Chhetri Academy

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GCSE MATHS

Algebra

Edexcel 1MA1 | Subtopic collection Topic 17

Linear equations

Foundation tier

Answers and examiner comments

139	2011-2025	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
13		0.06 or 6%	2	M1 for 1 - (0.09 + 0.18 + 0.16 + 0.21 + 0.30) oe OR M1 for 100 – (9 + 18 + 16 + 21 + 30) oe OR M1 for $1 - (\frac{9}{100} + \frac{18}{100} + \frac{16}{100} + \frac{21}{100} + \frac{30}{100})$ A1 for 0.06 or 6% (6 only gets A0) or $\frac{6}{100}$ oe [SC; B1 for 6 on the answer line without working, if M0 scored]

5	(i) (ii)		130 Reason	2	B1 for 130 cao B1 for reason eg "angles on a (straight) line (sum to) 180° NB: those underlined are the essential elements of an answer.

5MB2F_01

7	(i) (ii)		64 Vertically opposite angles	2	B1 cao B1 for 'vertically **opposite angles**' or '**vertically opposite** angles'

15	(a)		4	1	B1 cao
	(b)	9.5 – 4.75 = **OR** 9.5 ÷ 2 =	4.75	2	M1 for 9.5 – 4.75 **or** 9.5 ÷ 2 **or** 4.75 – 9.5 A1 cao
	(c)		6	1	B1 cao
	(d)	12 × 4 =	48	2	M1 for × 4 seen **or** identifying + 0.5 for every 2 inches **or** 12 + 12 + 12 + 12 oe **or** build up method eg 12, 24, 36, 48 allow one error A1 cao

27		$3x-15 = 2x+24$ $x = 39$ **OR** $2x+3x-15+2x+2x+24 = 360$ $9x + 9 = 360$ $9x = 351$ $x = 39$ **OR** $2x + 2x+24 = 180$ $4x + 24 = 180$ $4x = 156$ $x = 39$ **OR** $2x + 3x-15 = 180$ $5x - 15 = 180$ $5x = 195$ $x = 39$	39	3	M1 for forming an appropriate equation eg $3x - 15 = 2x + 24$ **or** $2x + 3x - 15 + 2x + 2x + 24 = 360$ oe **or** $2x + 2x + 24 = 180$ oe **or** $2x + 3x - 15 = 180$ oe **or** $2x + 3x - 15 = 2x + 2x + 24$ M1 (dep) for correct operation(s) to isolate x and non-x terms in an equation to get $ax = b$ A1 cao **OR** M2 for $\frac{351}{9}$ **or** $\frac{195}{5}$ **or** $\frac{156}{4}$ oe A1 cao

14	(a)	$3.5 \times 12 - 5$	37	2	M1 for $3.5 \times 12 - 5$ or 42 - 5 A1 cao
	(b)	$3.5 \times -9 - -6$	–25.5	2	M1 for $3.5 \times -9 - -6$ **or** $3.5 \times -9 + 6$ **or** sight of –31.5 A1 for –25.5 **or** $-\frac{51}{2}$ **or** $-25\frac{1}{2}$

1MA0_2F

19	(a)		19	1	B1 cao
	(b)		8	1	B1 cao
	(c)		$2\frac{1}{4}$	2	M1 for $4m = 15 - 6$ **or** clear attempt to subtract 6 from both sides of the equation A1 for $2\ \frac{1}{4}$ **or** 2.25 **or** $\frac{9}{4}$

1MA0_2F

5	(a)		5	1	B1 cao
	(b)		7	1	B1 cao

5MB3F_01

Question		Working	Answer	Mark	Notes
12	(a)	24 ÷ 4 + 5	11	2	M1 for 24 ÷ 4 + 5 or 6 + 5 A1 cao
	(b)	13 = ? ÷ 4 + 5 ? = (13 – 5) × 4	32	3	M2 for (13 – 5) × 4 (M1 for 13 – 5 × 4 or 13 = ? ÷ 4 + 5 or 13 – 5 or × 4 seen as second operation) A1 cao SC B1 for 47 as answer NB accept reverse flowcharts for inverse operations

5MB3F_01

17	(a)		7	1	B1 cao
	(b)		12	1	B1 cao
	(c)	$5w = 10 + 6$ $w = 16 \div 5$ or $w - \frac{6}{5} = \frac{10}{5}$ oe	16/5 oe	2	M1 for $5w - 6 + 6 = 10 + 6$ oe or $w - \frac{6}{5} = \frac{10}{5}$ oe A1 for $\frac{16}{5}$, $3\frac{1}{5}$, 3.2, oe

1MA0_1F

Original question 19

The full source mark scheme begins on page 219. Use the original paper code, tier and question number shown above.

Question		Working	Answer	Mark	Notes
10	(a)	30 + 8×4	62	2	M1 for 30 + 8×4 or attempt to add four 8s to 30 (allow one error in addition) A1 cao
	(b)	110 – 30 = 80 80÷8 = 10 **OR** 110 – 62 = 48 48÷8 = 6 4 + 6 = 10	10	3	M1 for 110 – 30 (=80) M1 (dep) for '80' ÷ 8 or A1 cao OR M1 for 110 – 62 (= 48) M1(dep) for '48'÷8 = 6 A1 cao

Question		Working	Answer	Mark	Notes
18	(a)	$y = 4 \times 7.5 + 5.4$	35.4	2	M1 for $4 \times 7.5 + 5.4$ A1 cao
	(b)	$18.8 = 4x - 2.4$ $x = \frac{18.8 + 2.4}{4}$	5.3	2	M1 for intention to add 2.4 to 18.8 or to subtract -2.4 from 18.8 or to divide 18.8 and (-)2.4 by 4 A1 cao

12	(a)	$5 \times 4 - 2 \times 3$	14	2	M1 for $5 \times 4 - 2 \times 3$ oe A1 cao
	(b)	-5×-5	25	1	B1 cao

9	(a)	25 × 9 + 10	235	2	M1 25 × 9 + 10 A1 cao
	(b)	360 – 10 = 350 350 ÷ 25	14	3	M1 360 – 10 (=350) or 360 ÷ 25 (=14.4) M1 for correct order of operations – 10 then ÷ 25 A1 cao OR M1 reverse flowchart for inverse operations with either – 10 or ÷ 25 M1 reverse flowchart for inverse operations with both – 10 and ÷ 25 in correct order A1 cao OR M1 14 × 25 M1 350 + 10 or 14 × 25 + 10 A1 cao

5MB3F_01

Question		Working	Answer	Mark	Notes
18		$x + x + 4 + x - 2 = 26$ $3x + 2 = 26$ $3x = 24$ $x = 8$ OR $26 - 4 = 22$ $22 + 2 = 24$ $24 \div 3$	8	4	M1 $x + x + 4$ or $x + x - 2$ or $x + 4 + x - 2$ or "expression in x" + $x + 4 = 26$ or "expression in x" + $x - 2 = 26$ M1(dep) "3"x + "2" = 26 M1 "3"x = 26 - "2" A1 cao OR M1 $26 - 4$ or $26 + 2$ M1 "22" + 2 or "28" - 4 M1 "24" ÷ 3 A1 cao OR M3 6 + 8 + 12 seen (M2 three ages that meet the criteria x, $x + 4$ and $x - 2$) (M1 two trials of three ages added or a set of three ages that would add to 26) A1 cao

9	(a)		$4a$	1	B1 for $4a$ oe as a single term
	(b)		$3cd$	1	B1 for $3cd$ oe as a single term
	(c)		$7ef$	1	B1 for $7ef$ oe as a single term
	(d)		3	1	B1 cao
	(e)		2	2	M1 for intention to subtract 7 from each side or divide each term by 5 or embedded method A1 cao

1MA0_1F

12	(a)		9	1	B1 cao
	(b)		12	1	B1 cao
	(c)		4	1	B1 cao
	(d)		22	2	M1 for 2×5 (= 10) and 3×4 (= 12) A1 cao

18	(a)		$4x + 1 = 19$	2	M1 for $x + x + 1 + 2x$ (= 19) A1 for $4x + 1 = 19$ following working
	(b)		4.5	2	M1 for subtracting 1 from both sides or for dividing each term by 4 A1 for 4.5 or 4½
	(c)		14.5	2	M1 for ('4.5' + 1) + 2 × '4.5' or 19 – '4.5' or 3 × '4.5' + 1 A1 for 14.5 or 14½ or ft '4.5'

23	(a)		10	1	B1 cao
	(b)		8.5	1	B1 accept $\frac{17}{2}$ or $8\frac{1}{2}$
	(c)		32	1	B1 cao
	(d)		$6 + 3t$	1	B1 for $6 + 3t$

PAPER: 1MA0_1F

Original question 28

The full source mark scheme begins on page 237. Use the original paper code, tier and question number shown above.

8	(a)	4×3	12	1	B1 cao
	(b)		5	2	M1 for $4 \times 2 - 3$ A1 cao

Original question 26

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

Question		Working	Answer	Mark	Notes
12	(a)		6	1	B1 cao
	(b)		7	1	B1 cao
	(c)		2.6	2	M1 for clear intention to add 4 to both sides **or** clear intention to divide all terms by 5 A1 for $\frac{13}{5}$ oe

Question		Working	Answer	Mark	Notes
20		$x + 2x + 15 = 63$ $3x = 48$	16	3	M1 for $x + 2x + 15 = 63$ M1 for attempt to subtract 15 from each side of their equation A1 cao **or** M1 for 63 – 15 (=48) M1 for '48'÷3 A1 cao **or** M2 for16 and 32 seen (M1 for strategy for finding at least two pairs of marbles that meet the criteria x, $2x$) A1 cao

13			4	2	M1 for correct order of operations +7 then ÷3 A1 cao OR M1 for forming the equation $3x - 7 = 5$ and showing intention to add 7 to both sides or divide each term by 3 as a first step A1 cao NB Embedded solutions get M1 mark provided the equation or working is complete.

PAPER: 1MA0_1F

Question		Working	Answer	Mark	Notes
19	(a)		14	1	B1 cao
	(b)		5	2	M1 for intention to subtract 4 from each side or divide each term by 3 as a first step **or** embedded answer. A1 cao

23	(a)		9	1	B1 cao
	(b)		5	1	B1 cao
	(c)		17	2	M1 for clear intention to expand bracket or divide both sides by 2 as the first step eg. $2y - 2\times5 = 24$ **or** $y - 5 = 24 \div 2$ A1 for 17
	(d)		$5(3p + 8)$	1	B1 cao

Question		Working	Answer	Mark	Notes
4			8	3	M1 for 23 – 7 (= 16) or 23 ÷ 2 (= 12.5) M1 for correct order of operations –7 then ÷ 2 A1 cao OR M1 for forming the equation $2x + 7 = 23$ M1 for attempt to isolate the number terms or divide all terms by 2 as the first step A1 cao

10	(a)		9	1	B1 cao
	(b)		28	1	B1 cao
	(c)		35	1	B1 cao
	(d)		12.5	2	M1 for attempt to isolate the number term or divide all the terms by 4 as the first step. A1 for 12.5 oe

PAPER: 5MB3F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
*11			No as 33 > 26 or 50 > 48.6	5	M1 for finding the sale price of either books eg 46 × 0.50 (= 23) or 68 × 0.30 (= 20.4) M1 for finding the total sale price of all the books eg 23 + 20.4 (= 43.4) M1 for finding the change (eg 50 – '23' – '20.4' (= 6.6)) or the sale price of the magazines (eg 26 × 0.20 (= 5.2)) A1 for 33 or 48 or 6.6(0) **and** 5.2(0) or 48.6(0) C1 (dep on at least M1) for No and comparison of their values (Accept working throughout in £ or pence)

PAPER: 5MB3F_01

18			34	2	M1 for 4×6 (=24) or 2×5 (=10) A1 cao

PAPER: 5MB3F_01

23	(a)		92.3521	1	B1 cao
	(b)		p^6	1	B1 cao
	(c)		t^5	1	B1 cao
	(d)		6	1	B1 cao
*24			Tuesday and Friday	3	M1 for 179 ÷ 12 or 162 ÷ 12 or 170 ÷ 12 or 143 ÷ 12 A1 for 14.9(166…) or 15 and 13.5 or 14 and 14.1(66…) or 15 and 11.9(16…) or 12 C1 (dep M1) ft for comparison of their results for all the days with the number of teachers available leading to a correct statement **Or** M1 for 179 ÷ 15 or 162 ÷ 13 or 170 ÷ 14 or 143 ÷ 12 A1 for 11.9(3…) or 12 and 12.4(6…) or 13 and 12.1(4…) or 13 and 11.9(1…) or 12 C1 (dep M1) ft for comparison of their results for all the days with 12 leading to a correct statement **Or** M1 for 15 × 12 or 13 × 12 or 14 × 12 or 12 × 12 A1 for 180 and 156 and 168 and 144 C1 (dep M1) ft for comparison of their results for all the days with the number of students taking part leading to a correct statement

PAPER: 1MA0_2F

26	(a)		⅔	2	M1 for intention to subtract 4 from both sides or divide each term by 3 or $3p = 2$ written in the workspace A1 for ⅔ accept answer to two decimal places rounded or truncated
	(b)		−4, −3, −2, −1, 0	2	B2 for all 5 correct values; ignore repeats, any order (B1 for 4 correct (and no incorrect) values or all five correct values and –5)

12			14	2	M1 for $4 + 2 \times 5$ A1 cao

Paper: 5MB3F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
14	(a)		4	1	B1 cao
	(b)		6	1	B1 cao

22	(a)		$5x - 3 = 52$	3	M1 for $2x$ or $2x - 3$ seen M1 for x and $2x$ and $2x - 3$ A1 for $5x - 3 = 52$ from correct working
	(b)		11	2	M1 for intention to either add 3 to both sides or divide all terms by 5 as a first step A1 cao

8	(a)		2	1	B1 cao
	(b)		15	1	B1 cao
	(c)		9	1	B1 cao
	(d)		14	2	M1 for intention to subtract 5 from sides or multiply both sides by 2 as a first step A1 cao
*9			56p	3	M1 for a correct method to find total cost of pencils in £ or pence eg 12×37 (=444) M1 for a correct method to find the change from £5 eg 500 – "444" C1 for 56p or £0.56 ie with correct monetary units

PAPER: 5MB3F_01

11			6 or − 6	3	M1 for 43 – 7 (=36) or √43 M1 for correct order of operations −7 then intention to square root A1 for 6 or −6 or both OR M1 for x^2 – 7 =43 M1 for adding 7 to both sides A1 for 6 or −6 or both

Original question 24

The full source mark scheme begins on page 277. Use the original paper code, tier and question number shown above.

12	(a)		22	1	B1 cao
	(b)		18	1	B1 cao
	(c)		3.4	2	M1 for intention to subtract 7 from both sides or divide all terms by 5 as a first step. A1 for 3.4 oe

<table>
<tr><td>13</td><td>(a)

(b)</td><td></td><td>9

50</td><td>1

1</td><td>B1 cao

B1 cao</td></tr>
<tr><td>*14</td><td></td><td>
<table>
<tr><td colspan="2">g</td><td colspan="2">kg</td></tr>
<tr><td>2000</td><td>600</td><td>2</td><td>0.6</td></tr>
<tr><td colspan="2">mm</td><td colspan="2">cm</td></tr>
<tr><td>400</td><td>450</td><td>40</td><td>45</td></tr>
<tr><td>210</td><td>350</td><td>21</td><td>35</td></tr>
<tr><td>75</td><td>80</td><td>7.5</td><td>8</td></tr>
</table>
</td><td>Yes with correct conversions</td><td>4</td><td>M1 for using 1 kg = 1000 g eg sight of 2000 or 0.6
M1 for using 1 cm = 10 mm eg sight of 400, 210, 25, 45, 35 or 8
M1 for evidence of considering three boxes eg 2.5×3 (=7.5) or reducing the 2kg parcel to compare with one box
C1 for “yes” with correct conversions of dimensions and weight
NB: Candidates can work in cm or in mm and in kg or g</td></tr>
</table>

Original question 19

The full source mark scheme begins on page 293. Use the original paper code, tier and question number shown above.

6		6	3	M1 for a correct inverse operation M1 for correct order of operations eg +10 then ÷4 A1 cao OR M1 for forming the equation $4x-10=14$ M1 for a correct first step at rearrangement A1 cao

5MB3F/01 June 2015

12	(a)		18	1	B1 cao
	(b)		2.5	1	B1
	(c)		70	1	B1 cao
	(d)		2.4	2	M1 for intent to − 6 from both sides or ÷ 5 both sides as first step A1 for 2.4 oe

5MB3F/01 June 2015

Question	Working	Answer	Mark	Notes
22		6	4	M1 for $7x + 22$ or $(5x+2)$ or $7b + 22p$ or $5b + 2p$ M1 for forming equation $7x + 22 = 2(5x + 2)$ M1 for correct intent to isolate x on one side A1 cao

1MA0 1F November 2015

Question		Working	Answer	Mark	Notes
6	(a)		12	2	M1 for correct first step, eg 37 – 13 (=24) or (37 + 13) ÷ 2 (=25) oe or two weights with a difference of 13 or two weights with a total of 37 A1 cao
	(b)		44 pounds or 20 kg	4	M1 for 30 × 2.2 (=66) M1 (dep) for 110 – "66" (=44) A1 for 44 A1 (dep on first M1) for pounds **OR** M1 for 110 ÷ 2.2 (=50) M1 (dep) for "50" – 30 (=20) A1 for 20 A1 (dep on first M1) for kg

1MA0 1F November 2015

Question		Working	Answer	Mark	Notes
12	(a)		410	2	M1 for 4 × 90 + 50 (=410) A1 cao
	(b)		9	3	M1 for one inverse operation eg −50 or ÷90 M1 for complete inverse operations, eg (860 – 50) ÷ 90 accept 860 – 50 ÷ 90 A1 cao **OR** M1 ft for finding the difference to part (a), ie 860 – "410" (=450) M1 for "450" ÷ 90 A1 cao

13	(a)		5	2	M1 for equating sides, eg $x + 1 + x - 1 = 10$ or $2x = 10$ or $x + 1 = 6$ or $x - 1 = 4$ A1 for ($x =$) 5
	(b)		30	2	M1 for $1y + 2y + 3y = 180$ oe or $180 \div 6$ (=30) A1 cao

5	(a)		5	1	B1 cao
	(b)		2.8	1	B1 oe
	(c)		1.5	2	M1 for the intention to subtract 3 from both sides or divide each term by 4 as a first step A1 1.5 oe

PAPER: 1MA0_2F					
Question		**Working**	**Answer**	**Mark**	**Notes**
*6			Diagram or chart drawn	4	M1 for key or suitable labels to identify Tyler and Fletcher M1 for 4 correct month labels OR a linear scale M1 for diagram or chart (combined or separate) set up for comparison, correctly showing data for at least three months C1 for fully correct diagram or chart to include all axes correctly scaled and labelled

15			19	2	M1 for $2 \times 6.5 + 3 \times 2$ **or** 13 and 6 A1 cao

15	(a)		10	1	B1 cao
	(b)		13	1	B1 cao
	(c)		8	1	B1 cao
	(d)		5	2	M1 for 7×-1 ($= -7$) and 4×3 ($=12$) A1 cao

23			31	4	M1 for $x + (2x+7) + (3x–4)$ (=75) M1 for complete method to isolate x condone one error or (x =) 12 M1 (dep on M2) for 2 × "12" + 7 (=31) A1 cao OR M1 for $x + (2x+7) + (3x–4)$ (=75) M1 for "$6x$ + 3" +"18" = 75 +"18" (=93) M1 for $3(2x + 7) = 93$ or "93" ÷ 3 (=31) A1 cao

5MB3F_01 November 2015

8	(a)		15	1	B1 cao
	(b)		6	1	B1 cao
	(c)		3	2	M1 for intention to subtract 7 from both sides or divide all terms by 2 as a first step A1 cao
*9			1 cm^2	3	M1 for method to find the area of A or area of B eg for A 6 + 3 (=9), 12 – 3 (=9) eg for B 4 + 4 (=8), 12 – 4 (=8) A1 for 9 and 8 C1 (dep M1) for 1cm^2 or ft from their 2 areas

PAPER: 1MA0/1F

PAPER: 1MA0_2F

Question	Working	Answer	Mark	Notes
21		9.25	3	M2 for $x + x + 4 + x + x + 4 = 45$ oe or $x + x + 4 = 22.5$ oe (M1 for $x + x + 4 + x + x + 4$ oe) A1 for 9.25 or $\frac{37}{4}$ oe OR M1 for 45 – 8 (= 37) or 22.5 – 4 (= 18.5) M1 for (45 – 8) ÷ 4 or (22.5 − 4) ÷ 2 A1 for 9.25 or $\frac{37}{4}$ oe
*22	400 ÷ 18 = 22(.2) 499 ÷ 20 = 24(.95) or 25 600 ÷ 26 = 23(.07…) (or equivalent in £) 18 ÷ 4 = 4.5 20 ÷ 4.99 = 4(.008…) 26 ÷ 6 = 4.3(333…)	18 pack (supported)	4	M1 for a method that would result in at least two values that could be used to compare two packs M1 for a method that would result in values that could be used to compare all three packs A1 for all fully correct figures suitable for comparison C1 ft (dep on M2) for comparison of their values with a correct conclusion from their figures

PAPER: 1MA0_2F

PAPER: 5MB3F/01

Question		Working	Answer	Mark	Notes
8			30	3	M1 for 50 + 10 (= 60) or 50 ÷ 2 (= 25) M1 for correct order of operations + 10 then ÷ 2 A1 cao

9			–3	3	M1 for full substitution or –12 or 9 M1 for –12 + 9 A1 cao

14	(a)		13	1	B1 cao
	(b)		3	1	B1 cao
	(c)		36	2	M1 for intention to subtract 3 from both sides or to multiply all three terms by 4 A1 cao

PAPER: 5MB3F/01

Question		Working	Answer	Mark	Notes
22			22.5	4	M1 for $4(x - 8) = 2x + 13$ M1 for expansion of bracket or division of all terms by 4, eg $4x - 32 = 2x + 13$, or $x - 8 = \frac{2x}{4} + \frac{13}{4}$ M1 for isolating x and number terms eg $2x = 45$, $\frac{x}{2} = \frac{45}{4}$ A1 for $\frac{45}{2}$ or 22.5 OR M1 for $(180 - 64) \div 2$ (= 58) M1 for $4(x - 8)$ = "58" or $2x + 13$ = "58" or "58" – 13 (= 45) M1 for isolating x and number terms eg $4x = 90$, $2x = 45$ or "45" ÷ 2 A1 for $\frac{45}{2}$ or 22.5 OR M1 for $64 + 4(x - 8) + 2x + 13$ M1 for $64 + 4(x - 8) + 2x + 13 = 180$ M1 for isolating x and number terms eg $6x = 135$ A1 for $\frac{45}{2}$ or 22.5

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

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

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

PAPER: 5MB3F_01			
Question		**Modification**	**Notes**
Q2		Diagram enlarged. Solid circles added at C, Y, S and H.	M1 for any route starting and ending at C going through H, S and Y. Condone missing last section back to C M1 for a valid route for which their total is shown A1 for 25.1 B1 ft for communicating their shortest route (must start and end at C and pass through S, H and Y).

PAPER: 5MB3F_01			
Question		**Modification**	**Notes**
Q3		Background grid removed. Shapes enlarged. Labels added above shapes. Shape D removed and last three shapes renamed. Grid enlarged. Shape F changed to shape E. Scale factor 3 changed to scale factor 2. Shape E put on the grid. Last 4 columns removed. Braille only: Question reversed. Shapes E and F given on diagram. Candidates asked to describe the transformation. Question changed: 'Look at the diagram for Question 3(c). The diagram shows shape E and shape F on a grid. Describe the single transformation that maps shape E on shape F.' Braille only - a set of cut out shapes is also available for this question. Shape E as original exam (was Shape F) Shape F x 2 scale factor enlargement given as (to match your MLP).	B1 cao B1 cao M1 for drawing at least one side correct length or a correct enlargement of scale factor other than 2 (excluding 1) A1 for fully correct enlargement
Q4	(a)	Wording added 'There are three boxes to fill.' under 'Complete the bill.' Outline of boxes made thicker. Answer lines removed from boxes.	B1 for 32 B1 for 12 B1 ft "32" for 88.92
Q5	(a)	Diagram enlarged.	B1 cao
Q5	(b)	Line kept the same size as in standard. Wording changed to 'On the diagram, draw a line parallel to the line given.' Braille only – Line made 10 cm long.	B1 for parallel line drawn.

PAPER: 5MB3F_01			
Question		**Modification**	**Notes**
Q6	(a)	Grid enlarged. Mirror line label repeated below. Mirror line extended at the top and bottom. Wording for V version added 'A cut out shape is available for you to use.' Shading changed to dotty shading.	B1 cao
Q6	(b)	Grid enlarged. Shading changed to dotty shading. Image labelled 'triangle A'. Rotation shown on the grid labelled 'triangle B'. Wording changed to 'It shows triangle A and triangle B on a grid.' Question changed: Image labelled triangle A, rotation shown on the grid labelled triangle B. Wording changed: 'Describe fully the single transformation that maps triangle A onto triangle B. Three answer lines given. Wording for V version added 'A cut out shape is available for you to use.'	M1 for 90° rotation or quarter turn. A1 clockwise about *O*
Q6	(c)	Grid enlarged. Shading changed to dotty shading. Top and bottom rows removed from the grid. Wording changed to 'You should draw at least 5 shapes. A cut out shape is provided for you to use if you wish.'	B2 for at least 6 correct shapes, including initial shape, correctly tessellating and no incorrectly drawn tiles or gaps. (B1 for at least 4 correct shapes, including initial shape, correctly tessellating; ignore any additional sections attempted, gaps or incorrect shapes)
Q10		North line extended. Frame removed. Crosses changed to filled in circles. Scale moved above and to the left of the diagram. Dashed line joins Skelton to Catterlen. Wording removed 'with a cross (x)'.	B1 for 8.5 – 9.5 M1 for correct angle used or 70 or 290 A1 for 105 – 115 B1 for a possible correct position

PAPER: 5MB3F_01			
Question		**Modification**	**Notes**
Q12		Grid enlarged. The horizontal axis is 1.5 cm for 1 and the vertical 1.5 cm for 10. [Leeway needed for answering the question.]	B1 for 82 - 88 M1 for reading off graph at 80°, 70° or 60° with at least one reading in the intervals, 0.5 – 0.7, 2.4 – 2.7, 4.8 – 5.2 M1 for correct method to find one time interval A1 for 0.3 – 0.7
Q15		Diagram enlarged. PR line kept the same size and standard and put below first diagram. Angle QPR changed to 45°. Crosses changed to filled in circles. Braille only – measurements given in the text.	M1 for angle P drawn as 40 – 50° or PQ drawn as 6.5 to 7.5 cm A1 correct triangle
Q17		Diagram kept the same size as original. Scale moved above the diagram and also put in the question paper.	B1 for circle centre M radius 5 cm B1 for circle centre N radius 3 cm B1 for correct region shaded

PAPER: 5MB3F_01			
Question		**Modification**	**Notes**
Q21		Diagram enlarged. Cross changed to filled in circles. Arrow heads removed.	M1 for $\pi \times 120^2$ (= 45238….) M1 for "$\pi \times 120^2$" ÷ 1800 A1 for 25.0 – 25.2 C1 for "surface is large enough as 25 > 20" oe OR M1 for $\pi \times 120^2$ (= 45238….) M1 for 20 × 1800 A1 for 36000 C1 for "surface is large enough as 36000 < 45238..." oe OR M1 for $\pi \times r^2 = 1800 \times 20$ M1 for 36000 ÷ π (=11459..) A1 for 107.0… C1 for "surface is large enough as 107…< 120" oe

Q22		Diagram enlarged. MLP only – x changed to y. Braille only – measurements given in the text.	M1 for $4(y - 8) = 2y + 13$ M1 for expansion of bracket or division of all terms by 4, eg $4y - 32 = 2y + 13$, $y - 8 = \frac{2y}{4} + \frac{13}{4}$ M1 for isolating x and number terms eg $2y = 45$, $\frac{y}{2} = \frac{45}{4}$ A1 for $\frac{45}{2}$ or 22.5 OR M1 for $(180 - 64) \div 2$ $(= 58)$ M1 for $4(y - 8) = 58$ or $2y + 13 = 58$ M1 for isolating y and number terms eg $4y = 90$, $2y = 45$ A1 for $\frac{45}{2}$ or 22.5 OR M1 for $64 + 4(y - 8) + 2y + 13$ M1 for $64 + 4(y - 8) + 2y + 13 = 180$ M1 for isolating x and number terms eg $6y = 135$ A1 for $\frac{45}{2}$ or 22.5

Question	Working	Answer	Mark	Notes
9 (a)		6	1	B1 cao
(b)		8	1	B1 cao
*10		Jane should buy Greens Garden Shop + costs	4	M1 for Suttons: 140 ÷ 20 (= 7) bags of compost needed M1 for 3 × 3.25 (= 9.75) + 1 × 2.25 (=12) M1 for Greens: cost of 2 bags eg × 4.99 (= 9.98) , 2 × 5 (=10) etc. C1 for correct conclusion from a comparison of correct appropriate figures

Question	Working	Answer	Mark	Notes
27		26	3	M1 for (360 − 90) ÷ 2 (= 135) M1 for $4x + 31 =$ "135" or $6x - 21 =$ "135" A1 cao OR M1 for forming an appropriate equation eg $4x + 31 = 6x - 21$ or $6x - 21 + 4x + 31 + 90 = 360$ oe M1 (dep) for isolating terms in x and number terms A1 cao

4	(a)		6	1	B1 cao
	(b)		4	1	B1 cao
	(c)		6	1	B1 cao
	(d)		3.25	2	M1 for method to isolate the q term or division by 8 through as the first step A1 oe
	(e)		19	2	M1 for substitution eg $4+5\times3$ A1 cao

PAPER: 5MB3F_01

7			9	3	M1 any appropriate inverse operation eg 22 +5, 27 ÷ 3 M1 complete method eg 22 + 5 ÷ 3 A1 cao

19	(i)		$N = 3x + 7$	5	M1 for $x + x + 3 + x + 4$ (=N) A1 cao
	(ii)		21		M1 ft for 61 = "$3x + 7$" M1 for isolating the x A1 ft "18" + 3 OR M1 for choosing a value of x and stating x, x+3, x+4 M1 for adding their values A1 ft

Question	Working	Answer	Mark	Notes
13 (a)		−7	2	M1 for substitution eg $4 \times 2 - 3 \times 5$ A1 cao
(b)		9	2	M1 for substitution eg $30 = 4x - 3 \times 2$ or $\frac{30+6}{4}$ or $y + 3t = 4x$ oe A1 cao

21		−2	3	M1 for expanding brackets e.g. $4x+12\ (=2x+8)$ or divide by 4 as a first step e.g. $x+3=\frac{2x}{4}+\frac{8}{4}$ M1 ft their equations which have to be of the form $ax + b = 2x + 8$ **or** $x + 3 = ax + b$ for isolating terms in x **and** numbers e.g. $4x - 2x = 8 - 12$ seen as part of their solution oe A1 cao

Paper: 1MA0/1F

12	(a)		12	1	B1 cao
	(b)		45	1	B1 cao
	(c)		16	2	M1 for correct order of inverse operations –12 then ÷3 or for forming the equation $3x + 12 = 60$ and showing intention to subtract 12 from both sides or divide each term by 3 as a first step A1 cao

3	(a) (b)		56*ef* 12.5	B1 B1	cao oe

16		$-\frac{1}{2}$	M1 A1	for substitution with operations shown e.g. $1 + -3 \times \frac{1}{2}$ **or** $1 - \frac{3}{2}$ **or** $1\frac{1}{2}$ **or** $-1\frac{1}{2}$ oe

19	(a)		9.5	M1 A1	expands brackets or divides by 4 as a first step oe
	(b)		−2, −1, 0, 1, 2	B2 (B1)	cao (for the numbers −2, −1, 0, 1 (accept with −3 and/or 2 only), or 4 correct with no incorrect)

9		54	M1 M1 A1	for method to form equation, eg $90 + 2x + 3x = 360$ or for $360 - 90$ (= 270) for $5x = 360 - 90$ or for $2x + 3x = 360 - 90$ or for $2x = 108$ or for $3x = 162$ or for $270 \div 5$ 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

Question	Working	Answer	Mark	Notes
10		75	P1 P1 A1	for 90 ÷ 6 (= 15) or for connecting *AB* and *BC* by ratio or proportion eg 5 and 1 on the diagram for a complete method to find the length *AB* eg 90 ÷ 6 × 5 (= 75) cao

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

3		42	B1	cao

16		$1\frac{1}{2}$	M1 M1 A1	for correct expansion of the bracket or dividing all terms by 3 as a first step eg $3x - 3$ or $(5x - 6)/3 = 3(x - 1)/3$ for isolating terms in x on one side of an equation eg $5x - 6 - 3x = -3$ or both constants on one side of an equation, eg $5x = 3x - 3 + 6$, ft $5x - 6 = 3x - 1$ for $1\frac{1}{2}$ oe

Question	Working	Answer	Mark	Notes
21 (a)		6	B1	cao
(b)		5	B1	cao
(c)		Shown	M1	for writing 100^a or 1000^b as a power of 10 (=10^{2a} or 10^{3b}) or $10^{2a + 3b}$ or $100 = 10^2$ and $1000 = 10^3$
			C1	for complete chain of reasoning leading to conclusion

Paper: 1MA1/2F

10		60	M1 A1	for method to find the number, eg. $48 \times \frac{3}{2}$ (=72) or to find $\frac{1}{6}$ th of the number, eg. $48 \div 4$ (=12) cao

Paper: 1MA1/3F

Original question 16

The full source mark scheme begins on page 309. Use the original paper code, tier and question number shown above.

11	(a)	17	B1	cao	
	(b)	12	B1	cao	
	(c)	5.5	B1	Accept $\frac{11}{2}$, $5\frac{1}{2}$ oe	

22		$y = 3x - 6$	M1 M1 A1	for a correct method to find the gradient of the line, or $m = 3$ **OR** identifies -6 as the intercept in words or in a partial equation **OR** $y - b = m(x - a)$ where $m \neq 3$ and (a, b) is a correct coordinate for $y = 3x + c$ **or** (L=) $3x - 6$ **or** $y =$ "3"$x - 6$ **OR** $y - y_1 = 3(x - x_1)$ **or** $y - b =$ "3"$(x - a)$ where (a, b) is a correct coordinate accept $y = 3x + -6$ oe	Just ringing -6 is insufficient Award of this mark implies the first M1 c must be seen either as a letter or a number

Paper: 1MA1/2F

Question	Answer	Mark	Mark scheme	Additional guidance
25	3.8	M1	for a correct first step, eg $5 - x = 2(2x - 7)$ or $5 - x = 4x - 14$ or $\frac{5}{2} - \frac{x}{2} = 2x - 7$	Method must show LHS ×2 and both terms on RHS ×2 or $5 - x$ and both terms on RHS ×2
		M1	(dep) for isolating terms in x eg $4x + x = 14 + 5$ or $-\frac{x}{2} - 2x = -7 - \frac{5}{2}$	eg $-4x$ both sides with -5 both sides or $+x$ both sides with $+14$ both sides
		A1	oe	Accept $\frac{19}{5}$, $3\frac{4}{5}$ oe but not $\frac{-19}{-5}$ oe

Paper: 1MA1/3F

19	(a)	8	M1 A1	for a correct first step eg $3x - 12 = 12$ **or** $3(x - 4) \div 3 = 12 \div 3$ cao	
	(b)	$3b(3 - b)$	M1 A1	for $3(3b - b^2)$ **or** $b(9 - 3b)$ **or** $3b$(two term linear expression) cao	

Paper: 1MA1/2F

17	(a)	Full working seen	M1	for an initial step with the expressions eg doubling $2x + 1$ or $x + 2$ **or** halving $4x$ **or** for identifying CD as $x + 2$ **or** for identifying DE as $2x + 1$	May be seen in working or on diagram
			M1	for an expression for the total perimeter, eg $4x + 2 \times (2x + 1) + 2 \times (x + 2)$	
			C1	for full simplification and equating to 18	
	(b)	1.2	M1	for isolating terms in x can ft an equation stated in (a) provided in form $ax + b = c$	$10x = 18 - 6$
			A1	for 1.2 oe	Accept $\frac{12}{10}$ or $\frac{6}{5}$

Paper: 1MA1/3F

10	(a)	4	B1	cao	
	(b)	8	B1	cao	
	(c)	3	M1 A1	for a correct first step eg subtracting 2 from both sides **or** dividing all terms by 6 cao	Division by 6 must be ALL terms

Paper: 1MA1/1F

Question	Answer	Mark	Mark scheme	Additional guidance
26	$c = -6$ $d = -1$	M1	for reflection in x-axis shown on diagram	Vertices (3, −2), (5, −2), (3, −5)
		A1	for $c = -6$ or $d = -1$	One correct value is M1A1 regardless of second value or diagram
		A1	for both $c = -6$ and $d = -1$	
			SCB2 for $c = -1$ and $d = -6$	

Question	Answer	Mark	Mark scheme	Additional guidance
11	23	M1 A1	for substitution eg. 7×5 and 3×−4 or 7(5) + 3(−4) cao	7×5 (= 35) and 3×−4 (= −12) may be seen separately but both must be seen for the award of M1

Question	Answer	Mark	Mark scheme	Additional guidance
20 (a)	$n > 2$	M1	for a method to isolate terms in n in any inequality or equation eg. $14n - 11n > 6$ or $n = 2$	Ignore incorrect inequality sign and accept "=" sign
		A1	cao	
(b)	 	M1	for $-2 - 3 < x \leq 4 - 3$ $(-5 < x \leq 1)$	A circle around −5 and 1 implies M1
		M1	for drawing a line from −5 to 1 **or** (indep) for an open circle at either −2 or −5 **or** (indep) for a closed circle at 4 or 1	A line from −5 to 1 implies M2 if no working shown
		A1	cao	

25	8.3 and 8.4	B1 B1	for 8.3 in the correct position for 8.4 in the correct position	 Accept $8.3\dot{9}$ or 8.399…

Question	Answer	Mark	Mark scheme	Additional guidance
15 (a)	330	M1	for 4 × 70 + 50 oe	May be seen as sum of four 70s and a 50 n × (70 + 50) or ambiguous working gets 0 marks
		A1	cao	
(b)	9	M1	for use of inverse operations eg (680 – 50) ÷ 70 **OR** rearranges an equation to solve eg $70x + 50 = 680$ rearranged to isolate x term. **OR** ft (a) eg ((680 – "330") ÷ 70) + 4	Need not have brackets; can be written in an incorrect order if the intention is clear A correct but embedded answer gets 1 mark
		A1	cao or ft their (a)	

Question	Answer	Mark	Mark scheme	Additional guidance
21	2	P1	for a process to find the number of men, eg. (60 ÷ 2) ÷ 3 (= 10)	
	(supported)	P1	for a process to find the number of children, eg. 60 – "30" – "10" (= 20)	60 ÷ 3 = 20 scores no marks.
		P1	for a start of a process to find the value of *n*, eg. ("20" : "10") ÷ 5 or 20 : 10 = 10 : 5 or "20" ÷ "10"	Any ratio must come from correct processes to find the number of children and the number of men
		A1	for 2 with supportive working	Award 0 marks for 2 with no correct supportive working Award full marks for 2 : 1 given as final answer from correct supportive working

7	35	M1 A1	for 4 × 8 (=32) cao	Award this mark if used ambiguously eg 4 × 8 + 3 = 4 × 11 as long as 4 × 8 is stated

Paper: 1MA1/3F

Question	Answer	Mark	Mark scheme	Additional guidance
14 (a)	Explanation	C1	for a correct explanation, eg that he has found the area not perimeter **Acceptable examples** He has found the area (not perimeter) He should have added The perimeter is 7+3+7+3 (=20) oe He did base×height He has timesed (not added) **Not acceptable examples** He has worked it out wrong He should have squared it He should have done 14×6 **or** 7×3×7×3 **or** 7×3 twice then add them He didn't include the top or the other side He should have doubled it It should be P=7×3 **or** he has done the sum not found the answer	Any incorrect statement as part of a correct response can be ignored unless it contradicts the statement, eg, he found area but perimeter equals 10
(b)	Explanation	C1	for correct explanation, eg that you cannot have a length of −2 **Acceptable examples** *x* cannot be negative Cannot have a negative length Has to be positive It is impossible Can't have −2(cm) (as a measurement) It has to be more than 0 **Not acceptable examples** You can have −2 Won't add to 180 He has a minus sign and the other sides have add signs It has to be a whole number or decimal there are no negative numbers to get a negative answer there is no cm after his answer It should be +2	Any incorrect statement as part of a correct response can be ignored unless it contradicts the statement.

Answer 91 | Mark scheme

Paper: 1MA1/3F

Paper: 1MA1/3F

Question	Answer	Mark	Mark scheme	Additional guidance
19	17	M1	for correctly expanding the bracket, as part of an equation to get $4x - 24 = 44$ **or** for dividing both sides of the equation by 4 as a first step, eg $\frac{4(x-6)}{4} = \frac{44}{4}$ oe	Award M1 for an embedded value of 17 if not identified as the answer
		A1	cao	

Question	Answer	Mark	Mark scheme	Additional guidance
19 (a)	$x^2 - 4x$	B1	cao	
(b)	$5(3y - 2)$	B1	cao	
(c)	9	M1	for a correct first stage, eg. expanding brackets, $7 \times f - 7 \times 5$ (= 28) oe **or** for division of both sides by 7, eg. $\frac{7(f-5)}{7} = \frac{28}{7}$	
		A1	cao	

10	(a)	12	B1	cao	
	(b)	4	B1	cao	

Paper: 1MA1/2F

Paper: 1MA1/2F

Question	Answer	Mark	Mark scheme	Additional guidance
15 (a)	–13	M1	for substitution eg 3×5 and 4×-7 **or** 15 and –28	3×5 (= 15) and 4×-7 (= –28) may be seen separately but both must be seen for the award of M1
		A1	cao	35 and 4–7 do not get the mark unless multiplication is shown eg 35 = 15 is evidence of multiplication and should not be seen as choice
(b)	5	M1	for $38 = 3 \times 6 + 4y$ **or** $38 - 18$ (=20) **or** for a complete method to make y the subject eg $y = \frac{T - 3x}{4}$	eg $y = (T - 3x) \div 4$
		A1	cao	

25	99.5	M1	for $\sin(34) = \frac{x}{178}$ oe **or** alternative method to find x	
		A1	for answer in range 99.5 to 99.7	If an answer in the range 99.5 to 99.7 is given in the working space then incorrectly rounded, award full marks

11	110	M1 M1 A1	for use of angles in a quadrilateral add to 360°, eg 360 – 130 – 95 – 65 (= 70) for 180 – “70” or for (130 + 95 + 65) – 180 cao	May be seen in diagram or as a sum to 360°. (130 + 95 + 65) – 180 gains M2

Paper: 1MA1/3F

14	(a)	$5x + y$	M1	for method to collect terms, eg $5x$ or y	May be seen in working. Accept if no ambiguity. Accept $1y$.
			A1	cao	
	(b)	3	M1	for subtracting 7 from both sides or dividing each term by 5 as a first step, eg $5p = 15$ or $5p = 22 - 7$ or $\frac{5p}{5} + \frac{7}{5} = \frac{22}{5}$	Must be carried out, not just intention. Division by 5 must be all terms.
			A1	cao	

Paper: 1MA1/3F

Paper: 1MA1/3F

Question	Answer	Mark	Mark scheme	Additional guidance
23 (a)	n^8	B1	cao	
(b)	cd^3	M1	for partial simplification, eg c or d^3	May be seen as simplification in original fraction
		A1	for cd^3	Accept c^1d^3
(c)	$x > \frac{14}{5}$	M1	for $5x > 14$ or $5x = 14$ or critical value, $\frac{14}{5}$ oe	Must see carried out correctly, ie at least $5x > 7 \times 2$ not just intention seen. Allow other signs for this mark.
		A1	$x > \frac{14}{5}$ or $x > 2\frac{4}{5}$ or $x > 2.8$	

Question	Answer	Mark	Mark scheme	Additional guidance
16 (a)	Explanation	C1	for explanation, eg AB cannot be zero (cm) **or** shows AB to be zero, eg $4 \times 0.5 - 2 = 0$	Accept say 'AB would then be 0'
(b)	2.5	P1	for a correct expression for AD, eg $3(4x - 2)$ **or** $12x - 6$ **OR** $2(3AB + AB) = 64$ oe **or** $3AB + AB = 32$ oe **or** $AB = 8$ **OR** for an equation with mixed variables, eg. $6AB + 2(4x - 2) = 64$	May be seen on diagram
		P1	for forming a correct equation in x, eg $4x - 2 + 4x - 2 + 3(4x - 2) + 3(4x - 2) = 64$ **or** $4x - 2 = 8$ **or** $4x - 2 + 3(4x - 2) = 32$	
		A1	cao	

Paper: 1MA1/1F

13	(i)	21	M1	for 180 – 75 – 84	
			A1	cao	Angle may be indicated on the diagram
	(ii)	Reason given	C1	for reason that Angles on a straight line add up to 180	The key words underlined must be present There should be no incorrect reasons given

17	(a)	$y^2 + 5y$	B1	cao	
	(b)	$2(2a - 3)$	B1	cao	
	(c)	2.9	M1	for a correct first stage eg. expanding the brackets, $2 \times 5x - 2 \times 4$ ($= 10x - 8$) **or** division of both sides by 2, eg $\frac{2(5x-4)}{2} = \frac{21}{2}$	
			M1	for isolating terms in x eg $10x = 21 + 8$	
			A1	oe	
	(d)	$20\,e^3 f^4$	M1	for any two of 4×5 (=20), e^{2+1} ($=e^3$), f^{1+3} ($=f^4$) in a product or written as individual terms	Do not award if there is contradiction
			A1	cao	

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

14	19	M1 A1	for a correct substitution, eg (y =) 6 × 4 – 5 cao	

Question	Answer	Mark	Mark scheme	Additional guidance
23	$x < 5$	M1	for adding 27 to both sides or dividing throughout by 7 (in an inequality or an equation) as a first step **or** showing 5 as the critical value	 Can be written as $x = 5$
		A1	cao	

17	(a)	$12 - 6x$	B1	for $12 - 6x$ (accept $-6x + 12$)	
	(b)	16	M1	for a correct first step, eg. $3y = 12 \times 4$ (= 48) or $\frac{y}{4} = \frac{12}{3}$	Do not accept ambiguous algebraic expressions
			A1	cao	
	(c)	$2(2p + 3)$	B1	cao	Do not accept equivalent expressions not fully factorised

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

Paper: 1MA1/3F

Question	Answer	Mark	Mark scheme	Additional guidance
24	1.5	P1	for process to develop 3 algebraic expressions, eg. (R =) n, (S =) $2n$, (T =) $2n – 6$, oe, at least two must be correct. **or** for selecting 3 values satisfying the given criteria, eg. (R =) 10, (S =) 20, (T =) 14	
		P1	for process to sum 3 algebraic expressions and equating to 54, eg. n + “$2n$” + “$2n – 6$” = 54 **or** for finding the correct sum of their values eg. “10” + “20” + “14” = 44	
		P1	for start of process to solve the correct linear equation, eg. $5n = 54 + 6$ ($n = 12$) **or** for 12, 24, 18	
		P1	for “12” : 2 × “12” – 6 oe eg 12 : 18 oe or 18 : 12 linked to T, R	
		A1	for 1.5 or $\frac{3}{2}$ or $1\frac{1}{2}$	Accept 1 : 1.5 etc as answer

Paper: 1MA1/3F

8	(a)	7	B1	cao	
	(b)	6	M1	for $4n$ (= 24) or 24 ÷ 4	
			A1	cao	

9	(a)	290	B1	cao	Accept 290°. May be seen on diagram provided no ambiguity
	(b)	reason	C1	for correct reason: Angles at a point add to 360	The key words underlined must be present with the 360 implied if not stated by use in part (a)

Paper: 1MA1/1F

Question	Answer	Mark	Mark scheme	Additional guidance
14 (a)	$7c + 6d$	M1	for $7c$ **or** $6d$	
		A1	for $7c + 6d$	
(b)	7	M1	for correct method to expand, eg $5 \times 2m - 5 \times 6$, **or** divides both sides by 5 as a first step.	
		M1	for correct method to isolate terms in m, eg $10m - 30 + 30 = 40 + 30$	
		A1	cao	
(c)	$3x + 2y$	M1	for $3x$ or $2y$	Condone use of b and p
		A1	cao	

Question	Answer	Mark	Mark scheme	Additional guidance
22	8.73	M1	for a correct trig statement, eg 14.5 × cos 53 or cos 53 = x ÷ 14.5	Can use a combination of skills but must have only one unknown in x to score this mark
		A1	answer in the range 8.726 to 8.73	If an answer is given in the range in working and then rounded incorrectly award full marks.

5	5	B1	cao	

Question	Answer	Mark	Mark scheme	Additional guidance
24	1.25	P1	for finding an expression for the area of one shape, eg $\frac{1}{2} \times 8 \times 6x$ (= $24x$) or $5(4x - 1)$ (= $20x - 5$) oe	Condone missing brackets for area of rectangle for all process marks
		P1	for finding an expression for the area of both shapes, eg $\frac{1}{2} \times 8 \times 6x$ **and** $5(4x - 1)$ oe **or** [area of triangle] – 10 or [area of rectangle] + 10 oe or [area of triangle] – [area of rectangle]	
		P1	for writing a correct equation, eg $\frac{1}{2} \times 8 \times 6x = 5(4x - 1) + 10$ oe **or** (dep on 1st P1) eg [area of triangle] – 10 = [area of rectangle] or [area of triangle] = [area of rectangle] + 10 or [area of triangle] – [area of rectangle] = 10	
		A1	for 1.25 oe	

Paper: 1MA1/2F

Question	Answer	Mark	Mark scheme	Additional guidance
11	13	P1	for beginning to process problem eg 72 – 7 (= 65) **or** writing $5x + 7 = 72$ oe	
		P1	for a complete process eg "65" ÷ 5 oe **or** writes $5x = 65$ oe	
		A1	cao	

18	4	M1 M1 A1	for a correct first step eg shows $4 \times 2x - 4 \times 3$ or $8x - 12$ or $2x - 3 = \frac{20}{4}$ for isolating terms in x eg $2x = 5 + 3$ cao	

Paper: 1MA1/3F

Paper: 1MA1/3F

Question	Answer	Mark	Mark scheme	Additional guidance
19	2.5	P1	for $450 \div 6$ (= 75) **or** statement $450 = \frac{3000 \times 6 \times y}{100}$ oe **or** $\frac{450}{3000}$ (= 0.15) or $\frac{450 \times 100}{3000}$ (= 15)	
		P1	for "75" ÷ 3000 (= 0.025) **or** (y =) $\frac{450 \times 100}{3000 \times 6}$ oe **or** $\frac{"0.15"}{6}$ (= 0.025) or $\frac{"15"}{6}$ **or** $\frac{3000 + "75"}{3000}$ (= 1.025)	
		A1	cao	

Paper: 1MA1/1F

Question	Answer	Mark	Mark scheme	Additional guidance
12 (a)(i)	26	M1	for substitution eg $2 \times 3 + 4 \times 5$ or $6 + 20$	
		A1	cao	
(ii)	13	M1	for substitution eg $38 = 2g + 4 \times 3$ **or** a complete numerical method eg $(38 - 4 \times 3) \div 2$ **or** for a correct first step to rearrange eg $P - 4h = 2g$ or $\frac{P}{2} = g + \frac{4h}{2}$ oe	
		A1	cao	
(b)	–11	M1	for $3 \times -3 = -9$ oe **or** a full substitution eg $(3 \times -3) - 2$	Condone absence of brackets
		A1	cao	

24	2400	P1 P1 P1 P1 A1	for setting up an equation in x eg $x + (3x + 1) + (2x – 5) = 44$ **or** $6x – 4 = 44$ **or** $x = 48 \div 6$ (= 8) for substituting "8" into either $(3x + 1)$ or $(2x – 5)$ eg $3 \times$ "8" + 1 (= 25) or $2 \times$ "8" – 5 (= 11) for finding the mass of one book eg 7500 ÷ "25" (= 300) for finding the mass of the books on shelf **A** eg "300" × "8" cao	

25	11	M1 M1 A1	for one correct step to isolate x term or constant term on one side, eg adds x to both sides to get $5x - 14 + x = 52 - x + x$ **or** adds 14 to both sides to get $5x - 14 + 14 = 52 - x + 14$ oe for both correct steps to isolate terms in x on one side and constant term on one side, eg "$6x$" $- 14 + 14 = 52 + 14$, **or** $5x + x =$ "66" $+ x - x$ cao	May be seen in different equivalent forms but must be carried out, not just intention seen. Can be implied by eg $4x = 66$ or $6x = 38$

Paper: 1MA1/2F

Question	Answer	Mark	Mark scheme	Additional guidance
16	−35	M1	for a correct first step, eg shows $\frac{x}{7}+9-9=4-9$ or $\frac{x}{7}=4-9$ or $\frac{7x}{7}+9\times7=4\times7$ or $x + 63 = 28$	
		A1	cao	

Question	Answer	Mark	Mark scheme	Additional guidance
28	$y = -2x + 3$	M1	for a correct method to find the gradient of the line, eg $\frac{-1-3}{2-0}$ $(=-2)$ **or** uses 3 as the intercept in $y = mx + c$, eg $y = mx + 3$ oe, $y = 1.5x + 3$	
		M1	for $y = [-2]x + c$ or for (L=) $3 - 2x$ or uses their gradient and a point on the line, eg $y - -1 = [-2](x - 2)$	$[-2]$ must be identifiable as their gradient
		A1	for $y = -2x + 3$ oe	Any correct equation gets 3 marks

Paper: 1MA1/1F

Question	Answer	Mark	Mark scheme	Additional guidance
17	3.5	M1	for correct expansion of brackets, ie $8x - 10$ **or** dividing throughout by 2 as a first step to solve equation, eg $4x - 5 = 9$	For M marks step must be carried out not just intention shown. For example, if you see $2(4x - 5) = 18$ $\div 2 \qquad \div 2$ Award M1 for: $4x - 5 = k$ with $k \neq 18, 36$
		M1	for isolating terms in x, eg $8x = 18 + 10$ **or** $4x = 9 + 5$	ft their equation of the form $ax \pm b = c$ For example, if you see $8x - 10 = 18$ $+10 \qquad + 10$ Award M1 for: $8x \quad = k$ with $k \neq 8, 18$
		A1	for 3.5 **or** $3\frac{1}{2}$ oe **or** $\frac{7}{2}$ oe	

28	$x \leq -4$	M1	for a correct first step working with an equation or inequality eg $x + 11 - 11 \leq 5 - \frac{1}{2}x - 11$ **or** $x + 11 + \frac{1}{2}x \leq 5 - \frac{1}{2}x + \frac{1}{2}x$ **or** $2 \times x + 2 \times 11 \leq 2 \times 5 - 2 \times \frac{1}{2}x$	Can work with an equation or incorrect inequality symbol for both M marks Allow for subtracting 5 from both sides or subtracting x from both sides. For M marks step must be carried out not just intention shown. For example, if you see $x + 11 \quad \leq \quad 5 - \frac{1}{2}x$ $-11 \qquad\qquad -11$ Award M1 for: $x \leq k - \frac{1}{2}x$ with $k \neq 5, k \neq 16$ or indicating $+\frac{1}{2}x$ reaching $kx + 11 \quad \leq \quad 5$ with $k \neq \frac{1}{2}, k \neq 1$ or indicating multiplying by 2 obtaining an equation or inequality with three of four terms correct and no term unchanged.
		M1 A1	for a full method to solve the inequality **or** for a critical value of -4 for $x \leq -4$ oe as final answer	Award 2 marks for answer of x? -4 where ? is an = or any incorrect inequality symbol, or for answer shown as just -4

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

Only mark scheme amendments are shown where the enlargement or modification of the paper requires a change in the mark scheme. 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_1F			
Question		**Modification**	**Mark scheme notes**
3	(a)	Diagram enlarged. Wording added 'Look at the diagram for Question 3 in the separate Diagram Booklet. The diagram is NOT accurately drawn. The diagram shows an angle labelled y.'	Standard mark scheme
4		Word 'five' added 'Write these five numbers in order of size.'	Standard mark scheme
7		Word 'below' added 'The table below shows the number…' The table is turned vertically in the Question Paper. Wording added 'Look at the diagram for Question 7 in the separate Diagram Booklet. The diagram is a grid.' Sentence changed 'On the grid, create a suitable diagram or chart for this information.' For Braille: sentence added 'A spare tactile diagram, sticky labels and bumpons are provided for this question.'	Standard mark scheme
8		Diagram enlarged. Wording added 'Look at the diagram for Question 8 in the separate Diagram Booklet. The diagram is NOT accurately drawn.' The diagram shows three straight lines OA, OB and OC. Angle AOC = 220° Angle AOB = x Angle BOC = 90°	Standard mark scheme
9		Sentence changed 'Look at the number machine below.'	Standard mark scheme
12		Diagram enlarged. Letters added to corners of triangle (ABC) and rectangle (PQRS). Wording added 'Look at the diagram for Question 12 in the separate Diagram Booklet. The diagram is NOT accurately drawn.' The diagram shows a triangle labelled ABC and a rectangle labelled PQRS. In the triangle ABC: AB = 36 cm AC = 30 cm BC = 14 cm In the rectangle PQRS: PQ shows the length of the rectangle. PS = 4 cm'	Standard mark scheme

PAPER: 1MA1_1F			
Question		**Modification**	**Mark scheme notes**
15		Wording added 'Look at the diagram for Question 15 in the separate Diagram Booklet. It shows a stem and leaf diagram.' Sentence changed: 'She showed her results in the stem and leaf diagram.'	Standard mark scheme
16		Diagram of batteries removed. Information put in boxes 4 batteries 8 batteries 12 Batteries £1.80 £3.20 £6.00	Standard mark scheme
19		Wording added: Look at the diagram for Question 19 in the separate Diagram Booklet. The diagram shows Triangle A and Triangle B on a coordinate grid. Describe fully the SINGLE transformation that maps Triangle A onto Triangle B. You may be given a cut out triangle for this question.' Labels on triangles changed to 'Triangle A' and 'Triangle B'	Standard mark scheme
22		Diagram enlarged. Letters added to diagram (ABCDEF). Wording added: 'Look at the diagram for Question 22 in the separate Diagram Booklet. The diagram is NOT accurately drawn. The diagram shows a plan of a floor labelled ABCDEF. In the diagram: AB = 10 m BC = 5 m EF = 6 m FA = 8 m	Standard mark scheme
23		Diagram enlarged. Labels changed to 'Set P' and 'Set Q'. Wording added 'Look at the diagram for Question 23 in the separate Diagram Booklet. The diagram shows a Venn diagram with Set P and Set Q.'	Standard mark scheme
25		Diagram enlarged. Wording added 'Look at the diagram for Question 25 in the separate Diagram Booklet. The diagram shows a straight line L drawn on a coordinate grid.'	Standard mark scheme

Question	Answer	Mark	Mark scheme	Additional guidance
13 (a)	$6cd$	B1	for $6cd$ or $6dc$ or $cd6$ oe	Inclusion of × scores B0, eg $6 \times cd$ oe
(b)	-5	M1	for $3 + 2 \times -4$ ($= 3 - 8$)	
		A1	cao	

Question	Answer	Mark	Mark scheme	Additional guidance
26	Shown with reason given	M1	for deriving a suitable equation, eg $4x + 15 + 2x + 15 + 4x + 8 + 3x - 3 = 360$ or $13x + 35 = 360$ **or** $4x + 15 + 2x + 15 = 180$ or $6x + 30 = 180$ **or** $4x + 8 + 3x - 3 = 180$ or $7x + 5 = 180$	May be seen in an equation
		M1	(dep) for a method to isolate terms in x, eg $4x + 2x + 4x + 3x = 360 - 15 - 15 - 8 + 3$ **or** $4x + 2x = 180 - 15 - 15$ **or** $4x + 3x = 180 - 8 + 3$	
		A1	for solving equation to $x = 25$	
		C1	for substituting $x = 25$ into $A + B$ or $C + D$ and showing $= 180$, and gives a suitable statement, eg co-interior/allied angles (sum to 180), **or** since $A + B = 180$ the lines are parallel	If starting with an equation = 180 need to substitute into the opposite pair.
			Alternative solution assuming it is a trapezium	
	Shown	M1	for deriving a suitable equation, eg $4x + 15 + 2x + 15 = 4x + 8 + 3x - 3$ or $6x + 30 = 7x + 5$	
		M1	(dep) for a method to isolate terms in x, eg $15 + 15 - 8 + 3 = 4x + 3x - 4x - 2x$	
		A1	for solving equation to $x = 25$	
		C1	for a fully correct statement, eg since $A + B = 180$ the lines are parallel	

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

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

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

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

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

Question	Answer	Mark	Mark scheme	Additional guidance
15 (a)	$3(2a + 5)$	B1		
(b)	2	M1	for correct expansion of brackets, ie $12y + 4$ **or** dividing throughout by 4 as a first step to solve equation, eg $3y + 1 = 28 \div 4$	For M marks step must be carried out not just intention shown. For example, if you see $4(3y + 1) = 28$ $\div 4 \quad \div 4$ Award M1 for: $3y + 1 = k$ with $k \neq 28$ or 112
		M1	for isolating terms in y, eg $12y = 28 - 4$ **or** $3y = 7 - 1$	ft their equation of the form $ay \pm b = c$ For example, if you see $12y + 4 = 28$ $-4 \quad -4$ Award M1 for: $12y = k$ with $k \neq 28$ or 32
		A1	cao	

Paper: 1MA1/1F

Question	Answer	Mark	Mark scheme	Additional guidance
27	3.125×10^7	M1	for $(k =)\ (1.25\times10^{-12})\div(4\times10^{-20})$ **or** for the digits 3125	Condone missing brackets on division 3.1×10^7 or 3.12×10^7 or 3.13×10^7 will score M1A0
		A1	cao	

23	10.2 and 10.3	B1 B1	for 10.2 in the correct place for 10.3 in the correct place	 Accept 10.2$\dot{9}$ or 10.299(99...)

Question	Answer	Mark	Mark scheme	Additional guidance
27	$y = -2x + 3$	M1	for a correct method to find the gradient of the line, eg $\frac{-1-3}{2-0}(=-2)$	
			or identifies 3 as the intercept in words or in a partial linear equation eg $y = mx + 3$ oe eg $y = 1.5x + 3$	Just circling 3 is insufficient
			or for $y = [-2]x + c$	[−2] can be any numerical value, c must be seen as a letter or a number
			or for $y - b = [-2](x - a)$ where (a, b) is a correct coordinate	[−2] can be any numerical value
		M1	for $y = -2x$ (+ c)	Award of this mark implies the first M1
			or for $y =$ "−2"$x + 3$, $m \neq 0$	
			or for (L =) $-2x + 3$	
			or $y - y_1 = -2(x - x_1)$	
			or for $y - b =$ "-2"$(x - a)$ where (a, b) is a correct coordinate	
		A1	for $y = -2x + 3$ oe	Any correct equation gets 3 marks

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

Only mark scheme amendments are shown where the enlargement or modification of the paper requires a change in the mark scheme. 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_3F			
Question		**Modification**	**Mark scheme notes**
4		Wording changed: 'Write the following five numbers in order.'	Standard mark scheme
6	(a)	Letter 'x' changed to 'p'.	Standard mark scheme
7	(a)	Wording changed: 'Look at the diagram for Question 7(a) in the Diagram Booklet. It shows a quadrilateral on a grid.' Diagram enlarged. Shading changed.	Standard mark scheme
	(b)	Wording added: 'Look at the diagram for Question 7(b) in the Diagram Booklet. It shows a blank grid.' Wording removed: 'below' For Braille: sentence added 'Bumpons and drawing film are provided if you wish to use them.' Diagram enlarged.	Standard mark scheme
8	(a)	Wording added: 'Look at the table for Question 8(a) in the Diagram Booklet. It shows an incomplete bill.' Wording changed: 'Her bill is shown in the Diagram Booklet.' For MLP: wording added 'There are three spaces to fill.' For Braille: wording changed 'Complete the missing information labelled (i) to (iii) in the bill.' Table enlarged.	Standard mark scheme
10		Wording changed: 'Look at the table for Question 10 in the Diagram Booklet. It shows part of a train timetable between Horwich and Manchester.' Table enlarged. Bolton row removed from the table. Last column removed from the table.	Standard mark scheme

PAPER: 1MA1_3F			
Question		**Modification**	**Mark scheme notes**
11		Wording changed: 'Look at the diagram for Question 11 in the Diagram Booklet. It shows a graph which you can use to change between miles and kilometres.' Diagram enlarged. Graph changed to go from 0 to 9 on the horizontal axis and from 0 to 6 on the vertical axis. (a) Value '10' changed to '5'. (b) Value '50' changed to '12'. 'Staithes' changed to 'Filey'.	(a) B1 for 8 cao (b) M1 for taking a suitable reading from the graph that could be used to convert, eg 4km = 2.5miles Allow the following ranges for the reading eg 1km = 0.5 – 0.75miles 2km = 1 – 1.5 miles 3km = 1.625 – 2.125 miles 4km = 2.25 – 2.75 miles 6km = 3.5 – 4 miles for miles to km allow 1 mile = 1.6 km M1 for a complete process, eg "2.5" × 3 + 17 **or (**17 × "1.6" + 12) ÷ "1.6" A1 for answer in range 23 to 26

PAPER: 1MA1_3F			
Question		**Modification**	**Mark scheme notes**
13		Wording changed: 'Look at diagrams 1-6 for Question 13 in the Diagram Booklet. You may be provided with two models. They are NOT accurate. The models show a crate and a box. Diagram 1 shows a 3D view of the crate. Diagram 2 shows the front of the crate. Diagram 3 shows the side of the crate. Diagram 4 shows a 3D view of the box. Diagram 5 shows the front of the box. Diagram 6 shows the side of the box.' m changed to metres Diagrams enlarged. 2D views added. Models provided.	Standard mark scheme
14		Wording added: 'Look at the table for Question 14 in the Diagram Booklet.' Wording added: 'in the Diagram Booklet' Table turned vertically and enlarged.	Standard mark scheme
15		Wording changed: 'Look at the table for Question 15 in the Diagram Booklet. It …' Table enlarged.	Standard mark scheme
17		Wording added: 'Look at the diagram for Question 17 in the Diagram Booklet. It shows a grid.' Wording added: 'below' Value '100' changed to '90'. Table enlarged and left aligned. Frequency values in the table changed from 12, 28, 30, 22, 8 to 10, 25, 30, 20, 5 Wording changed from 'below' to 'in the Diagram Booklet'. For Braille: sentence added 'Bumpons and drawing film are provided if you wish to use them.' Diagram enlarged. Open headed arrows.	Standard mark scheme but points plotted at heights 10, 25, 30, 20, 5

PAPER: 1MA1_3F			
Question		**Modification**	**Mark scheme notes**
19		Wording added: 'Look at the diagram for Question 19 in the Diagram Booklet. It shows angle ABC' Diagram enlarged. Diagram rotated so that BC is horizontal. For Braille: sentence added 'Drawing film is provided if you wish to use it.'	Standard mark scheme
20		Wording added: 'Look at the diagram for Question 20 in the Diagram Booklet. It shows an incomplete probability tree diagram.' For MLP: wording added 'in the Diagram Booklet. There are five spaces to fill.' For Braille: wording changed 'Complete the probability tree diagram by writing the missing values labelled (i) to (v).' Diagram enlarged.	Standard mark scheme
21		p changed to pence	Standard mark scheme
22		Wording changed: 'Look at the diagram for Question 22 in the Diagram Booklet. It is a stem and leaf diagram showing …' Diagram enlarged. Horizontal line added at the bottom of the diagram. Key moved above and left of the diagram.	Standard mark scheme
24		Wording changed: 'Look at the diagram for Question 24 in the Diagram Booklet. It shows a right-angled triangle ABC BC = 7.6 cm Angle ACB = 62° Angle ABC is a right angle.' Diagram enlarged. Right angle made more obvious. Angle moved outside of the angle arc and angle arc made smaller.	Standard mark scheme
27		Wording changed: 'Look at the diagram for Question 27 in the Diagram Booklet. It shows line L drawn on a grid.' Diagram enlarged. Open headed arrows.	Standard mark scheme

9	(a)	$x - 5$	B1	cao	Allow $-5 + x$
	(b)	$2x$	B1		Allow $x + x$ or $x2$ or $x \times 2$ or $2 \times x$
	(c)	3	B1	cao	

Paper: 1MA1/1F

Paper: 1MA1/1F

Question	Answer	Mark	Mark scheme	Additional guidance
22 (a)	4.5	P1	for a process to find the number of dark chocolates, eg $280 \times \frac{1}{7}$ oe (= 40)	
		P1	for a process to find one part of the ratio for milk chocolates to white chocolates eg (280 – "40") ÷ (1 + 3) (= 60)	
		P1	for process to find the number of white chocolates, eg "60" × 3 (= 180) or 280 −"40" −"60" (= 180)	Condone milk, white incorrectly labelled
		P1	for a ratio of white chocolates : dark chocolates eg "180" : "40" oe or for a process to find the value of *n* eg "180" ÷ "40"	Labels not required for this mark, but if seen must be correct Must be a 2-part ratio. Allow "40" : "180" if labelled as dark chocolate : white chocolate oe
		A1	(dep P3) for 4.5 oe	A correct answer with no supportive working gets 0 marks Condone answer of 4.5:1
(b)	No with reason	C1	for No with reason **Acceptable examples** No, the number of dark chocolates and white chocolates has not changed No, the ratio of *n*:1 only involved white and dark chocolates No, eating milk chocolates doesn't change the rest No, the ratio of dark to white chocolates doesn't change. **Not acceptable examples** Yes,… No, it doesn't matter how many milk chocolates are eaten No, the number of white chocolates doesn't change No, the number of dark chocolates doesn't change	Reason must refer to or imply both dark and white chocolates

Paper: 1MA1/1F

Paper: 1MA1/1F

Question	Answer	Mark	Mark scheme	Additional guidance
25	$y = -\frac{3}{4}x + 3$	M1	for a correct method to find the gradient of the line, eg $\frac{3-0}{0-4}$ $(= -\frac{3}{4})$ **or** identifies 3 as the intercept in words or in a partial equation **or** for $y = [-\frac{3}{4}]x + c$ **or** for $y - b = [-\frac{3}{4}](x - a)$ where (a, b) is a correct coordinate	Just circling 3 is insufficient $[-\frac{3}{4}]$ must be identifiable as their gradient c must be seen either as a letter or a number
		M1	for $y = -\frac{3}{4}x$ $(+ c)$ oe **or** for $y =$ "$-\frac{3}{4}$"$x + 3$, $m \neq 0$ **or** (**L** =) $-\frac{3}{4}x + 3$ **or** $y - y_1 = -\frac{3}{4}(x - x_1)$ **or** $y - b =$ "$-\frac{3}{4}$"$(x - a)$ where (a, b) is a correct coordinate **or** for an answer of $y = \frac{3}{4}x + 3$ oe	
		A1	for $y = -\frac{3}{4}x + 3$ oe provided the equation in the required form	Allow eg $y = 3 - \frac{3}{4}x$ A correct equation not in the required form scores M1M1A0

9	(i)	65	M1	for a complete method eg 180 – 85 – 30 **or** 360 – 180 – 85 – 30	May be seen on the diagram 85 + 30 + 65 = 180 scores M1A0 unless 65 clearly identified
			A1	cao	
	(ii)	Reason	C1	for Angles on a straight line add up to 180 **or** Angles at a point add up to 360	Reason must be for their chosen method If M0 awarded in (i) answer must be in the range 35 to 95 to award C1 Underlined words must be seen Condone use of ∠s for angles

13	(a)	n^3	B1	cao	
	(b)	6	M1	for isolating k terms, eg $5k = 26 + 4$ or $5k = 30$ **or** $k - \frac{4}{5} = \frac{26}{5}$ oe **or** $26 + 4 \div 5$	For M mark step must be carried out not just intention shown. For example, if you see $5k - 4 = 26$ $+4 \quad +4$ award M1 for $5k = r$ where $r > 26$
			A1	cao	

Paper: 1MA1/2F

Paper: 1MA1/2F

Question	Answer	Mark	Mark scheme	Additional guidance
25	370	P1	for finding the mean of list **A**, eg (276 + 400 + 157 + 139) ÷ 4 (= 243) **OR** for an expression for the mean of list **B**, eg $(530+500+270+x+440+320)\div 6\left(=\frac{2060+x}{6}\right)$ oe	
		P1	for beginning to work with ratio, eg "243" ÷ 3 (= 81) or [A] ÷ 3 **or** "243" × 5 (= 1215) or [A] × 5 **OR** $"\left(\frac{2060+x}{6}\right)"\times 3$ **or** [B] × 3 **or** $"\left(\frac{2060+x}{6}\right)"\div 5$ **or** [B] ÷ 5	[A] is what they believe to be the mean for **A** [B] must be clearly their mean of **B** and be an expression including x
		P1	for completing the work with ratio, eg "81" × 5 (= 405) **or** [A] ÷ 3 × 5 **or** [B] × 3 ÷ 5 **or** $"\left(\frac{2060+x}{6}\right)"\times \frac{3}{5}$ **OR** forms a suitable equation, eg $"243"\times 5=3\times"\left(\frac{2060+x}{6}\right)"$ or $[A]\times 5=3\times"\left(\frac{2060+x}{6}\right)"$	
		P1	for working with mean of list **B**, eg "405" ×6 (= 2430) or [A] ÷ 3 × 5 × 6 **OR** for process to remove brackets and denominator, eg $"243"\times 5\times 2=2060+x$ or [A] × 5 × 2 = 2060 + x or 2060 + x = "405" × 6	
		A1	cao	

Paper: 1MA1/2F

Question	Answer	Mark	Mark scheme	Additional guidance
26	60.3	M1	for a correct trig statement, eg $\tan x = \frac{7}{4}$	Other methods are possible but only award this mark at the point of an equation with x as the only unknown
		A1	60.2 to 60.42	

29	26	M1 M1 A1	for continuing the sequence to find the 5th term, eg $3a + 4a + 4a$ (= $11a$) (dep M1) for equating the fifth term with 286, eg $3a + 4a + 4a = 286$ oe **or** 286 ÷ "11" cao	 May be seen next to sequence Award M2 for a correct numerical statement relating 26, 11 and 286 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

PMT

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Mark Scheme (Results)

November 2012

GCSE Mathematics (Linear) 1MA0
Foundation (Non-Calculator) Paper 1F

PMT

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NOTES ON MARKING PRINCIPLES

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

2 Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.

3 All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e if the answer matches the mark scheme. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.

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

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

6 Mark schemes will indicate within the table where, and which strands of QWC, are being assessed. The strands are as follows:

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

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

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

7 With working

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

8 Follow through marks

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

9 Ignoring subsequent work

It is appropriate to ignore subsequent work when the additional work does not change the answer in a way that is inappropriate for the question: e.g. incorrect canceling of a fraction that would otherwise be correct
It is not appropriate to ignore subsequent work when the additional work essentially makes the answer incorrect e.g. algebra.
Transcription errors occur when candidates present a correct answer in working, and write it incorrectly on the answer line; mark the correct answer.

10 Probability

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

11 Linear equations

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

12 Parts of questions

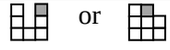
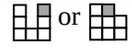
Unless allowed by the mark scheme, the marks allocated to one part of the question CANNOT be awarded in another.

13 Range of answers

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

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

1MA0_1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
1	(a)		E	1	B1 cao
	(b)		Cylinder	1	B1 for cylinder or circular prism. Use professional judgement re spelling of cylinder
	(c)		6	1	B1 cao
	(d)		8	1	B1 cao
2	(a)		507	1	B1 cao
	(b)		40	1	B1 for 40 or forty or 4 tens (do not accept an answer of "tens")
	(c)		6000	1	B1 for 6000 or six (6) thousand
3	(a)		43	1	B1 cao
	(b)	3 + 10	13	1	B1 cao
	(c)		7.1 – 7.9 inc.	1	B1 for answer in the range 7.1 – 7.9 inc
4	(a)		36 – 40 inc.	1	B1 for any answer in the range 36 – 40 inc.
	(b)		line	1	B1 for line of length 4.8 – 5.2cm inc.
5	(a)			2	B1 for 6 tins drawn for Thursday B1 for 3 + ½ tins drawn for Friday. Use professional judgement re sketch of semicircle
	(b)		15	2	M1 for (4.5 – 3)×10 or 1.5×10 or 4.5×10 – 3×10 or 45 – 30 or 10 + 5 A1 for 15

1MA0_1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
6	(a)		Tuesday	1	B1 for Tuesday (accept 8)
	(b)		– 6	1	B1 cao
	(c)		Wednesday or 8	2	B2 for Wednesday or 8 OR M1 for an attempt to find the difference in at least 3 of: 5 and 4, 8 and 6, 6 and -2, -1 and -4, -3 and -6; ie the answers need not be correct. A1 for Wednesday or 8
7	(a)		$\frac{3}{5}$	2	B2 cao (B1 for $\frac{9}{15}$ oe) [SC: B1 for an answer of $\frac{2}{5}$]
	(b)		0.9	1	B1 for 0.9 or 0.90 or .9
	(c)		No + reason	1	B1 for no and 0.75 or 80% or $\frac{75}{100}$ and $\frac{80}{100}$
8	(a)			1	B1 for 
	(b)			1	B1 cao

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1MA0_1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
9	(a)		No + reason	1	B1 for no and the (prob.) of red is (bigger than the (prob.) of blue. OR (prob.) of blue is nearer 0 OR (prob.) of red is closer to 1 OR (prob.) of red is 50% and the (prob.) of blue is about 20% oe
	(b)(i)		$\frac{4}{7}$	2	B1 for $\frac{4}{7}$ oe
	(ii)		0		B1 for 0 or $\frac{0}{7}$ or 0% (accept 0 out of 7, but not 0:7 or 0 to 7)
10		F + C + S 30 + 7 + 8 = 45 3×20 – 45 = 15	15	4	M2 for 30 + 7 + 8 (= 45) (M1 for 12 × 2 + 7 × 3 + 8 (= 53) or 12 × 2 + 7 × 2 (= 38)) M1 (dep on at least M1) for "20 × 3" – "45" or "20 × 3" – "53" A1 cao [SC: B1 for an answer of 22 if M0 scored]
11	(a)		(1, 2)	1	B1 cao (accept coordinates just shown on the grid)
	(b)		(0, –3)	1	B1 cao (accept coordinates just shown on the grid)
	(c)		(3, –2)	1	B1 for (3, –2) or (–3, –4) or (–1, 6) [SC: B1 for coordinates reversed, (–2, 3) or (–4, –3) or (6, –1) if coordinates reversed in parts (a) **and** (b)]

PMT

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
13	(a)		$3f$	1	B1 for $3f$ or $f3$ or $3 \times f$ or $f \times 3$
	(b)		$6m$	1	B1 for $6m$ or $m6$
	(c)		$4a + 5h$	2	B2 for $4a + 5h$ or $5h + 4a$ (B1 for $4a$ or $5h$ or $4a + 5h = 9ah$)
14	(a)		08 50	1	B1 for 08 50 or 8 50 (am) or 10 to 9
	(b)	13 43 – 13 29	14	1	B1 cao
	(c)*	e.g. HL to SC: 11 02 – 11 41 Visit (at least 3 hours) SC to HL: 15 16 – 15 49 [Note : there are 9 possible solutions]	A fully correct plan showing departure times and arrival times of the two bus journeys	4	B1 for a departure time of 08 02 or 09 04 or 10 12 or 11 02 from HL M1 (indep) for a correct arrival time at SC and a correct departure time from SC (or Cartbridge St) which allows for a stay of at least 3 hours in SC (the differencing does not have to be seen) OR for correctly adding 3 hours to a their arrival time at SC B1 for a departure time from SC of 13 20 (13 11 from CS) or 14 24 (14 14 from CS) or 15 16 (15 07 from CS) C1 (dep on M1) for a complete correct plan which includes the departure and arrival times of the two bus journeys [Note: bus departure times may be identified by their starting times. Eg the 15 07 from Cartbridge Street would be acceptable for the identification of the bus which arrives a HL at 15 49]

PMT

1MA0_1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
15	(a)		32	1	B1 cao
	(b)	e.g. $20 = £12.50 $100 = 5×£12.50 = £62.50 £62.50 – 60 = £2.50	£2.50 OR $4	3	M1 for a correct method to convert $100 to £, e.g. 5× '12.50' (= 62.50) ('12.50' is their reading from the graph at $20) M1 (dep) for '62.50' – 60 A1 for £2.5(0) (units must be stated) **OR** M1 for correct method to convert £60 to $, e.g. 3×32 (=96) or ft their answer to part (a) M1 (dep) for 100 – '96' A1 for $4 (units must be stated)
16	(a)	3×3×3×3	81	1	B1 cao
	(b)		4	1	B1 cao
17	(a)		7	1	B1 cao
	(b)		12	1	B1 cao
	(c)	$5w = 10 + 6$ $w = 16÷5$ or $w - \frac{6}{5} = \frac{10}{5}$ oe	16/5 oe	2	M1 for $5w-6+6 = 10 + 6$ oe or $w - \frac{6}{5} = \frac{10}{5}$ oe A1 for $\frac{16}{5}, 3\frac{1}{5}$, 3.2, oe

1MA0_1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
18	(a)		21	1	B1 cao
	(b)		17	1	B1 cao
	(c)	55 – 15	40	2	M1 for 55 – 15 (accept 15 – 55 or 15 to 55 or 55 to 15 or 15, 55 but not 15 + 55) A1 cao
19*		360 – 200 – 90 (=70) (180 – '70') ÷2 angles at a point add to 360°, angles in a triangle add to 180°, base angles of an isosceles triangle are equal	y = 55 reasons	4	M1 for 360 – 200 – 90 oe M1 for (180 – '70') ÷ 2 Reasons: angles at a point add up to 360° angles in a triangle add up to 180° base angles of an isosceles triangle are equal C2 for y = 55° and all correct reasons Note: An answer of 55° alone, is not enough; y = 55° must be explicitly stated or clearly shown on the diagram (C1 for one correct reason) Note: the award of any C mark is dependant upon the award of at least M1

1MA0_1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
20		$\frac{1}{2} \times 60 = 30$, $30 \times 5 = 150$ $\frac{1}{3} \times 60 = 20$, $20 \times 4 = £80$ $3 \times 60 = 180$ $180 + 75 - 150 - 80 = £25$ 10 bags (i.e. 60 – 30 – 20) sold for 25 $25 \div 10 = 2.50$ OR $\frac{1}{2} \times 60 = 30$, $30 \times £2 = £60$ profit $\frac{1}{3} \times 60 = 20$, $20 \times £1 = £20$ profit $60 + 20 = £80$ $80 - 75 = 5$ loss on 10 bags (i.e. 60 – 30 – 20) $10 \times £3 = £30$ $30 - 5 = £25$ $£25 \div 10 = £2.50$	2.50	4	M1 for $\frac{1}{2} \times 60 \times 5$ (=150) or $\frac{1}{3} \times 60 \times 4$ (=80) M1 (dep on 1st M1) for $3 \times 60 + 75$ – '150' – '80' oe (=25) M1 (dep on previous M1) for '25'÷(60 – '30' – '20') A1 for 2.50 (accept 2.5) OR M1 for $\frac{1}{2} \times 60 \times 2$ (=60) or $\frac{1}{3} \times 60 \times 1$ (=20) M1 (dep on 1st M1) for (60 – '30' – '20') × 3 – ('60' + '20' – 75) oe (=25) M1 (dep on previous M1) for '25'÷(60 – '30' – '20') A1 for 2.50 (accept 2.5)

<table>
<tr><th colspan="6">1MA0_1F</th></tr>
<tr><th colspan="2">Question</th><th>Working</th><th>Answer</th><th>Mark</th><th>Notes</th></tr>
<tr><td>21</td><td></td><td>e.g.
41 – 21 (=20)
49 – 10 – 20 (=19)
16 + 19 = 35

OR
(100 – 49) – (16 + 21) (=14)
14 + 10 (=24)
100 – (41 + 24) = 35

<table><tr><td></td><td>w</td><td>b</td><td>c</td><td></td></tr><tr><td>Boys</td><td>16</td><td>21</td><td>14</td><td>51</td></tr><tr><td>Girls</td><td>19</td><td>20</td><td>10</td><td>49</td></tr><tr><td></td><td>35</td><td>41</td><td>24</td><td>100</td></tr></table></td><td>35</td><td>4</td><td>M1 for 41 – 21 (= 20) or
M1 for 49 – 10 – ‘20’ (= 19)
M1 for 16 + ‘19’
A1 cao

OR
M1 for 100 – 49 (=51)
M1 for ‘51’ – 21 – 16 (= 14) and ‘14’ +10 (= 24)
M1 for 100 – (41 + ‘24’)
A1 cao

NB working may appear in table or diagram</td></tr>
<tr><td>22</td><td></td><td></td><td>4×6 rectangle</td><td>2</td><td>B2 for a single 4×6 rectangle drawn anywhere on the grid
(B1 for a single 4×n rectangle or a single m×6 rectangle drawn anywhere on the grid)

Note: All nets and 3-D sketches get NO marks</td></tr>
</table>

1MA0_1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
23		180×1.5 40×1.5 110×1.5 30×1.5	Flour = 270 Ginger = 60 Butter = 165 Sugar = 45	3	M1 for ×24÷16 oe or 24/16 or 1.5 seen or 180 + 90 (=270) or 40 + 20 (=60) or 110 + 55 (=165) or 30 + 15 (=45) or sight of any one of the correct answers A2 for all 4 correct answers (A1 for 2 or 3 correct answers)
24	(a) (b)		Positive (correlation) 83 to 87 inc.	1 2	B1 for positive (correlation) [do not accept a relationship] B2 for an answer in the range 83 to 87 inc. OR M1 for a single straight line segment with positive gradient that could be used as a line of best fit or for an indication on the diagram from 148 on the height axis A1 ft from their line of best fit
25		$\frac{9}{2}\times(12+18)=135$ 135 ÷ 20 = 6.75 (=7 bags) 7 × 4.99 OR $18\times9-\frac{1}{2}(6\times9)$ = 135 135 ÷ 20 = 6.75 (=7 bags) 7 × 4.99	34.93	4	M1 for $\frac{9}{2}\times(12+18)$ or $18\times9-\frac{1}{2}(6\times9)$ or $9\times12+\frac{1}{2}\times(18-12)\times9$ or 135 seen M1 (dep) for '135'÷ 20 or 6 or 7 seen M1 (dep on previous M1) for '6' × 4.99 or '7' × 4.99 A1 cao [SC: M1 for (12×9 + 6×9) ÷ 20 (= 162÷20) or 8 or 9 seen M1 (dep) for '8' × 4.99 or '9' × 4.99 OR M1 for (18×9 − 6×9) ÷ 20 (= 108÷20) or 5 or 6 seen M1 (dep) for '5' × 4.99 or '6' × 4.99]

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1MA0_1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
26			Eg. How many hours do you read each day? 0 to 1 h ☐ over 1 h to 2 h ☐ over 2 h ☐	2	B1 for an appropriate question with reference to a time frame, with a unit of time, or a question with a time frame, with a unit of time, implied by responses B1 for at least 3 non-overlapping boxes (ignore if not exhaustive) or for at least 3 exhaustive boxes (ignore if any overlapping) [Note: labels on response boxes must not be inequalities] Do not accept frequency tables or data collection sheets for award of the second B mark
27		Area of cross section 4×7 + 5×2 or 9×2 + 5×4 **OR** 9 × 7 – 5 × 5 (= 38)	380	3	M1 for 4×7 + 5×2 (=38) or 9×2 + 5×4 (=38) or 7×9 − 5×5 (=38) or 4×7×10 or 5×2×10 (=100) or 9×2×10 (=180) or 5×4×10 (=200) or 9×7×10 (=630) or 5×5×10 (=250) M1 (dep) for '38'×10 or 380 or 4×7×10 + 5×2×10 or 9×2×10 + 5×4×10 or (7×9 − 5×5) ×10 A1 cao
28			Region shaded	3	B1 for circle arc of radius 3cm (± 2mm) centre Burford B1 for circle arc of radius 5 cm (± 2mm) centre Hightown B1 for overlapping regions of circle arcs shaded

1MA0_1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
29*		180÷9×1:180÷9×3:180÷9×5 =20:60:100 Not enough cement (but enough sand and enough gravel) OR 1×15:3×15:5×15 =15:45:75 15+45+75=135 (<180) Not enough cement (to make 180kg of concrete)	No + reason	4	M1 for 180 ÷ (1+3+5) (=20) or 3 multiples of 1: 3: 5 M1 for 1×'20' or 3×'20' or 5×'20' or 20 seen or 60 seen or 100 seen A1 for (Cement=) 20, (Sand=) 60, (Gravel=) 100 C1 ft (provided both Ms awarded) for not enough cement oe **OR** M1 for (1×15 and) 3×15 and 5×15 or 9×15 or sight of the numbers 15, 45, 75 together. M1 for '15' + '45' + '75' A1 for 135 (<180) C1 ft (provided both Ms awarded) for not enough cement oe

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NOTES ON MARKING PRINCIPLES

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

2 Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.

3 All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e if the answer matches the mark scheme. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.

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

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

6 Mark schemes will indicate within the table where, and which strands of QWC, are being assessed. The strands are as follows:

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

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

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

7 With working

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

8 Follow through marks

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

9 Ignoring subsequent work

It is appropriate to ignore subsequent work when the additional work does not change the answer in a way that is inappropriate for the question: e.g. incorrect canceling of a fraction that would otherwise be correct
It is not appropriate to ignore subsequent work when the additional work essentially makes the answer incorrect e.g. algebra.
Transcription errors occur when candidates present a correct answer in working, and write it incorrectly on the answer line; mark the correct answer.

10 Probability

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

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

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

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

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

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

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

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

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

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

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

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

<table>
<tr><th colspan="6">PAPER: 1MA0_1F</th></tr>
<tr><th colspan="2">Question</th><th>Working</th><th>Answer</th><th>Mark</th><th>Notes</th></tr>
<tr><td>24</td><td></td><td><table><tr><td></td><td>M</td><td>F</td><td>T</td></tr><tr><td>Train</td><td>5</td><td><u>10</u></td><td>15</td></tr><tr><td>Car</td><td><u>8</u></td><td>17</td><td>25</td></tr><tr><td>Total</td><td><u>13</u></td><td>27</td><td><u>40</u></td></tr></table></td><td>25</td><td>3</td><td>NB : There is often a choice of methods seen in responses to this question. When this occurs, the guidance given in point 7 of the marking principles must be followed - mark the method that leads to the answer

M1 for 40 – 13 or 27 female or 40 – (13+10) or 13 – 8 or 5 males and train
M1 for a complete correct method
eg. “27” – 10 + 8 or 40 – (10 + “5”)
A1 for 25

OR

M1 for a 2-way table or diagram, with clear labeling showing at least 3 pieces of the given information correctly placed.
M1 for 27 female or 5 male and train
A1 cao

(Note for award of the final A1, the 25 in the diagram must be highlighted in some way to indicate it is the final answer (or placed on the answer line))</td></tr>
<tr><td>*25
QWC</td><td></td><td></td><td>$x = 50^o$ with complete reasons</td><td>3</td><td>M1 for 180 – (65 + 65)
A1 for $x = 50$ cao
C1 (dep on M1) Base <u>angles</u> of an <u>isosceles</u> triangle are <u>equal</u>
and <u>angles</u> in a <u>triangle</u> add up to <u>180</u></td></tr>
</table>

PMT

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

PMT

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

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

PMT

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

PMT

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

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

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

PAPER: 1MA0_1F			
Question		**Modification**	**Notes**
1	(b)	Angle x = 115 degrees.	Angle x is 115° ±5°
	(c)		10.5 ±5 mm
3		6 caravans changed to 5	Standard mark scheme
6		Hampton in Arden row has been removed.	Standard mark scheme
8	(a)	2cm grid – wording changed to "a grid of squares". Each square represents a one centimetre square."	Standard mark scheme
	(b)	2cm grid – wording added "Each square represents a one centimetre square."	Standard mark scheme
9	(ii)	(X) removed.	Standard mark scheme
11		Boxes removed. Information given instead.	Standard mark scheme
13		Pictures of coins was removed.	Standard mark scheme

PMT

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

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PMT

NOTES ON MARKING PRINCIPLES

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

2 Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.

3 All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e if the answer matches the mark scheme. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.

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

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

6 Mark schemes will indicate within the table where, and which strands of QWC, are being assessed. The strands are as follows:

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

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

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

7 With working

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

8 Follow through marks

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

9 Ignoring subsequent work

It is appropriate to ignore subsequent work when the additional work does not change the answer in a way that is inappropriate for the question: e.g. incorrect canceling of a fraction that would otherwise be correct
It is not appropriate to ignore subsequent work when the additional work essentially makes the answer incorrect e.g. algebra.
Transcription errors occur when candidates present a correct answer in working, and write it incorrectly on the answer line; mark the correct answer.

10 Probability

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

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

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

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

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

PMT

PAPER: 1MA0_2F					
Question		**Working**	**Answer**	**Mark**	**Notes**
1	(a)		2085	1	B1 for 2085 or 2,085
	(b)		five thousand, one hundred and eight	1	B1 for five thousand, one hundred (and) eight
	(c)		9 tenths		B1 for 9 tenths oe, eg $\frac{9}{10}$ or $\frac{90}{100}$
	(d)		160	1	B1 cao
2			inches grams litres	3	B1 for inch(es) or ins B1 for gram(s) or g B1 for litre(s) or *l* or millilitre(s) or m*l* (accept centilitres or cc or c*l* or cm^3)
3	(a)(i)		right angle marked	1	B1 for a clear intention to mark bottom left hand angle with R (accept r)or right-angle marked
	(ii)		acute	1	B1 for acute
	(iii)		reflex	1	B1 for reflex
	(b)		perpendicular line from *T* to *AB*	1	B1 for perpendicular line from *T* to *AB* (within guidelines of overlay)
4	(a)		5*m*	1	B1 for 5*m* or 5×*m* or *m*×5 or *m*5
	(b)		9*p*	1	B1 for 9*p* or *p*9
	(c)		4*tw*	1	B1 for 4*tw* or 4*wt* or *tw*4 or *wt*4 (condone 4×*tw* and 4×*wt*)

PAPER: 1MA0_2F					
Question		**Working**	**Answer**	**Mark**	**Notes**
5			$\frac{40}{200}$	3	**(uses frequencies)** M1 for 40 or 200 or any correct day total M1 for $\frac{40}{T}$, $T > 40$ or $\frac{n}{200}$, $n < 200$ A1 for $\frac{40}{200}$ oe accept 20% OR **(uses boxes)** M1 for 2 or 10 M1 for $\frac{2}{T}$, $T > 2$ or $\frac{n}{10}$, $n < 10$ A1 for $\frac{2}{10}$ oe accept 20% OR **(uses rectangles)** M1 for 8 or 40 M1 for $\frac{8}{T}$, $T > 8$ or $\frac{n}{40}$, $n < 40$ A1 for $\frac{8}{40}$ oe accept 20% [SC B2 for 40 out of 200 oe]
6	(a)		circle drawn, centre O radius OP	1	B1 for circle drawn radius OP within guidelines of overlay
	(b)		chord drawn	1	B1 for any line drawn joining two points on circumference of circle (accept diameter) [NB shaded segment scores B0]

PAPER: 1MA0_2F					
Question		**Working**	**Answer**	**Mark**	**Notes**
7			110	2	M1 for 30 + 70 + 20 (=120) or 50 + 40 + 20 (=110) or 50 + 10 + 60 (=120) A1 cao
8	(a)	4 × 3	12	1	B1 cao
	(b)		5	2	M1 for 4 × 2 – 3 A1 cao
9			5%	2	**(uses percentages)** M1 for 30 – 25 (= 5) or 25 – 30 (= −5) A1 for 5% oe OR **(uses decimals)** M1 for or 0.3 – 0.25 or 0.25 – 0.3 (= −0.05) A1 for 0.05 OR **(uses fractions)** M1 for $\frac{30}{100} - \frac{1}{4}$ or $\frac{1}{4} - \frac{30}{100}$ $(=-\frac{5}{100})$ A1 for $\frac{5}{100}$ oe OR **(uses trial value, eg 60)** M1 for 0.3×60 – 0.25×60 (=3) or 0.25×60 – 0.3×60 (= −3) A1 for $\frac{3}{60}$ oe
*10			diagram or chart	4	B1 for a key or suitable labels to identify Kitty and George B1 for diagram(s) or chart(s) set up for comparison, showing data for at least 3 months, eg dual bar chart, line graph etc B1 for correct heights for Kitty **or** George, dependent on a linear scale C1 for a fully correct diagram or chart to include 4 months labelled and eg 'cars' or 'frequency' axis correctly scaled and labelled

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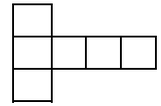
PAPER: 1MA0_2F					
Question		**Working**	**Answer**	**Mark**	**Notes**
11	(a)		12	1	B1 cao
	(b)		14	1	B1 cao
	(c)		16	1	B1 cao
12	(i)	2 2 3 3 3 4 4 5 5 6 (▲ under 4)	3.5	6	M1 for ordering the data condone one extra or one omission A1 for 3.5 or $3\frac{1}{2}$
	(ii)		4		M1 for 6 – 2 or 2 – 6 A1 cao
	(iii)		3.7		M1 for (2+2+3+3+3+4+4+5+5+6) ÷ 10 condone missing brackets or 37÷10 A1 for 3.7 or $3\frac{7}{10}$ [SC B1 for 31.6 or 33.4]
13			60	3	M1 for 9 × 14 + 6 (=132) M1 (dep) for full method to convert '132' from lbs to kg using the graph **or** for '132'÷2.2 (=60) A1 for 59 – 62 OR M1 for reading off 14 lbs (= 6.2–6.5) and 6 lbs (=2.4–2.9) M1 (dep) for 9 × '6.4' + '2.75' A1 for 59 – 62 [SC B2 for 66]

<table>
<tr><th colspan="6">PAPER: 1MA0_2F</th></tr>
<tr><th colspan="2">Question</th><th>Working</th><th>Answer</th><th>Mark</th><th>Notes</th></tr>
<tr><td>*14</td><td></td><td></td><td>Correct statement</td><td>4</td><td>M1 for 6.50 × 8 + 12 or 6.50 × 7 + 15
M1 for 6.50 × 8 + 12 and 6.50 × 7 + 15
A1 for 64 and 60.5(0)
C1 (dep on first M1) for correct statement ft their figures

OR
M1 for 6.50 × (8−7) or 15−12
M1 for 6.50 × (8−7) and 15−12
A1 for 6.5(0) and 3
C1 (dep on first M1) for correct statement ft their figures

[SC If no working shown B1 for 64 and 60.5(0) or B1 for 6.5(0) and 3]</td></tr>
<tr><td>15</td><td></td><td></td><td><table><tr><td>coin</td><td>tally</td><td>freq</td></tr><tr><td>£1</td><td>lll</td><td>3</td></tr><tr><td>50p</td><td></td><td>(0)</td></tr><tr><td>20p</td><td>~~llll~~1</td><td>6</td></tr><tr><td>10p</td><td>lll</td><td>3</td></tr><tr><td>5p</td><td>ll</td><td>2</td></tr><tr><td>2p</td><td></td><td>(0)</td></tr><tr><td>1p</td><td>ll</td><td>2</td></tr></table></td><td>2</td><td>B2 for all frequencies correct condone missing 0s
(B1 for at least 3 correct non zero frequencies or at least 3 correct non zero tallies or at least 2 correct non zero tallies with their frequencies correct)</td></tr>
</table>

PAPER: 1MA0_2F					
Question		**Working**	**Answer**	**Mark**	**Notes**
16	(a)		8	1	B1 cao
	(b)			2	M1 for 5 or 6 squares drawn and joined A1 for a correct net [NB missing internal lines may be implied by grid]
	(c)		54	2	M1 for 3 × 3 × 6 oe A1 cao
17	(a)		720	2	M1 for 6 × 120 or 600 × 120 ÷ 100 oe A1 for 720 oe (accept 720.0)
	(b)		£10 or €12	3	M1 for 540÷1.2 (=450) oe, eg 4×100+50 (=450) M1(dep) for 460 – '450' (=10) A1 for £10 oe (accept £10.0) OR M1 for 460×1.2 (=552) oe, eg 4×120+60+12 (=552) M1 (dep) for '552' – 540 (=12) A1 for €12 oe (accept €12.0)
18			11	3	M1 for $52 \times \frac{3}{4}$ (=39) oe or $\frac{120}{360} \times 150$ (=50) oe M1 for $52 \times \frac{3}{4}$ (=39) oe and $\frac{120}{360} \times 150$ (=50) oe A1 cao

PMT

PAPER: 1MA0_2F					
Question		Working	Answer	Mark	Notes
19	(a)		40	3	M1 for 120 × 100 (=12 000) or 20 × 15 (=300) M1 (dep) for '12 000' ÷ '300' A1 cao OR M1 for 120 ÷ 15 (= 8) or 100 ÷ 20 (= 5) M1 (dep) for '8' × '5' A1 cao OR M1 for 120 ÷ 20 (=6) or 100 ÷ 15 (=6.66…) M1 (dep) for '6'×'6.66…' (=40) or '6'×'6' (=36) or '6'×'7' (=42) A1 cao
	(b)		10.40	2	M1 for $\frac{20}{100} \times 52$ oe A1 for 10.4(0) [SC B1 for 62.4(0) or 41.6(0)]

PAPER: 1MA0_2F					
Question		**Working**	**Answer**	**Mark**	**Notes**
*20		**(Method 1)** Angle *ACB* = 180 – 135 (= 45) (sum of angles on a straight line = 180) Angle *ABC* = 180 – 70 – 45 (=65) (sum of angles in a triangle = 180 (*x* =) 180 – 65 (=115) (sum of angles on a straight line = 180) OR **(Method 2)** Angle *ACB* = 180 – 135 (= 45) (sum of angles on a straight line = 180) (*x* =) 70 + 45 (=115) (exterior angle = sum of interior opposite angles) OR **(Method 3)** Angle DAB = 180 – 70 = 110 (sum of angles on a straight line = 180) (*x* =) 360 – 135 – 110 (sum of exterior angles of a polygon = 360)	*x* = 115	5	M1 for correct method to find angle *DAB* or angle *ACB* or angle *ABC* (may be implied by correct angle marked in diagram) M1 for complete correct method to find *x* A1 for *x* = 115 C2 (dep on M1) for fully correct reasons for chosen method no extras (C1 (dep on M1) for one correct reason for chosen method) [NB *x* = 115 must be stated explicitly, 115 only scores A0]

PMT

PAPER: 1MA0_2F					
Question		Working	Answer	Mark	Notes
21	(a)		2.70	3	M1 for 2 × 1.40 + 2.10 + 2.40 (= 7.30) M1 (dep) for 10 – '7.30' or 2.7(0) A1 for 2.70 in correct money notation OR M1 for subtracting at least 2 different correct costs from (£)10 M1 for 10 – 1.40 – 1.40 – 2.10 – 2.40 A1 for 2.70 in correct money notation [SC B1 for 4.10 in correct money notation]
	(b)		2.21	3	M1 for 2.60×0.15 (= 0.39) or 260×0.15 (=39p) M1 (dep) for 2.60 – '0.39' or 260–39 (=221p) A1 cao OR M1 for 1 – 0.15 (=0.85) or 100 – 15 (=85) M1 (dep) for 2.60 × 0.85 oe A1 cao

PAPER: 1MA0_2F					
Question		**Working**	**Answer**	**Mark**	**Notes**
*22			Not enough mincemeat since 600<700 OR Only able to make 38 mince pies since insufficient mincemeat	4	M1 for 45 ÷ 18 (= 2.5) M1 for 2.5 used as factor or divisor A1 for 562.5 and 875 and 250 and 700 and 2.5 (accept 2 or 3) OR for availables as 400 and 400 and 200 and 240 and 2.4 (accept 2 or 3) C1 ft (dep on at least M1) for identifying and stating which ingredient is insufficient for the recipe (with some supportive evidence) OR M1 for a correct method to determine the number of pies one ingredient could produce M1 for a correct method to determine the number of pies **all** ingredient could produce A1 for 80 and 51 and 90 and 38 and 108 C1 ft (dep on at least M1) for identifying and stating which ingredient is insufficient for the recipe (with some supportive evidence)
23	(a)		Response boxes overlap and are not exhaustive	2	B2 for **TWO** aspects from: No time frame given Non-exhaustive responses Response boxes over-lapping (B1 for ONE correct aspect)
	(b)		How many magazines do you buy each month? 0-4 5-8 over 8	2	B1 for a question with a time frame B1 for at least 3 correctly labelled response boxes (non-overlapping, need not be exhaustive) **or** for a set of response boxes that are exhaustive (could be overlapping) [NB do not allow inequalities in response boxes]
	(c)		One reason	1	B1 for one reason eg all the same age, may all be males, may all like same types of magazines, sample too small, biased

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PAPER: 1MA0_2F					
Question		**Working**	**Answer**	**Mark**	**Notes**
24		<table><tr><th>x</th><th>$x^3 + 2x$</th></tr><tr><td>4</td><td>72</td></tr><tr><td>4.1</td><td>77.(121)</td></tr><tr><td>4.2</td><td>82.(488)</td></tr><tr><td>4.3</td><td>88.(107)</td></tr><tr><td>4.4</td><td>93.(984)</td></tr><tr><td>4.5</td><td>100.(125)</td></tr><tr><td>4.6</td><td>106.(536)</td></tr><tr><td>4.7</td><td>113.(223)</td></tr><tr><td>4.8</td><td>120.(192)</td></tr><tr><td>4.9</td><td>127.(449)</td></tr><tr><td>5</td><td>135</td></tr><tr><td></td><td></td></tr><tr><td>4.65</td><td>109.8(44625)</td></tr><tr><td>4.66</td><td>110.5(14696)</td></tr><tr><td>4.67</td><td>111.1(87563)</td></tr><tr><td>4.68</td><td>111.8(63232)</td></tr><tr><td>4.69</td><td>112.5(41709)</td></tr></table>	4.7	4	B2 for a trial $4.6 \leq x \leq 4.7$ evaluated correctly (B1 for a trial evaluated correctly for $4 \leq x \leq 5$) B1 for a different trial evaluated correctly for $4.65 \leq x < 4.7$ B1 (dep on at least one previous B1) for 4.7 [Note: Trials should be evaluated to at least accuracy shown in table, truncated or rounded] [NB No working scores 0 marks]

PMT

PAPER: 1MA0_2F					
Question		**Working**	**Answer**	**Mark**	**Notes**
25			28% or $\frac{14}{50}$	4	M1 for 100 − 30 (=70) or $1-\frac{3}{10}(=\frac{7}{10})$ M1 for '+70' ÷ (3 + 2) (=14) or '$\frac{7}{10}$' ÷ (3 + 2)(= $\frac{7}{50}$) M1 for '14' × 2 or $\frac{7}{50}\times 2$ A1 for 28% or $\frac{14}{50}$ oe OR M1 for a correct method to find (100−30)% of any actual sum of money, eg 0.7×500 M1 for '350' ÷ (3 + 2) (=70) M1 for '70' × 2 (=140) A1 for 28% or $\frac{14}{50}$ oe OR M1 for starting with a two numbers in ratio 3:2, eg 21 and 14 M1 for equating sum of their numbers to 100 – 30 (=70), eg '21' + '14' (=35) M1 for scaling sum of their numbers to 100%, eg '35'÷70×100 (=50) A1 for 28% or $\frac{14}{50}$ oe [SC award B3 for oe answers expressed in an incorrect form eg $\frac{2.8}{10}$]
26		$3x - 6 = x + 7$ $2x = 13$	6.5	3	M1 for $3\times x - 3\times 2$ (=$3x$ – 6) or $\frac{x}{3}+\frac{7}{3}$ seen M1 for correct method to isolate the terms in x or the number terms on opposite sides of an equation A1 for 6.5 oe
27			3.52	3	M1 for $1.35^2 + 3.25^2$ M1 (dep) for $\sqrt{(1.35^2 + 3.25^2)}$ (=$\sqrt{12.385}$) A1 for answer in the range 3.51 to 3.52

PMT

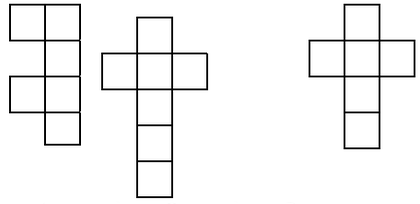
Modifications to the mark scheme for Modified Large Print (MLP) papers.

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

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

PAPER: 1MA0_2F			
Question		**Modification**	**Notes**
2		MLP: candidates told that there are three spaces to fill. Braille: table shows: (i) centimetres (ii) ounces (iii) pints and candidates have been asked to write down what is missing.	Standard mark scheme Standard mark scheme
3	(a)	size of diagram is ×1.5	Standard mark scheme
	(b)	Line AB is 10 cm and T is 5 cm away from the line.	Standard mark scheme
6	(a)	OP = 5 cm and is a horizontal line.	B1 for circle drawn radius 4.5 to 5.5 cm
	(b)	circle size is increased by 1.5	Standard mark scheme
8	(a)	a is changed to e and b to f.	Standard mark scheme
10		1.5 cm grid.	B1 for intention to draw correct heights for Kitty **or** George, dependent on a linear scale

PMT

PAPER: 1MA0_2F			
Question		**Modification**	**Notes**
13		*x*-axis:1.5 cm for $\frac{1}{2}$ *y*-axis: 1.5 cm for 2 Leeway will be needed in marking answers.	Standard mark scheme
16	(a)	Models as well as diagrams provided.	Standard mark scheme
	(b)	Question changed, now reads: Look at the diagrams for Question 16(b). Which diagram, Shape 1, Shape 2 or Shape 3 is the net of a cube?'  Shape 1 shape2 shape3	B2 for diagram 3
	(c)	models as well as diagrams provided.	Standard mark scheme
20		Wording added: 'Angle FCA = 135^0 Angle CAB = 70^0	Standard mark scheme
26		MLP only: *x* is changed to *y*.	Standard mark scheme
27		Braille only. Wording added: '*XY* = 1.35 metres. *YZ* = 3.25 metres.'	Standard mark scheme

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Mark Scheme (Results)

November 2014

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

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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.

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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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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.

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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 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.

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

Linear equations

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

12 Parts of questions

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

13 Range of answers

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

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

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

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

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

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

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

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

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

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

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

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

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Mark Scheme (Results)

Summer 2015

Pearson Edexcel GCSE
In Mathematics A (1MA0)
Foundation (Calculator) Paper 2F

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

13 Range of answers

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

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

PMT

PAPER: 1MA0_2F					
Question		**Working**	**Answer**	**Mark**	**Notes**
1	(a)		17.1	1	B1 cao
	(b)		1.3	1	B1 cao
	(c)		10.24	1	B1 cao
2	(a)		Hexagon	1	B1 cao
	(b)		8	1	B1 cao
3		$4 \times 17 + 3$	71	2	M1 for a complete method seen or 68 given as the answer A1 cao
*4			D C F S R 7 5 3 1 4 Suitable chart or diagram	3	M1 bar chart or other suitable chart with sections for at least 2 pets M1 sections for each pet and vertical axis correctly scaled / 2 correct frequencies C1 fully correct chart or diagram, including correct frequencies and all labels
5	(a)		$5e$	1	B1 cao
	(b)		$7gh$	1	B1 cao
	(c)		$a + 6d$	2	M1 for a or $6d$ A1 cao

PMT

PAPER: 1MA0_2F					
Question		**Working**	**Answer**	**Mark**	**Notes**
6			9	3	M1 for two correct operations seen or implied M1 for a complete method A1 cao OR M1 for 13 + 5 (= 18) and 4 + 7 (= 11) M1 for a complete method A1
7	(a)(i)		95	2	B1 cao
	(ii)		Reason		B1 angles in a triangle add to 180°
	(b)		Drawing	3	B3 for a fully correct triangle (B2 for a triangle with 2 of the 3 aspects: line of 8cm; angle of 40º; angle of 45º) (B1 for 1 of the 3 aspects)
8	(a)		15 minutes	2	B1 15 B1 (indep) minutes
	(b)		3 05	2	M1 for intention to add 10 minutes and 55 minutes to 2 o'clock A1 3 05 oe
	*(c)		No with reason	2	M1 for a method to add 75 minutes to '3 05' or to work out the difference between '3 05' and 4 pm or to subtract 75 minutes from 4 pm C1(dep M1) for conclusion based on appropriate working and correct time calculations, ft from (b)

PAPER: 1MA0_2F					
Question		**Working**	**Answer**	**Mark**	**Notes**
9	(a)		12.5	1	B1 cao
	(b)		500	2	M1 for a complete method to find $\frac{5}{6}$ of 600 or 600 ÷ 6 (= 100) A1 cao
10	(a)		$\frac{68}{105}$	1	B1 oe
	(b)		22	2	M1 for 105 – 15 – 68 oe A1 cao
	(c)		14.3	2	M1 15 ÷ 105 × 100 oe A1 for answer in range14.2 – 14.3
11	(a)		300	1	B1 cao
	(b)		100	3	M1 for intention to find the total number of adults or the total number of children M1(dep) for subtracting the two totals A1 for answer in range 90 to 110 OR M1 for intention to find the difference between the number of adults and the number of children for two months M1 (dep) for correctly processing all the differences A1 for answer in range 90 to 110

PAPER: 1MA0_2F					
Question		**Working**	**Answer**	**Mark**	**Notes**
*12			£52.74 or 5274p	4	M1 for subtracting to find the units used (= 293) M1 for '293' × 18 or '293' × 0.18 A1 for 52.74 or 5274 C1 (dep M2) for identifying their answer with the correct monetary units OR M1 for 2968 × 18 (= 53424) or 2675 × 18 (= 48150) or 2968 × 0.18 (= 534.24) or 2675 × 0.18 (= 481.50) M1 for subtracting their two costs (consistent in pence or pounds) A1 for 52.74 or 5274 C1 (dep M2) for identifying their answer with the correct monetary units
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					
Question		**Working**	**Answer**	**Mark**	**Notes**
14	(a)		12	1	B1 cao
	(b)		6	2	M1 for 18 –12 or 12 –18 or 12 to 18 A1 cao
	(c)		15	2	M1 for listing the numbers in order or identifying the middle two numbers as 15 or an answer of 14 A1 cao
	(d)	174÷12	14.5	2	M1 for adding the numbers and dividing by 12 A1 cao
*15			65 km is not enough	4	M1 for intention to add the four distances M1 for adding with consistent and correct use of units A1 65(km) oe [can work in other units eg metres] C1 (dep on M2) correct conclusion comparing their figure to 70 with supporting working eg 18.2+14.25+20.5+12.05 = 65km or 18+14+20+12 = 64; 0.2+0.25+0.5+0.05 = 1; 64+1 = 65km
16			Suitable data collection sheet	3	B3 for a table with all 3 aspects: column/row heading ‘colour’ or list of at least three colours column/row heading ‘tally’ or tally marks column/row heading ‘frequency’ or totals oe (B2 for a table with 2 of the 3 aspects) (B1 for a table with 1 of the 3 aspects) NB: Do not accept questionnaires or graphs

PMT

PAPER: 1MA0_2F					
Question		**Working**	**Answer**	**Mark**	**Notes**
17			$T = 6d + 15f$	3	M1 for $6d$ or $15f$ or T = a linear expression in d and/or f M1 for $6d + 15f$ oe or $T = 6d$ (+ kf) oe or $T = 15f$ (+ kd) A1 $T = 6d + 15f$ oe
18	(a)	2,5	2 or 5	1	B1 cao
	(b)	1, 4, 9, 16 1 + 4 + 16	1, 4, 16	2	M1 for identifying at least 2 different square numbers from the list A1 cao
19	(a)		–0.5	2	M1 for intention to subtract 19 from both sides or divide all terms by 8 as a first step A1 for –0.5 oe
	(b)		3	2	M1 for a correct operation to collect the c terms or the number terms on one side of the equation e.g. $2c – c + 5 = 8$, $2c + 5 – 5 = c + 8 – 5$ A1 cao
20			4	3	M1 for method to find 6% of 2000 (= 120) M1 (dep) for 480 ÷ '120' or for repeated addition of '120' to 480 A1 cao
21			45	4	M1 for finding the price of 1 kg or 0.5 kg of oranges M1 for using their value to find the price of 4.5 kg of oranges M1 (dep M2) for a complete method to find the price of 1 kg of apples A1 oe

PAPER: 1MA0_2F					
Question		**Working**	**Answer**	**Mark**	**Notes**
22	(a)		$\frac{1}{30}$	1	B1 oe
	(b)		$\frac{3}{10}$	2	M1 for method to sum number of white chocolates, eg 4 + 4 + 1 (= 9) A1 $\frac{3}{10}$ or $\frac{9}{30}$ oe
	(c)		0.48	2	M1 for 1 – (0.35 + 0.17) oe A1 0.48 oe
*23		1155 ÷ 15 = 77 $x + 2x + x – 7 = 77$ $4x – 7 = 77$ $4x = 84$ $x = 21$ OR $15x + (15 \times 2x) + 15(x – 7)$ $=1155$ $60x – 105 = 1155$ $60x = 1260$ $x = 21$	Redlands 21 St Samuels 42 Francis Long 14	5	M1 for $2x$ or $x–7$ M1 for 1155 ÷ 15 (= 77) M1 (dep M2) for equation summing their three expressions to '77' A1 for 21,42 and 14 C1 for fully correct answer with correct labels OR M1 an expression for the cost of the pupils from Redlands M1 for expression for the cost of the pupils from either St Samuels or Francis Long M1 (dep M2) for equation summing their three expressions to 1155 A1 for 21,42 and 14 C1 for fully correct answer with correct labels
24			Loci drawn	3	B1 line parallel to *BC* and 3 cm from *BC* B1 arc drawn centre *C* with radius 4 cm B1 ft for shading a region below their horizontal line **and** inside their arc

PAPER: 1MA0_2F					
Question		**Working**	**Answer**	**Mark**	**Notes**
*25			No supported by working	4	M1 for π × 7 (= 21.9 to 22) or π × 7 × 2.54 (= 55.5 to 56) M1 (dep) for a complete method that could lead to two figures that are comparable e.g. π × 7 × 2.54; π × 7 and 50 ÷ 2.54 A1 for correct comparable figures e.g. 55.5 to 56 (cm); 21.9 to 22 (in) and 19.6 to 19.7 (in) C1 (dep M2) for a correct conclusion based on their comparable figures OR M1 for 50 ÷ π (= 15.9 to 15.92) or 50 ÷ 2.54π (= 6.26 to 6.27) M1 (dep) for a complete method that could lead to two figures that are comparable e.g. (50 ÷ π) ÷ 2.54; 50 ÷ π and 7 × 2.54 A1 for correct comparable figures e.g. 6.26 to 6.27 (in); 15.9 to 15.92 (cm) and 17.7 to 17.8 (cm) C1 (dep M2) for a correct conclusion based on their comparable figures
26			172.1	4	M1 for $30^2 + 20^2$ or 900 + 400 or 1300 M1 for $\sqrt{30^2 + 20^2}$ or $\sqrt{1300}$ (= 36(.0555)) M1 for a complete method to find the length of wire required e.g. 2×'36.1' + 2×30 + 2×20 A1 172 – 172.2

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_2F			
Question		**Modification**	**Notes**
2	(a)	Diagram is enlarged.	
4		Diagram is enlarged.	
5	(c)	MLP only: *a* changed to *p*, *d* changed to *q*.	M1 for *p* or 6*q* A1 cao
7	(a)	Diagram enlarged. Angle arc put inside the angle size.	
	(b)	Diagram enlarged. Angle arc put inside the angle size. Braille only: base line given on diagram sheet. Part (c) added: 'Draw a line 8 cm long.'	

PAPER: 1MA0_2F			
Question		**Modification**	**Notes**
11		Diagram enlarged. Label for vertical axis placed above the axis. Right axis is labelled. 'Number of children': shading changed to dotty shading. Key moved to the top left.	
19	(b)	MLP only: *c* changed to *p*.	M1 for a correct operation to collect the *c* terms or the number terms on one side of the equation e.g. $2p - p + 5 = 8$, $2p + 5 - 5 = p + 8 - 5$ A1 cao
24		Rectangle has been widened so that *AD* and *BC* are 12 cm. In text, 8 metres has been changed to 10 metres.	B1 line parallel to *BC* and 3 cm from *BC* B1 arc drawn centre *C* with radius 5 cm B1 ft for shading a region below their horizontal line **and** inside their arc
25		Diagram is enlarged.	
26		Diagram is enlarged. 20 cm moved to the left. 30 cm moved to the top.	

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Mark Scheme (Results)

Summer 2018

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

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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. (eg. an incorrectly cancelled fraction when the unsimplified fraction would gain full marks).

It is not appropriate to ignore subsequent work when the additional work essentially makes the answer incorrect (eg. incorrect algebraic simplification).

8 Probability

Probability answers must be given as a fraction, percentage or decimal. If a candidate gives a decimal equivalent to a probability, this should be written to at least 2 decimal places (unless tenths).

Incorrect notation should lose the accuracy marks, but be awarded any implied method marks.

If a probability fraction is given then cancelled incorrectly, ignore the incorrectly cancelled answer.

9 Linear equations

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

10 Range of answers

Unless otherwise stated, when an answer is given as a range (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.

11 Number in brackets after a calculation

Where there is a number in brackets after a calculation E.g. 2 × 6 (=12) then the mark can be awarded **either** for the correct method, implied by the calculation **or** for the correct answer to the calculation.

12 Use of inverted commas

Some numbers in the mark scheme will appear inside inverted commas E.g. “12” × 50 ; the number in inverted commas cannot be any number – it must come from a correct method or process but the candidate may make an arithmetic error in their working.

13 Word in square brackets

Where a word is used in square brackets E.g. [area] × 1.5 : the value used for [area] does **not** have to come from a correct method or process but is the value that the candidate believes is the area. If there are any constraints on the value that can be used, details will be given in the mark scheme.

14 Misread

If a candidate misreads a number from the question. Eg. uses 252 instead of 255; method or process marks may be awarded provided the question has not been simplified. Examiners should send any instance of a suspected misread to review.

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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

PMT

Paper: 1MA1/1F				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
1	6000	B1	cao	Accept 6 thousand or six thousand
2 (a)	−6,−5,0,6,12	B1	for −6,−5,0,6,12 accept 12, 6, 0, −5,−6	
(b)	0.078,0.708, 0.78,0.87	B1	for 0.078, 0.708, 0.78, 0.87 accept 0.87, 0.78, 0.708, 0.078	Accept any additional '0's at the end of a decimal, eg 0.780 or 0.870
3	$\frac{20}{100}$	B1	$\frac{20}{100}$ oe, eg $\frac{2}{10}$ or $\frac{1}{5}$	Ignore any incorrect simplification of $\frac{20}{100}$ oe and award the mark if $\frac{20}{100}$ oe is seen
4	$\frac{3}{9}$	B1	for $\frac{3}{9}$ accept $\frac{1}{3}$	
5	14	B1	cao	
6 (a)	$12t$	B1	$12t$	Accept $t12$ but **not** $12 \times t$ or $t \times 12$
(b)	$7a$	B1	$7a$	Accept $a7$ or $7 \times a$ or $a \times 7$ Partial simplification of $5a + 2a$ or $8a - a$ does NOT get the mark

PMT

Paper: 1MA1/1F				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
7 (a)	D	B1	cao	
(b)	B	B1	cao	
(c)	Shown	M1	for number of green counters, eg $12 - (3+1+2) = 6$ **OR** for $\frac{3}{12}$ oe **or** $\frac{1}{12}$ oe **or** $\frac{2}{12}$ oe linked to the appropriate colour	This is awarded for a correct first step
		M1	for $1 - (\text{"}\frac{3}{12}\text{"} + \text{"}\frac{1}{12}\text{"})$ $(= \frac{8}{12})$ or "$\frac{2}{12}$"+ $\frac{\text{"6"}}{12}$ $(= \frac{8}{12})$ **OR** for method to find $\frac{2}{3}$ of 12, eg. $12 \div 3 \times 2$ $(= 8)$	This is awarded for a fully correct method from which the correct answer of $\frac{2}{3}$ can be found Sight of $\frac{8}{12}$ gets M2
		C1	for correct conclusion supported by accurate figures, eg $\frac{8}{12} = \frac{2}{3}$ **or** $\frac{2}{3}$ of 12 = 8 **and** number of yellow + green = 2 + 6 = 8	
8	36	M1	for method to find cost of 1 kg, eg $54 \div 3$ $(= 18)$ or $54 \div 3 \times 2$ oe	
		A1	cao	
9 (a)	Radius	B1	cao	Accept spelling mistakes
(b)	Tangent	B1	cao	Accept spelling mistakes

PMT

Paper: 1MA1/1F				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
10	535	P1	for a start to the process eg 1280+640+220 (=2140) **or** 1280÷4 (=320) **or** 640÷4 (=160) **or** 220÷4 (=55)	
		P1	for a full process to find cost per adult eg "2140" ÷ 4 **or** "320" + "160" + "55"	Can have arithmetical error as long as the complete processes, in the correct order, are present.
		A1	cao SC: B1 for answer of 1495 if P0 scored	
11 (a)	Example	C1	for a correct example, eg 3 × 4 = 12 or 12 ÷ 3 = 4 **or** a statement eg '3 is a factor of 12' or '1 is a factor of every number'	This may be seen, for example, in a factor tree or in a list of factors, but there must be no incorrect factors on the tree or in the list
(b)	Example	C1	for an example, eg 23 **or** a statement eg. 'the tens digit may be even' or 'the last digit only needs to be odd'	

PMT

Paper: 1MA1/1F				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
12 (a)	100	B1	for answer in the range 95 to 100	
(b)	660	M1	for reading at least 3 of the required figures from the graph eg 3 of "100", 260, 120, 340, 160, 440 **OR** for 260 – "100" (= 160) **or** 340 – 120 (= 220) **or** 440 – 160 (= 280) **OR** for"100" + 60 (= 160) **or** 80 + 100 + 40 (= 220) **or** 40 + 100 + 100 + 40 (= 280)	Figures may be seen on graph
		M1	(dep) for adding their 3 differences eg "160" + "220" + "280"	
		A1	for 660 or ft their answer to part (a)	
(c)	Tablets	B1	Tablets	
	and statement	C1	Statement eg the bars get proportionally longer over time (most in 2017 and least in 2015) **or** they (more than) double each year **or** for an increase of 280 **or** numbers range from 60 to 340	Values quoted for tablets must be correct. Ignore any calculations relating to laptops and/or desktop computers whether correct or not. Award previous mark if "tablets" is not specifically stated but can be implied from statement.
(d)	Statement (supported)	C1	for statement, eg (No because) we do not know costs or prices or profit.	Answer of 'Yes' gets C0 Answer of 'No' without justification gets C0

PMT

Paper: 1MA1/1F				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
13	3	P1	for a start to the process eg 240 − (2 × 45) (= 150) oe **or** (2 × 45) + 40 (= 130) oe	
		P1	for complete process eg "150" ÷ 40 (= 3.75) – can be implied by 40 + 40 + 40 = 120 **or** "130" + 40 + 40 (= 210)	Considering just one piece of 45 cm is not a misread but (240 – 45) ÷ 40 (= 4.875) oe should be awarded P1 only
		A1	cao	
14	Isabel (supported)	P1	for process to work with $\frac{3}{4}$ eg $1-\frac{3}{4}$ $(=\frac{1}{4})$ oe, eg 25% or $\frac{25}{100}$ **or** $\frac{3}{4}$ = 75% or $\frac{75}{100}$ **or** value of salary (say 1000) × 3 ÷ 4 (= 750)	
		P1	for process to work with ratio 3 : 7 eg $\frac{3}{3+7}$ oe **or** $\frac{7}{3+7}$ oe **or** value of salary (say 1000) ÷ (3+7) (= 100)	
		A1	for (28(%)), 25(%) and 30(%) **or** 72(%), 75(%), 70(%) **or** 0.28, 0.25, 0.3 **or** for using value of salary (say 1000) giving 280, 250, 300 **or** 720, 750, 700	
		C1	(dep P2) for Isabel or ft their comparative values	"Isabel" alone without supported evidence, gets 0 marks.

PMT

Paper: 1MA1/1F				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
15	24	M1	for method to find 15% of 160, eg 160 $\times \frac{15}{100}$ oe (= 24) **or** 10% = 160 ÷ 10 (= 16) plus 5% = "16" ÷ 2 (= 8) (= 24)	When using partitioning methods, the method to find individual %s must be clear including the need to show an intention to sum eg. 10% = 16 + 5%=8
		A1	cao SC B1 for answer of 136 or 184 if M0 scored	
16 (a)	14	M1	for 4 × 5 and 3 × −2, the substitution may be seen in two separate calculations, eg 4 × 5 (= 20) and 3 × −2 (= −6)	
		A1	cao	
(b)	$4e^2 + 8e$	B2	for $4e^2 + 8e$	
		(B1	for $4e^2$ or $8e$)	Note: $4e^2 + 8e = 12e^3$ for example gets B1 only
(c)	11	M1	for a correct first step eg 3 × m – 3 × 4 = 21 oe **or** m – 4 = 21 ÷ 3 (= 7) oe	Showing ÷3 by each side of equation is sufficient
		A1	cao	
17	1 : 3	M1	for $\frac{1}{4} : \frac{3}{4}$ oe **OR** for any correct un-simplified ratio, eg 25 : 75	
		A1	cao SC: B1 for an answer of 3 : 1 or 1 : $\frac{1}{3}$ if M0 scored	Ignore 'units' such as 1 nuts : 3 no nuts 1 : 3n gets M1A0

PMT

Paper: 1MA1/1F				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
18 (a)	15, 17, 19, 20, 21, 23, 25	M1	for listing either set eg 15,20,25 **or** 15,17,19,21,23,25 with no incorrect numbers	The 'lists' may be seen in a Venn Diagram or in the working space in part (b) provided they are not contradicted by incorrect lists in part (a)
		A1	15,17,19,20,21,23 and 25 with no repeats	If repeats (but no incorrect numbers) award M1 only.
(b)	Statement or 15 and 25	C1	eg odd multiples of 5 (between 14 and 26) oe NB Could be a general description, eg numbers that are in both (A and B), **or** 15 and 25 (ft from their sets A and B in part (a)) **or** numbers ending in 5 (between 14 and 26)	
19 (a)	$\frac{95}{28}$	M1	for a method to add using common denominators with at least one fraction correct (matching numerator with common denominator) eg $\frac{60}{28}+\frac{35}{28}$ **or** $(2)\frac{4}{28}+(1)\frac{7}{28}$	Use of decimals gets no credit unless it leads to a correct fraction
		A1	$\frac{95}{28}$ oe eg $3\frac{11}{28}$	
(b)	$1\frac{3}{5}$	M1	for $\frac{6}{5}\times\frac{4}{3}$ **or** $\frac{24}{20}\div\frac{15}{20}$ **or** $\frac{8}{5}$ oe eg $1\frac{9}{15}$	Use of decimals gets no credit unless it leads to a correct fraction
		A1	cao	

Paper: 1MA1/1F				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
20	140	P1	for beginning to solve the problem eg 50 ÷ 5 × 8 (= 80) **or** 14 : 8 : 5 oe **or** 14 : 8 and 8 : 5 oe (linked)	80 may be seen in the ratio 80 : 50
		P1	for a full process to solve the problem eg "80" ÷ 4 × 7 **or** $\frac{50}{5}$ × "14" **or** 140 : 80 : 50	
		A1	cao	If 140 clearly identified as houses in working award full marks
21	30	P1	for full process to find the number of bags sold eg 5 × 1000 ÷ 250 (= 20) **OR** for process to find selling price of 1 kg of sweets eg 0.65 × 4 (= 2.60)	This could be by repeated addition Calculations can be in £ or pence
		P1	for [number of bags] × 0.65 **or** "20" × 0.65 (= 13) **or** "2.60" × 5 (= 13) **OR** for 10 ÷ "20" oe (= 0.50) **OR** for 0.65 × 4 (= 2.60) **and** 10 ÷ 5 (= 2)	[number of bags] can only come from 5 × 10 ÷ 250 (= 0.2) or 5 × 100 ÷ 250 (= 2) or 5 ÷ 250 (= 0.02)
		P1	(dep on previous P1) for a process to find the percentage profit eg ("13" – 10) ÷ 10 × 100 **or** (0.65 – "0.50") ÷ "0.50" × 100 **or** ("2.60" – "2") ÷ "2" × 100 **OR** "13" ÷ 10 ×100 (= 130) oe	3/10 or 0.3 is not enough but should be awarded 2 marks Award P3 for 130(%)
		A1	cao	

PMT

Paper: 1MA1/1F				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
22 (a)	Estimated value	P1	for using a rounded value in a correct process eg 3000 ÷ 15 **or** 15 × 8 **or** 20 × 8	Their rounded value must be used in a calculation Rounding may appear after a correct process eg 15.12 × 8 = 120.96 ≈ 100 followed by eg 3069.25 ÷ 100
		P1	for a full process to find the number of days eg "3000" ÷ "15" ÷ "10" (= 20) **or** "3000" ÷ "15" ÷ 8 (= 25)	Accept 3069.25 ÷ 15.12 ÷ 8 oe
		A1	for a correct answer following through their rounded values	
(b)	Explanation	C1	eg less days required **or** it doesn't affect the answer because I would still round 16.27 down to 15 (or up to 20)	Refers to time taken

PMT

Paper: 1MA1/1F				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
23 (a)	isosceles triangle, base 6 cm, height 4 cm	M1	for drawing an isosceles triangle **or** for drawing a triangle of base 6cm and height 4cm	Accept a freehand drawing Only a single triangle is acceptable; do **not** accept any attempted nets or 3-D diagrams
		A1	for a fully correct diagram	Condone a perpendicular drawn from base to vertex
(b)	96 cm^2	M1	for a method to find the area of a triangular face eg ½ × 6 × 5 (= 15)	
		M1	(dep) for finding the total surface area eg 4 × "15" + 6 × 6	
		A1	for a numerical answer of 96 SC B1 for an answer of 84 if M0 scored	Ignore incorrect or absent units for this mark [The SC is from: 4 × ½ × 6 × 4 + 6 × 6]
		B1	cm^2	Ignore incorrect or absent numerical answer for this mark

PMT

Paper: 1MA1/1F				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
24	(22, 20)	P1	for process to find width or height of diagram eg 38 − 6 (= 32) **or** 36 – 7 (= 29)	Figures may be shown on the diagram
		P1	for process to find length of side of square eg "32" ÷ 4 (= 8) **or** process to find half width of diagram eg "32" ÷ 2 (= 16)	
		P1	for process to find x coordinate eg 6 + 2 × "8" (= 22) **or** 6 + "16" (= 22) **or** (6 + 38) ÷ 2 (= 22)	If (6 + 38) ÷ 2 leads to an answer other than 22, award P2 only
		P1	for process to find y coordinate eg 36 – 2 × "8" (= 20) **or** 36 – "16" (= 20) **or** 7 + 8 + "29"– 3 × "8" (= 20)	
		A1	cao SC: award 4 marks for (20, 22)	Award for P3 for (22, y) or (x, 20) or x = 22 or y = 20

PMT

Paper: 1MA1/1F

Question	Answer	Mark	Mark scheme	Additional guidance
25	Line drawn	B3	for a correct line between $x = -3$ and $x = 3$	
		(B2	for a correct straight-line segment through at least 3 of $(-3, 13)$, $(-2, 9)$, $(-1, 5)$, $(0, 1)$, $(1, -3)$, $(2, -7)$, $(3, -11)$ **or** for all of these points plotted but not joined **or** for a line drawn with a negative gradient through (0, 1) **and** clear intention to use a gradient of −4, eg line through (0,1) and (0.5, −1)	Ignore any incorrect points Table of values x −3 −2 −1 0 1 2 3 y 13 9 5 1 −3 −7 −11
		(B1	for at least 2 correct points stated or plotted **or** for a line drawn with a negative gradient through (0, 1) **or** a line with gradient −4)	Ignore any incorrect points coordinates may be in a table or in working
26	$\begin{pmatrix} 9 \\ 11 \end{pmatrix}$	M1	for $\binom{2\times5}{2\times2}$ [= $\binom{10}{4}$] or $2 \times 5 - 1$ (= 9) or $2 \times 2 + 7$ (= 11)	
		A1	cao	

PMT

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

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

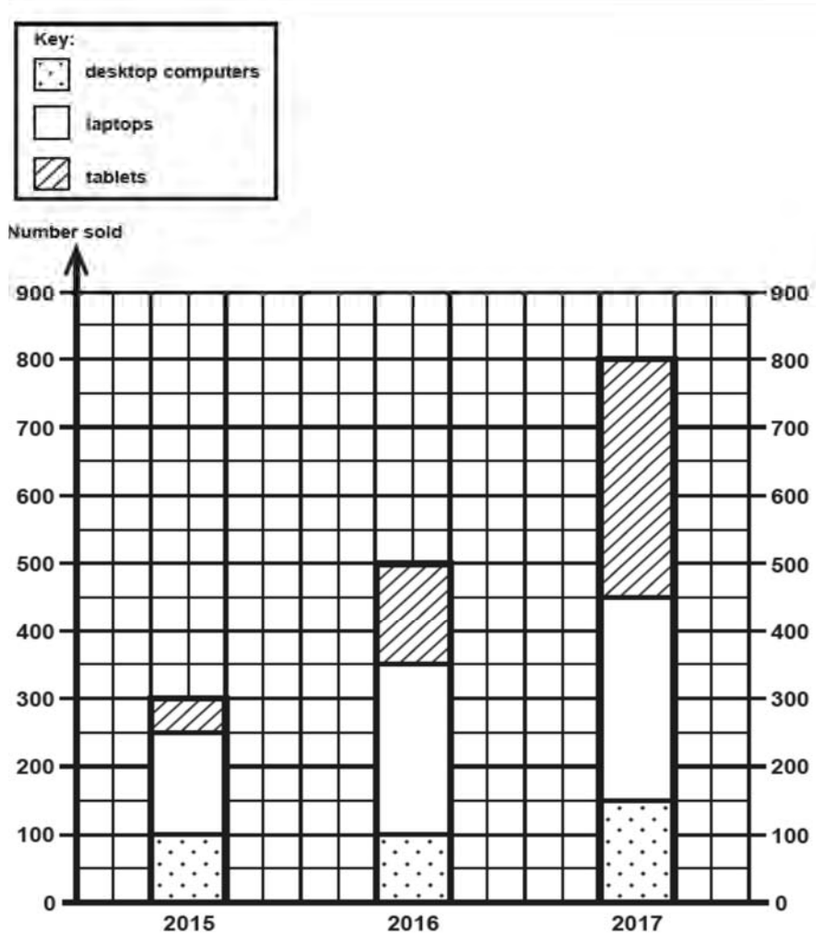
The following tolerances should be accepted on marking MLP papers, unless otherwise stated below:
Angles: ±5°
Measurements of length: ±5 mm

Paper: 1MA1/1F			
Question		**Modification**	**Mark scheme notes**
2	(a)	Wording ‘five’ added	Standard mark scheme
2	(b)	Wording ‘four’ added	Standard mark scheme
6	(b)	Change to *n*	Standard mark scheme but *a* changed to *n*
7		Probability scale enlarged and crosses changed to solid circles; Lines at zero, a half and 1 lengthened	Standard mark scheme
9	(a)	Diagram enlarged. Wording added ‘It shows a circle.’ Deleted wording ‘cross (x).’ replaced with ‘solid dot.’ Cross changed to solid dot.	Standard mark scheme
9	(b)	Diagram enlarged	Standard mark scheme

PMT

Paper: 1MA1/1F			
Question		**Modification**	**Mark scheme notes**
12		Diagram enlarged. Right axis labelled. Key moved above and to the left of the diagram. Vertical axis label moved above the vertical axis. Shading changed. Intermediates added on both the horizontal and vertical axes. Graph lines changed as follows: 2015 – Laptops changed from 260 to 250; Tablets changed from 260 to 250 and 320 to 300. 2016 – Desktops changed from 120 to 100; Laptops changed from 120 to 100 and 340 to 350. 2017 - Desktops changed from 160 to 150; Laptops changed from 160 to 150 and 440 to 450 Tablets changed from 440 to 450 and 780 to 800	(a) Standard mark scheme (b) M1 for reading at least 3 of the required figures from the graph eg. 3 of 100, 250, 100, 350, 150 or 450 or finding 2 differences from 250 – 100 (= 150), 350 – 100 (= 250), 450 – 150 (= 300) M1 (dep) for complete method shown eg 150 + 250 + 300 A1 cao for 700

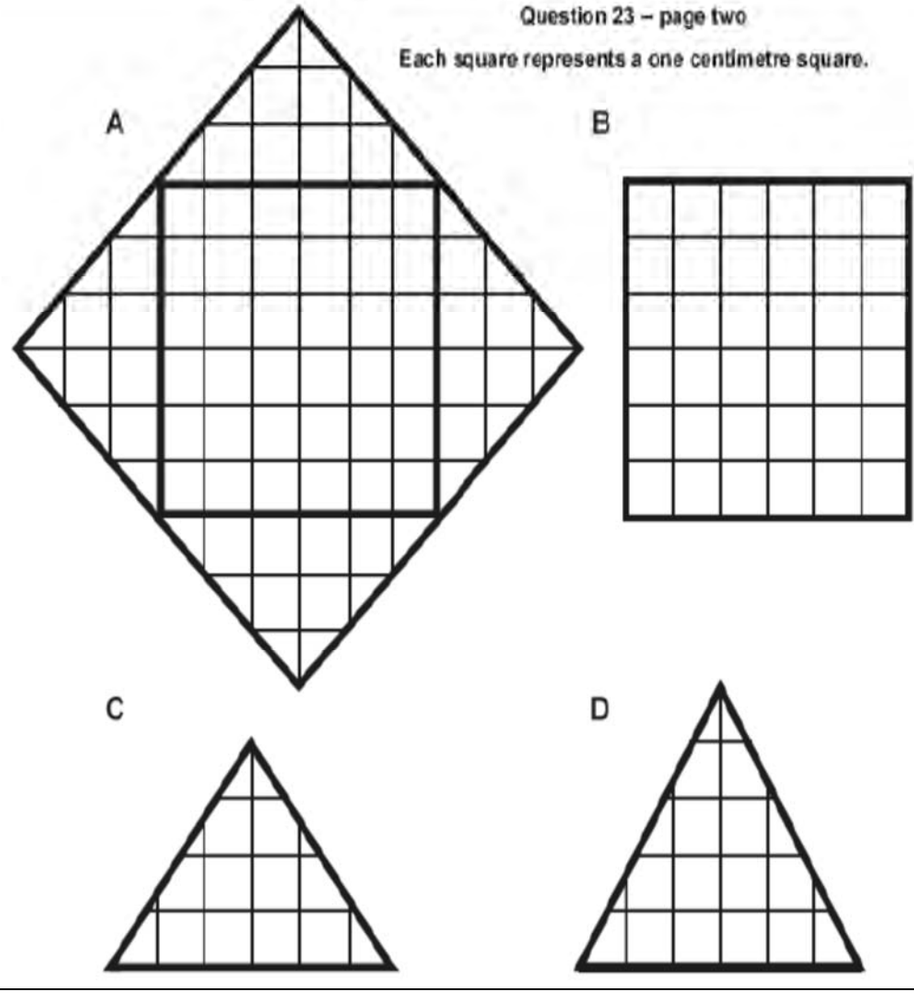
PMT

Paper: 1MA1/1F			
Question		**Modification**	**Mark scheme notes**
12 cont.			

PMT

Paper: 1MA1/1F			
Question		**Modification**	**Mark scheme notes**
16	(a)	MLP only: *x* and *y* changed to *s* and *t*.	Standard mark scheme, except for MLP in the mark scheme read *s* for *x*, and *t* for *y*.
16	(b)	Braille only: e changed to q.	Standard mark scheme, except for Braille in the mark scheme read *q* for *e*
23	(a)	Model and a diagram provided. Diagram enlarged. Dashed lines made longer and thicker. Dotted lines made more obvious. Question reversed: Four different options of the front view of the pyramid have been provided. The pyramid has been put on page one for question 23(a) and the four shapes labelled A to D have been put on page two for question 23(a). Question changed to 'Look at the model or at the diagrams for Question 23(a) in the Diagram Book. They are shown on two pages in the Diagram Book. Page one shows a solid square-based pyramid, VABCD. The base of the pyramid is a square of side 6 cm. The height of the pyramid is 4 cm. M is the midpoint of BC and VM = 5 cm. Page two for Question 23 shows four shapes, labelled A, B, C and D. Each square represents a one centimetre square. Which shape shows the accurate front elevation of the pyramid from the direction of the arrow?'	Award 1 mark for an answer of D Award 2 marks for an answer of C NB: Accept any other unambiguous indication of the answer such the diagram indicated by circling etc.

PMT

Paper: 1MA1/1F			
Question		**Modification**	**Mark scheme notes**
23 cont.		Question 23 – page two Each square represents a one centimetre square. 	

PMT

Paper: 1MA1/1F			
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
25		Diagram enlarged. Y axis has been cut to go from -14 to 14.	Standard mark scheme

PMT

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Question 10

In general, all three parts of this question were well answered. The answers to part (a) and part (b) were often just written down. Working was often seen in part (c), either the traditional algebraic method or a trial and improvement method. No marks are awarded for a trial and improvement approach to solving an equation unless the answer is correct so it is not the best approach to use.

Many students gave the correct answer but for those that did not and who used an algebraic approach many often wrote -2 beneath each side but then failed to do this correctly so did not score as they did not complete a correct first step. Some subtracted 2 from 6w and 2 and 20, others subtracted only from the 2.

Question 26

This question on the whole was not very well answered, as most students did not correctly reflect shape A in the *x*-axis. Many students had answers of -6 and -5 (seen in either order) which does not take the reflection into account, but is a translation vector for (3,2) to (-3,-3). Students who drew the reflection on the diagram were often able to achieve two or three marks, but it is clear that students need to develop their skills in multiple step transformations, clearly showing each transformation one step at a time.

Question 11

Although a correct answer of 23 was often seen, many students are clearly unable to evaluate expressions by substitution, particularly when negative values are included. 3×-4 was often seen written as $3 - 4$ leading to an incorrect answer of 34 $(35 - 1)$. Many students ignored the negative sign and simply worked out $7 \times 5 + 3 \times 4$, 47 being a very common incorrect answer. A number of students were unable to deal with the addition of a negative number and incomplete answers of $35 + -12$ were not uncommon; which is a concern especially given that this is a

calculator paper. Only a very few students wrote an incorrect substitution of 75 – 34 or 75 + 34. Some weaker students wrote 7 + 5 + 3 – 4 = 11, scoring no marks.

Question 20

Both parts of this question were poorly answered. In part (a), correct manipulation of the inequality was rare although some did show an intention to subtract $11n$ from both sides. However, many chose wrongly to subtract 6 from both sides. Algebraic methods did sometimes lead to $n = 2$ for the award of one mark. Sometimes this value was found by trial and improvement methods but this method often led to an incorrect answer of $n = 3$.

In part (b), very few students solved the two inequalities and values of – 5 and 1 were rarely seen. The most common attempt was a line drawn between – 2 and 4 sometimes with the correct

circle notation, gaining one mark. There were several attempts to select integer values satisfying the inequalities but this rarely resulted in any credit being earned. Some students put arrows or crosses on the number line showing a complete lack of understanding of the correct convention.

Question 25

Only a very few students gained the full two marks in this question. Some did earn one mark for one correct entry, usually 8.3. Near misses included answers of $8.25 \leq y < 8.35$ indicating some understanding of error intervals but from a rounded rather than a truncated number.

Question 15

This was a high scoring question, in both parts. A significant minority of students lost marks through mis-reading the figures in the question, typically using 5 instead of 50. The most common error was adding 70 and 50 first before multiplying by 4.

In part (b) the most common method was 680 – 50 then to divide by 70. Some students did $9 \times 4 \times 70 + 50$ which was probably the result of trialling rather than making use of inverse operations. A common error was to double the answer to part (a), concluding that if 4 weeks cost £330 then 8 weeks must cost £880.

Question 21

This question was quite well attempted by most students sitting this paper, with a high proportion of students being awarded at least two of the four marks available for finding that there were 10 men and 20 children in the choir. Some students stopped at this point, giving 20 as their final answer.
However, many students did go on to write down a correct ratio and simplified it to .2 : 1.
Examiners allowed 2 : 1 for full marks though the question did in fact ask for only the value of n.

Question 7

A good number of students gained both marks, but where that wasn't the case, many gained one mark for the first step. These students then typically completed the calculation in the wrong order, often arriving at 44. Of those who scored zero this was often a result of not including the "×" when substituting and simply writing 48 rather than 4 × 8, typically leading to an answer of 51.

Question 14

Both these response questions were well attempted by students and, in general, answered well. Part (a) was looking for students to realise that the area had been found rather than the perimeter, and many did. There were some cases where the response included mathematically incorrect statements, such as $P = 7 + 3 = 10$, and where this occurred the mark was not awarded.

In part (b) students were expected to realise that a triangle cannot have a negative length. This part was answered less well than the previous one, with many students either being unclear in their response, or making incorrect statements. It was not uncommon to see arguments relating to 180 (degrees) or students trying to find the value of x themselves, without sufficient information to do so.

Question 19

The majority of students attempted the expansion as their first step, and in many cases, were successful. Of those who were not successful this was for a variety of reasons. Common errors were to exchange the minus sign for a plus; to fail to multiply the second term when expanding, or to expand but not as part of an equation. The second mark was for the correct answer. As under general guidance, markers were able to award the first mark for an embedded “17” in working provided it wasn’t contradicted by the answer line.

Question 19

Algebraic manipulation is not a strong point for many Foundation students however it was pleasing to see many correct expressions in both parts (a) and (b). $x^2 - 4$ and $4x$ were common incorrect answers in (a) whilst in (b) the inability to factorise led to a multitude of incorrect offerings.

In part (c), many used non-algebraic methods to correctly solve the given equation by showing that the value for the bracket needed to be 4 with $28 \div 7 = 4$ and $9 - 5 = 4$ often seen. In some cases incorrect answers of, for example, 4 were written on the answer line. The most common errors in this part were either adding 5 to 28 or subtracting 7 from 28. Failure to multiply both terms in the brackets giving something like $7f - 5 = 28$ was a common first step.

Question 10

Part(a) was very well answered with very few errors seen.

Part(b) was also well answered, although a few more errors were seen here than in part(a). The common error was to see 10 and not 4 as the final answer.

Question 15

In part (a) only a few students scored one mark, most students either scored either no marks or two marks. The majority of students did score both marks but the main issue by far was incorrectly substituting in positive 7 instead of negative 7. Of those that successfully gained the first mark, some then did not subtract, but added 15 and 28 to get an answer of 43 even though they wrote 15 + – 28

Part (b) was not so well answered as part (a) although almost 40% of students scored full marks. Those that didn't gain full marks often received the first mark for substituting or for 38 – 18 = 20 but then didn't know to then divide by 4. A number of students could not substitute correctly into the equation and some students were not able to interpret $3x$ and $x = 6$ as meaning 3×6, with 36 seen here. Incomplete processing often led to only one mark being awarded.

Question 25

Students found this question challenging. Some scripts were left blank and others knew to use trigonometry but didn't know which to use out of sine, cosine or tangent, even when all the ratios were given correctly. Of those students that achieved the method mark, many could not then rearrange correctly to give the final answer. A common error seen was to try to use Pythagoras' Theorem or to try to use $\sin(34\times178)$ in their calculators.

Question 16

In part (a) many argued that Jasper was not correct because x could not be a decimal. The few who did substitute $x = 0.5$ into the given expression usually got the right idea and correctly explained the error. Only a very small minority gained any credit in part (b). Use of algebra was very nearly non-existent with students instead preferring to attempt numerical methods which were usually doomed to failure. The most common incorrect approach was to assume all 4 sides of the kite were equal and divide 64 by 4. A few students gained a mark for writing $3(4x - 2)$ or $12x - 6$, some then went on to incorrectly equate that to 64. Some thought they

were dealing with angles and introduced “360 degrees” into their working. Even when students correctly calculated AD, they were then unable to link this to an equation or expression for perimeter. Lots of incorrect responses featured students simply setting $4x - 2 = 64$ and then attempting to solve from there; this gained no credit.

Question 13

The majority of students scored both marks in part (i) calculating the angle to be 21 degrees. A small number of students used 360 in their calculation instead of 180 and this resulted in an incorrect answer of 201 degrees. The other error most often seen was arithmetic, again suggesting that students may have been reluctant to use their calculator for this question.

Part (ii) was less well answered. Students who did score the communication mark often wrote ‘angles on a straight line add up to 180’. The mark was most commonly lost for missing out the word angles, other incorrect response included, ‘half a circle is 180’, here neither angle nor line were mentioned. However, the most common error was for students to state or re state their numerical calculation without mention of geometrical properties. Centres should encourage students to write short succinct explanations.

Question 17

In part (a) many students correctly expanded the first part of the bracket to get y^2 but did not then multiply y by 5 to obtain $5y$.

Part (b) was less well answered. An incorrect factor of 4 was commonly seen outside the bracket.

In part (c) more students found success. It was pleasing to see the layout of the process to solve the equation clearly structured. Some students were more confident at expanding brackets than at solving equation algebraically, though some who expanded incorrectly were able to access the mark for rearranging their equation ready for solution. Unsuccessful efforts included those who tried a trial and improvement approach of substituting a variety of numbers into the equation.

Responses to part (d) were varied. Some secured full marks, but rarely. Most commonly students processed the numerical term but then multiplied the indices. Some failed to recognise that the lone e or f had an index of 1. Those who correctly remembered the rules of indices frequently wrote $9e^3f^4$

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 14

Basic arithmetical errors prevented many students gaining full marks here. $24 - 5$ and/or 6×4 were often seen calculated wrongly. The most common error was through incorrect substitution, usually resulting in $64 - 5 = 59$ or $6 + 4 - 5$. Some students attempted to balance and solve the equation.

Question 23

It was common to see the critical value of 5 identified by many students, usually as the solution of a linear equation, but less were able to actually solve the inequality. Attempts to add 27 to both sides as a first step were seen but were poorly executed in many cases. $7x < 35$ was often seen alone with no subsequent conclusion offered.

Some students employed trial and improvement methods, quite often ending up with an answer of 4 (the greatest possible integer value of x)

Question 17

Part (a) was generally well answered. Some students only partially processed the answer leaving it as $12 + -\ 6x$. Others went on from the correct $12 - 6x$ to write $6x$ on the answer line, this scored no marks since it is the answer on the answer line which must be accepted.

In part (b) the vast majority of students made some attempt. For those students who were successful their answers mainly came from an informal method of inverse operations, usually showing $12 \times 4 \div 3 = 16$ with a few using the formal approach of $3y = 48$. Another alternative method was to see $0.75y = 12$ as the first step. Students scoring one mark mainly got this for $3y = 48$ or an embedded answer of 16, usually shown as $3 \times 16 \div 4 = 12$; unfortunately, many then wrote the 12 on the answer line rather than the 16. Students who knew to multiply by 4 as the first step often failed to apply this to both sides of the equation and only stated the 48, which resulted in no marks since they wrote $4 \times 12 = 48$ rather than $3y = 48$. Students scoring zero were usually unsure of how to approach the first step and would try to add or subtract 4 rather than multiplying.

In part (c) students with understanding of factorisation in algebra did well. The most popular incorrect answer was $10p$ where students simply added $4p$ and 6 together without appreciating that these were unlike terms.

Question 23

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

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

Question 24

In this question many students were able to find the number of counters each person would get. There were two main routes to these values: algebraic and numeric. Weaker students started by dividing 54 by 3 but were then unsure of where to go from there.

Students who adopted a clear algebraic approach often went on to solve the question completely. However, students occasionally ended up with $4x - 6 = 54$ rather than $5x - 6 = 54$, due to not understanding that Tony had six less counters than Selma rather than Rick.

Most students adopted a numeric approach, and most were successful in arriving at the three numbers 12, 24 and 18 scoring three marks.

Students were less successful in converting the counters each had into a ratio between Rick and Tony. Where students managed this, they usually then went on to gain the full marks for $p = 1.5$ but those who did not recognise this unitary ratio expression were sometimes put off from writing their ratio of Rick to Tony.

Question 8. Part (a) was answered well, with very few failing to score the mark. Candidates performed less well in part (b) with many not collecting the like terms of $3n$ and n together as a first step. Many tried to subtract the n from both sides of the equation either resulting in $2n = 24$ (giving $n = 12$) or $3n = 24$ (giving $n = 8$). In this question, students usually scored no marks or full marks. Some used an embedded solution, with mixed success. Many candidates who achieved full marks did not attempt the algebraic approach and instead simply stated that $3 \times 6 + 6 = 24$, with a correct answer on the answer line.

Question 9. Part (a) was well answered with the vast majority subtracting 70 from 360 to get a correct answer of 290°. However, a great many were unable to give a correct reason for this answer in part (b). The most common incorrect explanation related to a circle "having 360°". Students need to be made aware that such an explanation is not acceptable. Many simply explained how they did it, rather than why e.g. "I subtracted 70 from 360". Students should be reminded that a calculation is not a reason.
In this case "angles at a point sum to 360°" or words to that effect is the reason required.
A common incorrect approach was to work with 180° rather than 360°.

Question 10. Most students correctly worked out that 5 was the greatest number of jars of coffee that could be bought for £23 in part (a). In part (b), a large number of candidates lost the mark as they hadn't read the question carefully enough, missing the word "exactly" in reference to the number of jars to be bought at half price. Many realised that Michael could now buy an extra 11th jar but then lost the mark because they answered 'yes' to the question "Is Michael correct?".

Question 11. Whilst many students correctly wrote down the scale factor of 2 in (a)(i), only a very small minority were able to pinpoint the centre of the enlargement in (ii). Many tried to position their centre either in between the two shaded triangles, in the centre of one of the triangles or on one (or two) of the vertices. In some cases, students who were able to draw lines to intersect at the point of enlargement identified it correctly but missed the mark because they also placed 'X' somewhere else on the graph.
In part (b)(i), accurate drawing of the mirror line was good. Whilst lines drawn with a straight edge are preferred, freehand, dotted or dashed lines were acceptable. In part (b)(ii), unfortunately, very few students were able to give the equation of their line. Common incorrect lines drawn were $x = 4$ or $y = 4$, which in some cases allowed a follow through mark if they stated this as their equation for (ii).

Question 12. Again with this multi-step problem in part (a), it was pleasing to see many students gaining good marks, often 2 or more. In this question, students had to find a sixth and 20% of 120 minutes. When performing calculations of this type it is important for students to show their working, eg $120 \div 6$ or $\frac{20}{100} \times 120$ so that credit can be awarded for correct method if errors are made with accuracy. In solving this problem, some students subtracted 50 from 120 to give 70 minutes and used this as the time spent playing badminton. Arithmetic errors were seen far too often from students when subtracting from 120.
In part (b), many ignored the good work they had done in part (a) and explained that Elana did not get to the café on time because she spent 2 hours at the sports centre making it 3.30pm when she left. This part followed through the working and answer in part (a) and the mark awarded if the reason and working were correct for the time given in (a).

Question 13. Part (a) was answered correctly by the majority of students, reading 60 from the bar chart. Part (b) was answered less well when a certain amount of extrapolation was required from the chart. 210 was a common incorrect answer.
In part (c), it was evident that many students weren't able to accurately read data from a composite bar chart, many reading the number of men as 90, women 200 and children 280 in 2020. The method mark here was awarded for sight of 80 (children) or 200 (men + women) used in a ratio. Many gained this mark but failed to score full marks as a result of incorrect values read from the chart. As a result of not reading the questions correctly, some students wrote an answer of 80 (child) : 90 (men) : 110 (women).

Question 14. Greater success was achieved in part (a) of this question by finding the sum of the distance travelled in one hour (54 miles) and the distance travelled in half an hour (27 miles). It was pleasing however, to see many students correctly quoting the equation distance = speed × time to solve this problem, although accuracy was often lost through incorrect use of the units of time. 54 × 90(mins) or 54 × 1.30 were common errors made.
In part (b), very few students were able to correctly convert from centimetres to kilometres. Many gained one mark for using the scale on the map correctly, 25 000 × 6. Credit was then given for a reasonable attempt at the conversion of 150 000 cm to km, usually just dividing by 1000. Most didn't seem to be clear that they had found a measurement in cm by multiplying by 25 000, those who did include units were more likely to be able to convert correctly as they often spotted that they could convert cm to m then m to km.

Question 15. The diagram proved very useful in getting one correct coordinate, for which one mark was awarded, usually $y = 1$, but rarely was a fully correct answer seen. Whilst many students did use the diagram, drawing the correct line segment, it was also rare to see the correct positioning of the required midpoint. This was often seen placed on the y-axis. There were very few instances of candidates using written methods to find the midpoint.

Question 16. Those students who attempted an algebraic solution often picked up good marks, 2 or more, for a correct expression for the perimeter and then equating it to the given value of 52. Simplifying their algebraic expression often proved more difficult and it was not uncommon to see quadratic terms creeping in. Some students assumed all the lengths to be the same and calculated 52/4 gaining no marks.
Some students correctly found the value of x and then failed to answer the question by finding $2x$, the length of DC. Poor arithmetic let many students down in being unable to divide 57 by 6 and hence not being able to achieve the accuracy mark.
Many students did however adopt a trial and improvement approach which usually cost them a great deal of time for little reward.

Question 17. Again, understanding of probability was good and many students gained the full 2 marks in part (a). One mark was awarded for sight of 100 – 30 (= 70) or a correct value for the probability of taking a blue counter. $\frac{3}{4}$ was a common incorrect answer by some of the less able students, assuming there was an equal number of coloured counters. Students should be reminded that expressing a probability as a ratio is not an acceptable form for this answer.
In part (b), the correct answer of 45 was the modal answer, with incorrect methods following no particular pattern. A common incorrect attempt was also to try to share 30 in the ratio 2 : 3.
Part (c) followed through student's answers in (b). Explanations were usually acceptable, such that 25 counters could not be shared equally between red and yellow. It should be noted that just saying '25 can't be divided by 2' gained no credit. Also, students should be aware that any calculations given as evidence in such questions need to be accurate.

Question 18. Many students were unable to make any progress in this question by not reading the question fully and jumping in to either find a half and/or a twelfth of 240 or to divide 240 by 5, then 3 then 2. Those that correctly divided 240 in the ratio 5 : 3 : 2 usually went on to gain good marks. Many scored 3 marks for finding the numbers of cans remaining, 120, 36 and 44 but were then unable to find the required percentage of cola cans remaining. Finding one number as a percentage of another is an area that needs addressing. Those that did find a percentage were often successful by simplifying their fraction of 120/200 to 60/100.

Question 19. The factorising of 500 was usually carried out with the aid of a factor tree diagram, many of which were seen to be fully correct. Failure to gain full marks was usually down to not giving their product of prime factors as powers as requested, often just leaving the factors in a list. Many arithmetical errors in the construction of a factor tree and some misunderstandings in the concept were seen where the sum instead of a product was given. Centres should emphasise here that complete tree diagrams should have each final branch ending in a prime

Question 20. In part (a), those students who dealt with the fractions and whole numbers separately often gained greater success in achieving full marks, although an answer of $3\frac{4}{9}$ was not uncommon.
Although no credit was given for simply converting the mixed numbers to improper fractions, many did so accurately and then were able to convert both to a common denominator with at least one correct numerator to gain one mark. However, the answer following this approach was often left as an improper fraction, $\frac{77}{20}$. Unfortunately, many just added the numerators and the denominators to give an incorrect answer of $\frac{17}{9}$.
Part (b) proved to be a much greater challenge for many students, many tried to concoct means of dividing $2\frac{2}{3}$ by 6 to get $\frac{4}{9}$, a few students however correctly changed $\frac{8}{3}$ to $\frac{24}{9}$ and divided this by 6 to get $\frac{4}{9}$. The most successful approach was $\frac{8}{3} \times \frac{1}{6}$ showing an ability to divide a fraction by a whole number. Some had success by transposing the problem to show that $\frac{4}{9}$ multiplied by 6 is equal to $2\frac{2}{3}$, although $\frac{24}{54}$ was often seen.
Many students seemed to not understand the requirements for this question.

Question 21. It was clear that the rules of indices are known by many students but the application of them was very poor. $(2^{-5} \times 2^{8})$ was often written as 4^3. This had to be carefully marked as 4^3 as a final answer was an acceptable Special Case answer for one mark.
Sometimes 2^{-10} or 2^{16} were seen but rarely both.
Less able students often unsuccessfully tried to evaluate the terms before finding a product or squaring and had little understanding of negative indices. Occasionally 2^3 was seen for the method mark but this was followed by 2^5. Working with negative numbers continues to be a problem with -5+8 being evaluated as 13 or -13. Many worked exclusively with the powers and did not include the base number at all; -5 + 8 = 3 was often seen.

Question 22. It was common to see the digits 128 quoted in the working or in an answer, but rarely was the fully correct answer of 0.00128 seen. Very few seemed to know the rule of finding the product of the numbers and then counting the decimal places in order to position the decimal point. Many used long multiplication techniques, usually to no avail. It was rare to see an answer given in standard form. Method marks were sometimes gained for arithmetic errors in working but with a correctly positioned decimal place.

Question 23. This question was not answered well at all. Sampling techniques were not well understood at this level. Many either multiplied 40 000 by 80 or divided by 15. Attempts to divide 40 000 by 80 often introduced arithmetic errors, some just left 500 as their answer and those that knew to multiply by 15 struggled to do so correctly. Some students tried to work with percentages which rarely gained any credit eg 15%.
Students need to be encouraged to consider the suitability of their answers as some offered answers which were greater than 40 000, the total number of cars produced.

Question 24. Students at this level find the comparing of ratios particularly challenging. The most common error in part (a)(i) was to add the values of *b* in the ratios to give a triple ratio of 1 : 9 : 5 or used some of the numbers in the given ratios and gave an answer of 1 : 3 : 5. Some using a correct common multiple often spoiled their final answer by more arithmetical mistakes. Although (i) was poorly answered many picked up marks for correctly following through with their values for *a*, *b* and *c* in part (ii).
In part (b), few students were able to make significant progress. Those who assigned values to *m*, *n* and *p* were often successful, but this was rare. The substitution of $n = 2m$ into $p = 5n$ was rare also but usually successful when seen. Occasionally answers lost the accuracy mark for an incorrect order of 10 : 1 or for including letters in their final answer, eg. 1n : 10n.

Question 25. This was very poorly answered. The formula and the force both being given meant there was only the need to work out the area by multiplying 4 by 2. Some students still think that when working with area, they need to square the values first before using them to divide into 10 000. Those who correctly worked out the area usually tried to divide 10 000 by 8, for one mark, but often then failed, again through poor arithmetic. Some stated the area as 6 (4 + 2) and therefore gained no credit.

Question 26. There were many trial and improvement attempts to answer part (a) of this question, the majority of which were unsuccessful, however a few did throw up the critical value of 6. Those following an algebraic approach were able to score one mark initially for a correct process to start a solution. Subtracting 3 from both sides was usually successful but multiplying both sides by 2 was often carried out incorrectly by omitting to multiply the 3 by 2 resulting in $5x + 3 > 36$ or $5x + 3 = 36$. A correct first step was often followed by an incorrect second step or no second step at all.
Replacing the inequality by an equality is not penalised but students must remember to replace the inequality for the final answer. Far too often an answer of $x = 6$ was given.
In part (b), the ability to factorise a polynomial was sketchy. Factorisation of the first two terms [eg. $x(x + 10) + 9$] was often seen but this gained no credit.
$(x + 10)(x – 1)$ was also a common incorrect answer seen. Common incorrect answers included $(x + 1x)(x + 9)$ or $(x + 9x)(x + 1)$

Summary

On the evidence of performance on this paper, students need to:

- take greater care when reading the questions. Performance in questions 6, 10b, 12 and 18 in particular was severely affected by this.
- take care when carrying out arithmetic operations and check their working to avoid careless errors.
- write clearly so that correct values quoted are not altered in subsequent working.
- show clear methods of working particularly in basic calculations such as finding fractions or percentages of quantities.
- set their working out clearly, crossing out working that is being replaced.
- be able to convert using metric units of distance.
- be clear on the specific wording required when giving geometric reasoning

Question 14

In part (a) this simplifying question was answered very well, with the majority of students being awarded both marks. The method mark was often awarded for correctly collecting like terms for one variable but often lost the second mark due to an error when working with $7d$ and $-d$. Commonly seen errors included an extra step to combine $7c$ and $6d$ to get a final answer of $13cd$ or, when working with the d variable, either misinterpreting the negative sign to get $7c - 6d$ or forgetting that this represented $1d$, resulting in $7c + 7$ being stated as the final answer. A less frequent error was to use powers when collecting like terms.

In part (b), students often struggled to expand the bracket correctly by only multiplying 5 by 2m to give 10m but failing to multiply 5 by 6 as well. Students that did correctly expand the bracket generally solved the equation successfully, with almost half of students scoring full marks.

A significant number of students attempted to solve the equation using trial and error rather than algebraic methods. This approach scores either full marks or zero marks and should not be encouraged.

In part (c), responses were encouraging. Students demonstrated a good understanding of how to write the expression $3x + 2y$ correctly, with again almost half of the cohort scoring full marks.

Where candidates failed to gain full marks, some gained one for having one of the terms correct but most failed to score at all. Often this was due to using powers or a subtraction sign or even missing the sign altogether.

Question 22

Many students did not recognise the need to use trigonometry in this 2 mark question, with many trying to work with the area, finding missing angles or using Pythagoras' theorem. Of those who did recognise that the use of trigonometry was needed, many selected to use the wrong ratio, with Sine being the most common incorrect ratio used. When the correct ratio was used, the majority of students found a correct answer within the acceptable range.

Of the students gaining only the method mark, it was often due to early rounding of figures. The incorrect use of the Cosine ratio due to writing cos (53 × 14.5) was occasionally seen so students should be encouraged to practice the correct use of trigonometric ratios and have a better understanding of the order of operations applied.

Question 5

It was not uncommon to see an answer of 1 coming from (3 – 2), although many correct answers were seen.

Question 24

This question proved to be challenging to most students and was not answered as well as expected. Some students were able to begin to write an expression for the area of the triangle, but many did not divide by 2. Of those who attempted to write an expression for the area of the rectangle, many gained the mark by writing $5 \times 4x - 1$ but this was often without using brackets which then caused difficulty in simplifying the expression later. Often $4x - 1$ was simplified as $3x$ or the area as $19x$. This demonstrated a weak understanding of creating expressions to represent the areas and collecting like terms.
Whilst a small number of students were able to write a correct expression for both shapes, it was rare for any of them to include the additional 10 cm^2 correctly in either of their expressions or in an equation. Multiplying or dividing by 10 or 100 was often seen instead. Some students omitted algebra altogether and wrote either '48' or '24' for the area of the triangle. Trial and improvement methods were often seen and, when used, were quite often unsuccessful. Another common mistake was to calculate the perimeter of the shapes and attempts to use Pythagoras' theorem by some students were seen.
Centres are encouraged to remind students that if only a method of trial and improvement is seen then they will score no marks unless a fully correct answer is given. This approach should not be encouraged.

Question 11

Overall an excellent response from the majority of students correctly answering the question. Most students answered by subtracting 7 then dividing by 5. The use of inverse operations was a common approach to this question with candidates choosing to work numerically rather than algebraically. Very little algebra was seen here, though there were some trial and improvement approaches. A common mistake was to put the answer 65 from the execution of just one inverse operation rather than two. Candidates sometimes carried out the calculation on their calculator without showing their working but checked their solution and showed it, proving that their answer was correct. Occasionally a function machine approach was used but this was not as successful as the other methods shown. Sometimes candidates lost the final mark for only showing their answer embedded in the expression.

Question 18

Candidates who were confident with their algebra often gained full marks. The most common approach involved expanding brackets whilst initial division by 4 was rare but successful when used. Candidates who expanded the brackets correctly, generally went on to answer the question well, although some mistakenly subtracted 12 from both sides, rather than adding. Other approaches such as trial and error or dividing both sides by 4 were also successful although less commonly used. When candidates failed to expand the bracket, they often failed to score any marks at all, choosing to guess an answer or to incorrectly remove the −3 first. A common mistake was to see $8x - 12 = 20$ turning into $8x = 8$ and then $x = 1$ given as the answer. There were cases of embedded answers shown within algebraic expressions.

Question 19

This question was attempted by most candidates, but few achieved full marks. Many candidates gained 1 mark, often by calculating 450 ÷ 6 and getting an answer of 75; or for finding '450 is 15% of 3000'. Unfortunately, many candidates were not able to progress past this point in their calculations and gained no further marks. Some candidates were able to take the calculation further but failed to finish the calculation giving final answers of 0.025 or 1.025. A common incorrect approach was to consider this to be a compound interest question and to use the compound interest formula.

Question 24

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

Question 25

The level of success when solving this algebraic equation with the unknown variable on both sides varied greatly. Students appeared to find this question challenging with a very small number not attempting at all. A correct 1st step of adding x or adding 14 was often indicated as the intention but incorrectly executed leading to $4x = 38$ or similar. A common error was to subtract x from both sides instead of adding. Elimination of -14 was more commonly carried out correctly. Most students attempted to answer the question algebraically, but a larger number than expected attempted an entirely numerical approach. Trial and improvement methods usually led to no marks, but some obtained the correct answer of 11 and therefore gained full marks.

Question 16

Generally, this was not well answered. If the candidate chose to multiply through by 7 as their first step, they were often unsuccessful at gaining method marks because they omitted to multiply the 9 as well as the other terms. With an incorrect first step no further marks were possible. Whilst those candidates who showed the intention to subtract the 9 from both sides as a first step were more successful at gaining method marks, they would often fail to carry out the subtraction on one or both sides. They had difficulty in subtracting a larger number from a smaller one often ending up with a positive solution demonstrating their struggles when working with negative numbers. If this step was completed successfully, they would often go on to divide by 7 rather than multiply. Another common error was to dispense with the divide by 7 altogether and to rewrite the equation as $7x + 9 = 4$ as they are more familiar with this type of equation.

Question 28

By this stage in the paper many candidates were struggling. It was common to see a table of values generated by taking the points from the straight line usually followed by an attempt to find an equation by trial and error. Candidates who had some knowledge of this skill knew to highlight the y-intercept at (0, 3), drawing a gradient triangle on the graph. However, many were unable to take the gradient triangle further and were unable to show correct working and/or that the gradient was "−2". A method mark was awarded for the few correct gradient workings seen and for arriving at "−2". Candidates who got this far nearly always went on to find the correct solution when using this method. It was more likely to see a solution of the form $y = mx+3$ which demonstrated understanding of the y-intercept. A few candidates, who knew what they were doing, spoiled their final solutions by using L instead of y, but were awarded the two method marks.

Question 17

Many candidates were able to correctly solve the equation given, most commonly expanding the brackets as the first step in their method of solving. It was also common to see well set out working. Where candidates were not able to solve the equation completely, they were often able to gain 1 mark for correctly expanding the brackets or for correctly isolating terms in x following on from their incorrect expansion. A common incorrect first step was to try to subtract 5 from both sides without expanding the brackets first. Others expanded the brackets correctly, but went on to add 10 to the left hand side and subtract 10 from the right hand side and giving an answer of $x = 1$. Those who were awarded the first two of three marks had failed to divide 28 by 8 correctly and reached answers like 3.4.

Question 28

Solving the inequality $x + 11 \leq 5 - \frac{1}{2}x$ proved very challenging for candidates with most unable to make progress towards a solution with a significant proportion of candidates not attempting the question at all. Where candidates did have a correct process many struggled to carry out $-\frac{6}{1.5}$ as their final step or, having evaluated this to -4 gave this value rather than an inequality as their final answer.
Many candidates chose to show their intended calculation step and then present the subsequent line of working, this was awarded credit where the elements of the inequality that should be acted upon by that step had changed (allowing for errors in arithmetic) and the other aspects of the inequality had not. A common incorrect approach was to incorrectly combine the terms in x with the constant terms or to attempt to multiply through by 2 and not apply this to all of the terms. Only a minority of candidates attempted trial and improvement which was generally not a successful approach.

Summary

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

- improving numeracy skills, including multiplication and division skills when working with integers, decimals, and fractions (including mixed numbers),
- the interpretation of problems involving ratio, particularly combined ratios,
- considering the context of the problem they are solving and would their answer be feasible,
- knowing, stating and applying angle facts,
- describing a single transformation,
- solving equations and inequalities,
- working with number machines and inverse number machines,
- processes for estimation (with emphasis of rounding a value to 1 significant figure) and identification of whether the chosen rounding leads to an overestimate or an underestimate of the answer,
- finding the equation of a given line,
- understanding of set notation,
- identification of different types of percentage question – including when reversed percentage change is required and how this should be performed,
- encouraging students to set out their working using logical steps,
- encouraging students to read the question carefully so that they understand what they are required to do and what format the answer should be stated in,
- interpretation of questions involving context and multiple step processes.

Question 13

The expression in part (a) was often simplified correctly, with over half of the cohort being awarded the mark. The most commonly seen error was to add the coefficients rather than multiply or still including multiplication signs.

Success in part (b) was very pleasing with a significant proportion of students demonstrating they understood substitution of negative numbers and could also evaluate correctly to score full marks. The most common incorrect answers stemmed either from doing $3 + 2 – 4$ instead of $3 + 2 \times (-4)$, or from evaluating incorrectly as -20 due to failing to apply the correct order of operations. The use of brackets $3 + 2(-4)$ was sufficient for students to achieve the method mark for a correct substitution and students should be encouraged to include brackets around negative values in every topic as this would mean incorrect evaluation from poor calculator use could be avoided.

Question 26

The majority of students were not able to form a suitable equation involving at least two angles. When marks were awarded, students were often able to secure 3 marks. However, they missed out on the final mark due to not providing a suitable conclusion to show that *ABCD* was in fact a trapezium. When marks were awarded, only a small minority were awarded 1 or 2 marks and this was often due to being able to form an equation but either not recognising the need to solve; simplifying incorrectly; using an incorrect method to isolate; or isolating correctly with arithmetic errors.

The main error when beginning the problem occurred when students did not recognise that a trapezium has one pair of parallel sides, and consequently, the co-interior angles on the same side of the transversal sum up to 180 degrees. Instead, they approached the problem as if dealing with a general quadrilateral, which often affected the final communication mark. Additionally, some students correctly added the four interior angles or a suitable pair of angles but did not equate the sum to 360° or 180° degrees to allow them to solve for the variable *x*. This oversight prevented them from securing any marks in this section.
Lots of responses tried to use the formula for area of a trapezium which again scored no credit.

Question 29

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

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

Summary

Based on the performance on this paper, students should:

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

Question 15

The factorisation of $6a + 15$ (part (a) of this question) was answered correctly by around half of the learners. Common incorrect answers included attempts at factorisation that would not expand to give the initial expression, for example $3(a + 5)$, $3a(2a + 5)$ and $3(2a + 3)$.

In part (b) learners were asked to solve $4(3y + 1) = 28$. Around half of the learners were able to solve this successfully with the more popular approach being to expand the bracket before solving the equation. There were also a significant minority of learners who were able

to gain partial credit often for expanding the bracket correctly or for correctly isolating terms in y following an incorrect attempt at expanding the brackets. Common errors included use of addition rather than multiplication when attempting to remove the bracket, use of subtraction rather than division when attempting to divide through to remove the bracket or attempts including collecting together terms which did not simplify in this way. Another common error was to forget to multiply the 4 and +1 leading to $12y + 1 = 28$. Quite a number of students used no algebraic solution, and instead approached this via a trial and improvement method.

Question 27

This question was not attempted well by the majority of the cohort. Learners often attempted to convert from standard form to ordinary numbers, which gained no credit and was not necessary, but rarely recognised that they should then be attempting a division. Sometimes a partial mark was awarded for finding the figures 3125 but this was rare. A very small minority were able to reach the accurate answer for 2 marks. Practising use of a calculator for manipulation of numbers in standard form would be helpful for learners.

Question 23

This question saw very few learners scoring 2 marks. Some were able to gain one correct limit, usually 10.2. There were a variety of incorrect answers with 10.15, 10.25 being the most common.

Question 27

It was very rare to see learners making much progress with this question. Those that gained 1 mark usually produced an equation with a value of c as 3. Many learners did not know how to start the method and simply wrote down pairs of coordinates such as $x = 1.5$, $y = 3$.

Summary

Based on the performance on this paper, learners should:

- learn the names of special quadrilaterals and their associated properties
- practise reading scales for axes on graphs
- work with the given information in the question and not include further interpretation of their own
- work on calculator skills, including the use of the mixed number button
- understand that a frequency polygon requires the points to be joined with line segments, not a curve
- work on percentage profit and finding one amount as a percentage of another in general
- practise finding the equation of a straight line from a graph
- practise finding an angle bisector
- show complete mathematical methods e.g. $\frac{2}{5}$ of 200 or 35% of 80 are not credit worthy unless seen with an accurate result
- be encouraged to use rulers with graphs such as frequency polygons

Question 9

In part (a), learners were told that Greg was x years old and that he was 5 years older than Katy. They were then asked to write down an expression, in terms of x, for Katy's age. Correct responses of $x - 5$ were awarded 1 mark, sometimes an equation such as $k = x - 5$ was given which was condoned. Common incorrect answers included $x + 5$, $5x$ and expressions which were not given in terms of x. An understanding of the term 'expression' was not always present. Some gave a numerical value given for what they thought was the age.

In part (b), learners were told that Carl is twice as old as Greg, and were asked to write down an expression in terms of x for Carl's age. Learners were often able to correctly give $2x$ or $x \times 2$. Common incorrect answers were x^2 or, in common with (a), responses which were not in terms of x.Solving $4y = 12$ was answered successfully by many learners. Where incorrect responses were seen these commonly included 48 (multiplying 12 by 4 rather than dividing) or 8 (from 12 subtract 4).

Question 22

The first part of this question required learners to work with fractions of amounts, dividing in a ratio then writing a ratio and simplifying. Most learners were able to make a start to the process by finding $\frac{1}{7}$ of 280. It was also common to see the correct processes to divide the remaining 240 chocolates in the ratio $1:3$ which was required for the next two marks. Writing the ratio of white chocolates to dark chocolates and simplifying accurately proved more challenging for learners. As with other questions, errors in arithmetic were seen which meant that the final accuracy mark was lost, however the process marks could be gained.

Common errors in the process were to divide 280 in the ratio $1:3$ having neglected the $\frac{1}{7}$ of the chocolates that were dark chocolates. Others assumed that the ratios $1:3$ and $n:1$ meant that there were equal numbers of milk and dark chocolates.

A less common approach, but one which was generally successful when seen was working with the fraction of each amount, identifying that there were $\frac{1}{7}$, $\frac{1.5}{7}$ and $\frac{4.5}{7}$ for dark chocolates, milk chocolates and white chocolates before then selecting 4.5 as their correct answer.

In part (b) learners were told that 10 milk chocolates were eaten and asked whether this affected their answer to part (a). This proved to be a challenging question for learners with many stating that it did impact their answer. Where correct responses were seen these generally identified that changing the number of milk chocolates did not impact the number of dark chocolates or white chocolates.

Question 25

In this question learners were asked to find the equation of the line shown. There were few fully correct responses to this question and a significant minority of learners did not attempt it. Where learners did attempt to answer the question it was unusual to see a fully correct equation for the line L. A greater number of responses correctly identified the y-intercept as 3 or used the correct structure for the equation of a line, $y = mx + c$ which were awarded 1 mark. It was uncommon to see a method to find the gradient.

Some learners gave an answer of $y = \frac{3}{4}x + 3$ which was only incorrect due to not dealing with the negative gradient and gained 2 marks. Common incorrect answers included giving coordinates, often (4, 3) which was obtained from the intercepts with the axes or stating $x = 4$ and $y = 3$ together, either in the working space or on the answer line, which did not gain credit. Where equations of lines were attempted, these often included the values 3 or 4, combined with the variables x and y, for example $y = 3x + 4$ or $3x + 4y$.

Question 9

This question required learners to use knowledge of angle facts and provide a reason. Learners set out their work in a variety of ways, but the most common was to add the two given angles before subtracting the total from 180. A complete method was required in order to award the first mark, so simply adding 85 and 30 was not sufficient and was the most common reason for responses not gaining credit along with subtracting from 360 rather than 180. However, it was pleasing to see a number of learners successfully attempting to answer the question by considering the sum of the angles around the point and including the 180º below the line as part of their calculations.

A wide variety of attempts at stating the reason in part (ii) were seen, with the mark scheme showing the underlined words that were needed as a minimum requirement for the mark to be awarded, namely angles and line. Learners should be encouraged to learn and be able to recall angle facts and be aware of key words to include as part of a reason as calculations alone are not enough when a reason is required. Very few responses contained a contradiction such as angles on a straight line total 360, but when a contradiction was seen within the reason, the mark was not awarded as per general marking guidance for C marks.

Question 13

In part (a), the mark was awarded for n^3 and there were many incorrect responses seen. Common incorrect responses that were seen included $3n$ or $n3$ or giving a choice of both the correct answer and an incorrect answer. It is important for learners to practice writing indices correctly as it was frequent for the index of 3 to not be clearly written as a power and shown as a normal number.

Part (b) required an equation to be rearranged. A correct first step was required for the M mark and many learners demonstrated this by adding 4. However, this had to be carried out on both sides of the equation, meaning that the first mark was not awarded for just showing +4 next to both sides of the original equation with no attempt to evaluate or for showing only $26 + 4 = 30$. Arithmetic errors were allowed as shown in the additional guidance of the mark scheme. It was possible to begin this question by dividing through by 5, and again the mark was only awarded if it was carried out, but this approach was seldom seen. Some responses used a 'function machine' approach such as $26 + 4 \div 5$ and was often correctly evaluated, but on occasion, the order of operations was not used correctly leading to an incorrect final answer, which was condoned for the first mark only.

Question 25

This was the largest question in terms of marks available, and as such it required several stages of workings to reach the correct answer. The usual start was to begin by working with the mean of List A, ideally by adding the given numbers and dividing the total by 4. If carried out correctly this scored the first mark, but occasionally incorrect order of operations as seen but condoned. For learners who had made a slip in finding the mean of List A, the award of the subsequent three process marks was looked for, with learners being allowed to use what they believed to be the mean for A in the ratio work to gain the second and third marks, and in the calculation to find the total in List B for the fourth mark. Therefore, working with the total of the numbers in List A, often 972 or 867.75, was acceptable for use as [A] on the mark scheme in the following P marks, as were the median, range or any value in List A with the second and third marks often being awarded for correct use of ratio. The alternative process involving the use of algebra to set up and solve an equation for the missing element of List B was equally acceptable. This approach was very seldom seen on the Foundation paper and was typically incorrectly, often due to omitting x or any other letter to represent the missing value which was needed for this approach to gain credit.

Whilst the first mark was often awarded, this was usually the only correct process seen as many learners did not know how to work correctly with the ratio and tried to divide by 8 instead.

Question 26

This question required the use of trigonometry to find the size of an angle and a correct trigonometric statement was needed for the M mark to be awarded. An answer between 60.2 and 60.42 allowed for both marks to be awarded to reward responses that were substantially correct other than a small amount of premature rounding. Incorrect or incomplete attempts included work with Pythagoras' Theorem, or measurement of the angle using a protractor, and gained no marks, as did incorrect trigonometry work using tan, often muddling the 7 and 4 using $4 \div 7$ rather than $7 \div 4$. Some responses showed addition or multiplication of the given lengths of the triangle, sometimes seen in calculations that also involved 90 or 180, and these also gained no credit.

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.



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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Examiners' Report

Principal Examiner Feedback

November 2023

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

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

Introduction

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

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

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

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

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

REPORT ON INDIVIDUAL QUESTONS

Question 1

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

Question 2

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

Question 3

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

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

Question 4

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

Question 5

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

Question 6

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

Question 7

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

Question 8

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

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

Question 9

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

Question 10

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

Question 11

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

Question 12

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

Question 13

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

Question 14

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

Question 15

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

Question 16

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

Question 17

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

Question 18

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

Question 19

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

Question 20

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

Question 21

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

Question 22

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

Question 23

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

Question 24

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

Question 25

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

Question 26

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

Question 27

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

Summary

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

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

and

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

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