Chhetri Academy

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GCSE MATHS

Algebra

Edexcel 1MA1 | Subtopic collection Topic 22

Sequences and the nth term

Foundation tier

Answers and examiner comments

66	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
5 (a)		Pattern drawn	1	B1 for correct pattern
(b)		37	2	M1 for continuation or diagrams A1 cao **OR** M1 for sequence of numbers seen 4, 7, 10, 13, 16 etc A1 cao **OR** M1 for use of formula $3n+1$ with $n=12$ A1 cao
(c)		No	2	M1 for attempt to divide 69 by 3 A1 for 'No' and comment on the fact that this is the number needed for pattern 23 **OR** M1 for Starts at 3 and builds up to 61 A1 for 'No' and comment on fact that 61 sticks are needed for pattern 20 NB: 0 for an answer that is an incorrect mathematical statement, or an answer that has an incorrect conclusion (eg "yes")

5MB2F_01

5MB2F/01

7	(a)		Pattern	1	B1
	(b)	7,10,13,16,19,22,25,28,31,34,37,40 43,46,49; or $3n+4$	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 $3n+4$ (could be shown as part of a valid calculation eg 15×3) A1 49

Original question 16

The full source mark scheme begins on page 92. Use the original paper code, tier and question number shown above.

Question	Working	Answer	Mark	Notes
14 (a)(i)		16	1	B1 cao
(ii)		Reason	1	B1 add 3 or 3×5+1or 3n+1
(b)		25	1	B1 cao
(c)		Yes with reason	1	B1 for "Yes" and "keep adding 3" oe 3×11+1 or 11th term or multiple of 3 plus 1
15*	$6 \times 2 + 3 \times 2 = 12 + 6 = 18$ or $2 \times 5 + 4 \times 2 = 18$ or $6 \times 5 - 4 \times 3 = 18$ $18 \div 2.5 = 7.2$ or $2.5 \times 7 = 17.5$ or $2.5 \times 8 = 20$	8 packs	4	M2 for a complete correct method for finding total area. (can be implied by 18) (M1 for attempt to calculating at least one area, 6×2(=12) or 3 × 2 or 2 × 5 (=10) or 4×2(=8) or 2 × 2 or 6×5 (=30) or 3×4 (=12)) M1for their area ÷ 2.5 or repeated addition of 2.5 of their area or equivalent repeated subtraction. C1 for clear communication that 8 full packs are required supported by their calculations provided at least 1 of the first 2 method marks awarded. SCB3 for 8 identified as answer.

5MB2F_01

11	(a)		6	2	M1for any valid method e.g. drawing diagrams, counting in 2s which may be on the diagram or table of values A1cao
	(b)	*n*th term is $2n + 2$ so 50th term is $50 \times 2 + 2$	102	2	M1for $50 + 50 + 2$ or any other valid method A1cao

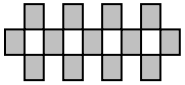
10	(a)(i)		A symmetrical diagram	3	M1 for at least two tiles placed so that they are symmtrical with the given black tiles or with each other. A1 for a correct positioning of the 4 tiles.
	(ii)	44 – 10	34		B1 cao
	(b)	6.20 × 5	31.00	2	M1 for 6.20 × 5 oe A1 for 31.00 (accept 31)

5MB2F_01

14	(a)(i)		27	2	B1 cao
	(ii)		Add 5		B1 for 'add 5' oe
	(b)		$5n - 3$	2	B2 for $5n - 3$ (oe, including unsimplified) (B1 for $5n + k$, $k \neq -3$ or k is absent, or $n = 5n - 3$)

5MB2F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
*15		500 × 1000 × 400 = 200 000 000 20 × 50 × 40 = 40 000 200 000 000 ÷ 40 000 = 5000 OR (500 ÷ 20) × (1000 ÷ 50) × (400 ÷ 40) = 25 × 20 × 10 = 5000	Proof	4	B1 for a correct unit conversion, could be seen on the diagram or in working M1 for 500 × 1000 × 400 or 200 000 000 or 20 × 50 × 40 or 40 000 or 5 × 10 × 4 or 200 or 0.2 × 0.5 × 0.4 or 0.04 M1(dep) for '200 000 000' ÷ '40 000' C1 for fully correct working leading to final answer of 5000 OR B1 for a correct unit conversion, could be seen on the diagram or in working M1 for (500 ÷ 20) or (1000 ÷ 50) or (400 ÷ 40) or at least two of 25, 20, 10 seen M1(dep) for '25' × '20' × '10' C1 for fully correct working leading to final answer of 5000

5MB2F_01

Question		Working	Answer	Mark	Notes
15	(a)			1	B1 for correct pattern
	(b)		31	2	M1 for correct diagram of pattern number 10 with or without shading A1 cao **OR** M1 for any 4 consecutive terms in the sequence 4, 7, 10, ... A1 cao **OR** M1 for use of $3n + 1$ with $n = 10$ A1 cao
	(c)		No with appropriate reason	2	M1 for attempt to divide 45 by 3 A1 for 'No' and comment that this is the number needed for pattern number 15 **OR** M1 for starts at 4 and builds up correctly to 46 or 55 A1 for 'No' and comments that 55 are needed for pattern 18 or 46 are needed for pattern 15 oe **OR** M1 for use of $3n + 1$ with $n = 18$ A1 for 'No' and comments that 55 are needed for pattern 18 oe **OR** M1 for $3n + 1 = 46$ A1 for 'No' and comments 46 are needed for pattern 15 oe

1MA0_2F

Question		Working	Answer	Mark	Notes
6	(a)		22	1	B1 cao
	(b)		42	1	B1 cao
	(c)		Reason given	1	B1 for correct reason – accept as sufficient: 101 is odd Terms of the sequence are even or end in 0, 2, 4, 6, 8 Shows terms 98 and 102 or either 98 or 102 alone with evidence of term to term difference of 4
	(d)		$4n + 2$	2	B2 for $4n + 2$ oe (B1 for a linear expression in $4n$ e.g. $4n + a$ ($a \neq 2$) or $n = 4n+2$) (B0 for $n = 4n$ or $n + 4$)

8	(a)		 or 	1	B1 for  or 
	(b)			1	B1 cao

1MA0_1F

Question		Working	Answer	Mark	Notes
12	(a)(i)		19	2	B1 cao
	(ii)		Add 4		B1 for add 4 (+4) oe or $4n - 1$ (or $\times 4 - 1$)
	(b)	15 – 10 = 5 5×4 = 20	20	2	M1 for (15–10)×4 or 4 + 4 + 4 + 4 + 4 or 59, 39 or (4×15 – 1) – (4×10 – 1) or '59' – '39' from a list A1 cao

Question		Working	Answer	Mark	Notes
8	(a)		29	1	B1 cao
	(b)(i)		45	2	B1 ft from (a)
	(ii)		Explanation		B1 for a complete method to generate the eleventh term.

Original question 2

The full source mark scheme begins on page 107. Use the original paper code, tier and question number shown above.

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

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)

2			8.32 8 51.22	3	B1 cao B1 cao B1 ft from ‘8.32’

6	(a)(i)		25, 22	2	B1 cao
	(ii)		Subtract 3		B1 for correct description Eg. 'subtract 3' **or** 'goes down by 3' oe **or** 'take-away 3' **or** -3 **or** $43 - 3n$ seen
	(b)		23	2	M1 for +5 seen **or** for continuing sequence for at least 2 terms (condone one arithmetic error) **or** $5n - 17$ A1 cao

PAPER: 1MA0_2F

Question	Working	Answer	Mark	Notes
24		115	4	M1 for 360 − 4 × 25 (=260) M1 (dep) for "260"÷ 4 (= 65) M1 for 180 – "65" **or** (360 −2 × "65") ÷ 2 A1 for 115 with working **OR** M1 for 360 ÷ 4 (= 90) M1 (dep) for "90" − 25 (=65) M1 for 180 – "65" **or** (360 – 2 × "65") ÷ 2 A1 for 115 with working

10	(a)		Correct pattern	1	B1
	(b)		12	1	B1 cao
	(c)	20÷2 or Diagram or Table	11	2	M1 for a complete method to find the pattern number from the number of grey tiles A1 cao

PAPER: 5MB2F_01

Question		Working	Answer	Mark	Notes
12	(a)		Correct diagram	1	B1
	(b)		Correct diagram	1	B1 cao
*13			Yes with working	4	M1 $9.60 \div 3$ (=3.20) or 9.60×2 (= 19.20) or $9.60 \times \frac{2}{3}$ (=6.40) M1 for a fully correct method to find the cost of the two shirts A1 12.8(0) C1 (dep on M2) ft statement supported by working OR M1 $9.60 \div 3$ (=3.20) or $9.60 \times \frac{2}{3}$ (=6.40) M1 $13 \div 2$ A1 for 6.4(0) and 6.5(0) C1 (dep on M2) ft statement supported by working

PAPER: 1MA0_1F

Question		Working	Answer	Mark	Notes
4	(a)		19	1	B1 cao
	(b)		203	1	B1cao
	(c)		Explanation	1	B1 for any correct reason, e.g. terms are all odd but 372 is even or use of *n*th term $4n - 1$ or not 1 less than a multiple of 4

8	(a)		27	2	M1 for a complete method to find the number of extra squares, e.g. by drawing a square of side 6 cm and attempt to find the number of extra squares or for $6^2 - 3^2$ or 3×9 or $4 \times 9 - 9$ A1 cao
	(b)		49	2	M1 for pattern 7 drawn or $(1 + 3 + 5) + 7 + 9 + 11 + 13$ or 40 or 7^2 or a list of square numbers up to 36 A1 cao

2	(a)		diagram	1	B1diagram for pattern number 4
	(b)		9, 11	1	B1 could ft their diagram
	(c)		31	1	B1 could ft their table
	(d)		explanation	1	B1 explanation eg “adding on 2”, $2n+1$ as a rule

8	(a) (b)		Diagram drawn 71	1 2	B1 appropriate diagram drawn M1 for generating a series beyond 4th term, adding on 7s, adding to diagrams, etc. or any other equivalent method A1 cao

15			108	5	M1 for a method for finding the dimensions e.g. length + width = 12 or 2 × length + width = 21 A1 for length = 9 (could be shown on diagram) A1 for width = 3 (could be shown on diagram) M1 for area = “9” × “3” × 4 A1 cao

PAPER: 5MB2F_01

Original question 16

The full source mark scheme begins on page 127. Use the original paper code, tier and question number shown above.

PAPER: 1MA0_2F

Question		Working	Answer	Mark	Notes
14	(a)			1	B1 cao
	(b)		17, 21	1	B1 for 17, 21 cao
	(c)		$4n + 1$	2	B2 for $4n + 1$ oe (B1 for $4n + k$, $k \neq 1$, or k is absent or $n = 4n + 1$)
	(d)		12	2	M1 for $(50 - 1) \div 4$ **or** evidence of using their formula from part (c) if in the form $an+b$ **or** repeated addition of 4 (at least 3) ft table in part (b) **or** 49 seen A1 cao
*15			148°	4	M1 for (angle BDC =) $360 - 250$ (=110) M1 (dep) for $180 - (180 - '110' - 38)$ (= 148) or for '110' + 38 (= 148) C2 (dep on M2) for $x = 148$ with full reasons, relevant to the complete correct method used, for example: Angles at a point add up to 360° **and** angles in a triangle add up to 180° **and** angles on a straight line add up to 180°; Or Angles at a point add up to 360° **and** exterior angle of a triangle is equal to the sum of the interior opposite angles or (C1 (dep on at least M1) for one reason relevant to correct method)

PAPER: 1MA0_2F

13	(a)(i)		19	2	B1 cao
	(ii)		Reason		B1 explanation, e.g. add 4 each time
	(b)		43	1	B1 cao
	(c)		Yes with reason	1	B1 reason eg 1 less than 80 and 80 is a multiple of 4, or generate series to 79, or 79 is the 20th term, oe

PAPER: 1MA0_2F

10		80, 75 reason	2	B1 cao B1 for correct reason, e.g. take 5 (each time)

18	(a)		$6n + 5$	2	B2 for $6n + 5$ (B1 for $6n + k$, where k is an integer or absent)
	(b)		no with explanation	2	M1 for "$6n + 5$" = 121 or any other valid method, eg counting on 6s to get to 119 (or more) A1 for no with complete explanation, eg $6n = 116$ will not give a whole number

1MA0 1F November 2015

7	(a)		Diagram	1	B1 cao
	(b)		15	2	M1 sequence written out and continued or diagram drawn or $2n+1$ given as the nth term A1 cao
	(c)		Explanation	1	B1 explanation eg answer must be odd or use of $2n + 1$ or pattern 17 has 35 circles

PAPER: 1MA0_2F

Question		Working	Answer	Mark	Notes
13	(a)		Odd	1	B1 cao
	(b)		$5n$	1	B1 cao
	(c)		$\frac{t}{4}$	1	B1 oe

Original question 19

The full source mark scheme begins on page 143. Use the original paper code, tier and question number shown above.

11	(a)		drawing	1	B1 cao
	(b)		9	1	B1 cao
	(c)		Yes (supported)	1	C1 for Yes with reason eg “the number of squares is always even (and 50 is even)” oe
	(d)		38	1	B1 cao

PAPER: 1MA0_2F

Question	Working	Answer	Mark	Notes
19 (a)		45	2	M1 for 60 + 60 + 60 oe (= 180) or 0.75 × 60 oe A1 cao
(b)		48	3	M1 for 120 ÷ 30 (= 4) or 720 ÷ 60 (= 12) M1 (dep) for "4" × "12" A1 cao OR M1 for 120 ÷ 60 (= 2) or 720 ÷ 30 (= 24) M1 (dep) for "2" × "24" A1 cao OR M1 for 720 × 120(= 86400) or 60 × 30 (= 1800) M1 (dep) for "86400" ÷ "1800" A1 cao

PAPER: 5MB2F/01

Question		Working	Answer	Mark	Notes
8	(a)		6	1	B1 cao
	(b)		11	1	B1 cao
	(c)	(s, Δ) = (2,1), (3,3), (4,5), (5,7), (6, 9), (7, 11), (8, 13), (9, 15), (10, 17)	17	2	M1 for relating number of triangles to number of stars for at least one pattern greater than Pattern 7, eg (8, 13), (9, 15) or (10, 17) or for identifying Pattern 9 A1 cao

Question		Working	Answer	Mark	Notes
5	(a)			1	B1 cao
	(b)		20	1	B1 cao
	(c)	(i)	15	2	B1 cao
	(c)	(ii)	Response		B1 for "divide 45 by 3" or "divide 30 by 2" or "a third of the squares are grey" oe

2	(a) (b) (c)		19 31 Reason given	1 1 1	B1 cao B1 cao B1 for correct reason eg: 80 is even Terms of the sequence are odd Terms end 1, 3, 5, 7, 9 Shows 79 and 83 or 79 or 83 with term to term difference of 4 given	C C E

5	(a)		Diagram	1	B1 for correct addition to diagram
	(b)		13, 16	1	B1 cao
	(c)		37	1	B1 cao
	(d)		24	1	B1 cao

Question	Working	Answer	Mark	Notes
11 (a)		36	M1	demonstrates the start of a method that could lead to the answer, eg recognition of square numbers, **or** use of differences, **or** diagrams
			A1	cao
(b)		80	M1	demonstrates the start of a method that could lead to the answer, eg repeated addition of 4, **or** 20 × 4
			A1	cao
(c)			C2	conclusion with supportive evidence, eg odd × odd = odd, **or** all odd numbers squared will be odd.
			(C1)	(e.g. starts to work with (generate) square numbers for odd patterns or $(2n + 1)^2$ eg 1 × 1 = 1, or generates sequence for squares using differences)

Original question 25

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

5		47	B1	cao

Question	Working	Answer	Mark	Notes
18 (a)		$3n + 1$	M1	for a method to deduce the nth term, eg. $3n + k$, where k is an integer or k is omitted or for $n = 3n + 1$
			A1	for $3n + 1$ oe (accept n replaced by another letter)
(b)		No (supported)	C1	for using (their expression in (a)) = 90 or shows that 88 or 91 is in the sequence
			C1	for an answer of "No" and a convincing argument eg. pattern number 30 has 91 counters or $(90 – 1) \div 3$ (= 29.66…) or shows that the next term after 88 is 91 Note: no ft from (a)

Question		Modification	Mark scheme notes
24		Diagram enlarged. Crosses changed to solid dots. Wording changed to 'It shows a pattern made from four identical squares.'	Standard mark scheme

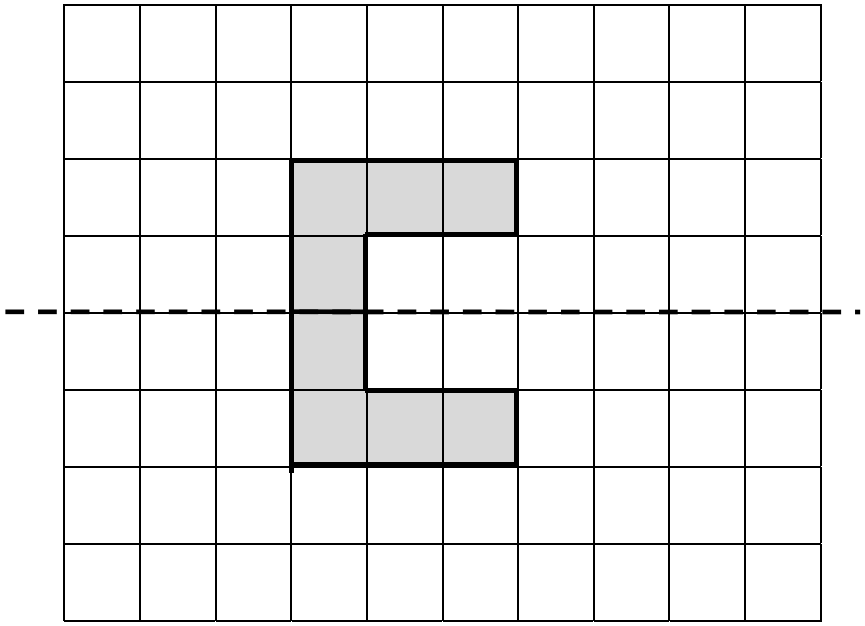
4	(a)(i)	30	B1	cao	
	(ii)	Explanation	C1	for explanation, eg increase by 7, add 7, states $7n - 5$	
	(b)	65	B1	cao	

Question	Answer	Mark	Mark scheme	Additional guidance
9 (a)	Explanation	C2	full explanation eg explains that both 19 and 22 are terms in the sequence **or** solves $3n + 4 = 21$ to find $n = 17/3$ oe **Acceptable examples** 19 is in the sequence and 19 + 3 is more than 21 The 5th term is 19 and the 6th term is 22 7, 10, 13, 16, 19, 22 17 is not in the 3 times table Because 21 is in the 3 times table and the sequence is plus 4	7, 10, 13, 16, 19, 22, ...
		(C1	for substituting to find a term in the sequence **or** forming an equation eg $3n + 4 = 21$ **or** for a partial explanation or an explanation with some ambiguity) **Acceptable examples** The closest number is 22 $3 \times 6 = 18$, 18 + 4 is higher than 21 19 is in the sequence so 21 can't be in the sequence. Starting at 7 and adding 3 each time won't lead to 21 It's the 3 times table plus 4 21 is in the 3 times table **Not acceptable examples** Adding 4 each time won't lead to 21 It doesn't end up at 21, it goes past it	

Paper: 1MA1/2F				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
9 (b)	terms given	B1	states two terms eg 7,11 **or** 8,16 **or** 5, 7	
	explanation	C1	explanation eg add one more each time, doubling **Acceptable examples** Add 3 and add 4 The difference goes up by one each time It doubles +1, +2, +1, +2 or indicates +1, +2 repeats itself **Not acceptable examples** It goes up by 1 each time It doubles so $2n$ +1, +2, +3, +4 so $2n + 1$	May be indicated on the sequence with no contradictory statement made

26	$6n - 1$	M1 A1	for $6n + k$, where $k \neq -1$ or missing oe	Accept a different variable for M1 only Note $n = 6n - 1$ gets M1 only

10



Modifications to the mark scheme for Modified Large Print (MLP) papers. Paper 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**
1		Boxes removed	Standard mark scheme
5		Diagram enlarged. Model provided for all candidates.	Standard mark scheme
6	(a)	Diagram enlarged. Numbers moved above the scale.	Standard mark scheme
9		Diagram enlarged. Labels added above the shapes. V and K versions – 5 cut out shapes provided. Wording changed from 'The diagram shows five shapes on a centimetre grid.' to 'It shows five shapes on a grid of squares.'	Standard mark scheme
10		Diagram enlarged. Mirror line labelled on the left-hand side of the grid. Shading changed to dotty shading. Cut out shape provided for all candidates. Wording added 'You do not need to shade your shape.'	Standard mark scheme

PAPER: 1MA1_3F			
Question		**Modification**	**Mark scheme notes**
12		Diagram enlarged. 10° markings added to the pie chart and a dot at the centre. Question wording changed from 60 people to 90 people. Frequencies changed as follows: Peas 40, Carrots 20, Mushrooms 30.	Amended mark scheme: M1 for method to find at least one angle eg P: 360 ÷ 90 × 40 (=160) **or** C: 360 ÷ 90 × 20 (=80) **or** 360 ÷ 90 × 30 (=120) M1for all 3 angles correctly calculated **OR** at least one accurately drawn angle A1 fully correct pie chart with labels
14		Diagram enlarged. Spike removed and dot added. Table turned to vertical format.	Standard mark scheme
17		Diagram enlarged. Wording 'A B C D E' added after pentagon. MLP only – x changed to y. Wording added 'Right angles are marked at A and E.' AB labelled $2y+1$, BC labelled $y+2$, AE labelled $4y$	Standard mark scheme
19	(a)	Diagram enlarged.	Standard mark scheme
19	(c)	MLP only - x changed to p.	Standard mark scheme with x changed to p
22		Wording added 'There are four spaces to fill.' Table turned to vertical format. Grid enlarged. Y axis changed to go up in units of 2 from -10 to10.	Standard mark scheme
23		Diagram enlarged. Right axis labelled. Shading changed to dotty shading. Axes labels moved to the left of the horizontal axis and above the vertical axis.	Standard mark scheme
25		Diagram enlarged.	Standard mark scheme

28	(a)	24, 39	B1	cao	
	(b)	8*a*	M1	for a complete method to find the next 2 terms, eg. $a + 2a$ (= $3a$) **and** $2a$ + "$3a$" (= $5a$)	
			A1	$8a$ oe	SC: B1 for 3, 5, 8 seen if M0 scored

13	(a)	example	C1	example given eg 40, 80, etc.	
	(b)	No with reason	C1	for No with reason **Acceptable examples** 80 and 88 are both in the sequence 80 is in the sequence and 85 is 5 more 24, 32, ….. 80, 88, …. 85 is not in the 8 times table 85 is an odd number $8n+16=85$ so n is not a whole number. **Not acceptable examples** adding 8 each time will not lead to 85 (insufficient) it goes past 85 Yes …..	No can be implied from their statement

26	Shown (supported)	M1 M1 A1	for method to find at least two terms, eg $2 \times 4^2 - 1$ (= 31) **and** $40 - 3^2$ (= 31) for generating at least three correct terms of each sequence for generating at least the terms 1, 7, 17, 31, 49 of the first sequence **and** at least the terms 39, 36, 31, 24, 15, 4 of the second sequence	1 7 17 31 49 71 97 127 161 199 39 36 31 24 15 4 –9

8	21, 28	B2 (B1	both correct one correct in the correct position **or** for 15 + 6 (= *a*) or *a* + 7 (= *b*) where $a \neq 21$ and $b \neq 28$)	May be written alongside the given sequence but if contradiction accept the answer line. If both correct, accept in either order. May be seen as "+6" next to the sequence

Paper: 1MA1/3F

20	$3n - 2$	B2 (B1	for $3n - 2$ oe for $3n + k$ where $k \neq -2$ or is absent unambiguously shown)	Accept a different variable, eg. $3x - 2$ $n = 3n - 2$ gets B1 only $n + 3$ gets NO marks

Paper: 1MA1/3F

Question	Answer	Mark	Mark scheme	Additional guidance
12 (a)(i)	20, 15	B1	cao	Working may be seen near the sequence
(ii)	11	B1	cao	Working may be seen near the sequence
(b)	39	B1	cao	

13	(a)	Explanation	C1	for explanation **Acceptable examples** the sequence is going +1, +2 so the next term is +3 1 +1= 2, 2 +2= 4, 4 +3= 7 add the current term position to the term to get the next term add the two previous terms and add 1 **Not acceptable examples** you add 1 each time the number goes up by 3 7 is wrong it should be 8 because you double each time	The pattern may be just seen on the sequence given
	(b)	36	M1 A1	for finding the next term of 10 + 5 (=15) **or** for $\frac{1}{2} \times 8 \times (8 + 1)$ oe cao	

Paper: 1MA1/1F

Paper: 1MA1/3F

Question	Answer	Mark	Mark scheme	Additional guidance
25	12	P1 P1 A1	for a process to find the fifth term eg 3a + 5a (=8a) for setting up the equation eg $a + 2a + 3a + 5a + [8a] = 228$ cao	 [8a] allow use of what is clearly indicated as the missing term $\frac{228}{19}$ or $\frac{228}{1+2+3+5+8}$ scores P1 P1 $\frac{228}{1+2+3+5+[8]}$ scores P0 P1

9	(a)	Shape drawn	B1	cao	
	(b)	9 and 11	B1	cao	Ignore any subsequent values

Question	Answer	Mark	Mark scheme	Additional guidance
8 (a)	28 33	B1	cao	
(b)	Explanation	C1	for explanation **Acceptable examples** all terms end in 3 or 8 there are no terms that end in 0 50 does not end in 3 or 8 48 and 53 are both in the sequence (could be shown) 48 is in the sequence and 50 is 2 more $5n–2=50$ so n is not a whole number. if it started at 0 then it would but it starts at 3 so it never will or shows sequence continuing up to and beyond 50 **Not acceptable examples** adding 5 each time will not lead to 50 (insufficient) it goes past 50 the closest number to 50 is 48	One correct, one incorrect statement gets C1 as long as they are not contradictory.

20	(a)	$6n + 1$	B2	oe	
			(B1	for $6n + c$ where c is an integer $\neq 1$ or is missing)	
	(b)	Shown with supportive working	M1	for $8 - 6n = -58$ or $8 - 6 \times 11$ $(= -58)$ **or** starts to list terms of the sequence, with at least 3 correct or any other valid method.	2, −4, −10, −16, −22, −28, −34, −40, −46, −52
			A1	shown with working or an explanation , eg Yes and 11 or 2, –4, –10, –16, ..., –52, –58	May stop at −58 or ring if sequence continues

10	(i)	terms given	B1	states two terms eg 11, 10 or 9, 6	May be written on the sequence with no contradiction elsewhere
	(ii)	explanation	C1	explanation **Acceptable examples** Take away 2 then 1; take away 4 then 3 The difference goes down by 1 each time −4, −3; −2, −1 The differences are 4 and 3; the differences are 2 and 1 **Not acceptable examples** It goes down by 1 each time An algebraic rule	

19	$8n - 13$	B2 (B1	for $8n - 13$ oe for $8n + k$ where $k \neq -13$ or is absent unambiguously shown)	Accept a different variable eg $8x - 13$ $n = 8n - 13$ or $8n^{th}$ - 13 gets B1 only

Question	Answer	Mark	Mark scheme	Additional guidance
9 (a)	28	B1	cao	
9 (b)	4 : 9	M1	for 8 : 18 or for any ratio equivalent to 4 : 9 **or** 9 : 4 or 2.25 : 1	
		A1	for 4 : 9	Accept 4 : 9 in the form 1 : *n*, eg 1 : 2.25

8	(a)	Explanation	C1	for explanation, eg subtract 6, decrease by 6, going down by 6	
	(b)	12	M1	for $73 - 61$ **or** 6×2	At least one term must be correct and intention to subtract shown
			A1	cao	Accept -12
	(c)	Explanation	C1	for explanation relating to odd and/or even numbers **Acceptable** 52 is even the sequence is odd numbers it goes to **55** (and you cannot reach 52) it goes to **49** (which has gone past 52) nth term is $103 - 6n = 52$ which has no integer solutions 52 is between the 8th and 9th terms **Not acceptable** subtracting 6 each time will not lead to 52 it goes past 52	

Paper: 1MA1/3F

20	$4n - 3$	B2 (B1	for $4n - 3$ oe for $4n + k$ where $k \neq -3$ or is absent unambiguously shown)	Accept a different variable eg $4x - 3$ Accept $u_n = 4n - 3$, $T = 4n - 3$ etc $n = 4n - 3$ or $4n^{th} - 3$ gets B1 only

Paper: 1MA1/1F

2	20	B1	cao	

29	26	M1	for continuing the sequence to find the 5th term, eg $3a + 4a + 4a$ (= $11a$)	
		M1	(dep M1) for equating the fifth term with 286, eg $3a + 4a + 4a = 286$ oe **or** 286 ÷ "11"	May be seen next to sequence Award M2 for a correct numerical statement relating 26, 11 and 286
		A1	cao	An answer of 26 coming from an incorrect method, eg $a + 3a + 4a + 7a + 11a = 26a$ scores M1 only unless numerical statement relating 26, 11 and 286 with no a is seen

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**
4		Wording changed from 'some' to 'five'.	Standard mark scheme
8		Wording changed: 'A list of ten numbers is shown below.'	Standard mark scheme
9		Wording changed: 'Look at the diagram for Question 9 in the Diagram Booklet. It shows a straight line PQR and the angles listed below. Angle PQS = 85° Angle SQT = 30° Angle TQR = x°' Diagram enlarged. Angles moved outside of angle arcs and angle arcs made smaller. Labels S and T added.	Standard mark scheme
12		Wording changed: 'Look at the diagram for Question 12 in the Diagram Booklet. It shows an incomplete two-way table.' Wording added: 'in the Diagram Booklet. There are 12 spaces to fill.' Braille: Wording added: 'below, by writing the missing values labelled (i) to (viii). You may complete the table in any order you choose.' Braille: Values added to the table: 35, 98, 25 and 240	MLP: Standard mark scheme Braille: B3 fully correct (B2 for 6 or 7 correct entries) (B1 for 4 or 5 correct entries)
14	(a)	Wording changed: 'Look at the diagram for Question 14(a) in the Diagram Booklet. It shows an incomplete accurate pie chart.' Wording added: 'in the Diagram Booklet.' Diagram enlarged. Angles moved outside of angle arcs and angle arcs made smaller. Braille: Wording added 'Drawing film and labels are provided if you wish to use them.' Braille: 'Mandarin' and 'Spanish' labels provided.	Standard mark scheme
16		Wording changed: 'Look at the diagram for Question 16 in the Diagram Booklet. It shows a travel graph.' Diagram enlarged. Open headed arrows. Vertical axis cropped at 50 (40 on Braille) and horizontal axis cropped at 60. Braille: Wording added 'Drawing film and Bumpons are provided if you wish to use them.'	Standard mark scheme

PAPER: 1MA1_2F			
Question		**Modification**	**Mark scheme notes**
18		Wording added: 'You may be provided with a model for this question. It shows a cube. It is NOT accurate.' Model provided.	Standard mark scheme
19	(a)	Wording changed: 'Look at the diagram for Question 19(a) in the Diagram Booklet. It is an inequality…' Diagram enlarged. Open headed arrows.	Standard mark scheme
	(b)	Wording added: 'Look at the diagram for Question 19(b) in the Diagram Booklet. It shows another number line.' Wording changed from 'below' to 'in the Diagram Booklet'. Diagram enlarged. Open headed arrows. Braille: Wording added 'Drawing film and Bumpons are provided if you wish to use them.'	Standard mark scheme
22		Wording changed: 'Look at the diagram for Question 22 in the Diagram Booklet. It shows a plan…' m changed to metres. Wording added: 'The triangle has a base of 16 metres and a height of 14 metres.' Diagram enlarged. Open headed arrows.	Standard mark scheme
23		Wording changed: 'Look at the diagram for Question 23 in the Diagram Booklet. It shows point C on a grid. 1 square length on the grid represents 1cm.' Wording added: 'in the Diagram Booklet' Diagram enlarged. Cross changed to a solid dot.	Standard mark scheme
25		Wording changed: 'Two lists of numbers are shown below.' Braille: Wording changed 'Below are two lists of numbers'	Standard mark scheme

PAPER: 1MA1_2F			
Question		**Modification**	**Mark scheme notes**
26		Wording changed: 'Look at the diagram for Question 26 in the Diagram Booklet. It shows right-angled triangle ABC. AB = 7cm BC = 4cm Angle BCA = x° Angle ABC is a right angle.' Diagram enlarged. Angles moved outside of angle arcs and angle arcs made smaller.	Standard mark scheme
28		Wording added: 'Look at the diagram for Question 28 in the Diagram Booklet. It shows a blank set of axes. On the axes, sketch the …' Diagram enlarged. Open headed arrows. Braille: Demand changed to 'Describe or sketch on the axes the graph of $y = x^2 + 2$' Braille: Wording added 'Drawing film is provided if you wish to use it.'	Standard mark scheme
29		Letter 'a' changed to 'p'.	Standard mark scheme but note change of letter

12	(a)	11	B1	cao	
	(b)	Yes (supported)	M1	for method to show that 63 is in the sequence, eg starts to list terms of the sequence, with at least 3 correct **or** $6n + 3 = 63$ **or** $(63 - 3) \div 6$ (= 10) **or** $6 \times 10 + 3$ **or** $(63 - 27) \div 6$ **or** $27 + 6 + 6 + 6 + 6 + 6 + 6$	33, 39, 45, 51, 57, 63
			A1	eg Yes **and** 33, 39, 45, 51, 57, 63 Yes **and** $n = 10$ Yes **and** $(63 - 3) \div 6$ is a whole number Yes **and** $6 \times 10 + 3 = 63$ Yes **and** $63 - 27$ is divisible by 6, and the sequence goes up in 6's Yes **and** $27 + 6 + 6 + 6 + 6 + 6 + 6 = 63$ **OR** Like all the other terms in the sequence, it is in the 3 times table but not the 6 times table It's the 10th term / 63 is the 10th term	'Yes' can be implied by an equivalent statement eg '63 is in the sequence' Ignore additional incorrect statements but if the statement contradicts award A0 eg '33, 39, 45, 51, 57, 63, and yes and it's the 11th term' would be M1A0

Paper: 1MA1/3F

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Mark Scheme (Results)

March 2011

GCSE

GCSE Mathematics (Modular) – 5MB2F
Paper 01

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Reasoning, explanation or argument is correct and appropriately structured to convey mathematical reasoning.

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The mathematical methods and processes used are coherently and clearly organised and the appropriate mathematical vocabulary used.

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

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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.

5MB2F_01								
Question	**Working**						**Answer**	**Mark**	**Notes**
14							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

x	-3	-2	-1	0	1
y	-3	-1	1	3	5

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5MB2F_01				
Question	**Working**	**Answer**	**Mark**	**Notes**
15	342 ×24 6840 1368 8208 24 ×342 7200 960 48 8208 3 4 2 0 6 / 0 8 / 0 4 2 8 1 2 / 1 6 / 0 8 4 2 0 8 300 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)

March 2013

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

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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

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)

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

PMT

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)

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

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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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Mark Scheme (Results)

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NOTES ON MARKING PRINCIPLES

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

2 Mark schemes should be applied positively.

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

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

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

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

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

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

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

With working

If there is a wrong answer indicated on the answer line always check the working in the body of the script (and on any diagrams), and award any marks appropriate from the mark scheme.
If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.
If it is clear from the working that the "correct" answer has been obtained from incorrect working, award 0 marks. Send the response to review, and discuss each of these situations with your Team Leader.
If there is no answer on the answer line then check the working for an obvious answer.
Partial answers shown (usually indicated in the ms by brackets) can be awarded the method mark associated with it (implied).
Any case of suspected misread loses A (and B) marks on that part, but can gain the M marks; transcription errors may also gain some credit. Send any such responses to review for the Team Leader to consider.
If there is a choice of methods shown, then no marks should be awarded, unless the answer on the answer line makes clear the method that has been used.

8 Follow through marks

Follow through marks which involve a single stage calculation can be awarded without working since you can check the answer yourself, but if ambiguous do not award.
Follow through marks which involve more than one stage of calculation can only be awarded on sight of the relevant working, even if it appears obvious that there is only one way you could get the answer given.

9 Ignoring subsequent work

It is appropriate to ignore subsequent work when the additional work does not change the answer in a way that is inappropriate for the question: e.g. incorrect cancelling of a fraction that would otherwise be correct
It is not appropriate to ignore subsequent work when the additional work essentially makes the answer incorrect e.g. algebra.

10 Probability

Probability answers must be given a fractions, percentages or decimals. If a candidate gives a decimal equivalent to a probability, this should be written to at least 2 decimal places (unless tenths).
Incorrect notation should lose the accuracy marks, but be awarded any implied method marks.
If a probability answer is given on the answer line using both incorrect and correct notation, award the marks.
If a probability fraction is given then cancelled incorrectly, ignore the incorrectly cancelled answer.

Linear equations

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

12 Parts of questions

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

13 Range of answers

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

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

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

PAPER: 1MA0_1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
1	(a)		Lhotse	1	B1 cao
	(b)		8200	1	B1 cao
	(c)		Seven thousand four hundred and twenty-eight	1	B1 for any unambiguous answer
	(d)		8051	1	B1 cao
2	(a)		4,8,3,3,2	2	M1 for at least 2 tallies or 2 frequencies correct A1 for 5 correct frequencies
	(b)		correct graph	3	M1 for bar chart or other suitable chart with at least 2 correct frequencies drawn for their scale (ft from (a)) M1 for all bars labelled and vertical axis correctly scaled A1 for accurately representing their data, with all labels, ft from (a)
3	(a)		56 000	1	B1 cao
	(b)		276	1	B1 cao
	(c)		6	1	B1 cao
	(d)		29	1	B1 cao
	(e)		13	1	B1 cao

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

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

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

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

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

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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]

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

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

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

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

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

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

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Mark Scheme (Results)

November 2015

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

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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)

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

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5MB2F_01 November 2015					
Question		**Working**	**Answer**	**Mark**	**Notes**
1	(a)		37	1	B1 cao
	(b)		23 079	1	B1 cao
	(c)		8 hundred	1	B1 for 8 hundreds or 800
2			117 cm	2	M1 for 123−6 or 1.23−0.06 or 117 or 1.17 A1 for 117 cm or 1.17 m
3	(a)		(4, 2)	1	B1 cao
	(b)		Cross at $(1, \frac{1}{2})$	1	B1 cao
4			80	3	M1 for 120 ÷ 3 (=40) M1 for 120 − "40" A1 cao OR M1 for 120 ÷ 3 (=40) M1 for "40" × 2 A1 cao

5MB2F_01 November 2015					
Question		**Working**	**Answer**	**Mark**	**Notes**
5	(a)		7.5 cm	2	B2 for 7.3 cm − 7.7 cm or 73 mm − 77 mm or 7 cm 5 mm (B1 for cm with value in range 6.5 − 8.5 or mm with value in range 65 − 85)
	(b)(i)		Acute	2	B1 cao
	(ii)		53		B1 for 51 − 55
6			3	2	M1 for correct method to find both total scores A1 cao OR M1 for correct method to find differences for each judge A1 cao
7	(a)		Parallelogram	1	B1 (accept trapezium)
	(b)		2	1	B1 cao

5MB2F_01 November 2015					
Question		**Working**	**Answer**	**Mark**	**Notes**
*8			No with working	3	M1 for correct method to find time of arrival at station 8 16 + 25 + 12 A1 for 8 53 C1 ft (dep on M1)for correct comparison of "8 53"(and 8 50) OR M1 for correct method to find time interval from 8 16 to 8 50 A1 for 34 and 37 C1 ft (dep on M1) for correct comparison of "34" and "37"
9	(a)		0.37, 0.401, 0.439, 0.46	1	B1 cao
	(b)	$\frac{1}{4}, \frac{1}{2}, \frac{2}{3}, \frac{3}{4}, \frac{7}{8}$ 0.75, 0.875, 0.25, 0.5, 0.66	0.25, $\frac{1}{2}, \frac{2}{3}$, 75%, $\frac{7}{8}$	2	M1 for attempt to convert all to same form or one error in ordered listing A1 for correct order (Accept 0.67 or 0.66 for $\frac{2}{3}$) (**SC**: B1 for order reversed)
10			3.15	4	M1 for correct first step eg 8.2 + 6.1 + 6.1 (= 20.4) eg 30 − one ticket price M1 for finding money left over eg 30 – "20.4" (= 9.6) or finding the cost of 3 drinks of one size eg 3.15 × 3 M1 for a complete method to work out the price of each drink eg "9.6" ÷ 3 (= 3.2) eg 30 – "20.4" **and** cost of 3 drinks of all sizes A1 for 3.15 from correct calculations

5MB2F_01 November 2015					
Question		**Working**	**Answer**	**Mark**	**Notes**
11	(i)		11	3	B1 cao
	(ii)		50		B1 cao
	(iii)		31		B1 cao
12			27	2	M1 for $6 \times 2 + 5 \times 3$ oe A1 cao
13	(a)		5r	1	B1
	(b)		14t	1	B1
	(c)		2ab	1	B1
14			40	3	M1 for $24 \div 3$ (= 8) M1 for "8"× 5 A1 cao OR M1 for 3×24 (= 72) M1 for "3×24" – 8 – 8 – 8 – 8 A1 cao
15		1, 4, 9, 16, 25 1, 8, 27	Liz 25, Howard 27	2	M1 for a list of at least 2 square numbers or at least 2 cube numbers identified with no ambiguity or Liz and Howard's ages reversed A1 cao

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5MB2F_01 November 2015					
Question		Working	Answer	Mark	Notes
*16			20°	4	B1 for identifying 60° angle on the diagram or in a correct statement of working M1 for completing method eg 180−(360−140−60) A1 for 20 C1 for all reasons used Angles at a point add up to 360° Angles in a triangle add up to 180° Base angles of an isosceles triangle are equal
17			50	2	M1 for 200 ÷ 4 A1 cao

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5MB2F_01 November 2015					
Question		Working	Answer	Mark	Notes
18			68	5	B1 for correct conversion of units M1 for 250 ÷ 25 (= 10) or 300 ÷ 20 (= 15) M1 for "10" × "15" M1 (dep on M2) for number of tiles ÷ 20, round up, × 8.5(0) A1 for 68 OR B1 for correct conversion of units M1 for 250 ÷ 20 (= 12.5) or 300 ÷ 25 (= 12) M1 for "12.5" × "12" M1 (dep on M2) for number of tiles ÷ 20, round up, × 8.5(0) A1 for 68 OR B1 for correct conversion of units M1 for 3 × 2.5 (= 7 .5) or 20 × 25 (= 500) M1 for "3 × 2.5" ÷ "0.2 × 0.25" or "300 × 250" ÷ "20 × 25" M1 (dep on M2) for number of tiles ÷ 20, round up, × 8.5(0) A1 for 68
*19		1, 4, 7, 10, 13 8, 6, 4, 2, 0	Explanation	2	M1 for listing at least 3 terms of both sequences C1 for Yes and explanation from fully correct working that 4 is in both sequences; numbers in A are increasing; numbers in B are decreasing

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5MB2F_01 November 2015					
Question		**Working**	**Answer**	**Mark**	**Notes**
20			7.21 (am)	3	M1 for listing multiples 9,18,27,36 and 12,24,36 (condone 1 arithmetic error) or method to find LCM M1 for identifying 36 as LCM A1 cao OR M1 for listing times 6.54, 7.03, 7.12, 7.21 or for listing times 6.57, 7.09, 7.21 (condone one arithmetic error) M1 for listing times 6.54, 7.03, 7.12, 7.21 **and** 6.57, 7.09, 7.21 (condone one arithmetic error) A1 cao

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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 $x = 4$

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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 $270 \div 5$
			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 28

Both parts of this question were poorly answered. In part (a), 21 (15 + 6) or 18 (15 + 3) were common 6th terms. In part (b), many chose incorrect patterns to follow; $2a$, $3a$, $3a$, $4a$, $4a$, etc. and $3a$, $4a$, $5a$, $6a$, etc. and $4a$, $6a$, $8a$, $10a$, etc. were typical incorrect patterns seen. Students who got the correct pattern, perhaps with no understanding of a Fibonacci sequence, usually succeeded in both parts.

Question 13

The most common answer in part (a) was 40, though some gave 80. A significant minority lost the mark by giving the full sequence of numbers, but not highlighting 40 as their chosen answer.

Part (b) was also well attempted but at times was poorly explained by students who would just say they counted up. The most common explanations included the numbers 80 and 88, or focussed on the fact that the sequence was all even numbers, factors of 8, or that 85 was an odd number. Students who deduced the algebraic rule and did a division to show it was not an integer could also gain the mark, as long as their working was correct.

Question 26

This question was not answered well. It was disappointing that many students could not find at least two terms by substituting values of n. Many of those that did attempt to find terms of each sequence did not generate sufficient terms to satisfy the demand of the question. Some students found that the number 31 is in both sequences but did not show that that there is only one number that is in both sequences by generating the first five terms of the first sequence and the first six terms of the second sequence. Errors in generating terms using $2n^2 - 1$ were often the result of using an incorrect order of operations, most often finding $2n$ and then squaring.

Question 8

It is clear that many of the students were familiar with this sequence (triangle numbers) and were simply able to write down the next two terms. Many others were able to decipher the correct pattern and generated the next two terms by addition of 6 then 7. Some of these students only gained one of the two marks, for, despite knowing what to add, they made arithmetic errors along the way.

Question 20

The great majority of students recognised 3 as the difference between terms of the given sequence of numbers. This alone gained no credit as further processing was needed to form a general expression in terms of n. Many students did gain full marks but incorrect answers of $3n + 2$ or $3n$ (which were awarded one mark) and $n + 3$ or $-2n + 3$ (which failed to score) were common.

Question 13

In part (a), the great majority of students recognised and were able to explain why 7 could be the next term of the given sequence. The usual incorrect response was from those who insisted that Emma must be wrong since the pattern was one of doubling resulting in 8 as the next term. Many students did not explain the rule well or gave an ambiguous explanation. Those that annotated the original sequence made their explanation clearer. Another common incorrect response was 1+2+4=7, using the sum of all previous terms.

In part (b) most students usually gained at least one mark for a 5th term of 15. Many correctly completed subsequent terms of the sequence but then chose 45 as the 8th term, applying eight differences by mistake.

Question 25

Many students left this question blank or gave poor responses. Some students managed to gain 1 mark for finding the next term of the sequence, or for taking a step to use their (incorrect) fifth term in working towards a value for a. These included a significant minority who thought the fifth term was $7a$ and then gained a mark for $228 \div (1+2+3+5+7)$. Some students used a trial and improvement method but these were unsuccessful.

Question 9

Both parts of this question were answered well with very few mistakes seen.

Question 8

Most found the two terms 28 and 33 in part (a).

In part (b) most students could work out the next two terms but justifying why 50 wasn't in the sequence was not done as well; a significant number of students left this section blank. The most common and efficient answer was to state that all the terms end in a 3 or an 8.

Students who chose another method were not as consistent with achieving the mark. A number of students would state the 48 or 53, but not the two together and therefore not fully proving why 50 was not in the sequence. Some stated the nth term as $5n - 2$ but this needed to be supplemented by a further statement linked to the question. Students should be encouraged to always write out the sequence if it is possible; those who did this secured a sound answer for both parts on this occasion.

Question 20

For part (a) students had mixed success finding the nth term, with almost equal numbers gaining either 0 or 2 marks. Errors made were finding the common difference but not recognising this as $6n$ and stated a response of $n + 6$ or $6 – n$.

Those students who identified $6n$ sometimes paired it with $–1$ instead of $+1$ or put $6n + 7$ or left as $6n$. A common incorrect answer was $7 – 6n$ which gained no credit.
In part (b) some students were successful in listing the terms of the sequence. But a common listing error was to start with 6 and subtract 8, rather than the other way around.
There were very few attempts to set up and solve an equation. Those that set up the equation $8 – 6n = – 58$ were then unable to successfully show that n was 11 as many arithmetic errors occurred.

Centres should ensure that students practising creating equations and solving them, especially involving negative numbers.

Question 10

In part (i), most students were able to find one of the two solutions given in the mark scheme, 11, 10 being seen most frequently. Errors occurred when candidates assumed it was a linear sequence and only found the first difference and applied that throughout, or where they had difficulty processing a decreasing sequence and added onto the starting number and found the terms that came before the start of the sequence instead of terms 4 and 5. Occasionally arithmetic errors lost the mark.
In part (ii) candidates had difficulty in explaining the decreasing difference, often referring to the amount or sequence going down by one rather than the difference. The most common successful strategy for gaining the mark was for writing the differences, (-4, -3, -2, -1), sometimes on the sequence itself. Those that did not use numbers had less success here as many of the worded answers without examples were too vague or incoherent. Candidates are advised to practice talking about differences in terms of what operation they are performing and its value. There was also some confusion as to whether it was an increasing or decreasing sequence.

Question 19

Many students correctly found the difference of 8 between terms but were unable to offer a complete expression for the *n*th term, $n + 8$ and $8n$, the latter gaining one mark, were common answers. After finding $8n$ many candidates were unable to find the correct number to subtract. Other common incorrect responses were $13n - 8$ and $-13n + 8$

Question 9

Almost all students could continue the sequence correctly to gain the mark in part (a).

Part (b) performed less successfully. Whilst many were generally able to write the correct values using ratio notation, not all continued to write their ratio in the simplest form and although many achieved the correct simplified ratio, some went on to do further incorrect

simplification such as 4:9 leading to 2:3 which lost the accuracy mark. However correct simplification to 1:2.25 (1: *n*) did not lose the accuracy mark and was occasionally seen. When no marks were awarded, it was often due to not understanding how to write the appropriate values using ratio notation, such as simply writing as a fraction instead. Other commonly seen responses that gained no credit included choosing the incorrect terms from the sequence or selecting three terms e.g. 8:23 or 8:13:18 and a small minority attempted to find the *n*th term.

Question 8

(a) Most candidates were able to articulate that the sequence was decreasing by 6, by saying exactly that or in an alternative way such as; "subtract 6", "decreasing by 6", "minus 6" or "go down 6". Some spoiled their answers by not quantifying the reduction.
(b) The majority of candidates were able to continue the sequence, often next to the number sequence given. They then went on to either work out the difference between the 5th and 7th term by completing a subtraction. There were two main methods seen; 73 − 61 or it was sometime shown in two different steps: 73 − 6 = 67 and 67 – 6 = 61.
(c) Candidates always find response type questions more difficult to answer and often do not give enough detail to explain their reasoning, but on this occasion this question was well answered. Answers such as "subtracting 6 will not get to 52" or it goes past 52 or similar were not enough to be credited with the mark without further supportive evidence of their statement. Most candidates chose to either comment: "the sequence is odd" and/or "52 is an even number" **or** continued the sequence far enough to show that the 8th term was 55 and/or the 9th term was 49.

Question 20

A minority of candidates were able to find the *n*th term for the arithmetic sequence given in the question. More candidates were able to give an answer in the form $4n + k$ having identified the common difference for the sequence, but finding the incorrect constant term or no constant term (i.e. $4n$). Common incorrect answers included identifying the next term in the sequence (17), stating the term-to-term rule for the sequence, +4, $n + 4$ where the need for an algebraic expression was recognised but the common difference was incorrectly used, or switching the coefficient of *n* with the constant term $-3n + 4$

Question 2

In this question learners were presented with a list of the first four even numbers and asked to find the 10th even number. This was answered well by the majority of learners, however where errors were seen these included giving an answer of 10 (the next term in the sequence) or an answer of 20th.

Question 29

Responses to the final question suggest learners were not very familiar with Fibonacci sequences or how they are formed. The first step was to continue the sequence as far as the fifth term, which should have been $11a$. Some responses show a range of incorrect attempts to carry on the sequence such as alternating additions of $2a$ and a, or simply by writing $4a$ followed by $5a$. Of the responses that correctly continued the sequence and found $11a$, some continued and gained the second mark for equating the fifth term with 286 in some way, with many then finding the correct final answer, but some were unable to show how this linked to 286 in a correct way and gained no further credit. Blank responses were also commonly seen.

Summary

Based on their performance on this paper, learners should:

- ensure they are well-practised in efficient use of their calculator
- read questions carefully, including checking whether the magnitude of an answer is sensible, units are appropriate, and the level of accuracy required is shown
- show every stage of working, particularly if the question specifically requests this
- improve knowledge of formulae for area and volume
- when working with percentages, show and use calculations rather than written statements such as 15% of 9000 = …
- be able to work with both familiar and unfamiliar situations
- remember to cross out incorrect work or positively identify their chosen method when using a range of approaches to avoid losing marks due to choice.

Question 12

In part (a), B1 was awarded for a response of 11. Common incorrect responses included expressions such as $3n - 1$, $7n - 1$, and $12n - 3$, or numerical values such as -1, 7, and 42.

In part (b), there were several valid approaches to gain 2 marks. The most frequent correct method involved continuing the sequence to 63 and giving a correct decision of 'yes'. Some responses used the nth term to show that 63 was the 10th term or that $n = 10$. It should be noted that stating the nth term $(6n + 3)$ alone was not sufficient for credit; it needed to be used, for example by setting it equal to 63, to gain M1.

Responses that continued the sequence but included errors could still gain M1 if at least three correct terms were shown. Common responses that did not gain credit included statements such as "yes, as $57 + 6 = 63$" or "yes, as I keep on adding 6 to reach 63", which did not demonstrate that 63 is part of the sequence mathematically.



Examiners' Report
Principal Examiner Feedback

November 2020

Pearson Edexcel GCSE (9 – 1)
In Mathematics (1MA1)
Foundation (Calculator) Paper 3F

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GCSE (9 – 1) Mathematics – 1MA1
Principal Examiner Feedback – Foundation Paper 3

Introduction

The overall quality of the presentation of work was good. However, students need to read the questions carefully. There remain a concerning number of cases where students copy down the wrong figures from the question, mis-copy their own figures, or round figures almost randomly. Equally another error sometimes occurs when students prematurely round or truncate figures, either their own figures or figures from the calculator, which usually result in lost accuracy marks and could also make questions more difficult than they were designed to be.

Approaches to questions that required some interpretation or explanation were inconsistent. Questions 10 and 21 were answered well, but poor attempts were made in questions 15 and 26. On too many occasions students included contradictory or incorrect statements, which cannot be credited.

Within a broad range of questions, the paper was able to discriminate well. Weakest areas continue to be the application of ratios, scales and rates, but also algebraic manipulation and problem solving. Most demonstrated good use of a calculator, though on some occasions it was clear that they did not have an understanding of the way in which their calculator worked or did not have one at all, such as in question 9.

Questions which had a slightly unexpected approach, that is required more thought, caused immediate problems for many, even in the earlier part of the paper. This includes questions 18, 20 and 24. Question 25 to 29 were the more challenging questions for those striving to demonstrate ability at the highest grades available, and a significant proportion of students therefore failed to score on these questions.

There were far fewer attempts using trial and improvement approaches. These mainly occurred when students showed evidence of not having a calculator, mainly evident in questions 15, 18, 19 and 20 where non-calculator methods were also seen, such as multiple additions.

The inclusion of working out to support answers remains an issue for many; but not only does working out need to be shown, it needs to be shown legibly, demonstrating the processes of calculation that are used. This is most important in longer questions, and in “show that” questions.

Report on Individual Questions.

Question 1

This was a poorly answered question. Most students gave the correct answer of 3 but 300, 30 and 3000 were frequently seen.

Question 2

A well answered question with nearly all giving the correct answer of 8.

Question 3

This was not always answered correctly.

Question 4

There were few incorrect answers in this question.

Question 5

This was very well answered with few failing to gain the mark. The most common error was the absence of one of the numbers.

Question 6

A very well answered question. There were a few who gave the answer of 4 to part (a).

Question 7

Students were generally very successful with this question with most obtaining full marks. Those achieving partial marks tended to mis-read the shaded section and recorded the fraction unshaded instead leaving their answer as $\frac{1}{4}$. A significant minority failed to give their answer in its simplest form, usually leaving the answer as $\frac{12}{16}$.

Question 8

This question was generally well done with the majority dividing 200 by 25 (some with multiple additions of 25) and then completing the process of 9.75 × 8 and giving the correct answer 78. Some students preferred to list eight lots of £9.75. The most common errors were students multiplying the cost by 200 or by 25.

Question 9

Parts (a) and (b) were not always answered correctly, with students having difficulty with the order of operations on their calculators.

It was rare to see any correct answers to part (c). Knowing the meaning of the term “reciprocal” is clearly a weakness in students.

Question 10

Most students got the marks in parts (a) and (b).

In part (c) students were able to explain that the drop in the first 3 minutes was steeper than the last 3 minutes. Some struggled to articulate this and some forgot to agree and imply that Pam was correct. There were a wide variety of values presented by students, although this question assessed the interpretation of the graph rather than the accuracy of reading values. Students generally used suitable values to explain their reasoning. Some students didn’t use the graph at all but tried to explain that water cools more quickly when it is hotter.

Question 11

Many responses achieved full marks. Many managed to use the fact that angles in a quadrilateral sum to 360 or found the angle on the straight line to y was 70 degrees and score one mark. Not all students who correctly calculated angle *PSR* were able to complete this question correctly, deciding to go off in all sorts of related incorrect calculations. Some of the weaker students knew that angles on a straight line totalled 180° but chose to use angle *QPS* with angle y to sum to this total.

Question 12

Part (a)(i) was well answered. In parts (a)(ii) and (b) it was clear students did not properly understand the meaning of "term". This was evidenced by statement involving algebra, "nth term", "n –5" and numbers not relating to the sequence given in the question.

Question 13

Many students added up the numbers that they saw on the diagram to get an answer of 26. Many more managed to score at least one mark on this question as they identified the length of one of the missing sides, usually on the diagram. For some reason finding 2cm was much more prevalent than finding 6cm. Some then forgot to find the missing length of 6cm leading to an answer of 28. The majority understood the meaning of perimeter, but some divided the shape into rectangles and added together the perimeter of both rectangles. The other common mistake was trying to find the area.

Question 14

In part (a) most students understood the need to collect like terms and it was often done successfully. If full marks were not awarded, students usually achieved one method mark, usually for the $5x$.
The negative sometimes caused problems when collecting the y terms. Common errors seen included $6xy$ and $5x^2 \pm y^2$.
Part (b) was well done by many with the answer 3 on the answer line, though a formal algebraic approach was not seen very often, students preferring to show $22 - 7 \div 5$. Some showed "–7" written by the equation but this was not credited unless the next stage was shown by, for example, writing $5p = 15$. Few attempted to divide by 5 as their first step. The most common incorrect answer seen was 10 from subtracting the 5 and 7 from 22.

Question 15

There were some good attempts at this question, encouraging since there were several steps needed to get to the answer: division to get the number of packs and rounding 7.5 to 8 before calculating the cost. Conclusions were well stated. The common error was to work out the individual cost of the batteries in each shop and then find the cost of 30 which clearly demonstrated misunderstanding about the packs.

Part (b) was usually well stated with 'No' and a clear reason. Most calculated the cost of 30 individual batteries of £12 and £13.50 and stated 'No, shop A is still cheaper'.

Question 16

In part (a) the majority wrote the correct answer on the answer line. Some went on to convert their answer to a decimal which was unnecessary. It was also pleasing to see most students using the

correct notation for probability with only a minority using the incorrect notation of a ratio. Of those not gaining both marks, most earned M1 for $\frac{5}{n}$ or $\frac{m}{11}$.

In part (b) a common incorrect answer was 0.3, but the majority of students gave the correct answer of 0.7, which was sometimes written as an equivalent fraction.

Question 17

The majority of students attempting this question gained full marks. There were many who gained 1 mark for drawing only one 6cm line correctly, though quite a few struggled to draw an accurate isosceles triangle. Though they were not required in this question, there was very little evidence of construction lines/arcs drawn; it seemed most measured using their rulers.

Question 18

Many students secured one mark for providing an accurate conversion using the graph. However, others drew lines on the graph, not always correctly, but failed to take any accurate readings from these. Of those that did, most went on to complete the method, but many of these confused their $ with £ and so lost the method mark. Other students chose to take their initial reading near the origin, for instance using £5 = $6, which by the time they had multiplied it up to $345 was too inaccurate to give an answer within the range allowed. There was some misunderstanding of the scale on the $ axis, with some students assuming 1 small square = $1

Question 19

In part (a) to achieve both the marks, students needed to understand through proportional reasoning that the number of tuna sandwiches represented 40% of the total sold. Many students were not able to demonstrate this and as such scored no marks. There were some who adopted a bar modelling approach e.g. stating 40% = 56 so 20% = 28, and adding 56 + 56 + 28.

Part (b) was answered slightly better, but still demonstrated that students need more practice of ratio and proportion. Where students showed some understanding of what was required but chose to use a percentage of 18 to scale up were often not able to achieve a solution that was accurate enough.

Question 20

Students that were able to demonstrate some understanding of the context were rewarded with one of two process marks if they able to sum the total of money (200) that Akhtar, Ben and Carl had without the £10 notes or used the mean amount to calculate the total of all the money (240). After scoring one or two process marks there was a variable understanding of how to use these values to solve the problem. Of those who made mistakes many appreciated that the answer had to be an integer and rounded their mistakes rather than reflecting that there had to have been an error and a further check of their work was needed.

Question 21

Part (a) was answered well, with many students gaining the mark. The most common incorrect answer was $\frac{25}{50}$, a probability statement rather than a statement of the number of times.

In part (b) some students thought that the answer was Paula because "10 times was enough" as her approach was quicker. Lots of students had the right idea that the more trials, the more reliable your results, but some failed to actually say "Simon, because…" A common mistake was just talking about 100 throws and not making comparisons.

Question 22

This question was attempted by most students but very few correct plan views were seen. Most students incorrectly drew a net or a side elevation involving a square with a triangle attached. Out of the ones who scored any marks, most scored one mark for a square with sides 6cm, but without the diagonals drawn.

Question 23

Part (a) was not well answered. n^{15} was a common incorrect answer.

In part (b) c was usually shown correctly (frequently written as c^1 but often paired with d^4). Most achieved one mark for c or (less likely) d^3. There were a significant number of correct values for c found from an incorrect method.

In part (c) many students were unsure where to start and a common incorrect answer given was $2.5x > 7$. Of those students who did start to approach the question correctly, many ignored the inequality sign throughout the process getting $x = 2.8$ or $x = \frac{14}{5}$ and as a result could not gain the accuracy mark.

Question 24

Most students attempted this question but very few achieved full marks. The distance, speed, time triangle did not help in this question; students always seem to make more errors at this level when using it rather than taking an everyday approach to the problem. Some added the distances together and the speeds together then divided by 2. Quite a few students gained one mark, but more students gained two marks for finding the times as decimals and adding the two times but failing to convert the times correctly and ended up with 2 hr 75 mins or 3 hr 15 mins which were the most common answers seen.

Question 25

Error intervals remain a weakness and was poorly attempted. Some were able to correctly give 9.35 but rarely gave 9.45; a few 9.44 but not 9.4499...

Question 26

Many were able to secure the first process mark for finding the area of one of the lawns (45 m^2 or 140 m^2) or the amount of seed available (10kg) but did not proceed any further with many reasoning incorrectly that if 3kg covered 5 × 9 area, then 6kg would cover 10 × 18, more than is needed. Other students were successful in gaining the second process mark mainly for the coverage of 1 kg of grass seed ($15m^2$). The most successful approaches seen where students were able to reach the correct conclusion were finding the amount of grass seed needed (9.3…kg) and comparing it with 10kg or finding the area that could be seeded with 10kg ($150m^2$) and comparing it with $140m^2$.

Part (b) required reasoning supported by correct figures and as a result, students were not successful in gaining many marks.

Question 27

Part (a) was generally answered well, and most students were able to write at least two correct probabilities on the tree diagram, sometimes writing these as equivalent fractions of $\frac{2}{4}$2/6 and 4/6. Some students chose to try to use decimals for this problem but were not able to score any marks due to inaccurate approximations of $\frac{1}{3}$.

Having perhaps achieved one or both marks in part (a) many students lacked the knowledge that they needed to select the correct branches and multiply the fractions together and the few that did were rewarded with the marks in part (b).

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 29

Many started off knowing that they needed to multiply the dimensions 6, 4 and 10 but many failed to take into account that the end shape was a triangle and division by 2 was required. The biggest failing, after calculating the volume correctly, was to divide by 0.8 getting the answer 150. For those students that only omitted division by 2 there was a special case mark for the answer of 192.

Summary

Based on their performance on this paper, students should:

- accurately transcribe figures taken from the question, and taken from their own work
- avoid rounding or truncating answers, and to use the most accurate values in subsequent calculations
- ensure that their work is legible for examiners to consider awarding marks. For example, avoid any possible confusion when writing 1s and 7s, when writing 4s and 9s, and even when writing 0s and 6s.
- ensure that they include working out to support answers
- work on algebraic manipulation and derivation, and application of ratios, scaling and rates in preparing for future examinations.
- learn the meaning of technical terms such as “reciprocal”, the “term” of a sequence and error intervals
- continue to need practise answering response type questions where a written explanation is required.

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