$ $y = -2$	B1	cao	

Paper: 1MA1/1F

10	(a)	6	B1	cao	
	(b)	14 00	M1	for use of graph to find the maximum time paid for, eg £9.00 = 6 hours	May be seen on graph
			M1	for intention to add times, eg 08 00 + "6" hrs	8, 9, 10, 11, 12, 1 is enough to show a clear intention to add For method marks condone use of incorrect time notation
			A1	for 14 00 or 2 pm	Correct time notation required

28	B, D, E, C, A	B3 (B2 (B1	for all correctly matched for 3 or 4 correctly matched) for 2 correctly matched)	

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

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: ±5°
Measurements of length: ±5 mm

PAPER: 1MA1_2F			
Question		**Modification**	**Mark scheme notes**
6	(a)	Wording added 'Look at the diagram for Question 6(a) in the Diagram Booklet. It shows a probability scale.' Wording removed 'with a cross (x)' Numbers moved to above the scale.	Standard mark scheme
6	(b)	Wording added 'Look at the diagram for Question 6(b) in the Diagram Booklet. It shows a probability scale.' Wording removed 'with a cross (x)' Numbers moved to above the scale.	Standard mark scheme
7	(a) (b)	Wording added 'Look at the diagram for Question 7(a) and 7(b) in the Diagram Booklet. It shows'. Wording removed 'Here is' Wording added 'ABC.' Triangle enlarged such that AC is exactly 15cm, angle B is exactly 100° and BC is 10cm.	(a) Accept answer in the range 14.5 to 15.5 (b) Accept answer in the range 95 to 105
7	(c)	Wording added 'Look at the diagram for Question 7(c) in the Diagram Booklet. It shows' Wording removed 'Here is' Wording added 'PQR.' Diagram enlarged.	Standard mark scheme
8		Wording added 'Look at the diagram for Question 8 in the Diagram Booklet. It' Wording removed 'The diagram' Diagram enlarged. Arrows removed. Vertical lines added at P, Q, and R. Wording added 'PQ represents 8 cm. QR represents 16 cm' Braille: Wording added "The diagram IS accurately drawn." Extra information added: "In the diagram: PQ = 8 cm QR = 16 cm"	Standard mark scheme
10		Wording added 'Look at the diagram for Question 10 in the Diagram Booklet. It shows a graph that'. Wording removed 'This graph'. Wording '12 hours' removed and replaced with '8 hours'. Diagram enlarged but grid reduced to 8 hours and £12. Open headed arrows. Black grid lines. Graph line made thicker. Axes labels moved to above the vertical axes and left of the horizontal axes. Graph cut to allow for enlargement and to reduce the amount of information presented.	Standard mark scheme
11		Wording added 'Look at the table for Question 11 in the Diagram Booklet. It'. Wording removed 'The table'. Table enlarged. Number of people column widened, to allow for working out in the table.	Standard mark scheme

12	(a)	Wording added 'Look at the diagram for Question 12(a) in the Diagram Booklet. It shows a grid.' Grid enlarged. Shading changed. Shapes labelled 'shape A' and 'shape B'. Grid cut. Black grid lines. Wording added 'in the Diagram Booklet'.	Standard mark scheme
12	(b)	Wording added 'Look at the diagram for Question 12(b) in the Diagram Booklet. It shows a grid.' Wording 'Here is the diagram Alex draws.' removed and replaced with 'The diagram shows the reflection, shape R, that Alex draws.' Wording added 'is shown in the Diagram Booklet.' Diagram enlarged. Open headed arrows. Shading changed. Right shape labelled 'shape P'. Left shape labelled 'shape R'. Black grid lines.	Standard mark scheme
14		Wording added 'Look at the diagram for Question 14 in the Diagram Booklet. You may be provided with two models. The models show a packet and a box. The diagram shows a packet and a box.' Diagrams enlarged. Titles moved to above the diagrams. Dimension labels moved to the left.	Standard mark scheme
15		Wording added 'Look at the diagram for Question 15 in the Diagram Booklet. It shows'. Wording removed 'Here is'. Diagrams enlarged and stacked vertically. Spike removed from the spinner and replaced with a dot in the centre. Dice straightened up and rotated so that the number 6 is on the front section. Braille: Model of Tactile dice provided. . Sentence changed to "Ask for the dice for Question 15. It is a fair ordinary dice."	Standard mark scheme
19		Wording added 'Look at the diagram for Question 19 in the Diagram Booklet. It shows an incomplete frequency tree.' Wording 'this information' removed and replaced with 'the information above'. Wording added 'in the Diagram Booklet.' Diagram enlarged. Braille: Add (i), (ii), (iii), (iv), (v) and (vi) in the blank spaces on the diagram. Add answer lines "Ans: (i) __ (ii) __ (iii) __ (iv) __ (v) __ (vi) __"	Standard mark scheme
23	(b)	Wording added 'Look at the diagram for Question 23(b) in the Diagram Booklet. It shows a number line'. Wording removed 'below'. Diagram enlarged. Open headed arrow. Axis label moved to the right of the horizontal axis.	Standard mark scheme
23	(c)	Letter 'g' changed to 't'.	Standard mark scheme but note letter change.

24		Wording added 'Look at the diagram for Question 24 in the Diagram Booklet. It shows a triangle ABC and a rectangle PQRS.' Wording removed 'Here is a triangle and a rectangle.' Triangle labelled ABC. Rectangle labelled PQRS. Diagram enlarged. Diagrams stacked vertically. Right angle made more obvious. Shape labels moved to the left and to above the rectangle. Wording added 'In triangle ABC: AB is marked $6x$; BC is marked 8; Angle ABC is a right angle. In rectangle PQRS: PQ is marked 5; PS is marked $4x - 1$'	Standard mark scheme
26		Letter 'd' changed to 'n'.	Standard mark scheme but note letter change.
28		Wording added 'Look at the diagram for Question 28 in the Diagram Booklet. It shows five graphs labelled A – E.' Wording removed 'Here are five graphs.' Diagrams enlarged. Open headed arrows. Graphs labelled 'Graph A', 'Graph B', 'Graph C', 'Graph D', and 'Graph E'. Axes labels moved to the top of the vertical axes and to the right of the horizontal axes. Wording added 'below'. Table enlarged and left aligned.	Standard mark scheme

Paper: 1MA1/3F

Question	Answer	Mark	Mark scheme	Additional guidance
13 (a)(i)	30	B1	cao	
(ii)	10	B1	cao	
(b)	Drawn	M1	for a line from (1330 , 35) to (1500 , 35) **or** a line to the *x* axis from a point on *y* = 35 to 1600 on the *x* axis	
		A1	fully correct graph	
(c)	35	B1	for 35 or ft their graph	ft must be 35 ÷ time duration for their line

Paper: 1MA1/1F

Question	Answer	Mark	Mark scheme	Additional guidance
14	Graph drawn	B3 (B2 (B1	for a correct line between $x = -2$ and $x = 2$ for a correct straight-line segment through at least 3 of $(-2, -9)$, $(-1, -5)$, $(0, -1)$, $(1, 3)$, $(2, 7)$ **or** for all these points plotted but not joined **or** for a line drawn with a positive gradient through $(0, -1)$ **and** clear intention to use a gradient of 4, eg line through $(0, -1)$ and $(1, 3)$) for at least 2 correct points stated or plotted **or** for a line drawn with a positive gradient through $(0, -1)$ **or** a line with gradient 4)	Accept freehand line drawn Ignore any incorrect points. Table of values x −2 −1 0 1 2 y −9 −5 −1 3 7 Ignore any incorrect points. Coordinates may be in a table or working. Do not accept $y = -1$ drawn

Question	Answer	Mark	Mark scheme	Additional guidance
20 (a)	4 **0** **–2** –2 **0** **4**	B2	for all 4 correct values	
		(B1	for 2 or 3 correct values)	
(b)	Graph	M1	ft (dep B1) for plotting at least 4 points correctly	
		A1	for a fully correct curve drawn	Accept a freehand curve drawn that is not made of line segments.

Question	Answer	Mark	Mark scheme	Additional guidance
16 (a)	170	B1	for answer in the range 167 to 173	
(b)	35	M1	for correctly using readings from the graph as a factor of 1000 from the grams scale, eg 200 × 5 or 100 × 10 or 20 × 50 or 250 × 4 **or** for method to use multiples of grams and corresponding ounces readings, eg 1000 ÷ "answer to (a)" × 6 **or** 1000 ÷ grams × ounces oe	May be seen as a build-up method using multiple readings that can be read from the graph but must total 1000 grams (ounces, grams) is a point on the line
		A1	for an answer in the range 34 to 36	

Question	Answer	Mark	Mark scheme	Additional guidance
24 (a)	(6) 2 (0) 0 (2) 6	B2	for all 3 values correct	
		(B1	for 1 or 2 correct values)	
(b)	Graph drawn	B2	for a fully correct graph	Accept a freehand curve drawn that is not made of line segments Ignore anything drawn outside the required range
		(B1	ft (dep on B1 in (a)) for plotting at least 5 of the points from their table correctly)	
(c)	–1.7 to –1.5 and 2.5 to 2.7	M1	for drawing the line $y = 4$ or reading off intersections where $y = 4$ **or** one correct solution **or** both solutions given as coordinates, eg (–1.6, 2.6) or (–1.6, 4) **and** (2.6, 4)	ft their graph for this mark Accept these coordinates reversed
		A1	for answers in the range –1.7 to –1.5 **and** 2.5 to 2.7 **or** ft their graph with at least 2 solutions	Algebraic methods score 0 marks

Paper: 1MA1/2F

Question	Answer	Mark	Mark scheme	Additional guidance
19	$y = 3x - 2$ drawn	B3	for a correct line between $x = -2$ and $x = 3$	x: −2, −1, 0, 1, 2, 3 y: −8, −5, −2, 1, 4, 7
		(B2	for a correct straight line segment through at least 3 of (–2, –8), (–1, –5), (0, –2), (1, 1), (2, 4), (3, 7) **or** for all of these points plotted but not joined **OR** for a line drawn with positive gradient through (0, –2) **and** clear intention to use a gradient of 3, eg line through (0, –2) going across 2 squares and up 6 squares)	Ignore any incorrect points. Points need not be plotted for a correct line (segment) drawn
		(B1	at least 2 correct points stated or plotted **OR** for a line drawn with positive gradient through (0, –2) **OR** a line with gradient of 3)	Ignore any incorrect points Coordinates may be in a table or in working

Paper: 1MA1/3F

14	(a)	2	B1	cao	
	(b)	Graph completed	M1	for straight line from (3, 5) to (5, 5) **or** for a straight line from (5, 5) to (6 30, 0) **or** line drawn from (3, 5) to (4 30, 0) **or** a line drawn from (x, 5) to (x + 1 30, 0) where $x \geq 3$	Accept hand drawn, ruler not required but intention clear
			A1	cao	

Paper: 1MA1/2F

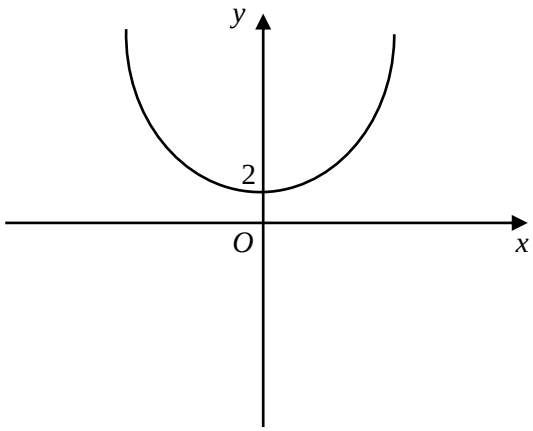
Question	Answer	Mark	Mark scheme	Additional guidance
24 (a)	5, (0), –3, –4, (–3), 0, 5	B2 (B1	for all 5 correct values for at least 2 correct values)	
(b)	Graph drawn	B2 (B1	for a fully correct graph ft (dep on B1 in (a)) for plotting at least 5 of the points from their table correctly)	Accept freehand curves drawn that are not line segments Ignore anything drawn outside the required range

Question	Answer	Mark	Mark scheme	Additional guidance
11 (a)	16	B1	cao	
(b)	48	M1	for taking a suitable reading from the graph that could be used to convert, eg 25 km = 15.5 miles **or** 17 miles = 27.2 km	Allow a tolerance of one small square for the reading eg 10 km = 6 – 6.5 miles 20 km = 12.25 – 12.75 miles 25 km = 15.25 – 15.75 miles 30 km = 18.5 – 19 miles for miles to km allow 1 mile = 1.6 km 17 miles = 27 – 28 km
		M1	ft, for a complete method, eg "15.5" × 2 + 17 **or (**"27.2" + 50) ÷ 1.6	For ft, allow use of their stated conversions but they must be conversions that could have come from graph
		A1	for an answer in the range 47 – 49.5	

21	(a)	(2),–2,(–4), –4, –2, 2	B2 (B1	for all 4 values correct for 2 or 3 correct values)	
	(b)	Graph drawn	B2 (B1	for a fully correct graph ft (dep on B1 in (a)) for plotting at least 5 of the points from their table correctly)	Accept a freehand curve drawn that is not made of line segments Curve must not have a horizontal segment between $(-1, -4)$ and $(0, -4)$ Ignore anything drawn outside the required range
	(c)	– 0.5, – 4.25	B1	ft their graph with a single turning point or for *x* coordinate = – 0.5 and *y* coordinate = – 4.25 oe	

Paper: 1MA1/1F

Paper: 1MA1/2F

Question	Answer	Mark	Mark scheme	Additional guidance
28	Graph sketched	B2	for fully correct graph with *y*-intercept labelled 	
		(B1	for the general shape in the correct orientation incorrectly positioned **or** graph with a *y*-intercept clearly labelled at 2)	

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Mark Scheme (Results)

March 2011

GCSE

GCSE Mathematics (Modular) – 5MB2F
Paper 01

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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. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.

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. Examiners should also 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 indicate within the table where, and which strands of QWC, are being assessed. 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 labeling 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.

7 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.
Any case of suspected misread loses A (and B) marks on that part, but can gain the M marks. Discuss each of these situations with your Team Leader.
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 canceling 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.
Transcription errors occur when candidates present a correct answer in working, and write it incorrectly on the answer line; mark the correct answer.

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.

11 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.

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)

Guidance on the use of codes within this mark scheme
M1 – method mark 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

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5MB2F_01				
Question	**Working**	**Answer**	**Mark**	**Notes**
1 (a)		Kite drawn	1	B1 Accept a rhombus, square, etc.
(b)		Parallelogram	1	B1
2 (a)		9	1	B1 cao
(b)		0.6,2.8,4.71,13.4	1	B1 cao
(c)		0.7	1	B1 cao
3 (a)		5	1	B1 cao
(b)		Line of symmetry	1	B1 for line of symmetry
4 (i)		Acute	2	B1 cao
(ii)		53°		B1 for an angle 51°-55°
5 (i)		130	2	B1 for 130 cao
(ii)		Reason		B1 for reason eg "angles on a (straight) line (sum to) 180° NB: those underlined are the essential elements of an answer.

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5MB2F_01				
Question	**Working**	**Answer**	**Mark**	**Notes**
6 (a)		3*c*	1	B1 cao
(b)		2*x* + 6*y*	2	B2 for 2*x* + 6*y* (B1 for 2*x* or 6*y*)
7 (a)		Pattern	1	B1
(b)	7,10,13,16,19,22,25,28,31,34,37,40 43,46,49; or 3*n*+4	49	2	M1 for method eg counting up in 3s (to at least pattern number 6; allow errors if intention is clear), diagram extension (ft), use of 3*n*+4 (could be shown as part of a valid calculation eg 15×3) A1 49
8	Ticket sales: 16 × 100 = £1600 Meals: 12 × 100 = 1200 Fixed costs: 230 + 150 + 30 = 410; 410+1200=1610 or 1600-230-150-30=1190; 1190-1200 = -10 Total 410 + 1200 = £1610 (<£1600) OR £1610÷100=£16.10 ticket price (>£16) OR £1600 – 410 – 1200 = - £10 (or £10 needed) OR £1600-1200 = £400 (< £410 costs)	No. £1610 >£1600 £410 >£400	4	M1 for addition of 230, 150, 30 (or + 410) (=422 or 800) M1 for 12 × 100 (= 1200) A1 for £1610 total costs or £16.10 ticket price needed. C1 (dep on at least M1) for correct comparison and statement that “£1610”>”£1600” and that costs will not be covered. OR M1 for subtraction of 230, 150, 30 (or - 410) M1 for 12 × 100 (=1200) A1 for £400 left or -£10 C1 (dep on at least M1) for correct comparison and statement that “£410”>”£400” and that costs will not be covered.

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5MB2F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
9	(a)	-7 to -9	2	1	B1 Accept -2
	(b)	8 to -7	15	1	B1 cao
10	(a)	$\frac{1}{2}\times\frac{1}{5}=$	$\frac{1}{10}$	1	B1 oe
	(b)	$\frac{1}{2}+\frac{3}{8}=\frac{4}{8}+\frac{3}{8}=$	$\frac{7}{8}$	2	M1 common denominators with at least one numerator correct or an unsimplified answer, or a fraction that is not completely processed eg $\frac{1\times 8+2\times 3}{2\times 8}$ OR conversion to correct decimals: 0.5 + 0.375 A1 for $\frac{7}{8}$ or 0.875
11	(a)		12	1	B1 cao
	(b)		200 cm^3	3	M1 for 10 × 4 × 5 A1 cao B1 (indep) for cm^3

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5MB2F_01				
Question	**Working**	**Answer**	**Mark**	**Notes**
12	London: £15, £34, £26 (£75) → 450, 1020, 780 (2250) KC Prague: 450, 750, 810 KC (2010KC) → £15, £25, £27 (£67) £ to KC is ×30; KC to £ is ÷30.	Yes. Cheaper in Prague (More in London)	5	M1 conversion method (× or ÷ as appropriate) or evidence of use of graph (seen, or implied, by at least lines or evidence of conversion by marks on axes) for at least one figure. M1 (dep) conversion applied to 3 figures or totals (converted figures must be stated, marks on graph insufficient) A1 converted figures shown (all three individual items or totals converted correctly; NB: no tolerance on graph) M1 totalling converted amounts C1 (dep on at least M1) comparison of "**totals"** and correct conclusion Eg "2250KC">"2010KC", "£75">"£67" so cheaper to buy in Prague.
13	Zparts: 150 is 15 boxes; 15 × £35 = £525 CompParts: 150÷11 is 13.6 so 13 offers (150-13)×£4=137×4=£548 OR 13×11=143; 150-143=7 extra (13×10+7)=137; 137×4=£548 OR 150×4=£600 13 offers so 13 free: 13×4=52; 600-52=£548	Zparts £525 CompParts £548 so Zparts cheaper	5	M1 for 15 × £35 (= £525) M1 for attempt to account for 1 free (eg ÷11 or listing with 10 charged and one not) M1 for ×4 (may be shown as ×40) A1 for totals of £548 and £525 OR unit costs of £3.64/£3.63 and £3.50 (oe) C1 (dep on at least M1) for making comparison figures clear and giving correct deduction.

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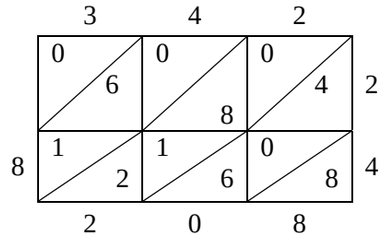
5MB2F_01								
Question	**Working**						**Answer**	**Mark**	**Notes**
14	x	-3	-2	-1	0	1	Line	3	**(Table of values)** M1 for at least 2 correct attempts to find points by substituting values of x. M1 ft for plotting at least 2 of their points (any points plotted from their table must be correct) A1 for correct line between -3 and 1 **(No table of values)** M2 for at least 2 correct points (and no incorrect points) plotted OR line segment of $2x+3$ drawn (ignore any additional incorrect segments) (M1 for at least 3 correct points with no more than 2 incorrect points) A1 for correct line between -3 and 1 **(Use of $y=mx+c$)** M2 for at least 2 correct points (and no incorrect points) plotted OR line segment of $2x+3$ drawn (ignore any additional incorrect segments) (M1 for line drawn with gradient of 2 OR line drawn with a y intercept of 3 and a positive gradient) A1 for correct line between -3 and 1
	y	-3	-1	1	3	5			

5MB2F_01				
Question	**Working**	**Answer**	**Mark**	**Notes**
15	342 ×24 6840 1368 8208 24 ×342 7200 960 48 8208  300 40 2 6000 800 40 20 1200 160 8 4 6000+800+40+1200+160+8=8208	8208	3	M1 for a 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. A1 cao M1 for a complete grid with not more than 1 multiplication error, addition not necessary (inside numbers) M1 (dep) for addition of all the appropriate elements of the calculation (eg outside numbers) A1 cao M1 for sight of a complete partitioning method, condone 1 multiplication error, addition not necessary. M1 (dep) for addition of all the appropriate elements of the calculation. A1 cao

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5MB2F_01				
Question	**Working**	**Answer**	**Mark**	**Notes**
16 (a)		21	1	B1 cao
(b)		$4n+1$	2	M1 for $4n$ + k ($k \neq 1$) A1 oe NB $n = 4n + 1$ gets M1 only.
17	300 ÷ (2 + 3 + 5) × 5 = 300 ÷ 10 × 5 =	150	2	M1 for 300 ÷ (2 + 3 + 5) or 300 ×5 or 30 seen or 60:90:150 A1 cao

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5MB2F_01				
Question	**Working**	**Answer**	**Mark**	**Notes**
18	LCM (40, 24) = 120 Rolls 120 ÷ 40 = Sausages 120 ÷ 24 = OR Rolls 40 is 2 × 2 × 2 (×5) Sausages 24 is 2 × 2 × 2 (×3) 40, 80, **120**, 160, 200, 240, 280 24, 48, 72, 96, **120**, 144, 168	Rolls (packs) 3 Sausages (trays) 5 Hot dogs 120	5	M1 attempts multiples of either 40 or 24 (at least 3 but condone errors if intention is clear) M1 attempts multiples of both 40 and 24 (at least 3 of each but condone errors if intention is clear) M1 (dep on M1) division by 40 or 24 or counts up multiples. (implied if one answer correct or answers reversed) A1 rolls (packs) 3, sausages (trays) 5 OR any multiple of 3,5 A1 hot dogs 120 or ft on both of their packs or ft 'common multiple' OR M1 expansion of either number into factors M1 demonstrates one of the expansions that includes 8 oe M1 demonstrates a 2nd expansion that includes 8 oe A1 cao for rolls (packs) 3, sausages (trays) 5 A1 hot dogs 120
19	Bottom / top is 5 × 10 = 50; 50 × 2 = 100; 280 – 100 = 180 Other dimensions: 10 + 10 + 5 + 5 = 30; 180 ÷ 30 =	6	4	M1 recognition that the bottom/top is 5 × 10 (= 50), 50 seen M1 for 280 – 2 × "50" (= 180) M1 for "180" ÷ "other dimensions" or valid attempt to find height using these dimensions A1 cao

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Mark Scheme (Results)

June 2012

GCSE Mathematics (2MB01) Foundation
Paper 5MB1F_01 (Calculator)

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Comprehension and meaning is clear by using correct notation and labeling conventions.

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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.

11 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.

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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)

Guidance on the use of codes within this mark scheme
M1 – method mark 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

5MB1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
1	(a)		Mary, 5, blue, dog	1	B1 cao
	(b)		2	1	B1 for 2 or ft from their table
	(c)		cat	1	B1 for cat or ft from their table
2	(a)	2 × 12	24	1	B1 cao
	(b)	e.g. 12 + 6	18	2	M1 for 4.5 × 12 – 3 × 12 or (4.5 – 3) × 12 or 12 + 6 or 6 seen "54" – "36" oe A1 cao
	(c)	2.75 × 12 × 8	2.64	3	M2 for complete method seen, "2.75×12"×8 or "12+12+9"×8 or "2.75 × 8"×12 or "33"×8 "96" + "96" + "72" or the digits 264 seen (M1 for 2.75×12 or 12+12+9 or 24+9 or "33" or 2.75×8 or 12×8 or 24×8 or 9×8 or 192 seen or 96 seen or 72 seen) A1 cao (SC M1 (12+12+8)×8 but not 32×8) Note: The method marks can also be awarded if the candidate uses 0.08
3	(i)		Impossible	3	B1 cao
	(ii)		$\frac{1}{2}$		B1 for cross marked at $\frac{1}{2}$
	(iii)		$\frac{1}{6}$		B1 for $\frac{1}{6}$ oe

<table>
<tr><th colspan="5">5MB1F_01</th></tr>
<tr><th colspan="2">Question</th><th>Working</th><th>Answer</th><th>Mark</th><th>Notes</th></tr>
<tr><td>4</td><td></td><td>e.g.
<table><tr><td>Start time</td><td>Finish time</td></tr><tr><td>(A)10 00</td><td>(10 05)</td></tr><tr><td>(B)10 05</td><td>(C)10 48</td></tr><tr><td>(10 48)</td><td>(15 11)</td></tr><tr><td>(D)15 11</td><td>(E)15 53</td></tr><tr><td>(15 53)</td><td>(F)15 58</td></tr></table>
e.g
leave house (before) 8 00
catch 8 05 train
arrive in Middleton at 8 48
leave Middleton 14 42
arrive back 15 26
get home (after) 15 31</td><td>Completed schedule</td><td>5</td><td>M1 (indep) for establishing a start time at least 5 minutes before (B) or the end time, provided the end time is not after (B)

M1 (indep) for establishing a correct start and finish time from the first train timetable using (B) and (C) or their equivalent bracketed values if (B) and/or (C) is missing

M1 (indep) for establishing at least 4 hours in Middleton by using (C) and (D) or their equivalent bracketed values if (C) and/or (D) is missing

M1 (indep) for establishing a correct start and finish time from the second train timetable using (D) and (E) or their equivalent bracketed values if (D) and/or (E) is missing. (E) can be after 16 00.

A1 for a fully correct schedule with (F) before 16 00 and at least 5 minutes after (E) or the start time, provided the start time is not before (E)

(Note: If the candidate writes a schedule without using the table then mark their written schedule.)

(Note: Candidates can use 12hour clocktimes.)</td></tr>
</table>

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5MB1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
5	(a)		Thursday	1	B1 cao
	(b)		45	1	B1 cao
	(c)		Bar chart completed	2	B2 for bars of correct length, correctly shaded (condone Sophie's bar left unshaded) (B1 for one correct length bar with correct shading or two correct length bars with incorrect or no shading)
	(d)		Comparison	1	B1 for one correct comparison, e.g. Sophie spent more time (on the Internet) at the beginning of the week than Zach (Note: if candidates quote total amounts of time spent on the internet they must be correct or support by evidence of how they got them. Sophie: 215min or 3h35min Zach: 240min or 4h)

5MB1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
***6**		e.g. £25 = $40, so £100 = $160 £20 = $32, so £40 = $64 £100 + £40 = $160 + £64 = $224 (London) $220 (New York)< $224(London)	New York is less expensive	4	B1 for stating a correct conversion fact from the graph $40 ≡ £25oe M1 (indep) ft for a complete method to convert £ to $ using their conversion fact e.g. 40÷25×140 oe A1 ft for $224 C1 ft (dep on M1) for more (expensive) in London oe OR B1 for stating a correct conversion fact from the graph £25 ≡ $40 oe M1 (indep) ft for a complete method to convert $ to £ using their conversion fact e.g 25÷40×220 oe A1 ft for £137.5(0) C1 ft (dep on M1) for less (expensive) in New York oe
7		(8 = 3 + 3 + 2 =) £9 + £9 + 2×£3.75 = £25.50 £40 - £25.50 = £14.50	14.50	3	M1 for 2×9 + 2×3.75 oe or 18 + 7.5(0) or 25.5(0) seen M1 for 40 – "25.50" A1 cao (SC B1 for £10 or £13 or £12.25)

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5MB1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
8	(a)		3, 7, 5, 4, 2, 3	2	M1 for at least one correct frequency or tally A1 for 3, 7, 5, 4, 2, 3 cao (B2 for correct frequencies without the use of tallies)
	(b)		2	1	B1 for 2 or ft from their frequency table
	(c)		Diagram or chart	3	M1 (ft from their frequency table) for a diagram or chart, e.g. bar chart, stick graph, pictogram, pie chart, showing correct data for at least 3 scores M1 (indep) for correct scale and label on vertical axis or fully correct labelling on horizontal axis or a suitable key A1 (ft from their frequency table) for fully correct diagram or chart (to include all axes labelled)
9			15, **17**, 12, 44 **18**, 22, **16**, **56** **33**, **39**, 28, 100	3	B3 fully correct table (B2 for 4 or 5 correct entries) (B1 for 2 or 3 correct entries)
10	(a)		$b - a$	1	B1 cao
	(b)		$\frac{(a + b)}{2}$	1	B1 for $\frac{(a+b)}{2}$ oe

5MB1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
***11**		2×39.50 + 3×23.75 = 150.25 2×40.25 + 3×21.85 = 146.05	Seawagon	4	M1 for 2×39.50 + 3×23.75 or 150.25 or 2×40.25 + 3×21.85 or 146.05 or 2*a* + 3*b*, where *a* and *b* are consistent values from table or sight of 39.50 and 23.75 or 40.25 and 21.85 M1 for 2×39.50 + 3×23.75 and 2×40.25 + 3×21.85 A1 for (£)150.25 and (£)146.05 C1 (dep on M1) for Seawagon or ft from their answers and condone stating an incorrect difference
12	(a)		(5, 300) plotted	1	B1 for point plotted at (5, 300) allow ± ½ square tolerance
	(b)		The greater the age the less the value	1	B1 for the greater the age the less the value (price, cost etc.) Accept negative correlation but "negative" or "negative relationship" gets B0
	(c)		500 to 800 inc.	2	B2 for an answer in the range 500 to 800 (inc.) OR M1 for a single straight line segment with negative gradient that could be used as a line of best fit A1 ft from their line of best fit [SC: B1 ft reading from their single straight line with negative gradient at Age = 4 if M0 scored]

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5MB1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
13	(a)	1 – (0.15 + 0.32 + 0.27) 1 – (15 + 32 + 27) $1 - (\frac{15}{100} + \frac{32}{100} + \frac{27}{100})$	0.26 26% $\frac{26}{100}$ (oe)	2	M1 for 1 – "(0.15 + 0.32 + 0.27)" oe or 26 seen A1 for 0.26 or $\frac{26}{100}$ (oe) or 26% (must include the % sign) [Note: 0.26 seen in the table and contradicted by an incorrect answer on the answer line gets M1A0]
	(b)	0.15 × 300	45	2	M1 for 0.15 × 300 (=45) oe A1 accept 45 out of 300

5MB1F_01

Question		Working	Answer	Mark	Notes
14	(a)		5 | 9 6 | 3 5 6 6 7 | 1 2 5 5 6 7 9 9 8 | 3 9 Key: eg, 7/2 represents 72	3	M1 for at least 2 correct 'rows' with correct stem and correct ordered or unordered leaf A1 for a fully correct ordered stem and leaf diagram B1 for a key [Ignore spacing on leaves provided the order is` correct]
	(*b)	Gill: HV 95 >; LV 75 >; Mean 80 >; Range 20 < Jamal: HV 89; LV 59; Mean 73; Range 30	Comparisons	5	M1 for '72+59+76+...'÷15 or 1095 ÷ 15 (= 73) M1 for 95 – 75 (=20**) or** '89' – '59' (= 30) or '89' and '59' seen ft from their stem and leaf diagram in (a) A1 for mean of Jamal's scores is 73 cao or for ranges of 20 and 30 cao C1 (dep on first M1) ft for a correct comparison of mean scores, e.g. Gill's mean score > Jamal's mean score oe C1 ft for a correct comparison of ranges, (dep on M1 awarded for correct method to find range) e.g. The range of Gill's scores < The range of Jamal's scores **or** a correct comparison of both end values (dep on M1 awarded for '89' and '59' seen) , e.g. Gill's lowest score > Jamal's lowest score and Gill's highest score > Jamal's highest score. oe [For the award of C2, the word 'score' must be explicitly stated. If not deduct 1 mark]

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Mark Scheme (Results)

March 2013

GCSE Mathematics (Linear) 1MA0
Foundation (Calculator) Paper 2F

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1MA0_2F					
Question		**Working**	**Answer**	**Mark**	**Notes**
1	(a)		7025	1	B1 cao
	(b)		Nine thousand four hundred (and) fifty	1	B1 for Nine thousand four hundred (and) fifty Accept 'nine thousand' written as '9 thousand', 'four hundred' written as '4 hundred' and 'fifty' written as '5 tens' or any mixture of these. Do not penalise poor spelling.
	(c)		29	1	B1 for 29 or twenty nine or 29.0
	(d)		7000	1	B1 for 7000 or 7 thousand or seven thousand
2	(a)		8, 10	1	B1 cao
	(b)		24	1	B1 cao
	(c)		reason	1	B1 for a valid reason that demonstrates the understanding that the number of triangles is twice the pattern number
3	(a)		240	1	B1 for 240
	(b)		arrow at 125°C	1	B1 for arrow (or line) pointing within a range of 122.5 to 127.5 (ie nearer to 125 than either 120 or 130) Use professional judgement.
	(c)		6.05 (pm)	1	B1 for 6.05 (pm) oe

1MA0_2F					
Question		**Working**	**Answer**	**Mark**	**Notes**
4	(a)		Thursday	1	B1 cao
	(b)		7	1	B1 cao
	*(c)		Nick	3	M1 for the intention to add Dave's 4 times or Nick's 4 times A1 for 58 and 64 C1 (dep on M1 and two totals) for clearly stating Nick as their answer or ft from their two totals OR M1 for the intention to find the difference between the times on each of the 4 days A1 for 6 or −6 C1 (dep on M1 and a net difference) for clearly stating Nick as their answer or ft from their difference [SC: B1 for "Nick spent 6 minutes more than Dave on his phone" if M0 scored.]
5			9 squares shaded	1	B1 for any 9 squares shaded oe
6			66	2	M1 for a correct method to find the number of people on the bus if the 15 get off first. (= 57) A1 cao OR M1 for a correct method to find the number of people on the bus if the 9 get on first. (= 81) A1 cao OR M1 for a correct method to find the net change in the number of people on the bus (= 6 or −6) A1 cao

1MA0_2F					
Question		**Working**	**Answer**	**Mark**	**Notes**
7		20 − 6.65 13.35 ÷ 3	4.45	3	M1 for a correct method to find the amount shared by B, R and T M1 (dep) for a correct method of dividing this amount by 3 A1 cao [SC: B1 for an answer of 17.78 (20 – 6.65 ÷ 3), if M0 scored, with or without working]
8	(a)		3, 6, 9, 3	3	B3 for a table showing all 4 correct frequencies in the correct place. (condone the absence of or any incorrect tallies) [(B2 for 2 or 3 correct tallies or 2 or 3 correct frequencies even in the wrong columns) (B1 for 1 correct tally or 1 correct frequency even in the wrong column)] [SC: B2 for 3/21 and 6/21 and 9/21 and 3/21 shown in the frequency column]
	(b)		3	1	B1 for 3 or ft table in (a)
9			Circle radius 5 cm drawn	1	B1 for a circle of radius 5 cm drawn (condone an alternative centre)

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1MA0_2F					
Question		**Working**	**Answer**	**Mark**	**Notes**
10	(i)		5,15 or 5,125 or 15,125 or 30,50 or 30,60 or 30,90 or 30,100 or 50,60 or 50,90 or 50,100 or 60,90 or 60,100 or 90,100	4	B1 for 2 numbers, from the list, whose sum is an even number.
	(ii)		60 or 100		B1 for 60 or 100 or both
	(iii)		5 or 15		B1 for 5 or 15 or both
	(iv)		125		B1 cao
11		9.39 × 10 24.30 × 3 + 9.39 93.90 − 82.29	£11.61	5	M1 for a correct method to find the most expensive way to buy the 10 cartridges (= 93.90) M1 for a correct method to find the least expensive way to buy the 10 cartridges (= 82.29) M1 (dep on M1 scored) for a correct method to find the difference between their least and their most expensive way, provided that both totals are for the cost of exactly 10 cartridges A1 for 11.61 B1 (indep) for correct units

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1MA0_2F					
Question		**Working**	**Answer**	**Mark**	**Notes**
12	(a)(i)		B and D	2	B1 cao
	(ii)		G and E		B1 for G and E (allow B and D if not in (i))
	(b)	3 + 3 + 3 + 2 + 2 +1 + 1 + 1	16	1	B1 cao
13	(a)		6am	1	B1 for 6am (accept −4) Do not accept 6 alone.
	(b)		3	1	B1 for 3 (allow − 3)
	(c)	−1−5	−6	2	M1 for −1 − 5 or intention to subtract 5 from -1 (may be shown on a diagram) A1 cao

1MA0_2F					
Question		**Working**	**Answer**	**Mark**	**Notes**
*14			Yes + supporting work	4	M1 for adding the weights of all the ingredients (= 96) M1 (dep) for '96' × 8 A1 cao for 768 C1 (dep on M2), ft for a correct conclusion (yes or no) from a comparison of 750 (pots) with their '768' pots; units must be quoted [SC: B1 for 768 seen without working if M0M0 scored] **OR** M1 for adding the weights of all the ingredients (= 96) M1 for 750 ÷ 8 A1 cao for 93.75 C1(dep on M2), ft for a correct conclusion (yes or no) from a comparison of their weight of ingredients in one tank full '93.75' kg with '96' kg; units must be quoted [SC: B1 for 93.75 seen without working if M0M0 scored]] **OR** M1 for adding the weights of all the ingredients (= 96) M1 (dep) for 750 ÷ '96' A1 cao for 7.8125 C1(dep on M2), ft for a correct conclusion (yes or no) from a comparison of their number of pots, '7.8125' pots with 8 (pots); units must be quoted [SC: B1 for 7.8125 seen without working if M0M0 scored]]
15			85 29 54 **168** **93** 31 47 171 13 5 **9** **27** 191 **65** **110** 366	3	B3 for fully correct table (B2 for 3 or 4 or 5 correct entries, B1 for 1 or 2 correct entries)

PMT

1MA0_1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
16	(a)(i)		5	3	B1 cao
	(ii)		8		B1 cao
	(iii)		5		B1 cao
	(b)		correct sketch	2	B2 for fully correct sketch [B1 for a square (or rectangle) drawn with 2 or 3 connecting triangles on the outside of the square]
17	(a)(i)		12.978(61279…)	2	B1 for 12.978(…..)
	(ii)		13		B1 for 13 or ft from a(i) [Note: An answer of 13.0 gets B0]
	(b)		100000	1	B1 cao
18	(a)	$2 \times 8 = 16$ $16 + 7$	23	2	M1 for correct substitution of 8 into the expression $2f$ A1 cao
	(b)	$3 \times -2 + 5 \times 4$	14	2	M1 for correct substitution into the formula A1 cao

PMT

1MA0_2F					
Question		**Working**	**Answer**	**Mark**	**Notes**
19	(a)		$\frac{40}{360}$	1	B1 for $\frac{40}{360}$ oe (ignore any incorrect simplification) Accept 0.11…. if no fraction shown
	(b)		4	3	M1 for a correct method to find the angle of the 'weeding' sector If measured, accept an angle between 138 and 142 inc. M1 (dep) for a correct method to find the number of degrees per hour (= 20) or the number of hours ($\frac{1}{20}$ (3 mins) per degree A1 cao for 4
20	(a)		2.5	2	M1 for 10 (cm) or "10" ÷ 4 A1 for 2.45 – 2.55
	(b)		A marked on diagram	2	M1 for a point marked (or line drawn) on a bearing of 038° from either point B or point W, OR for a point marked (or arc drawn) 6 cm from B A1 for the position of Avebury marked (accept without label if not ambiguous)

PMT

1MA0_2F					
Question		**Working**	**Answer**	**Mark**	**Notes**
21	(a)		30	1	B1 for 30 minutes oe
	(b)		20	1	B1 cao
	(c)		graph completed	2	B1 for horizontal line from (5, 20) to (5.30, 20) B1 for a single straight line with the correct gradient from '(5.30, 20)' to the time axis
22	(a)		$x = 3$ drawn	1	B1 for $x = 3$ drawn [Note: each line drawn must be a single line segment satisfying $x = 3$]
	(b)		$y = x$ drawn	1	B1 for $y = x$ drawn [Note: each line drawn must be a single line segment satisfying $y = x$]
	(c)	Gradient = $\frac{3-0}{0--2}$	1.5	2	M1 for a method to find the gradient of the given line A1 for 1.5 oe
23	(a)		n^8	1	B1 for n^8 (accept n^{5+3})
	(b)		n^5	1	B1 for n^5 (accept n^{7-2})

1MA0_2F					
Question		**Working**	**Answer**	**Mark**	**Notes**
24	(a)	15 ÷ 6	2.5	2	M1 for 15 ÷ 6 oe A1 for 2.5 or $2\frac{1}{2}$
	*(b)		Yes + evidence	2	M1 for a correct method to change 15 miles into kilometres C1(dep on M1) for 24 km **and** statement with correct conclusion [SC: B1 for "Yes" oe and 24 km shown if M0 scored] **OR** M1 for a correct method to change 20 kilometres into miles C1(dep on M1) for 12.5 miles **and** statement with correct conclusion [SC: B1 for "Yes" oe and 12.5 miles shown if M0 scored]

1MA0_2F					
Question		**Working**	**Answer**	**Mark**	**Notes**
25			414.96	5	M1 for a correct method to work out the amount of oil required to fill the tank M1 for a correct method to find the cost of oil required before the discount M1 for a correct method of finding 5% of their calculated cost M1 (dep on previous M1) for a correct method to find the discounted cost A1 for correct answer of 414.96 or 41496p **OR** M1 for a correct method of finding 5% of the cost of 1 litre of oil M1 (dep on previous M1) for a correct method to find the discounted cost of 1 litre of oil M1 for a correct method to work out the amount of oil required to fill the tank M1 for a correct method to find the discounted cost of the oil required A1 for correct answer of 414.96 or 41496p **OR** M1 for a correct method to work out the amount of oil required to fill the tank M1 for a correct method of finding 5% of their calculated amount of oil M1 (dep on previous M1) for a correct method to find the reduced amount of oil M1 for a correct method to find the cost of the reduced amount of oil A1 for correct answer of 414.96 or 41496p

1MA0_2F					
Question		**Working**	**Answer**	**Mark**	**Notes**
26	(a)	$1 - 0.2 - 0.1$ $0.7 \div 2$	0.35	3	M1 for correctly using total probability 1 or 100% if percentages used M1 (dep) for complete correct method to complete the solution A1 for 0.35 or 35% or $\frac{35}{100}$ oe
	(b)	0.1×200	20	2	M1 for 0.1×200 A1 cao [SC: B1 for an answer of $\frac{20}{200}$ if M0 scored]
27	(a)		$3x + 12$	1	B1 for $3x + 12$ or $12 + 3x$
	(b)		$x^3 + 2x$	2	M1 for the intention to multiply both terms in the bracket by x A1 for $x^3 + 2x$ OR B2 for $x^3 + 2x$ [B1 for x^3 or $2x$ seen]
	(c)		$x(x - 6)$	1	B1 for $x(x - 6)$ or $(x - 6)x$

1MA0_2F					
Question		**Working**	**Answer**	**Mark**	**Notes**
28			1180	3	M1 for a correct method to find the area of the cross section M1 (dep) for a complete correct method for the volume of the prism A1 cao OR M1 for a correct method to find the volume of one cuboid M1 (dep) for a complete correct method for the volume of the prism A1 cao

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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. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.

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. Examiners should also 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 indicate within the table where, and which strands of QWC, are being assessed. 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 labeling 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.

7 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.
Any case of suspected misread loses A (and B) marks on that part, but can gain the M marks. Discuss each of these situations with your Team Leader.
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 canceling 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.
Transcription errors occur when candidates present a correct answer in working, and write it incorrectly on the answer line; mark the correct answer.

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.

11 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.

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)

Guidance on the use of codes within this mark scheme
M1 – method mark 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

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PAPER: 1MA0_1F					
Question		Working	Answer	Mark	Notes
1	(a)		B	1	B1 cao
	(b)		118°	1	B1 Accept 116 – 120
	(c)		10.5 cm	1	B1 Accept 10.3 – 10.7 (or 103 – 107 if cm crossed out and replaced by mm)
2	(a)		12	1	B1 cao
	(b)		9	2	M1 for complete method to find total number of white bread sandwiches **or** 28 **or** total number of brown bread sandwiches **or** 19 A1 cao **OR** M1 for method to find difference between white and brown ham **or** ±1 **or** white and brown egg **or** ±8 (may result in positive or negative number) A1 cao
3	(a)		2	1	B1 cao
	(b)		Puffin Seal	1	B1 cao
	(c)	579 − 449	£130	2	M1 for identifying 579 **and** 449 (may be indicated in the table) A1 cao
	(d)		3.6m	3	M1 for 30 × 12 **or** digits 36 M1 (dep) for “360” ÷ 100 A1 for 3.6 or 3.60 or 3m 60cm **OR** M1 for 30 ÷100 (=0.3) M1 (dep) for "0.3"× 12 A1 for 3.6 or 3.60 or 3m 60cm

PAPER: 1MA0_1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
4	(a)		8	1	B1 cao
	(b)		- 12	1	B1 cao
5		Eg. 65 − 17 + 29 = 77 80 − "77"	3	3	M1 for 77 **or** a correct start to the process using at least two of the given figures M1 for a complete correct method A1 cao
6	(a)		34	1	B1 cao
	(b)		10 45	1	B1 10 45 accept any correct time notation, ignore am or pm
7			1.83 m or 183 cm	2	M1 for 178 + 5 **or** 1.78 + 0.05 **or** 183 **or** 1.83 A1 for 1.83 m or 183 cm (units must be correct)
8	(a)		14 cm	2	B1 for 14 cao B1 (indep) for cm
	(b)		3 by 3 square	1	B1 cao
9	(a)(i)		(-2, -3)	2	B1 cao
	(a)(ii)		Cross at (5, 2)		B1 professional judgement
	(b)		y = 3	1	B1 for correct line (at least 2cm spanning the *y* axis) with professional judgement
10			BA, BP, BO, AP, AO, PO	2	M1 for at least 3 correct pairs A1 for all 6 pairs, no extras or repeats

PMT

PAPER: 1MA0_1F					
Question		Working	Answer	Mark	Notes
*11 QWC			Shop B with working	4	**Considering cost of all pens** M1 for a correct start eg. 30 ÷ 3 or 10 **or** 3×10 **or** 30 ÷ 5 **or** 5×6 **or** 6 **or** list of at least six multiples of 3 or 5 M1 for complete correct method to find total cost for shop A **or** complete correct method to find total cost for shop B eg. for A : 30÷3×2 **or** 10×2 **or** list of multiples of 3 to 30 with (£)20 **or** 3×10 with (£)20 eg. for B : 30÷5×3 **or** 6×3 **or** list of multiples of 5 to 30 with (£)18 **or** 5×6 with (£)18 A1 for (£)20 and (£)18 C1 (dep on M1) ft for statement giving "Shop B" with two comparable figures [SC : B1 for (£)18 and (£)20 without working] **OR** **Considering cost of one pen (or could be for 15 pens)** M1 for correct method to find cost of one pen in shop A **or** correct method to find cost of one pen in shop B M1 for correct method to find cost of one pen in shop A **and** correct method to find cost of one pen in shop B A1 for 66.6...p rounded or truncated to at least 2 sig figs eg. 66(p) or 67(p) **and** 60(p) C1 (dep on M1) ft for statement giving "shop B" with two comparable figures [SC : B1 for 66.6...p rounded or truncated to at least 2 sig figs eg. 66(p) or 67(p) **and** 60(p) without working]

PAPER: 1MA0_1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
12	(a)		50	3	M1 for $\frac{6}{8}$ × 80 oe (= 60) **or** $\frac{1}{8}$ × 80 oe (= 10) (may be seen on gauges eg. 10 by $\frac{1}{8}$ position **or** 60 by $\frac{6}{8}$ position on either gauge) M1 (dep) for a complete correct method eg.“60” – “10” **or** 5 × "10" A1 for 50 (accept answers in the range 49 - 51) or M1 for $\frac{6}{8}-\frac{1}{8}$ $(=\frac{5}{8})$ M1 (dep) for “$\frac{5}{8}$”× 80 A1 for 50 (accept answers in the range 49 - 51)
	(b)		12	2	M1 for 180 ÷ 15 oe A1 cao
*13 QWC			No and eg. £4.10, £4 or 10p	3	M1 for adding at least 3 of 1.25, 1.15, 85, 85 A1 for 4.1(0) or 410 C1 ft (dep on M1) for correct statement comparing £4 and their total (units must be given and correct) **or** for correct statement referring to difference eg. 10p short (units must be given and correct) **OR** M1 for finding at least one difference between coins and costs eg 2 – 0.85 – 0.85 or 1.15 – 1 or 1.25 – 1 A1 for 0.10 or 10 C1 ft (dep on M1) for correct statement referring to total difference units (must be given and correct) (SC : B1 for correct figures with no working eg. £4.10 and £4 **or** 10p)

PMT

PAPER: 1MA0_1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
14	(a)(i)		27	2	B1 cao
	(a)(ii)		Add 5		B1 add 5 or states rule is 5n - 3 (may be exemplified on diagram)
	(b)		Reason	1	B1 for correct reason Eg all numbers in sequence end in 2 or 7 **or** continuation of sequence to beyond 45 with statement **or** 42, 47 with statement
15	(a)		6	1	B1 cao
	(b)		21	1	B1 cao
	(c)		5	1	B1 cao
16	(a)		10	1	B1 cao
	(b)	9 + 4 × 5 = 9 + 20	29	2	M1 for evidence of correct start to order of evaluation, 3 × 3 **or** 9 **or** 20 A1 cao
	(c)		125	1	B1 cao
	(d)		4	1	B1 accept - 4 or ±4
17			2400	3	B1 for one of 20, 40, 3 or 300 M1 for "20"×"40"×"3" **or** "20"×"40"×"300") (values do not need to be rounded) A1 for answer in range 2280 − 2520 SC : Award B3 for an answer of 2400 if no working seen NB. An answer of 2416.05 implies B0 M1 A1

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PAPER: 1MA0_1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
18	(a)(i)		$\frac{1}{6}$	2	B1 for $\frac{1}{6}$ or any equivalent fraction, percentage or decimal (rounded or truncated to 2 or more significant figures)
	(a)(ii)		0		B1 accept $\frac{0}{6}$, 0%, zero
	(b)		20	2	M1 for $\frac{1}{6} \times 120$ oe A1 cao (NB: An answer of $\frac{20}{120}$ scores M1 A0)
19			£1.12	3	M1 for use of 1000 g in 1 kg eg. 1000 ÷ 200(=5) **;** 200 ÷ 1000(=0.2) oe **;** 20% **;** 500g costs £2.80 **;** 100g costs 56p M1(dep) for a fully correct method eg. 5.60 ÷ "5" (= 1.12) **or** 56 × 2 A1 £1.12 or 112p
20			7	3	M1 for 4×10 **or** 40 **or** $\frac{12+6+15+x}{4}$ **or** a correct equation M1 for a complete correct method A1 cao

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PAPER: 1MA0_1F					
Question		Working	Answer	Mark	Notes
21	(a)		A	1	B1 cao
	(b)		2	1	B1 cao
	(c)		Tessellation	2	B2 for at least 6 correct shapes, including initial shape, correctly tessellating with at least 2 points where 3 tiles meet and no incorrectly drawn tiles or gaps. (B1 for at least 4 correct shapes, including initial shape, correctly tessellating with at least one point where 3 tiles meet; ignore any additional sections attempted, gaps or incorrect shaped tiles)
22	(a)		3	1	B1 cao
	(b)		5	1	B1 cao
	(c)		18	2	M1 for "30" – "12" seen with at least one correct A1 cao (SC : B1 for 25 **and** 12 seen with an answer of 13)
23	(a)		10	1	B1 cao
	(b)		8.5	1	B1 accept $\frac{17}{2}$ or $8\frac{1}{2}$
	(c)		32	1	B1 cao
	(d)		$6 + 3t$	1	B1 for $6 + 3t$

PMT

PAPER: 1MA0_1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
24		<table><tr><td></td><td>M</td><td>F</td><td>T</td></tr><tr><td>Train</td><td>5</td><td><u>10</u></td><td>15</td></tr><tr><td>Car</td><td><u>8</u></td><td>17</td><td>25</td></tr><tr><td>Total</td><td><u>13</u></td><td>27</td><td><u>40</u></td></tr></table>	25	3	**NB : There is often a choice of methods seen in responses to this question. When this occurs, the guidance given in point 7 of the marking principles must be followed - mark the method that leads to the answer** M1 for 40 – 13 **or** 27 female **or** 40 – (13+10) **or** 13 – 8 **or** 5 males and train M1 for a complete correct method eg. "27" – 10 + 8 **or** 40 – (10 + "5") A1 for 25 **OR** M1 for a 2-way table or diagram, with clear labeling showing at least 3 pieces of the given information correctly placed. M1 for 27 female or 5 male and train A1 cao (Note for award of the final A1, the 25 in the diagram must be highlighted in some way to indicate it is the final answer (or placed on the answer line))
*25 QWC			$x = 50^o$ with complete reasons	3	M1 for 180 – (65 + 65) A1 for $x = 50$ cao C1 (dep on M1) Base <u>angles</u> of an <u>isosceles</u> triangle are <u>equal</u> **and** <u>angles</u> in a <u>triangle</u> add up to <u>180</u>

PMT

PAPER: 1MA0_1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
26	(a)	(4,0) (3, 0) (3, -1) (2, -1) (2, 2) (4, 2)	Correct position	2	B2 for correct shape in correct position (B1 for any incorrect translation of correct shape)
	(b)		Rotation 180° (0,1)	3	B1 for rotation B1 for 180° (ignore direction) B1 for (0, 1) **OR** B1 for enlargement B1 for scale factor −1 B1 for (0, 1) (NB: a combination of transformations gets B0)

PAPER: 1MA0_1F					
Question		Working	Answer	Mark	Notes
27			24	4	M1 for 0.15 × 240 oe (= 36) M1 for $\frac{3}{4}$ × 240 oe (= 180) M1 (dep on both prev M1) for 240 – "180" – "36" A1 cao **OR** M1 for 15(%) + 75(%) (= 90(%)) M1 for 100(%) – "90"(%) (= 10(%)) M1 (dep on both prev M1) for "$\frac{10}{100}$" × 240 oe A1 cao **OR** M1 for 0.15 + 0.75 oe(= 0.9) M1 for "0.9" × 240 oe (= 216) M1 (dep on both prev M1) for 240 – "216" A1 cao **OR** M1 for 0.15 + 0.75 oe(= 0.9) M1 for 1 – "0.9" oe (= 0.1) M1 (dep on both prev M1) for "0.1" × 240 = 24 A1 cao

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PAPER: 1MA0_1F					
Question		Working	Answer	Mark	Notes
28			1.5	4	M1 for correct expression for perimeter eg. $4 + 3x + x + 6 + 4 + 3x + x + 6$ oe M1 for forming correct equation eg. $4 + 3x + x + 6 + 4 + 3x + x + 6 = 32$ oe M1 for $8x = 12$ **or** $12 \div 8$ A1 for 1.5 oe **OR** M1 for correct expression for semi-perimeter eg. $4 + 3x + x + 6$ oe M1 for forming correct equation eg. $4 + 3x + x + 6 = 16$ M1 for $4x = 6$ **or** $6 \div 4$ A1 for 1.5 oe

PMT

PAPER: 1MA0_1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
29		x – 2 -1 0 1 2 3 4 y 4 4.5 5 5.5 6 6.5 7	$y = ½ x + 5$ drawn	3	**(Table of values / calculation of values)** M1 for at least 2 correct attempts to find points by substituting values of x. M1 ft for plotting at least 2 of their points (any points plotted from their table must be plotted correctly) A1 for correct line between $x = −2$ and $x = 4$ **(No table of values)** M1 for at least 2 correct points with no more than 2 incorrect points M1 for at least 2 correct points (and no incorrect points) plotted **OR** line segment of $y = ½ x + 5$ drawn A1 for correct line between $x = −2$ and $x = 4$ **(Use of y=mx+c)** M1 for line drawn with gradient of 0.5 **OR** line drawn with a y intercept of 5 M1 for line drawn with gradient of 0.5 **AND** with a y intercept of 5 A1 for correct line between $x = −2$ and $x = 4$ SC : B2 for the correct line from $x = 0$ to $x = 4$

PMT

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	(b)	Angle x = 115 degrees.	Angle x is 115° ±5°
	(c)		10.5 ±5 mm
3		6 caravans changed to 5	Standard mark scheme
6		Hampton in Arden row has been removed.	Standard mark scheme
8	(a)	2cm grid – wording changed to "a grid of squares". Each square represents a one centimetre square."	Standard mark scheme
	(b)	2cm grid – wording added "Each square represents a one centimetre square."	Standard mark scheme
9	(ii)	(X) removed.	Standard mark scheme
11		Boxes removed. Information given instead.	Standard mark scheme
13		Pictures of coins was removed.	Standard mark scheme

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PAPER: 1MA0_1F			
Question		**Modification**	**Notes**
15		Braille only – roman numerals (i) to (iii) given as 0.5 (i) 2 15 3 (ii) (iii) 33	Standard mark scheme
21	(c)	Size of diagram ×2 – grey tiles changed to dotty shaded. One shape given for MLP and six shapes given for Braille and TLP	Standard mark scheme Standard mark scheme
22	(c)	Grid – *y* axis- 3cm for 1; *x* axis 3cm for 5. Tuesday graph goes from (0,0) to (20,3).	Tuesday graph altered. Answer now 10 minutes M1 for '30' – '20' seen with at least one correct (SC : B1 for 25 **and** 20 seen with an answer of 5)
23	(a)	MLP – *x* changed to *y*	Standard mark scheme
25		Braille – diagram labelled A B C and additional information was given about the diagram.	Standard mark scheme
26	(a)	2cm grid – shape P moved up two squares.	**P** is in a different starting position - mark scheme remains the same B2 for correct shape in correct position (B1 for any incorrect translation of correct shape)
	(b)	No shading of shapes – *x* axis -2 and -4 removed as they would obscure shape.	Standard mark scheme
28		MLP and Braille – *x* changed to *y*	Standard mark scheme
29		1.5 cm grid	Standard mark scheme

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Mark Scheme (Results)

November 2014

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

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NOTES ON MARKING PRINCIPLES

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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) (b) (c)		18 56 33	1 1 2	B1 cao B1 cao 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

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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

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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	

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

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Mark Scheme (Results)

Summer 2016

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

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It is not appropriate to ignore subsequent work when the additional work essentially makes the answer incorrect e.g. algebra.
Transcription errors occur when candidates present a correct answer in working, and write it incorrectly on the answer line; mark the correct answer.

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).
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12 Parts of questions
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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)

Guidance on the use of codes within this mark scheme
M1 – method mark 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

PMT

PAPER: 1MA0/1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
1	(a)		February	1	B1 cao
	(b)		Onions	1	B1 cao
	(c)		Lettuces	1	B1 cao
2	(a)		0.5	1	B1 cao
	(b)		$\frac{3}{10}$	1	B1 for $\frac{3}{10}$ or equivalent fraction
	(c)		80	1	B1 cao
	(d)		57.6	1	B1 cao
	(e)		$\frac{1}{3}$	2	M1 for writing over a single denominator eg $\frac{7-3}{12}$ or for $\frac{4}{12}$ A1 cao
3	(a)		A, D	1	B1 cao
	(b)		B	1	B1 cao

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PAPER: 1MA0/1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
*4	(a)		Statement (supported)	3	M1 for method to find total visitors for 2009 or for 2010 eg 185+108+133+231+124 (=781) or 177+120+128+230+118 (=773) A1 for 781 **and** 773 (or 781000 **and** 773000) C1 ft (dep on M1 and two totals) for clearly stating 2009 as their answer or ft from their two totals. OR M1 for method to find difference in the number of visitors for each castle eg 8, −12, 5, 1, 6 or −8, 12, −5, −1, −6 A1 for correct total net difference 8 or −8 C1 (dep M1 and a net difference) for clearly stating 2009 as their answer or ft from their net difference.
	(b)(i)		09 36	2	B1
	(ii)		54		B1 cao
	(c)		09 21	1	B1
5	(a)		unlikely	1	B1 cao
	(b)		cross at $\frac{1}{2}$	1	B1 for cross at $\frac{1}{2}$
	(c)		cross at O	1	B1 for cross at O

PAPER: 1MA0/1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
6	(a)		30	3	M1 for 21 × 6 (= 126) or 32 × 6 ÷ 2 (=96) M1 for 21 × 6 – (32 × 6 ÷ 2) A1 cao OR M1 for 21 × 2 – 32 (= 10) M1 (21 × 2 – 32) × 6 ÷ 2 A1 cao
	(b)	(C, F) (C, E) (C, T) (L, F) (L, E) (L, T)	list of 6 pairs	2	B2 for six correct and distinct pairs with no repeats (B1 for at least 3 correct pairs and no incorrect pairs)
7	(a)		parallelogram	1	B1 cao
	(b)		Sketch of cuboid	1	B1 for sketch of cuboid
8	(a)		15	1	B1 cao
	(b)		6	1	B1 cao
	(c)		3	2	M1 for intention to subtract 7 from both sides or divide all terms by 2 as a first step A1 cao
*9			1 cm^2	3	M1 for method to find the area of A or area of B eg for A 6 + 3 (=9), 12 – 3 (=9) eg for B 4 + 4 (=8), 12 – 4 (=8) A1 for 9 and 8 C1 (dep M1) for 1cm^2 or ft from their 2 areas

PAPER: 1MA0/1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
10	(a)		6	1	B1 cao
	(b)		44	1	B1 cao
	(c)		33, 11, 4 or 4, 11, 33 or 8, 4, 6 or 6, 4, 8	1	B1 cao
11	(a)		24	3	M1 for 4×10 (= 40) M1 for operations –"40" then ÷ 7 in correct order or 20 A1 cao
	(b)		$35e$	2	M1 for $7 \times e$ or $5 \times e$ or $7 \times 5 \times e$ oe A1 for $35e$ (ignore £ signs)
12			40 m*l* or 0.04 *l*	3	M1 for 12×330 (= 3960) M1 for $4 \times 1000 - (12 \times 330)$ (= 40) A1 for 40 m*l* OR M1 for $12 \times \frac{330}{1000}$ (= 3.96) or digits 396 M1 for $4 - (12 \times \frac{330}{1000})$ (= 0.04) A1 0.04 *l*

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PAPER: 1MA0/1F					
Question		Working	Answer	Mark	Notes
13	(a)		42	5	M1 for 300 × 3 (= 900) or 150 ÷ 3 (= 50) M1 (dep) for "900" ÷ 150 (= 6 jars) or 300 ÷ "50" (= 6 jars) M1 for 500 ÷ 160 (= 4 boxes) M1 for "6" × 4.00 (=24) + "4" × 4.50 (18) A1 cao
	(b)		168	3	M1 for 6 × 30 M1 (dep) for "180" – 12 A1 cao

PAPER: 1MA0/1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
*14	(a)		4.5	1	B1 cao
	(b)		Comparison (supported)	3	M1 for correct use of graph to convert 0°F into °C A1 for –17.5 to –18 C1 (dep M1) for correct comparison of relative temperatures with units correct. eg freezer is warmer with –18°C or ft using their converted temperature with correct units. OR M1 for correct use of graph to convert −10°C into °F A1 for 14 C1 (dep M1) for correct comparison of relative temperatures with units correct. eg freezer is warmer with 14°F or ft using their converted temperature with correct units.
15			Data collection sheet	3	B1 for a fruit type column. B1 for tally column. B1 for frequency column.
16	(a)		30	1	B1 cao
	(b)		120	2	M1 for $\frac{15}{100} \times 800$ oe A1 cao

PMT

PAPER: 1MA0/1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
17	(a)		3 (5) 7 (9) 11, 13	2	B2 for 3, 7, 11, 13 (B1 for 2 or 3 correct values)
	(b)		Graph drawn	2	M1 (may ft from (a) if B1 awarded) for at least 5 points correctly plotted A1 for correct graph from $x = 0$ to $x = 5$
18	(a)		$\frac{120}{360}$	2	M1 for 360 – 45 – 105 – 90 (= 120) oe A1 for $\frac{120}{360}$ oe OR M1 for measuring angle as 118 – 122 A1 ft for $\frac{"120"}{360}$ oe
	(b)		18000	2	M1 for 4500 × 4 oe A1 cao

PMT

PAPER: 1MA0/1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
19	(a)(i)		12	2	B1 cao
	(ii)		8		B1 cao
	(b)		Sketch of net	2	M1 for attempt to draw net with 2 of the following 3 features: 6 rectangles 2 polygon faces with at least 5 edges a net with correct connections to give at least one vertex with 3 faces meeting. A1 for a correct net
	c)		750 cm^3	3	M1 for 30×25 A1 for 750 B1 (indep) for cm^3
20	(a)		p^7	1	B1 cao
	(b)		$-5m + 10$	2	M1 for $3m + 12$ or $-8m - 2$ or $8m + 2$ A1 for $-5m + 10$ or $10 - 5m$ or $-5(m - 2)$ or $5(2 - m)$
	(c)		$n(n - 7)$	1	B1 cao

PMT

PAPER: 1MA0/1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
21	(a)		250	2	M1 for $400 \div 8$ or $\frac{5}{8}$ oe A1 cao
	(b)		60	3	M1 for $\frac{16}{80}$ or $\frac{300}{80}$ oe M1 (dep) for "$\frac{16}{80}$" $\times 300$ or "$\frac{300}{80}$" $\times 16$ A1 cao
22	(a)		Correct shape	2	B2 for correct reflection with vertices (–4, 2) (–6, 3) (–6, 7) (–4, 6) (B1 for reflection in a vertical or horizontal line)
	(b)		Correct shape	2	B2 for correct rotation with vertices (–1, 3) (–5, 3) (–6, 5) (–2, 5) (B1 for rotation of 90° clockwise about (0,1) **or** correct orientation fully in correct quadrant)
23	(a)		Reasons	2	B2 for 2 reasons from: no time frame, vague response boxes, not exhaustive eg "always" (B1 for 1 reason)
	(b)		Question written	2	B1 for a suitable question which includes a time frame (the time frame could appear with the response boxes) B1 for at least 3 non-overlapping exhaustive response boxes with no use of inequality symbols

PMT

PAPER: 1MA0/1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
*24			Conclusion (supported)	5	M1 for finding the area of one rectangle which is not 6 × 10 eg 2×2.5 (=5) or 4×10 (=40) or 2.5 × 6 or 5 × 2 M1 for a complete method to find the total area eg 5+5+40 or 60−10 (=50) M1 for a complete method to find the number of tins needed eg "50" ÷ 5 ÷ 2.5 (=4) OR for a complete method to find the number of litres needed. eg "50" ÷ 5 (=10) OR for a complete method to find the area covered by 3 tins eg 3×2.5×5 (=37.5) A1 for 50 (m^2) **and** (4 tins needed) **or** for 10 (litres) **and** 7.5 (litres) **or** for 50(m^2) **and** 37.5(m^2) C1 (dep M2) for a conclusion supported by their calculations

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		3rd row in table for beans removed	Standard mark scheme
3	(a)	Background grid has been removed. Labels added above the shapes. MLP only: Shape B and D exchanged.	B1 for A, B
3	(b)	Background grid has been removed. Labels added above the shapes. MLP only: Shape B and D exchanged.	B1 for D cao
4	(b)	Braille only: Coombe Florey row removed.	B1 cao
5		Diagram enlarged.	Standard mark scheme
	(b)	Probability scale enlarged. The wording 'with a cross (x)' has been removed.	Standard mark scheme
	(c)	Probability scale enlarged. The wording 'with a cross (x)' has been removed	Standard mark scheme
7	(a)	Diagram enlarged	Standard mark scheme
	(b)	Model of a cuboid provided for all candidates. Diagram enlarged and also provided for MLP. Wording changed 'Name the solid shape shown.' Answer line added	B1 for cuboid

PAPER: 1MA0_1F			
Question		**Modification**	**Notes**
9		Grid enlarged. Shading changed to dotty shading. Label added above the shapes. 'centimetre grid' replaced by'grid of squares'. Wording added 'Each square on the grid represents a one centimetre square.'	Standard mark scheme
13	(a)	Diagrams removed.	Standard mark scheme
	(b)	Diagrams removed.	Standard mark scheme
14		Grid enlarged. Small squares removed.	Standard mark scheme
17	(a)	Wording added above the table 'There are four spaces to fill.'	Standard mark scheme
	(b)	Grid enlarged. Right axis labelled.	Standard mark scheme
18	(a)	Diagram enlarged.	Standard mark scheme
	(b)	Diagram enlarged.	Standard mark scheme
19	(a)	Model provided for all candidates. Diagram enlarged and also provided for MLP	Standard mark scheme
	(b)	Question changed: 4 nets drawn A, B, C and D. Wording removed 'In the space below, sketch a net of the prism.' Wording added 'Which shape A, B, C or D shows the net of the prism.'	B2 for B cao
	(c)	Model provided for all candidates. Diagram enlarged and also provided for MLP.	Standard mark scheme
21		Diagram enlarged. Dot added to the centre. Arrow head changed to an open headed arrow. Left side of arrow removed.	Standard mark scheme

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PAPER: 1MA0_1F			
Question		**Modification**	**Notes**
22	(a)	Reflection drawn on the diagram. Shading changed to dotty shading. Wording changed 'It shows shape P and shape Q given on a grid. Describe fully the transformation that maps shape P onto shape Q.' Grid enlarged. y axis is cut at -4. 3 answer lines given.	B1 for reflection B1 for x = – 1
	(b)	Rotation drawn on the diagram. Wording changed 'It shows shape P and shape S given on a grid. Describe fully the single transformation that maps shape P onto shape S.' 3 answer lines given.	B2 for all three of: Rotation 90° anti-clockwise Centre (0, 1) (B1 for two)
24		Diagram enlarged. Braille only: Plan of floor labelled ABCDEFGH as 1F Q24.	Standard mark scheme

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Mark Scheme (Results)

November 2016

Pearson Edexcel GCSE
In Mathematics B (2MB01)
Foundation (Calculator) Unit 1

PMT

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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.

7 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.

11 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)

Guidance on the use of codes within this mark scheme
M1 – method mark 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: 5MB1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
1	(a)		10p	1	B1 cao
	(b)		5p	1	B1 cao
	(c)		30	1	B1 cao
2	(a)		Style Master	1	B1 cao
	(b)		700	1	B1 cao
	(c)		3	1	B1 cao
3	(ai)		36	2	B1 cao
	(aii)		30		B1 cao
	(b)		2 hexagons 1 hexagon and 1 triangle	2	B1 for 2 hexagons (each divided into 6 triangles) B1 for 1 hexagon (divided into 6 triangles) and 1 triangle
4	(ai)		evens	2	B1 for evens circled oe
	(aii)		unlikely		B1 for unlikely circled oe
	(b)		cross at 0	1	B1 for 0 marked with a cross
5		Eg 1045 – 1120 Penguin feeding time 1200 – 1245 Jeep safari 1300 – 1340 Dolphin show 1400 – 1425 Steam train	Correct time plan	3	B3 for 4 activities between 1020 and 1430 with correct start times and correct finish times (B2 for 2 or 3 activities between 1020 and 1430 with correct start times and correct finish times B1 for 1 activity between 1020 and 1430 with correct start time and correct finish time)

PAPER: 5MB1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
*6			Diagram or chart	4	B1 for a key or suitable labels to identify Trudy and Phil B1 for horizontal or vertical axis labelled B1 for at least 3 correct plots C1 for fully correct diagram(s) or chart(s)
7	(a)		5	1	B1 cao
	(b)		4	2	M1 for ordering numbers A1 cao (SC B1 for 7)
	(c)		6	2	M1 for 7 and 1 seen together A1 cao
8	(a)	(4, 4) (4, 5) (4, 6) (5, 4) (5, 5) (5, 6) (6, 4) (6, 5) (6, 6)	Complete diagram	1	B1 cao
	(b)		$\frac{1}{36}$	1	B1 for $\frac{1}{36}$
	*(c)		7 has greater probability with correct reason	1	C1 for 7 has greater probability oe with correct reason, eg gets a total of 7 more often

PAPER: 5MB1F_01

Question		Working	Answer	Mark	Notes
9	(a)		Data collection sheet	3	B1 for lemonade and cola and orange (squash) B1 for tallies B1 for frequency or total oe
	(b)		4.32	4	M1 for cost of 2 bottles of orange and 3 bottles of lemonade M1 for finding $\frac{1}{5}$ of a cost M1 (dep on M2) for correct method to find change A1 cao
10	(a)		4 : 3	2	M1 for 20 : 15 or 3 : 4 A1 cao
	(b)		$35 - x - y$	2	M1 for $20 - x$ or $15 - y$ A1 for $20 - x + 15 - y$ oe
11		<table><tr><td></td><td>Friday</td><td>Saturday</td><td>Sunday</td><td>Total</td></tr><tr><td>Morning</td><td>27</td><td>34</td><td>51</td><td>112</td></tr><tr><td>Afternoon</td><td>38</td><td>52</td><td>63</td><td>153</td></tr><tr><td>Total</td><td>65</td><td>86</td><td>114</td><td>265</td></tr></table>	Complete two-way table	3	B3 cao (B2 for 4 or 5 correct B1 for 2 or 3 correct)

PAPER: 5MB1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
12	(a)		315	2	M1 for taking a reading from graph A1 for 310 – 320
	(b)		0.45	2	M1 for amount paid ÷ distance travelled, eg 45 ÷ 100 A1 for 0.425 – 0.475 or 42.5p – 47.5p OR M1 for 'part (a)' ÷ 700 A1 ft for 0.425 – 0.475 or 42.5p – 47.5p
13			4 | 7 8 8 5 | 0 0 1 3 5 7 8 6 | 1 2 4 6 6 9 7 | 3 5 8 4 | 7 represents 47 grams	3	B2 for fully correct ordered diagram (B1 for correct unordered diagram or ordered with at most 2 errors) B1 for correct key, eg 4 | 7 represents 47 (grams)
14	(a)		The greater the hand length the greater the foot length	1	B1 for the greater the hand length the greater the foot length oe (accept positive correlation)
	(b)		24 – 25	2	M1 for a single straight line segment with positive gradient that could be used as a line of best fit **or** an indication on the diagram from 18.5 on the *x*-axis A1 for answer in range 24 – 25

PAPER: 5MB1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
15	(a)		Suitable question	2	B1 for a suitable question including time period (may appear with response boxes) B1 for at least 3 non-overlapping boxes which are exhaustive for their question
	(b)		Suitable reason	1	B1 for suitable reason eg sample not representative
*16			No from a correct method	5	M1 for method to find cost of room after discount eg (1 – 0.15) × 168 oe (= 142.8) M1 for method to find income or method to find total expenditure eg 48 × 9.5 (= 456) eg 50+25+15+225+ '142.8' (= 457.8) M1 (dep on M2) for complete method to work out if Freya has enough money eg '457.8' and '456' (or 1.8) eg '457.8'÷ 48 (= 9.53– 9.54) eg '456' – 90 – 225 (= 141) A1 for correct values for comparison eg 457.8 and 456 eg 9.53 – 9.54 eg 141 and 142.8 C1 (dep on M1) for No or ft their values, with no incorrect statement.

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Mark Scheme (Results)

Summer 2017

Pearson Edexcel GCSE (9 – 1)
In Mathematics (1MA1)
Foundation (Calculator) Paper 2F



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General marking guidance

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

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

Where some judgement is required, mark schemes will provide the principles by which marks will be awarded; exemplification/indicative content will not be exhaustive. When examiners are in doubt regarding the application of the mark scheme to a candidate's response, the response should be sent to review.

2 All the marks on the mark scheme are designed to be awarded; mark schemes should be applied positively. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme. If there is a wrong answer (or no answer) indicated on the answer line always check the working in the body of the script (and on any diagrams), and award any marks appropriate from the mark scheme.

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

3 **Crossed out work**
This should be marked **unless** the candidate has replaced it with an alternative response.

4 **Choice of method**
If there is a choice of methods shown, mark the method that leads to the answer given on the answer line.

If no answer appears on the answer line, mark both methods **then award the lower number of marks.**

5 **Incorrect method**
If it is clear from the working that the "correct" answer has been obtained from incorrect working, award 0 marks. Send the response to review for your Team Leader to check.

6 Follow through marks

Follow through marks which involve a single stage calculation can be awarded without working as you can check the answer, but if ambiguous do not award.

Follow through marks which involve more than one stage of calculation can only be awarded on sight of the relevant working, even if it appears obvious that there is only one way you could get the answer given.

7 Ignoring subsequent work

It is appropriate to ignore subsequent work when the additional work does not change the answer in a way that is inappropriate for the question or its context. (e.g.. 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 (e.g.. 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 (e.g. 3.5 – 4.2) then this is inclusive of the end points (e.g. 3.5, 4.2) and all numbers within the range.

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
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: 2F				
Question	**Working**	**Answer**	**Mark**	**Notes**
1 (a)		$3p$	B1	cao
(b)		$2m^3$	B1	cao
(c)		$10 - 4c + 6d$	M1	for $-4c$ or $6d$ (accept $+-4c$)
			A1	for $10 - 4c + 6d$
2		60	B1	cao
3 (a)		Walk	B1	cao
(b)		7 on chart	B1	for bar of height 7 drawn for girls walking
(c)		4	B1	cao
(d)		96	M1	for method to find number of Year 6 students in the survey e.g. $5 + 9 + 6 + 4 + 9 + 7 + 4 + 1 + 2 + 1$ (= 48) or $14 + 10 + 16 + 5 + 3$ (= 48)
			A1	for 96 or ft from (b), eg 82 if no bar in (b)
4		$\frac{11}{30}, \frac{2}{5}, \frac{7}{15}, \frac{1}{2}$	M1	converts fractions to a common form, e.g. fractions with a denominator of 30, decimals or percentages, at least two conversions correct or any 3 fractions in correct order
			A1	correct order

Paper 1MA1: 2F				
Question	**Working**	**Answer**	**Mark**	**Notes**
5 (a)		Monday wrong	C1	for seeing difference in tally marks and frequency for Monday
(b)		Comment	C1	for suitable comment, eg extra picture for Tuesday needed or explains that 0.5 of a CD is not possible
6		268.20	P1	for a process to work out the value of the £1 coins, eg. 495 ÷ 3 (= 165) or 495 × 0.33...or of the 50p coins, eg. 124 ÷ 2 (= 62)
			P1	for process to find the number of 20p coins, eg. (495 – 124 – (“165”) (= 206)
			P1	for complete process to find total value using consistent units., eg. (“165”) + (124 ÷ 2) + (“206” × 0.2) or 165 + 62 + 41.2
			A1	cao (accept 268.2)
7		0.985	B1	oe
8 (a)		25	B1	for 25 (accept 5^2)
(b)		24	B1	cao
(c)		23, 29	B1	for 23 and 29 and no extras
9		54	M1	for method to form equation, eg 90 + 2x + 3x = 360 or for 360 – 90 (= 270)
			M1	for 5x = 360 – 90 or for 2x + 3x = 360 – 90 or for 2x = 108 or for 3x = 162 or for 270 ÷ 5
			A1	cao

Paper 1MA1: 2F				
Question	**Working**	**Answer**	**Mark**	**Notes**
10		Letters2send (supported)	P1	for the start of a process to find comparable costs at either shop, e.g. 150 ÷ 25 (= 6) or 150 ÷ 30 (= 5), 150 ÷ 10 (= 15), 2.10 ÷ 15 = (=0.14)
			P1	for process to find cost from Letters2send, e.g. (150 ÷ 25) × 3.49 (= 20.94)
			P1	for process to find cost at Stationery World, e.g. (150 ÷ 30) × 2 × 2.10 (= 21)
			C1	for correct conclusion with correct values from each shop (20.94 and 21)
				OR
			P1	for the start of a process to find comparable costs, eg 3.49 ÷ 25 (= 0.1396), 2.10 ÷ 10 (= 0.21), 25 ÷ 3.49 = (7.1...), 2.10 ÷ 15 = (= 0.14)
			P1	for process to take into account the offer at Stationery World, eg buy 30 envelopes pay for 20,
			P1	for complete process to find values that can be used for comparison, eg 30 × 0.13(96) and 2 × 2.10 (= 4.2(0))
			C1	for correct conclusion with correct values from each shop (4.1(88) and 4.2(0))

Paper 1MA1: 2F				
Question	**Working**	**Answer**	**Mark**	**Notes**
11 (a)		29	B1	answer in the range 29 to 30
(b)		186 to 195	M1	for changing 6ft 3 inches to inches e.g. $6 \times 12 + 3$ (= 75) or changing 1ft to 30 cm
			M1	for a method to convert to cm, e.g. 25 →63 then × 3, $6 \times 30 + \frac{1}{4} \times 30$
			A1	for answer in the range 186 to 195 or ft from correct use of graph
12		0.0733(03...)	M1 A1	for correct numerator (3.4496.....) or correct denominator (47.0596) or 0.073 for 0.0733(03.....)
13 (a)		Rotation	B2	for a fully correct rotation at (–4,–1), (–3,–1), (–4,–4), (–1,–2)
			[B1	for the quadrilateral in correct orientation and size or rotated 90° anticlockwise about the origin]
(b)		Reflection in the *y*-axis	B1	for reflection
			B1	for *y*-axis (or *x* =0)
				[A combination of transformations scores 0 marks]

Paper 1MA1: 2F				
Question	**Working**	**Answer**	**Mark**	**Notes**
14 (a)		$5(1 - 2m)$	B1	cao
(b)		$2ab(a + 3b)$	M1	for $2a(ab + 3b^2)$ or $2b(a^2 + 3ab)$ or $ab(2a + 6b)$ or $2ab$(2 term expression with terms in a or b or ab, can include constants), eg $2ab(1a + 3ab)$, $2ab(1 + 3b)$
			A1	for $2ab(a + 3b)$
15 (a)		0.47	B1	
(b)		2.28×10^9	M1	for correct value but not in standard form, eg $22.8 \times 10^{3+5}$, 228×10^7, 2 280 000 000 or for 2.28×10^n , $n \neq 9$
			A1	cao
16		T shown on the map	C1	for showing a perpendicular bisector or point T equidistant from points B and C.
			C1	for a circle or arc of circle of radius 2.5 cm or point T 2.5 cm from point A
			C1	for T shown in correct position

Paper 1MA1: 2F				
Question	**Working**	**Answer**	**Mark**	**Notes**
17		98	P1	for process to find P(1), e.g. 1 – 0.17 – 0.18 – 0.09 – 0.15 – 0.1 (= 0.31) or for a process to find P(1 or 3), e.g. 1 – 0.17 – 0.09 – 0.15 – 0.1 (= 0.49)
			P1	for process to find the number of 3s, e.g. 0.18 × 200 (=36) or process to find the number of 1s, e.g. P(1) × 200 (= 62), or process to find the number of (1 or 3)s, eg [P(1) + 0.18] × 200 or process to find any expected frequency, using any probability × 200, eg 0.17 × 200
			A1	cao
				OR
		98	P1	for process to find P(2 or 4 or 5 or 6), eg 0.17 + 0.09 + 0.15 + 0.1 (= 0.51)
			P1	for process to find the number of (2 or 4 or 5 or 6)'s, eg "0.51" × 200 (= 102)
			A1	cao

Paper 1MA1: 2F				
Question	**Working**	**Answer**	**Mark**	**Notes**
18		Yes (supported)	P1	for process to work out the total number of children, e.g. 117 × 4 (= 468)
			P1	(dep P1) for process to work out total number of adults or the total number of people, e.g. "468" × 5 ÷ 2 (= 1170) or "468" × 7 ÷ 2 (= 1638)
			A1	for 1170 or 1638
			P1	for process to work out the percentage of theatre full, e.g. $\frac{"468"+"1170"}{2600} \times 100$ (= 63) or for a process to work out 60% of 2600 (= 1560)
			C1	for a correct conclusion supported by correct figures e.g. 63% or 1560 **and** 1638
				OR
			P1	for a process to work out 60% of 2600, eg. $\frac{60}{100} \times 2600$ (= 1560)
			P1	(dep P1) for process to work out total number of children, e.g. "1560" × 2 ÷ 7 (= 445(.7...)
			A1	for 445(.7...)
			P1	for process to work out number of children in the circle, eg. "445(.7...)" ÷ 4 (= 111 to 112)
			C1	for a correct conclusion supported by correct figures e.g. 111 to 112
				[Where appropriate, accept rounded or truncated values]

Paper 1MA1: 2F				
Question	**Working**	**Answer**	**Mark**	**Notes**
18 cont.				OR
			P1	for a process to find the maximum number of children, eg. 2600 × 2 ÷ 7 (= 742(.8…))
			P1	for process to work out the total number of children, e.g. 117 × 4 (= 468)
			A1	for 468 and 742(.8...)
			P1	for $\frac{"468"}{"742(.8..)"} \times 100$ (= 63) or process to work out 60% of "742.8.." (= 445(7..))
			C1	for a correct conclusion supported by correct figures e.g. 63% or 468 and 445(.7...)
				[Where appropriate, accept rounded or truncated values]
19		Side elevation	C2	for the side elevation (4 cm by 2 cm rectangle with a solid line drawn 1 cm from the 2 cm edge, and correct orientation)
			[C1	for the side elevation as a rectangle]
		Front elevation	C2	for the front elevation as a trapezium in correct orientation with base 4 cm, parallel sides 1 cm and 4 cm
			[C1	for the front elevation as a trapezium with two right angles]
				[Ignore incorrect or no labelling]

Paper 1MA1: 2F				
Question	**Working**	**Answer**	**Mark**	**Notes**
20 (a)		57.1	P1	for a process to find time from Liverpool to Manchester, eg. 56 ÷ 70 (= 0.8 (hrs) or 48 (mins))
			P1	for a process to find the total distance, eg 56 + 61 (= 117) or the total time, eg"48" + 75 (= 123) or "0.8" + $\frac{75}{60}$ (= 2.05), with consistent units of time
			P1	(dep P2) for a correct process to find average speed with consistent units of time, eg."117" ÷ "2.05" or ."117" ÷ "123"
			A1	for answer in the range 57 to 57.1
(b)		explanation	C1	for explaining that the time taken for the two parts of the journey must be the same or the distance from Leeds to York is $\frac{3}{4}$ the distance from Barnsley to York oe
21 (a)		3.9	M1	for a ratio of $\frac{8.1}{5.4}$ (= 1.5) oe or $\frac{5.4}{8.1}$ (= 0.66..) oe or $\frac{2.6}{5.4}$ (= 0.48..) oe or $\frac{5.4}{2.6}$ (= 2.07..) oe
			A1	cao
(b)		2.05	M1	for $\frac{5.4}{8.1} \times 6.15$ (= 4.1) or $\frac{2.7}{8.1} \times 6.15$ oe or ft "scale factor" from (a)
			A1	cao

Paper 1MA1: 2F				
Question	**Working**	**Answer**	**Mark**	**Notes**
22		Secure Bank (supported)	P1 P1 C1	for a process to work out the interest after one year e.g. 0.02×25000 (= 500) or 0.043×25000 (= 1075) or for 1.02 or 25500 or 1.043 or 26075 for process to find value of the investment after 3 years or the multiplicative factor for 3 years at one of the banks, e.g. $25000 \times 1.02 \times 1.02 \times 1.02$ oe (= 26530...) or 1.02^3 (= 1.0612...) or $25000 \times 1.043 \times 1.009 \times 1.009$ oe (= 26546...) or $1.043 \times 1.009 \times 1.009$ (= 1.0618.....) [accept total interest of 1530...or 1546...if final values of investment are not found] for Secure Bank from correct figures eg 26530.. and 26546..or 1530.. and 1546.. or 1.0612.. and 1.0618
23		$4.755 \leq n < 4.765$	B2 [B1	for $4.755 \leq n < 4.765$ for 4.755 or 4.765 or 4.764$\dot{9}$]
24		$x = -8$, $x = 3$	M1 M1 A1	for factorisation or for substitution into quadratic formula $(x \pm a)(x \pm b)$ where product of a and b = 24, eg $(x \pm 4)(x \pm 6)$ or difference of a and b = 5, eg $(x \pm 2)(x \pm 7)$ $\frac{-5 \pm \sqrt{5^2 - 4 \times 1 \times -24}}{2}$ oe (condone one sign error) for $(x + 8)(x - 3)$ or for $\frac{-5 \pm \sqrt{121}}{2}$ oe cao

Paper 1MA1: 2F				
Question	**Working**	**Answer**	**Mark**	**Notes**
25 (a)		$5n - 2$	B2	for $5n - 2$ oe
			[B1	for $5n + k$, k may be 0]
(b)		No (supported)	C1	for No with evidence, e.g. $3 \times 4^2 = 48$, $\sqrt{48}$ is not an integer, he has multiplied by 3 first but should have squared first

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: 1MA1_2F			
Question		**Modification**	**Mark scheme notes**
1	(c)	MLP and braille: *c* and *d* changed to *s* and *t*.	Standard mark scheme but change *c* & *d* to *s* & *t*
3		Grid enlarged. Key moved above the diagram. Right axis has been labelled. Boys shading has been changed to dotty. The vertical axis label has been moved above the vertical axis	Standard mark scheme
5	(b)	Pictogram enlarged. Key moved above the diagram.	Standard mark scheme
8		Wording 'nine' added	Standard mark scheme
9		Diagram enlarged. Angle sizes moved outside the angle arcs; the arcs have been made smaller.	Standard mark scheme
11		Grid enlarged. Right axis labelled. Axes labels have been moved to the left of the horizontal axis and above the vertical axis. In (a) Number '74' changed to '90'.	(a) becomes 35 to 37. In (b) suggest 180 to 200
13	(a)	Question reversed. Rotation drawn on the diagram and labelled as 'shape B'. Grid enlarged and *y* axis reduced so it finishes at 2. Shapes labelled 'shape A' and 'shape B'. Wording changed 'It shows shape A and shape B given on a grid. Describe fully the single transformation that maps shape A onto shape B.'	Award B1 for "rotation" Award B1 for "90° clockwise about centre O [or (0,0)] NB: award B0 for any indication of a mention of other transformations
13	(b)	Grid enlarged and y axis reduced so it starts at -2. Wording 'B' and 'C' deleted and shapes labelled as 'shape P' and 'shape Q'. Triangles P and Q moved above the *x* axis. Wording added 'It shows shape P and shape Q given on a grid.'	Standard mark scheme

PAPER: 1MA1_2F			
Question		**Modification**	**Mark scheme notes**
14	(b)	MLP only: *a* changed to *x* and *b* changed to *y*.	Standard mark scheme but change *a* & *b* to *x* & *y*
16		Number '250 metres' changed to '500 metres'. Points *B* and *C* moved to the right to allow for use of specialist equipment. Points *B* and *C* joined with a line. Scale moved above the diagram.	Standard mark scheme, but given the alternations to the given diagram, the relative positions of any constructions and the position(s) of *T* will change.
17		Table turned to vertical format.	Standard mark scheme
19		Alternative question. Model has been provided for all candidates. Diagram enlarged and also provided for MLP. The measurements on the prism have been doubled. Wording added next to the diagram of the trapezium 'Diagram NOT accurately drawn'. Four shapes have been provided below the trapezium labelled A to D. Wording added above the four shapes 'scale: 2 cm to 1 metre'. Question wording has changed and has been split into two parts: 'Look at the model or at the diagrams for Question 19 in the Diagram Book. They show a prism with a cross section in the shape of a trapezium. All measurements are in metres. Below the prism there are four shapes A, B, C and D. (i) Which shape shows the front elevation of the prism? (ii) Which shape shows the side elevation of the prism?'	Mark scheme amended as follows: (i) B2 for C (ii) B2 for A (B1 for B or D)
21		Diagram enlarged. Measurements '2.6 cm' and '5.4 cm' added to the diagram.	Standard mark scheme

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Question 29

This question was not well answered. There were some blank responses seen. It is not clear if the terms ‘turning point’ or ‘roots’ were understood by some students.

Part (a) was usually correct or blank.

Many who gave answers to part (b) stated all the intercepts with both axes or tried to give coordinate solutions. A few students tried to solve the quadratic algebraically, usually unsuccessfully.

Summary

Based on their performance on this paper, students should:

- take care when carrying out arithmetic operations, checking answers to avoid careless errors
- set out working clearly for all questions, particularly those with three or more marks
- practice answering ‘explain’ and ‘give a reason for your answer’ type of questions
- practice working with questions involving the speed-distance-time formula and working in

fractions of an hour and decimal equivalents of time

Question 21

It was pleasing to see so many correct graphs drawn, although it is still a surprise that so many students plot the correct points and then fail to join them up, denying themselves of an easy additional mark. Incorrect points plotted were usually the inability of some students to work with negative numbers. Disappointing also, to see that those with one or two incorrect plots failed to realise that a straight line was the correct answer. A few students drew only part of the line, failing to go completely from $x = -2$ to $x = 4$. Some students used the -2 and 4 to mean co-ordinates and plotted them. A number of responses saw the students confused due to the difference in scales on the two axes.

Question 11

In part (a) some students did not read the graph with sufficient care when changing 3 stones to kilograms. Answers such as 10.9 or 20 were quite common.

The most common approach seen to change 80 kilograms to stones in part (b) was reading from the graph at a factor of 80, which was often 40, and scaling up to 80. A few students used two values that sum to 80. The scale on the horizontal axis was often not read correctly and statements such as 40 kg = 6.1 stones or 10 kg = 1.3 stones were common. An answer outside the range 12.4 to 12.8 was awarded full marks if it came from a complete method that included a correct reading from the graph. Some students, for example, read from the graph to find 1 stone = 6 kg and then divided 80 by 6 to complete the method. Too many students gave an answer with little or no working out. When the answer was not in the range 12.4 to 12.8 marks could only be awarded if a complete method was shown. Students should be encouraged to show a clear method on the graph as, without this, incorrect conversions can be given no marks. Attempts at answering the question by extending the graph were usually unsuccessful.

Question 25

Both parts of this question were poorly answered.

Relatively few students were able to identify the graph with equation $y = x^3$ in part (a). It was perhaps to be expected that many students would choose graph B instead of graph F but it was surprising that both graph A and graph E were very popular incorrect choices.

In part (b) graph F was a popular incorrect choice for the graph with equation $y = 1/x$.

Question 17

A really well answered question. There were relatively few cases of incorrect tables, and where there were incorrect values they tended to be when x was negative. It was rare to award no marks in part (a).

Part (b) was answered very well, and in many cases better than part (a). It was not uncommon for students to have incorrect values in their table and to then draw a fully correct graph. The method mark in part (b) was able to be awarded as a follow through mark from their table in (a) provided one mark had been scored in part (a). The most common cause for a lost mark in this part was to not complete the graph by joining the points plotted with a line.

Question 22

The most common mistakes here were in getting *B* and *C* and/or *A* and *D* the wrong way round. Having said that, many scored at least one mark.

Question 24

Many students scored at least one mark for completing the table, but the modal score for this part of the question was two marks. However, a substantial number of students did not substitute the numbers given correctly into the equation and either assumed it was linear and thus gave y values as 7, 6, 5, 4 and 3 or made an error with the first entry of the table, suggesting again an area for development for students is the use of negative numbers in algebraic expressions.

A large proportion of students achieved one mark for part (b) as they were able to plot at least four co-ordinates from their table assuming that they had initially gained a mark for getting at least two values

correct. Many students did not attempt to draw a curve and of those that did, some joined the points with line segments rather than drawing a curve and attempts at lines of best fit were sometimes seen.

Question 28

There were very few correct answers in part (a). There seemed little evidence of an understanding that the solutions could be read from the graph. A significant number attempted an algebraic solution, but their algebraic abilities were insufficient for such a task.

In part (b) there were a few who got full marks but for those who knew to read from the intercepts often included 2 with 0.6 and 3.4. Some spoilt their answers by writing the two values as coordinates. Other errors included those who attempted to substitute values into the equation, then plot the points on the graph, using algebraic solving/factorising methods or stating the y value at the minimum point.

Question 18

Tables of values were seen but very often with very many errors in them, especially for the calculations involving negative values of x. Often correct values shown in a table were contradicted by incorrect points plotted on the grid, thus negating any award. It was still not uncommon to see the correct points plotted, but not joined with a straight line. However, there were some indications that stronger students managed this by using the gradient and y-intercept rather than by drawing a table of values.

Question 14

The vast majority of students answered both parts of this question correctly, demonstrating a good understanding of the skills being assessed.

In part (a) many did gain the first mark by stating an answer within the range of 14 to 16. A common error seen was to read off the value of 75 for 5 hours but not make the adjustment to a payment for one hour or not being able to interpret the divisions on the scale correctly as £2 per square, with £10.60 being seen frequently. A very small number of students added together readings for 1, 2, 3, 4 and 5 hours.

The most common and successful approach to part (b) was to use their hourly rate found in part (a) and multiply by 36. A build up method using one or more readings from the graph was less common and less successful, particularly as many using this method only found the pay for 35 hours by using the reading at 5 hours and not adding an extra hour of pay to show a complete build-up.

Question 23

Part (a) of this question was not often correctly answered. Many students were able to correctly identify that they needed to divide distance by time to arrive at the answer but very few went on to convert minutes into hours. Common incorrect responses were often 1.3 or 20. Those students that obtained the correct answer of 80 often did so by scaling ie multiplying 20 by 4.

It would be beneficial for centres to ensure students are confident answering questions involving compound measures.

Part (b) was often awarded part marks with only a few students scoring all the marks for a fully correct graph. Those who scored one mark often did so by drawing the correct horizontal line for the stop in Sam's journey. A few students scored two marks for drawing a line representing the correct distance travelled in the last 20 minutes but forgot to show the stopping time on the graph.

Rarely was 25 seen as part of calculations and a common error seen was for students to continue their line to (1050,50).

Question 24

This question was not well answered. Many students continue to find working with negative numbers difficult and hence 5 was rarely seen in the correct place in the table, 3 was the most popular incorrect answer.

Students were usually able to plot their points but far too many did not join them with any form of a curve.

Because few quadratic graphs were drawn the answer to part (c) was often blank. This question is at the higher levels required on the foundation paper and so its lack of success is not surprising. The correct answers seen were from drawing a line at $y = 4$ but even with this line most students then just read off the positive answer and so still only gained one mark.

Question 28

This question was not attempted by the majority of students. Of those who did attempt it, the most popular response was to sketch the line $y = x$ or a quadratic graph. In some instances, students attempted to plot the graph using a table of values but failed to draw the graph due to the lack of numbers on the axis; in a few cases an attempt was made to draw the graph in just one quadrant.

Summary

Based on their performance on this paper, students should

- show all working out and ensure that their written work is legible
- transcribe figures taken from the question correctly
- avoid rounding or truncating answers to calculations and use the most accurate values where appropriate
- practice working with time and conversion of all types of metric units, including units of area
- practice questions assessing algebraic manipulation and derivation, application of ratios, scaling and rates

Question 28

Accurately completing the table of values in part (a) was rare with the usual mistake occurring when substituting the negative value of x. Some ignored the quadratic expression given and simply tried to complete an arithmetic sequence.

If a mark had been awarded in part (a) for at least two correct values, then at least one mark was usually earned in part (b) for correctly plotting their values. The drawing of a graph following a fully correct table in part (a) was sometimes spoiled by a 'flat bottom' to the quadratic curve through (1, -1) and (2, -1) or by joining the points with line segments.
Many students did not understand what was required in finding solutions to the quadratic equation in part (c). Those that did, often wrote their solutions in a coordinate form; one mark was still available for this.

Question 17

This is a commonly asked question but on this occasion the topic was not well answered. The lack of a table to fill in seemed to confuse some students. Centres should encourage students to set up their own table of values if one is not given. Those students that did this were the most successful in scoring full marks. Even though this graph had a negative gradient many students tried to draw a line with a positive gradient going up in ones instead of down. It was also disappointing to see many students had plotted the correct points but failed to join them up with a line, hence losing the accuracy mark.

Another common error seen was to have the correct graph for the positive values of x but the incorrect values for the negative values of x. It would help students to recognise the format for the equation of a straight line and know that their graph should be both straight and have all points joined.

Question 24

This question was completed with varying degrees of accuracy. It was rare to give full marks for all parts of the question but many students scored 1 or 2 marks within different parts of the question.

Part (a) was probably answered most, although it was clear that some students did not understand what was being asked as there were a large number of incorrect responses. Some students understood how to identify the y intercept and wrote their answer expressed as a co-ordinate, which was accepted.

In part (b) some blank scripts were seen and it was disappointing to see a significant number the coordinates written in reverse i.e. (– 5, 3) suggesting that the term turning point was understood but the order of the coordinates was the stumbling block.

For part (c) there were a large number of blank responses. When the right number was there it was often in the form of a coordinate. Only a handful of responses gained 1 mark for marking the roots on the graph. It is clear that many did not understand the meaning of ‘root’ of an equation.

Centres would benefit from reminding students to mark all key points on the diagram. If mistakes are made method marks may still be awarded.

Question 14

In part (a), the answer of 30 was most often correct. But in part (b) many candidates were unprepared for the requirements for reading from the graph and scaling their reading. There were very few who chose the most appropriate value of 20 to scale to 80, and many who took inaccurate readings from the axis. This question highlighted that candidates need more practice with this topic of the curriculum.

Question 28

Very few realised that the solution of the simultaneous equations was determined by the point of intersection of the two lines. Many spent far too much time trying to solve the simultaneous equations algebraically usually without any success.

Question 10

Part (a) was usually correct. Rare mistakes arose from misreading the scale or reading off from the incorrect axes.

Part (b) required the use of the conversion graph combined with working with time and was attempted by nearly all students. Very few students drew lines on the graph from £9 to 6 hours and this sometimes led to the graph not being read correctly. However, very many responses gained full or partial marks even if the graph showed no indication of use.
The most common error occurred in the use of correct time notation when writing the final answer, with a significant number of students losing the final accuracy mark. Occasionally a correct answer in 24-hour notation was given on the answer line along with an incorrectly converted 12-hour time.
There was some confusion when adding on 6 hours, with students counting 08:00 as 1, 09:00 as 2 etc and arriving at a final answer of 1:00. Where a list of times appeared in the working, they were able to gain the method marks for a correct reading from the graph and attempting to add to 8 am. Less commonly seen errors were: misreading the Cost axis and mistaking £9 for £8.50 resulting in a time in hours and minutes that they did not know how to deal with, and inaccurate lines drawn by hand on the graph giving wrong 'hour' values.

Question 28

Student's responses to this last question were very mixed, with some not attempting it at all. Very few students successfully matched all the graphs to a correct equation, although a few scored 1 mark for two graphs correctly assigned.

Summary

Based on their performance on this paper, students should:

- read questions carefully, including after reaching a final answer to check whether the magnitude is sensible, units are appropriate, and the level of accuracy required is shown
- practice questions involving proportion and algebraic expressions
- practice using measuring equipment such as rulers and, more particularly, protractors
- give clear and succinct explanations when a written answer is required
- use a calculator rather than relying on paper methods, particularly when working with percentages
- avoid using inconsistent units or rounded or truncated figures in calculations so that their final answer is inaccurate

Question 13

Both parts of (a) were generally answered well with candidates demonstrating that they were able to read the initial information from the graph, though a significant minority struggled to read the scale on the graph correctly, sometimes reading the wrong scale and giving the answer 10 in (i). Others offered nothing close to 30, with 65 and 95 not uncommon.
In part (b) many candidates were able to draw a horizontal line at the correct length to indicate Daniel resting and most went on to draw a diagonal line back to the x-axis with a ruler. Candidates who did not use a ruler were not penalised provided that their line appeared straight. Those who had not drawn a horizontal line or drew a horizontal line of incorrect length were still able to understand that the diagonal line should be drawn to 1600 on the x-axis.
In part (c) candidates used their correct diagonal line OR the information provided to correctly arrive at the average speed of 35 miles per hour. It was rare to see a candidate use "their" incorrect diagonal line to try and calculate the average speed, however the few candidates that were able to do this were rewarded for demonstrating this correct process. In this final part, there were some candidates who were able to write the formula, but were unable to substitute their values correctly, and others who were unable to manipulate it correctly or were confused with the concept of time and/or units.

Question 20

A large number of students assumed the graph would be a straight line and completed the table to suit their line with no calculations using the given equation being shown. Some students gained 1 mark by correctly evaluating the y coordinate for the positive values of x only, although very few gained both marks for part (a) as they struggled evaluating the y coordinates for the negative values of x, indicating difficulty in carrying out calculations with negative numbers. Similarly, many students achieved the method mark in part (b) for correctly plotting 4 of their points correctly but plotted the points with negative x and/or y values incorrectly. Very few students produced a fully correct curve, with a very small number who evaluated and plotted all points correctly losing the accuracy mark as they joined all points with line segments rather than a curve or did not show the minimum point of with a clear curve.

Question 16

Part (a) required an accurate reading from the conversion graph provided, and many students were able to give an answer within the acceptable range of 167 to 173 and those not gaining the mark often demonstrated they knew how to use the graph correctly but made an error when interpreting the grams scale.

Part (b) however, was often poorly attempted in comparison. Successful students were those who used the graph wisely to extrapolate data and clearly showed what reading they were using and how this multiplied to make 1000g. Many students were either competent in using readings from the graph as a factor of 1000 or applied a build-up method of various readings.

Of the students identifying the need to use a factor of 1000 and reading from the graph, most go on to get full marks. Some students only gained one of the two marks available as they were unable to interpret the scale for ounces, e.g. reading 100g = 3.5 ounces as 100g = 2.8 ounces, but could follow through and scale up correctly.

Another common error that students made was to use 300 grams as part of a build-up, usually equating this to 10 ounces or more before multiplying by 3 and adding a reading for 100g. This approach gained no credit due to 300g being outside of the range of the graph.

Extrapolation has always proved to be a challenging topic for students and in this series, although improvements can be seen, many of the students show insufficient working when the answer is outside of the specified range as incorrect readings need to be supported to gain credit.

Question 24

A standard and familiar question split into 3 parts and assessing knowledge of quadratic graphs.
In part (a) many students achieved the full 2 marks for finding all three values correctly. However, equally as many achieved 1 mark for finding one or two correct values, with the corresponding y value for when x was negative being incorrect. Students should be encouraged to use their calculator to find the values, using brackets when substituting negative values.

The majority of students achieved one mark for plotting at least 5 of their coordinates correctly, with many of these being for following through their incorrect points provided a mark in part (a) had already been awarded. Some of the students who got full marks in (a) only achieved one mark in (b) as they did not join their points, joined them using line segments or their parabola did not have a clear vertex below the x-axis.
The final part of the question was not answered very well at all and was often left blank. Very few students achieved the full two marks for two solutions in range. The method mark was occasionally awarded for an answer of 2.5 to 2.7 but many students often disregarded the negative value of x and very few attempted to draw the line $y = 4$ or marked the solutions on the graph which would have also led to the method mark being awarded. Another common mistake leading to lost marks was writing the answer(s) embedded in coordinates.

Question 19

A minority of this cohort gained 3 marks on this question; these students produced a table of values and a correct graph from there but some were seen without a table implying they used the equation of the line, gradient and intercept. Of those that didn't gain full marks, most gained no marks and many did not make any attempt to generate coordinates to be able to plot and join;

students should be encouraged to draw the table of values, those who did nearly almost always gained 3 marks. The most common errors were from finding incorrect coordinates using the negative x-values; the majority of these students only lost 1 mark as long as they plotted their points correctly and had a correct line segment through at least 3 of the correct points. Students should be encouraged to recognise that equations in the form $y = mx + c$ should produce graphs that are a straight line without a 'dog leg' or any other type of curve. If no marks were scored the most common incorrect response was simply plotting points at $(-2, 3)$ and $(3, -2)$ and joining up.

Question 14

This question assessed the ability to interpret and complete a travel graph, with responses to part (a) typically being correct to gain a mark. A large number of good responses were seen in part (b), with many learners able to draw a horizontal line of the correct length, followed by a correct straight line back down to the time axis. Sometimes only one of the two was correct, which gained just 1 mark. In responses where the horizontal part was incorrect, it was usually either the wrong length or completely missing, rather than being drawn at an angle. For the part representing the journey home, some learners incorrectly drew an upwards-sloping line, and others drew lines to the incorrect time on the x-axis or drew lines which were either not a single line or were curved rather than straight, which were not acceptable.

Question 24

A standard and familiar topic, this question discriminated well, with a range of different scores seen. Many learners were able to gain 2 marks of the 4 available for either completing the table correctly in part (a) or finding at least 2 correct values and beginning to plot points. The most common error when completing the table predominantly involved the negative x value or when $x = 0$. Another commonly seen wrong answer was an attempt at an arithmetic sequence to give 1, (0), −1, −2, (−3), −4, −5 which gained no marks.
When plotting the points in part (b), most learners could do so accurately and gained one mark for plotting. Most attempted to join them with a smooth curve but where points were joined with clear line segments between points, a maximum of 1 mark could be awarded. Pleasingly, this was less frequently seen compared to previous series.

Question 11

In part (a), a good number were able to gain 1 mark with a correct answer of 16. The most common incorrect answer was 15.2, presumably from misinterpreting the scale on the horizontal axis. Part (b) was not answered well with few learners gaining 3 marks. To make progress readings needed to be taken from the graph that could be used to convert 50 kilometres into miles and a variety of different ways of doing this were seen. A tolerance of one small square was allowed for the reading but it was still common to see inaccurate readings given in the workspace. Even if inaccurate readings were taken, the second method mark could still be gained if the readings were used in a complete method and this was often seen. Some learners attempted to convert 17 miles to km and go from there; this rarely led to a correct answer but it was often awarded the first M1 for an accurate reading.

Question 21

In this question learners were working with a quadratic equation in what was a fairly standard question. In part (a) they were asked to complete the table of values for the given equation, in part (b) to draw the graph and in part (c) to write down the coordinates of the turning point of the graph.

Some learners were confident in the method required to find the missing values for the table – substituting the given x values in order to find the corresponding y values. Common errors when attempting substitution were errors in dealing with working with the negative number (-2), particularly when squaring, or in working with the 0. Some learners did not attempt substitution. Others tried to complete the missing values by looking for a pattern in the table which would have been successful in a table of values for a linear equation with equally spaced x coordinates, but did not work in the case of the quadratic equation in this question.

In part (b) learners generally demonstrated understanding of how the table of values related to drawing the graph required, as was evidence by plotting of their points. Provided 1 mark was awarded in (a) then a follow through was awarded in (b) for correctly plotting their points. Where learners did not have a correct table of values in (a) this often led to a curve which did not have the expected parabolic shape, however it appeared that many learners were not aware of the shape of the quadratic curve and so did not identify this as an issue.

After plotting their points, most went on to join their points with a smooth curve which gained both marks if the correct points had been plotted. Curves with a flat bottom (between $(-1, -4)$ and $(0, -4)$) were a common error. Some learners who plotted correct points were inaccurate when joining this with a curve, missing some of their points entirely. Only a small proportion of those who attempted to join the points with a curve utilised line segments.

In a very small number of cases learners who did not complete the table of values in (a) plotted a correct curve in (b) which was awarded the marks.

Part (c) of the question asked for the coordinates of the turning point of the curve. Learners who had a curve in (b) were often able to identify the coordinates of their single turning point

and gain the mark here. Common errors were inaccuracy in reading the coordinates or for omitting a negative sign (commonly on the x-coordinate). In some instances it was not possible to award the mark here as there was not a single turning point in (b) due to the shape of the graph shown. Some learners attempted this part of the question but did not have a graph with a single turning point plotted in (b) so would only have been able to gain credit for the correct turning point of the quadratic graph which could be obtained by calculation, however this was not seen.

Question 28

Two marks were available in this question for being able to use knowledge of equations to sketch a quadratic graph with the y-intercept labelled. Whilst a mark was sometimes awarded for the correct shape with the right orientation or for any graph with a y-intercept of 2, it was rare to award both marks for including both elements in the sketch. Of the responses that showed the correct shape and orientation of the curve, many only showed a table of values which was not acceptable for a mark unless this was transferred to their sketch with 2 clearly marked either by showing a numbered scale or including the intercept as a coordinate.



Examiners' Report

Principal Examiner Feedback

November 2023

Pearson Edexcel GCSE (9 – 1)
In Mathematics (1MA1)
Foundation (Non-Calculator) Paper 1F

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GCSE (9 – 1) Mathematics – 1MA1
Principal Examiner Feedback – Foundation Paper 1

Introduction

This paper provided good coverage across the specification and allowed students the opportunity to demonstrate their ability across the grades. Plenty of success was seen across the early part of the paper as students showed confidence picking up marks in the first half of the paper.

Challenges arose when questions contained a context and with it large amounts of text; extracting the key pieces of information and applying it using the correct mathematical processes are an area for improvement. Good amounts of working out were seen which certainly helped students, especially those which had arithmetic errors as part of their solution.

Question 21 onwards proved challenging for this cohort with very few students gaining full marks and the mode score being 0 marks on almost all questions. Nevertheless, the majority of questions were at least attempted in a bid to gain some credit.

For those questions requiring a written conclusion, most responses did have some sort of decision showing that students are well-accustomed to this sort of demand in a question.

Areas of the specification that need to be improved upon are highlighted in the list at the end of this report.

REPORT ON INDIVIDUAL QUESTONS

Question 1

A good number of students were able to give a correct answer of 6 but there were a significant number who did not and a wide variety of incorrect answers were given. The most common incorrect answers were 4 (from finding the median) and 5 (from finding the mean).

Question 2

This question was answered well with the majority of students able to give a correct answer of 31. Of those that didn't gain B1, 209 was the most common incorrect answer from adding instead of subtracting; 41 was also seen when students were unable to deal with the tens correctly.

Question 3

This simplifying question saw mixed results. The majority of students were able to give a correct answer of $12a$ but there were a variety of incorrect answers seen. Students should note that this

type of simplifying question requires no multiplication signs in the answer; $12 \times a$ and $3 \times 4a$ were often seen and gained no marks.

Question 4

Measuring angles is an area of the specification that needs attention. Although some students did gain a correct answer in range, with 40 most commonly seen, there were a whole range of incorrect answers given such as 35, 50 and 140.

Question 5

The majority of this cohort were able to gain B1 for a correct answer of 60. Of those that didn't, 50 and 150 were the most common incorrect answers seen.

Question 6

The majority of students gained 3 marks for an answer of 2300 on this question. For those that didn't it was an error in conversion which was often seen with 1 litre = 100 millilitres being the most common incorrect conversion used; these students could still gain 1 mark if they had a correct process to find the difference using one of the incorrect conversions stated in the mark scheme. Those students who converted 3 litres into millilitres were more successful than those who converted 700 ml into litres and errors in arithmetic were noted when doing 3000 – 700. A small number of students arrived at 2300 but spoiled their answer by then trying to convert to litres; this was still allowed if the student gave an answer of 2.3 litres but 2.3 on its own lost the A mark and this was seen on occasions. Some students also missed that the question was about 3 litres and instead subtracted 700 from 1 litre (1000 ml) obtained 300 ml and gained no marks.

Question 7

Part (a) was answered very well with the majority gaining B1 for an answer of 15. Some students found the difference between 1 and 5 and added this to 3. Part (b) saw less success with more incorrect answers seen than in (a), the most common being 10 from dividing 20 by 2 instead of 4. There were still a good proportion of the cohort who gained B1 for an answer of 4.

Question 8

Part (a) saw mixed results. A good number of students were able to find the correct frequencies for 2 marks. Many gave the correct frequencies in the tally column and something incorrect such as frequency/24 as a fraction which gained 1 mark. Some also confused the definitions of tally and frequency and put the information in the wrong column. It was encouraging to see that a number of students were crossing out items in the list as they entered their tally marks in the frequency table and were using the correct bar notation for recording the tallies. Part (b) was answered well with many gaining B1 for a correct answer; those that didn't often gave a number

for their answer instead of the correct word. Part (c) saw the full range of marks awarded with most students gaining full marks. Of those that didn't, the most common error was an incorrect linear scale, although these students could still gain 2 marks for labelling bars and correct height bars for their scales and many did. Students often struggled to correctly scale the vertical axis, sometimes writing the numbers between the squares instead of on the gridline or using multiples of 3 or 5 which often led to errors.

Question 9

For part (i) and (ii) the majority of students answered the questions correctly to gain 2 marks. Of those that didn't, giving the answer in an incorrect notation, such as ratio, was often the issue; students should be reminded that correct notation for probabilities are fractions, decimals or percentages. Some students gave an answer of $\frac{8}{22}$ for (ii), e.g. the probability for 'pink' instead of 'not pink'. In (iii) the majority of students gained B1 for a correct answer with 0 and $\frac{0}{22}$ given in equal measure. Incorrect answers generally involved incorrect notation such as 0:22 or worded answers, e.g. impossible.

Question 10

It was pleasing to see the majority of students gain 3 marks on this question. The most common process seen was to divide 60 by 20 and then multiply 250 by 3 to arrive at 750. The majority of students who reached this point also gave a positive decision to gain the full 3 marks. Some students used a 'build-down' process starting at 900 and subtracting 250 three times to deduce there would be 150 grams left. Some students attempted to find the amount needed for one cookie and go from there but this process often led to arithmetic errors. Common incorrect processes often revolved around arithmetic errors and a small number of students reached an accurate figure to compare but gave an incorrect or no decision. Some students worked with the other ingredients too but this was ignored as long as it did not contradict their final answer. A number of students believed doubling and then doubling again went from 20 to 60 rather than 80 and therefore gained no credit.

Question 11

Less than half of students in this cohort were able to gain 2 marks for a correct enlargement. Of those that didn't, the main error was in the height of the triangle and the positioning of the top vertex; most were able to gain B1 for a base of 6 cm. Some students misread the scale factor and enlarged the shape by a different scale factor – usually 2 – if done correctly B1 could still be gained.

Question 12

Part (a)(i) was answered well with most students able to gain 2 marks for an answer of 26. Of those that didn't, it was common to see incorrect algebraic expressions such as $6g + 20h$ and 23 + 45 was often seen. Part (a)(ii) saw less success with many students unable to make any progress with the substitution. Many were unsure as to which letters should be substituted for which values and substituting g for 38 was often seen. For those that did manage to show a correct substitution, some were able to rearrange correctly to reach an answer of 13. One commonly seen incorrect answer was $g = 26$. Students should be advised to write the correct answer on the answer, on occasions 13 could be seen embedded in a calculation but the wrong answer given on the answer line, leading to 0 marks. Part (b) saw mixed results as less than half of students in this cohort gained 2 marks. Of those that didn't, many gained 1 mark, usually in one of two ways; successfully working out 3×-3 as -9 but being unable to accurately subtract 2 or for a full substitution; common incorrect answers included -7, 7 and 11. Some students wrote notes saying 2 negatives make a positive, leading to the misconception that the negative for the 9 and the subtraction sign meant the two values needed to be added, leading to an answer of 11.

Question 13

This question saw the full range of marks awarded. Some students were able to work through the process to reach an answer of 23p or £0.23. Of those that didn't, it was common to see 2 or 3 marks awarded, in particular for students who reached 160 or 460 but could go no further. Those that earned 3 marks gave a complete process with arithmetic errors in the process. It is encouraging to see that more students are fully demonstrating their method enabling them to gain marks despite their final answer being incorrect. Centres should continue to encourage their students to set out their working in a logical order so that they can access Method and Process marks. Some students dealt with the information and started the process incorrectly such as $100 \div 3$ or started correctly e.g. $100 \div 5$ but went wrong after that such as 20 + 8 and an answer of 28p. Some students incorrectly divided £3 by 5 following their process of dividing 100 by 5, resulting in an answer of 60p or 68p (after adding 8p) whereas others mixed up units within their working, e.g. 300/100 = 3g instead of 3p.

Question 14

This question saw the full range of marks awarded. Of those students who managed to plot the correct 5 points it was usual to see this accompanied by a straight line through the points. Some students gained 2 marks, usually for a line segment through 3 correct points; students should be able to recognise that an equation of the form $y = mx + c$ produces a straight line and therefore if one point is not in line with the others it will likely be incorrect. Some students gained 1 mark for producing 2 correct points either plotted or stated in the workspace but there were difficulties in calculating y when x was negative. More than half of the cohort gained 0 marks so this is an area of the specification that needs to be worked on.

Question 15

This question saw the full range of marks awarded. The majority of the cohort made a good start with a process to find 25% of 12,000. It was common to see students using the build-up method to work out percentages of amounts but this alone could not be credited with method or process marks if arithmetic errors were made and the process is not complete e.g. all steps seen such as 10% = 12,000 ÷ 10 = 1,200. Many then picked up the 2nd process mark for subtracting the deposit from 12,000 and also the 3rd for a complete process. It was common to see the accuracy mark not gained as students were unable to carry out the arithmetic for the division; 405 and 45 were commonly seen incorrect answers. Some students were not able to gain the first P mark but were able to gain the second and third P mark for a correct process using their deposit value and this was often seen. 12,000 was often misread as 1,200.

Question 16

Around two thirds of this cohort were able to gain 2 marks by reaching a value to show that Shah had passed the exam, usually 42 or 75(%). Some students had a correct method but could not carry it out accurately. Others were not able to gain any marks as they set up a fraction such as $\frac{45}{60}$ but were not able to go any further. Some students reached 42 or 75 but failed to interpret the results correctly, often saying that Shah did not pass the exam.

Question 17

The majority of students were able to gain at least 1 mark for correctly inverting the second fraction and multiplying. It was common to see the second mark gained too, usually for reaching $\frac{18}{5}$. Students who attempted to find a common denominator, e.g. $\frac{18}{30} \div \frac{5}{30}$ often made no further progress. The final step proved to be the most challenging for this cohort but some were able to successfully convert to a mixed number. Students should read the demand of the question carefully as 3.6 given as an answer was seen.

Question 18

The majority of students opted to use column multiplication for this arithmetic question. Some students managed correct place value in their structure and a good number of those managed to reach the digits 1512 to gain the first accuracy mark and place the decimal point correctly to the gain the full 3 marks. Common errors seen were incorrect place value in the columns, as well as incorrect arithmetic when adding the columns, usually arriving at the digits 378 or in trying to break down the components but only using 6 × 2 and 0.3 × 0.4, giving an answer of 13.2. Some students reached 1512 but were unable to place the decimal point in the correct place; centres need to continue to encourage students to use approximation to decide on a sensible place for their decimal point.

Question 19

It was rare to see a correct answer in (a)(i) with incorrect answers of 0 and 5 seen often. (a)(ii) also saw little success with the majority of students gaining B0; common incorrect answers included 0.05, −10 and −25. Part (b) saw mixed results, some students were able to make a correct first step, usually adding the powers for the numerator to reach 2^9. From there students either went onto gain 2 marks for a correct answer or incorrectly simplified, with $2^9 \div 2^3 = 2^3$ most commonly seen. A good proportion of the cohort gained no marks, making an incorrect first step such as $2^5 \times 2^4 = 4^9$ or $2^5 \times 2^4 = 2^{20}$. Some students also evaluated the terms as ordinary numbers and worked from there; if 64 was reached this gained M1 and was seen regularly.

Question 20

Part (a) saw most students make a good attempt at a factor tree. A good number of students were able to complete their factor tree accurately and also write their prime factors as a product. The factor tree was attempted by most students and well set out. There was a good understanding of the need for prime factors and very few included 1. Of those that did not gain 2 marks, common errors included incorrectly considering 39 as a prime number and arithmetic errors when considering the next pair of prime factors. For part (b) it was more common to see 1 mark gained rather than 2. Students were able to produce either the prime factors of 130, at least 4 factors of 156 or 130 or a common factor of 156 and 130. Of those students who gained no marks, finding the lowest common multiple was the most commonly seen incorrect method.

Question 21

Part (a) saw the full range of marks awarded. Some students completed a fully correct process to reach an answer of 3.5 or equivalent. Of those that didn't, some reached as far as $14 \div 4$ but could not follow the process through with 3.2 quite often seen as the result of the division; students and centres should note that $\frac{14}{4}$ gained full marks. Some students were able to find the total length of the 5 sticks but made no further progress. There were also a good number who did not manage to make a correct first step and gained 0 marks; a common error was to calculate 4×7 or 4×4.2 rather than 5×4.2. Part (b) saw little success as most students gained no marks, with common incorrect responses centring around the mean increasing or the length of the other 4 sticks being reduced.

Question 22

It was rare to see a fully correct construction and 90° angle at *P* on this question. Almost all students on this paper did not know what arcs were required. Many students did however gain 1 mark for drawing a 90° angle at *P* without the correct construction lines.

Question 23

Very few students were able to gain full marks on this question. A small number made a positive start and gained one of the first two P marks, the equations most commonly seen were $x = 2y$, $2x + y = 180$ and $y + w = 180$. Division by 3, rather than 5, of the 180° in the triangle was commonly seen. Most students understood the correct angle facts for angles in a triangle / on a straight line. Many students ignored the fact the triangle was isosceles and calculated the angles as if it was an equilateral triangle, giving 60° angles which led to $180 - 60 = 120$ as the incorrect answer. Many students attempted to assign values to x and y, these values were usually incorrect but if the correct values were seen this usually led to a correct value for w as well.

Question 24

This was another challenging multi-step question for this cohort; the majority gained 0 marks. Some were able to make a correct start and set up an equation in x, although some failed to include the x from shelf **A**. Progress from there required a correct process to solve their equation and substitute the value for x into one of the expressions for shelves **B** or **C**, any students that did this successfully often gained the 3rd P mark as well for 7500 ÷ "25". It was rare to see any students get as far as the 4th P mark but those that did usually went on to gain full marks assuming their arithmetic had been correct. There were many completely incorrect solutions seen such as expanding $(3x + 1)(2x - 5)$ or setting $3x + 1$ equal to 7500 and going from there.

Question 25

Those that knew the density, mass, volume formula generally scored 2 marks. Of those that did not gain 2 marks, most scored 0 for incorrect use of mass and volume, with the most common error being to multiply 27 and 10 instead of divide. Other incorrect methods involved trying a volume unit conversion, confusing units^3 with 10^3 and dividing 27 by 1000, and being unable to choose between m/v and $m \times v$ and stating both.

Question 26

It was common to see students gain the first method mark for rounding one of the figures appropriately, 6 or 8 on the numerator being seen most often. The majority then struggled with the next step which was to carry out an accurate calculation. Some were able to reach the digits 16, from attempting 48 ÷ 0.3 but resulting in incorrect place value. Some students attempted to work out the accurate calculation and then round the answer, gaining no marks. A few students were able to deal with the decimal value of 0.3 in the denominator by multiplying both the top and bottom of their fraction by 10. This is a useful skill for centres to continue teaching their students but in general dividing by decimals is a skill that needs more practice. Some students rounded 0.26 down to 0 which led to 48 ÷ 0 and were confused with what to do with the calculation.

Question 27

For part (a) there were many good attempts to expand the brackets but these attempts rarely resulted in credit being awarded. Common errors included $6x$ or $5x$ instead of $6x^2$ and incorrect signs being used. Those students using the grid method to expand the quadratic were usually successful at gaining at least 1 mark. In part (b) a small number of students were able to give a correct factorisation. Some students who gained B0 were able to give a pair of brackets with the product of the constants being -16, such as $(x + 2)(x - 8)$.

Summary

Based on the performance on this paper, students/centres should work on:

- measuring angles accurately.
- improving numeracy skills, including division skills for integers and decimals, multiplication skills for decimals.
- the interpretation of problems involving ratio.
- the formation of algebraic equations and solving them along with subsequent substitution to apply to problems in context.
- drawing a straight line graph by correctly calculating a table of values.
- using equilateral, isosceles and right-angled triangles to solve angle questions.
- encouraging students to show a full method for percentage calculation, noting that before method marks can be awarded a full explanation of each step has to be shown. If the answer is just stated then process marks will be lost if there are any arithmetic errors.
- encouraging students to set out their working using logical steps.
- encouraging students to read the question carefully so that they understand what they are required to do and what format the answer should be stated in.
- encouraging students to use approximations to check if their answers are sensible.
- encouraging students to set their work out in an orderly fashion.
- improving the expertise and accuracy required in geometric constructions.

and

- in questions requiring finding the prime factors of a number, encourage a more structured approach of dividing the number by the smallest prime numbers successively until the result was a prime number.
- ensure students know common metric equivalents from the specification, from one unit to another.
- practise arithmetic processes involving negative numbers.

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