Chhetri Academy

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GCSE MATHS

Statistics

Edexcel 1MA1 | Subtopic collection Topic 57

Averages and spread

Foundation tier

Answers and examiner comments

111	2010-2025	Foundation
question groups	available papers	tier

Using this booklet

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

Name _____ **Date** _____

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

Question	Working	Answer	Mark	Notes
6 (a)		6	1	B1 cao
(b)		4, 4, 7	2	M1 for identifying two of the numbers as 4 or the sum as 15 (may be implied by three numbers that sum to 15) A1 for 4, 4 and 7 in any order
7*		Diagram or chart	4	B1 for a key or suitable labels to identify boys and girls The key may be ignored if unclear provided the graph is clear, ie if different colours are used to shade in the graph. Give benefit to candidate. B1 for 5 correct labels for days clearly in the appropriate place B1 for a diagram(s) or chart(s)(combined or separate) set up for comparison, showing data for at least three days e.g. dual bar chart, back-to-back stem and leaf diagrams, pie charts, pictograms, etc C1 fully correct diagram or chart to include all axes labeled. QWC: Fully correct diagram or chart and all labelling is correct and clear.

5MB1F_01

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Question	Working	Answer	Mark	Notes
10 (a)		3	1	B1 cao
(b)	$0\times4+1\times5+2\times4+3\times7+4\times4=50$	50	2	M1 for *fx* calculated (could be implied by at least 2 correct) A1 cao
(c)	$360°\div24=15$ Sector angles: W=150; D=90; L=120	Angles drawn, labelled	3	M1 for $360\div24$ or 15 seen or one angle correct in pie chart ($\pm2°$), ignore all labels, or one correct angle in the table A1 for any two angles correct in pie chart. Ignore labels A1 for fully correct and labelled pie chart All angles ±2º

5MB1F_01

5MB1F_01				
Question	**Working**	**Answer**	**Mark**	**Notes**
11*	714 × 2 =1428 714 × 0.95 = 678.30 678.30 × 2 = 1356.60 1428 + 1356.60 = 2784.60 802 × 2 = 1604 802 × 0.85 = 681.70 681.70 × 2 = 1363.40 1604 + 1363.40 = 2967.40	Comparison	5	B1 for identifying 714 and 802 M1 for $\frac{95}{100}\times'714'$ oe or $\frac{85}{100}\times'802'$ oe M1 for 2 × 'adult' + 2 × 'child' oe for at least on e holiday A1 for 2784.6(0) and 2967.4(0) or 2785 and 2967 C1 for comparing the costs of their two holidays for 2 adults and 2 children and clearly indicating which is cheaper. Conclusion must clearly follow from working. QWC: Decision and justification should be clear with working clearly presented and attributable. (allow full marks for a candidate who has calculated the cost per day for each holiday (397.8(0) and 211.95(7..)) and compares these costs accordingly.)

5MB1F_01

Question	Working	Answer	Mark	Notes
12 (a)		67	1	B1 cao
(b)	$84-58=26$	26	2	M1 for $84-58$, accept 58 to 84 and $58-84$ A1 cao
(c)		Two comparisons	2	Ft B1 for heart rates faster after walking , bigger median, median increase by 11 Ft B1 for heart rates more spread out after walking, bigger range, range increases by 11 Statements must be entirely true and not contradictory

Question	Working	Answer	Mark	Notes
6 (a)		3, 7, 5, 3, 2	2	M1 for at least 1 correct frequency or 1 correct tally cell A1 all frequencies correct (with or without the tally column completed or incorrectly completed)
(b)		2	1	B1 for 2 or ft from (a)
(c)	20 + 18 + 23 + 17 + 15 + 21 114 ÷ 6	19	2	M1 for "(20 + 18 + 23 + 17 + 15 + 21)" [=114] ÷ 6 A1 cao [SC: B1 for an answer of 96.5 if M0 scored]

5MB1F_01

10	(a)		27	1	B1 cao
	(b)	(27 + 1)/2 = 14 so 14th is median value	23	1	B1 cao
	(c)	53 - 8	45	2	M1 for 53-8 A1 cao [SC: B1 for 8 to 53 or 8 - 53 oe or 8 and 53 identified if M0 A0 awarded]

5MB1F_01

5	(a)	18 – 10	8	2	M1 for 18 – 10 A1 cao [SC: B1 for 10 to 18, 10 – 18, 18 to 10 oe, if M0 scored]
	(b)		13	1	B1 cao
	(c)	(13+14+12+10+13+16+14+13+18+16) ÷ 10 = 139 ÷ 10	13.9	2	M1 for (13+14+12+10+13+16+14+13+18+16) ÷ 10 allow one error, omission or extra in 10 temperatures, condone missing brackets. A1 cao

8	(a)		2	1	B1 cao
	(b)		11	2	M1 for 12 – a or b – 12 or 12 – 1 or -11 A1 for 11
	(c)		4	2	M1 for attempted ordering with or without the 9th number (5), or clear evidence of selecting the middle number from an unordered list. A1 cao

16		$(x + x + 3 + 2x) \div 3$ $= (4x + 3) \div 3$	$\frac{x + x + 3 + 2x}{3}$ oe	2	M1 $x + x + 3 + 2x$ $(=4x+3)$ oe or $4x + 3 \div 3$ oe A1 $\frac{x + x + 3 + 2x}{3}$ oe

Question		Working	Answer	Mark	Notes
9	(a)(i)		2.23	4	B1 cao
	(ii)	2.19+3×2.23+2.26+2.28+2×2.29+2.31+2.33 22.64 ÷ 10	2.264		M1 for summing heights and dividing by 10 A1 for 2.26(4)
	(iii)		0.14		B1 accept – 0.14
	(b)		mean for men is greater and range for women is greater	2	B1 ft for comparison of means B1 ft for comparison of ranges

Question		Working	Answer	Mark	Notes
14	(a)		7 | 1 3 8 8 | 1 4 4 7 8 9 | 1 2 3 5 6 6 6 8 10 | 0 1 3 4 Key: 7 | 1 means 71cm	3	B2 for fully correct diagram Accept a stem of 70, 80, 90, 100 (The order of the numbers in the stem may be reversed) (B1 for ordered leaves or unordered leaves (with one error or omission)) B1 for a correct key (units may be omitted)
	(b)	104 − 71	33	1	B1 for 33 or ft from diagram
	(c)		92.5	1	B1 for 92.5 or ft from diagram if ordered.

20	(a)		6	1	B1 cao
	(b)		44	1	B1 cao
	(c)		31	2	M1 for 60 – 29 **or** 29 – 60 **or** any correct method that is attempting to find the difference between 29 and 60 (allow 1 arithmetic error) A1 cao

1MA0_1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
21*		Angle *DBC* = (180 – 50) ÷ 2 Base angles of isosceles triangle are equal Angle *ABD* = 180 – 65 Angles on a straight line add up to 180 *x* = 180 – 20 – 115 Angles in a triangle add up to 180 **OR** Angle *DBC* = (180 – 50) ÷ 2 Base angles of isosceles triangle are equal *x* = 65 – 20 Exterior angle of triangle is equal to sum of interior opposite angles **OR** Angle *DCB* = (180 – 50) ÷ 2 Base angles of isosceles triangle are equal *x* = 180 – 50 – 20 – 65 Angles in a triangle add up to 180	45 with reasons	4	M1 for (180 – 50) ÷ 2 oe **or** 65 seen M1 for 180 – 20 – (180 – "65") **or** "65" – 20 or 180 – 50 – 20 –'65' oe C2 for *x* identified as 45 with full reasons QWC: Reasons clearly laid out with correct geometrical language used (C1 (dep on M1) for one reason QWC: Reasons clearly laid out with correct geometrical language used) NOTE: *x* = 45 with no working or without any correct angles marked on the diagram cannot score.

1MA0_1F

Question		Working	Answer	Mark	Notes
13	(a)		4	1	B1 cao
	(b)	34 ÷ 10	3.4	2	M1 for attempt to sum all values and divide by 10 **or** 34 ÷ 10 A1 3.4, $3\frac{4}{10}$, $3\frac{2}{5}$
	(c)		5	2	M1 for 6 – 1 **or** 1– 6, **or** –5 A1 cao

Original question 28

The full source mark scheme begins on page 158. Use the original paper code, tier and question number shown above.

Question		Working	Answer	Mark	Notes
8	(a)		3, 7, 5, 4, 2, 3	2	M1 for at least one correct frequency or tally A1 for 3, 7, 5, 4, 2, 3 cao (B2 for correct frequencies without the use of tallies)
	(b)		2	1	B1 for 2 or ft from their frequency table
	(c)		Diagram or chart	3	M1 (ft from their frequency table) for a diagram or chart, e.g. bar chart, stick graph, pictogram, pie chart, showing correct data for at least 3 scores M1 (indep) for correct scale and label on vertical axis or fully correct labelling on horizontal axis or a suitable key A1 (ft from their frequency table) for fully correct diagram or chart (to include all axes labelled)

10	(a)		$b - a$	1	B1 cao
	(b)		$\frac{(a + b)}{2}$	1	B1 for $\frac{(a+b)}{2}$ oe

5MB1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
***11**		2×39.50 + 3×23.75 = 150.25 2×40.25 + 3×21.85 = 146.05	Seawagon	4	M1 for 2×39.50 + 3×23.75 or 150.25 or 2×40.25 + 3×21.85 or 146.05 or 2*a* + 3*b*, where *a* and *b* are consistent values from table or sight of 39.50 and 23.75 or 40.25 and 21.85 M1 for 2×39.50 + 3×23.75 and 2×40.25 + 3×21.85 A1 for (£)150.25 and (£)146.05 C1 (dep on M1) for Seawagon or ft from their answers and condone stating an incorrect difference

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

2	(a)		July and August	1	B1 (allow incorrect spellings or abbreviations as long as the intention is clear)
	(b)		April	1	B1 (allow incorrect spelling or abbreviation as long as the intention is clear)
	(c)		14	1	B1 cao
	(d)	24–13	11	2	M1 for attempt to read off and subtract (eg 24–13) A1 for 11 (accept – 11)

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

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7	(a)	3 4 4 5 5 6 8 9 10	5	2	M1 for ordering the 9 numbers A1 cao
	(b)	(4 + 8 + 5 + 9 + 10 + 5 + 6 + 3 + 4)÷9 54 ÷ 9	6	2	M1 for (4 + 8 + 5 + 9 + 10 + 5 + 6 + 3 + 4) ÷ 9 or 54 ÷ 9 A1 cao

Original question 7

The full source mark scheme begins on page 179. Use the original paper code, tier and question number shown above.

9	(a)		13	1	B1 cao
	(b)		12	2	M1 for ordering at least 16 of the original values and identifying the middle of the ordered list or indicating at least one of the middle two numbers for n =16 or 18 and the middle number for n = 17 A1 cao

10	(a)	(6+8+6+4+5+5+6+7+4+6) ÷10 = 57 ÷ 10	5.7	2	M1 for adding all the numbers and dividing by 10 A1 cao
	(b)	(3×1)+(1×2)+(4×3)+(0×4) +(2×5) = 3+2+12+0+10	27	2	M1 for (3×1)+(1×2)+(4×3)+(0×4)+(2×5) allow 1 error A1 cao

5MB1F_01

7	(a)		4	1	B1 cao
	(b)		13	1	B1 cao
	(c)		11 and 14	1	B1 cao
	(d)		4	2	M1 for 14–10 or 10 –14 or –4 or 10 to 14 or 14 to 10 A1 cao
	(e)	4 + 3 + 2 + 5 + 3	17	2	M1 for adding at least 4 correct heights out of 4 or 5 heights A1 cao

1MA0_1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
*8	(a)		20 45	1	B1
	(b)	Example of figures for comparison 7min 30 sec with 7 min 28 secs 3 mins 43 secs with 3mins 45 secs 224 secs with 225 secs 3mins 44 secs with 3 mins 45 secs	No	3	M1 for doubling Seeta's time or halving Ninal's time or finding the difference between the two times Eg 3 min 45 sec × 2 or (7m 28s) ÷ 2 or 7m 28s-3min 45 secs M1 for a complete method to convert their time(s) to common units with the units stated C1 for No and **correct** figures compared (could be in secs or mins and secs)

Question		Working	Answer	Mark	Notes
1	(a)		6, 7, 4, 3	2	M1 for at least 2 correct frequencies or 2 correct tallies A1 for all frequencies correct (with or without the tally column completed or incorrectly completed)
	(b)		Bus	1	B1 ft from frequency column or from tally column if different to frequency

2	(a)		3	2	M1 for ordering at least 8 of the numbers or indicating the middle value of the unordered numbers A1 cao
	(b)		8	2	M1 for 9 – 1 (accept 1 – 9 or 9 to 1 or 1 to 9) A1 cao

10			7	3	M1 for 4 × 6 (= 24) or 4 + 6 + 7 (= 17) M1 (dep) for “24” – “17” A1 cao

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

12	(i)	2 2 3 3 3 4 4 5 5 6	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]

Question		Working	Answer	Mark	Notes
5	(a)		33	2	M1 for 45 – 12 or 12 to 45 or 24 – 20 A1 cao
	(b)	12, 15, 15, 18, 20, 20, 22, 24, 25, 32, 36, 45	21	2	M1 for arranging the numbers in order or stating 28.5 A1 for 21 cao
	(c)	(12+15+15+18+20+20+22 +24+25+32+40+45) ÷ 12	24	2	M1 for attempt to add and divide by 12

Question		Working	Answer	Mark	Notes
14	(a)		68	1	B1 cao
	(b)		37	1	B1 cao
	(c)		41	2	M1 for an attempt to find the middle number or circling the 1 in the diagram or writing 1 or 4|1 A1 cao

PAPER: 1MA0_1F

Question		Working	Answer	Mark	Notes
12	(a)		2	1	B1 cao
	(b)		0,1,2	2	M1 for any two of 0, 1, 2 correct with no extras **or** for showing 3,4,6,7 as consecutive numbers in an ordered list (ignore numbers before or after 3,4,6,7 and allow an extra 4 written within the list 3,4,4,6,7). A1 fully correct answer in any order

PAPER: 1MA0_2F

Question	Working	Answer	Mark	Notes
14 (a)		2	1	B1 cao
(b)		4	2	M1 for showing a clear intention to add all ten numbers **and** to divide by 10 A1 cao
(c)		55	2	M1 for evidence of at least 4 attempts to multiply number of birds by frequency eg. 0×3 , 2×1 , 3×2 , 4×3 , 5×4 , 3×5 A1 cao
*15		34 or 33	4	M1 for one operation e.g. 12 × 4.5 (= 54) **or** 12 × 5 (= 60) **or** 4.5 × 5 (= 22.5) **or** ÷8 M1 for two operations e.g. 12 × 4.5 × 5 (= 270) **or** 12 × 4.5 ÷ 8 (= 6.75) **or** 4.5 × 5 ÷ 8 (= 2.8125) **or** 12 × 5 ÷ 8 (7.5) M1 for a complete method e.g. 12 × 4.5 × 5 ÷ 8 (=33.75) C1 for 34 accept 33 clearly identified from correct calculations and correct figures

Original question 5

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

5	(a)		3	1	B1 for 3, accept – 3
	(b)		1	2	M1 for evidence of adding all 7 or all 6 non zero temperatures **and** dividing by 7 A1 cao

Original question 9

The full source mark scheme begins on page 203. Use the original paper code, tier and question number shown above.

PAPER: 1MA0_2F

Question		Working	Answer	Mark	Notes
10			13	2	M1 for ordering the 9 numbers or for indicating the middle number A1 cao

17	(a)		30	1	B1 cao
	(b)		63	2	M1 for [(4 × 0)] + (5 × 1) + (10 × 2) + (7 × 3) + (3 × 4) + (1 × 5) Or [0] + 5 + 20 + 21 + 12 + 5 condone one error or omission or for 67 given as total A1 cao
	(c)		2.1	2	M1 for an attempt to divide the number of customers by the number of tables A1 for 2.1 or ft from (a) and (b)

7	(a) (b) (c)		Correct frequencies: 4,9,6,3 Swimming or 9 Diagram or chart	2 1 3	B2 for all frequencies correct (B1 for 2 tallies or 2 frequencies correct) B1 ft from frequencies or tallies in (a) or diagram in (c) B1 for labelling horizontal axis with activities B1 for linear scale labelled frequency oe B1 for accurately representing the data ft from their frequencies or tallies in (a)
*8			Yes and reason	2	M1 for a line drawn up from 50 or across from 80 or reading 55 or 74 C1 (dep on M1) for statement including yes and a correct reading eg 55, 74 or £6 less”

Paper: 5MB1F_01

Paper_5MB1F_01

Question		Working	Answer	Mark	Notes
9	(a)		13	2	M1 for 18 – 5 or 5 – 18 or a – 5 or 18 – a (where a is score in list $a \neq 18$) or − 13 A1 cao
	(b)		11.5	2	M1 for an attempt to order or for answer 9 Or $\frac{10+13}{2}$ or $\frac{5+13}{2}$ A1 cao
	(c)		15	2	M1 12 × 7 (=84) or "84" − 69 A1 cao
*10			Quick Mix from correct working	4	M1 for 13.50 + 4 × 6.90 (= 41.1) M1 for 7.20 × (4 + 1) +5.90 (= 41.9) A1 for 41.1(0) **and** 41.9(0) if working seen C1 ft (dep on M1) for a statement of Quick Mix with amounts clearly associated with correct companies

Paper: 5MB1F_01

Original question 2

The full source mark scheme begins on page 222. Use the original paper code, tier and question number shown above.

Original question 9

The full source mark scheme begins on page 222. Use the original paper code, tier and question number shown above.

Original question 14

The full source mark scheme begins on page 222. Use the original paper code, tier and question number shown above.

Original question 15

The full source mark scheme begins on page 235. Use the original paper code, tier and question number shown above.

PAPER: 1MA0_2F

Question		Working	Answer	Mark	Notes
10	(a)		1	1	B1 cao
	(b)		1.8	2	M1 for adding all 10 scores **and** dividing by 10 eg 18 ÷10 A1 cao
	*(c)		Greater and explanation	2	M1 (ft from (b)) adding all 12 scores and dividing by 12 or for comparing 4 and 2 with '1.8' or comparing 4 + 2 with 2 × '1.8' C1 (ft from (b)) for correct conclusion and correct explanation NB: if M1 A1 awarded in (b) comparison must be with 1.8

15	(a)		1	1	B1 cao
	(b)		54	2	M1 *fx* (at least 3 seen from 0×2, 1×12, 2×8, 3×6, 4×2) or for an answer of 56 A1 cao

PAPER: 1MA0_1F

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

Question	Working	Answer	Mark	Notes
8 (a)	7 8 8 8 9 9 10 13 14	9	2	M1 Put in ascending or descending order **or** select middle value (7) from unordered list A1 9 cao
(b)	Girls' median is 9 Boys' mean is 9.5(55…) Girls' mean is 10 Boys' range is 7 Girls' range is 8	Comparison	4	B1 Girls' median is 9 **or** (boys' mean = 9.5(55…) **and** girls' mean = 10) Also allow comparison of minimum or maximum values B1 Girls' range = 8 and boys' range = 7 C1 Comparison of medians (ft) or means C1 Comparison of ranges (ft). At least one comparison must be in context for the award of both C marks

PAPER: 1MA0_2F

Question		Working	Answer	Mark	Notes
9	(a)		Plus Power	1	B1 cao
	(b)		TMF Energy	1	B1 cao
	(c)		2.9	2	M1 for 11.1 – 8.2 or 8.2 – 11.1 or 8.2 to 11.1 A1 cao

12	(a)		4	1	B1 cao
	(b)		3	2	M1 for listing the numbers in order or an answer of 5 A1 cao
	(c)		2	2	M1 for adding the numbers and dividing by 11 A1 cao

PAPER: 1MA0_2F

Original question 8

The full source mark scheme begins on page 251. Use the original paper code, tier and question number shown above.

PAPER: 1MA0_2F

Question		Working	Answer	Mark	Notes
10	(a)		19	1	B1 cao
	(b)		21.5	2	M1 for evidence of adding all 10 numbers and dividing by 10 eg (20+14+21+19+27+31+19+19+24+21)÷10 or 215 ÷10 or $x \div 10$ seen where $205 \leq x \leq 225$ A1 cao
	(c)		96	3	M1 for 320 × 2.4 (= 768) or for 1000 ÷ 2.4 (= 416.6 or 416) M1 for (1000 – 320 × 2.4) ÷ 2.4 or for 1000 ÷ 2.4 – 320 or an answer of 96.6(66....) or 96.7 or 97 A1 cao

20	(a)		32.5	2	M1 for median value is 10.5^{th} evidenced by 10th and 11th seen or "31, 34" written or (31 + 34) ÷ 2 (condone missing brackets) or both 31 and 34 identified in the stem and leaf diagram or in a fully ordered list A1 for 32.5 (accept $32\frac{1}{2}$)
	(b)		32	2	M1 for 47 – 15 or 15 – 47 A1 cao
	(c)		7	1	B1 cao

PAPER: 1MA0_2F

PAPER: 5MB1F/01

Question		Working	Answer	Mark	Notes
6	(a)		5, 1, 4, 8	2	M1 for at least 2 correct frequencies or 2 correct tallies A1 for all frequencies correct (ignore tally column)
	(b)		dog	1	B1 ft from frequency column or from tally if different to frequency. Accept 8

PAPER: 5MB1F/01

Question		Working	Answer	Mark	Notes
11	(a)		46	1	B1 cao
	(b)		35.5	2	M1 for identifying 35 and 36 or for 5 and 6 or for 5.5 A1 for 35.5
	(c)		5	1	B1 cao

16			$\frac{x+10+x+x-4}{3}$	3	M1 for $x + 10$ or $x - 4$ M1 for $x + 10 + x + x - 4$ A1 for $\frac{x+10+x+x-4}{3}$ oe

Question	Working	Answer	Mark	Notes
22 (a)		$50 < a \leq 60$	1	B1 for correctly identifying the modal class interval e.g. 50 – 60 oe
(b)		Polygon	2	B2 for fully correct frequency polygon - points plotted at the midpoint (B1 for all points plotted accurately but not joined with straight line segments **or** all points plotted accurately and joined with last joined to first to make a polygon **or** all points at the correct heights and consistently within or at the ends of the intervals **and** joined (can include joining last to first to make a polygon) **NB**: ignore parts of graph drawn to the left of the 1st point or the right of the last point; ignore any histograms drawn.

6	(a)		32	2	M1 for reading off frequencies (condone one error) A1 cao
	(b)		7	1	B1 cao
	(c)		8	2	M1 for 10 − 2 or 2 − 10 or −8 A1 cao

19	(a)		9.6	2	M1 for complete method to calculate the mean eg (12+6+7+10+13) ÷ 5 A1 for 9.6 oe
	(b)		5	2	M1 for $\frac{12}{240} \times 100$ oe A1 cao

7	(a)		5	1	B1 cao
	(b)		4	2	M1 for ordering numbers A1 cao (SC B1 for 7)
	(c)		6	2	M1 for 7 and 1 seen together A1 cao

11	(a)		Newcastle	1	B1 cao
	(b)		6	1	B1 accept −6
	(c)		−4	1	B1 cao
	(d)		1	2	M1 for (4 −2 + 3 − 4 + 4) ÷ 5 A1 cao

Question	Working	Answer	Mark	Notes
20 (a)		Frequency polygon	2	B2 correct frequency polygon (B1 for points plotted correctly but not joined **or** for points plotted at the correct heights, consistently placed within the class intervals (including ends) and joined **or** for an otherwise correct frequency polygon with no more than one point incorrect **or** correct frequency polygon with first and last points joined directly) **NB**: ignore parts of graph drawn to the left of the 1st point or the right of the last point; ignore any histograms drawn.
(b)		$60 < A \leq 80$	1	B1 ft from their frequency polygon

Question	Working	Answer	Mark	Notes
14 (a)		6	1	B1 cao
(b)		5.5	2	M1 for listing the numbers in order or an answer of 4 A1 for 5.5
(c)		7	2	M1 for 9 – 2 or 2 – 9 or 2 to 9 A1 cao

13	(a) (b)		1.5 to 2 7.5 to 12	B1 M1 A1	in the range 1.5 to 2 for scale factor in the range 5 to 6 (ft) or for answer in the range 7.5 to 12

Paper: 1MA1/1F

Original question 20

The full source mark scheme begins on page 265. Use the original paper code, tier and question number shown above.

Paper: 1MA1/3F

Question	Working	Answer	Mark	Notes
6 (a)		Reason	C1	reason, eg must order numbers first
(b)		10	M1 A1	for 22 − 12 or 12 − 22 or 12 to 22 cao
(c)		16	M1 A1	for adding the numbers and dividing by 7 cao

17	(a)		12	B1	cao
	(b)		Explanation	C1	No with statement about not being mutually exclusive events eg a person could be in both categories

Paper: 1MA1/3F

10	(a)		Jake with reason	C1	Explanation referring to spread eg range **or** Jakes figures are closer together **or** highest and lowest values for both.
	(b)		Reason	C1	Reason eg stem not used or it should be 26

11	(a)	30 ÷ 8	4	P1	for 30 ÷ 8 **or** 3.75 **or** 3 **or** counting up 8s towards 30 to at least 3 lots of 8 **or** 4 × 8(=32) oe
				A1	cao
	(b)		No with reason	C1	No with 32 ÷ 8 **or** ft from (a)

27	(a)		365	M1	*fx* with *x* consistent within intervals eg 200 × 1 , 300 × 11 , 400 × 5 , 500 × 0 , 600 × 3, if 200, 3300, 2000, 0, 1800 are seen without working then condone 1 error
				M1	(dep) $\Sigma fx \div \Sigma f$ eg "7300" ÷ 20
				A1	Cao
	(b)		Comment	C1	for comment about outliers affecting mean

Paper 1MA1: 1F

4 (a)		6	P1	for process to find the total weight of one type of fruit eg 4 × 125 (=500) or 2 × 170 (=340) or 3 × 135 (=405) or 1245
	1785−1245 =540		P1	complete process to find the total weight of oranges eg “1785” – (“500” + “340” + “405”) or sight of digits 54 or answer given as 0.6 or 60
	540 ÷ 90		A1	cao SC B1 for answer of 15
(b)(i)		No	P1	Starts process, eg 1000 ÷ 75 (digits 13(.3..) seen) or 15 × 75 (= 1125) or 1.125 or showing 1000 ÷ 15 (=66(.6..)) or counts to 975 or 1050
		(supported)	C1	“No” with correct working eg as evidenced by work from P1 mark.
(b)(ii)		Comment	C1	for valid comment, eg may get enough tomatoes if tomatoes weigh less than assumed (75g), not if weight is more than 75g.

Paper: 1MA1/2F

Question	Working	Answer	Mark	Notes
18 (a)		31.4	P1	for working with circumference formula, eg $\pi \times 80$ (=251.(….)) oe
			A1	for answer in the range 31.4 to 31.5 accept 10π
(b)		No (supported)	C1	Mean distance stays the same with reason, eg total distance remains unchanged or same number of points

19	(a)		$160 < h \leq 170$	B1	correct class interval
	(b)		Line segments joining the points (135, 4), (145, 11), (155, 24), (165, 22) and (175, 19)	C2 [C1	for fully correct frequency polygon for points plotted correctly at midpoints of intervals OR joining points with line segments at the correct heights and consistent within the intervals (including end values) OR correct frequency polygon with one point incorrect OR correct frequency polygon with first and last point joined] NB: ignore any histogram drawn and any part of frequency polygon outside range of first and last points plotted

Paper: 1MA1/3F

15 (a)	Incorrect order of operation	C1	for identifying an incorrect order of operation, eg should be 12 – 8 **or** "should multiply first"	Showing that 12 – 2 × 4 is 4 (and not 40) is insufficient for this mark; the explanation should focus on what Jenny has done wrong.
(b)	Statement	C1	for stating that the range is the difference between the greatest and least values, oe **or** stating that he didn't put numbers in order	Stating the correct calculation for the range (8 – 1) or stating the (correct) range as 7 is sufficient for this mark.

Paper: 1MA1/3F

Question	Answer	Mark	Mark scheme	Additional guidance
23 (a)	5	M1	"2" ÷ 40 × 100	"2" comes from their reading of the height of the 20 to 24 column
		A1	cao	
(b)	9.5 shown	M1	for frequencies of 11, 8, 13, 6 and 2 (allow one error) **or** for midpoints 2, 7, 12, 17 and 22	May be seen on chart
		M1	for finding at least 4 products *fx* consistently within interval (including end points)	
		M1	for Σ"*fx*" ÷ ("11" + "8" + "13" + "6" + "2") **or** (11×2 + 8×7 + 13×12 + 6×17 + 2×22) ÷ 40 **OR** Σ"*fx*" (=380) **and** 9.5 × ("11" + "8" + "13" + "6" + "2") (=380)	Evidence of two different calculations that should lead to 380 are required for this mark
		C1	for correct figures showing the answer or accurate figures to compare from correct working eg 380 from two calculations	

Paper: 1MA1/3F

Paper: 1MA1/1F

Question	Answer	Mark	Mark scheme	Additional guidance
7 (a)	7	P1	for process to find the number of blue flowers, eg 30 – 8 – 10 – 5	Allow one error
		A1	cao	
(b)	white	B1	for white or ft from (a)	Must be seen clearly for ft

Question	Answer	Mark	Mark scheme	Additional guidance
18 (a)	2	B1	cao	
(b)	81	M1	for working with values from the table eg (0 × 4), (1 × 3), … with at least 3 products shown correct **or** (0 +), 3, 14, 15, 24, 25 with at least 3 correct	Check working space or next to the table. Zero points may not be seen so accept without 0 × 4, 0
		A1	cao SC B1 for 85	

Paper: 1MA1/3F

Question	Answer	Mark	Mark scheme	Additional guidance
26 (a)	$40 < h \leq 50$	B1	accept 40 – 50 oe	
(b)	polygon drawn (15,7), (25,13) (35,14), (45,12) (55,16), (65,18)	B2 (B1	for fully correct polygon with points plotted at the midpoints for points plotted correctly but not joined by straight lines **or** joining points at correct heights consistently within intervals including plotting at end values **or** correct frequency polygon with one point incorrect **or** correct frequency polygon with first and last points joined directly)	Joining must be with line segments for example, at 10, 20, 30,…or at 20, 30, 40,… Ignore any histogram drawn and any part of frequency polygon outside range of first and last points plotted

Paper: 1MA1/3F

25	No (supported)	P1 P1 C1	for process to find total weight of the 4 red bricks, eg. 5 × 4 (= 20) **or** for process to find total weight of the 5 blue bricks, eg. 9 × 5 (= 45) for process to find total weight of all 10 bricks, eg. “20” + “45” + 6 (= 71) No with correct supporting evidence **Acceptable examples** No, it is 7.1 She is wrong, it is 0.1 more No, (the total weight is) 71 not 70 **Not acceptable examples** Yes …. No, it is 71	May be seen next to statements 20 must be clearly referenced to the red bricks. 5 + 9 + 6 = 20 scores no marks Candidates working in grams will need to give 7100 and 7000 for example as comparable figures.

Paper: 1MA1/1F

Question	Answer	Mark	Mark scheme	Additional guidance
9 (a)	5	M1	for listing numbers in order, eg 3 4 4 6 8 9 **or** answer of 4, 6 **or** answer of 8.5	Condone one error or additional number
		A1	cao	
(b)	$\frac{2}{6}$	M1	for $\frac{2}{x}$ with $x > 2$ **or** for $\frac{y}{6}$ with $y < 6$	Incorrect notation can imply a correct method. Award M1 for eg 2 out of 6 **or** 2 in 6 **or** 2 : 6
		A1	for $\frac{2}{6}$ oe	Accept any equivalent fraction, decimal form 0.33(33..) or percentage form 33(.33..)%
(c)	3, 6	P1	for at least one 3 **or** 5×5 (= 25)	Numbers may be seen on the cards (but the answer line takes precedence)
		A1	for 3, 6 or 6, 3	

13	43	M1 A1	for identifying 74 and 31 as the key numbers cao	It is insufficient to identify these on the diagram (eg as 1, 4) –43 as an answer implies M1

Paper: 1MA1/3F

Paper: 1MA1/3F

Question	Answer	Mark	Mark scheme	Additional guidance
25	18.6	M1	for finding 4 products within intervals (including end points)	Min *fx*: 5, 20, 105, 160; Max *fx*: 10, 30, 140, 200
		M1	for Σ"*fx*" ÷ (1+ 2 + 7 + 8) **or** (7.5×1 +12.5×2 + 17.5×7 +22.5×8) ÷ (1+ 2 + 7 + 8) **or** ("7.5" + "25" + "122.5" + "180") ÷ "18" **or** "335" ÷ "18"	Σ"*fx*" **must** come from 4 products *fx* within intervals (including end points)
		A1	for 18.6(111…)	

Question	Answer	Mark	Mark scheme	Additional guidance
16 (a)	Explanation	C1	for explanation **Acceptable examples** the number of points only goes up to 4 because the median is 2 no-one scored 5 points (implies number of points scored was less than 5) **Not acceptable examples** she was right since 5 is the middle number she has used the wrong column (insufficient) the median is 3	Explanations must relate to median number of points and not median of the frequency values
(b)	Explanation	C1	for explanation identifying the error in the working **Acceptable examples** $0 \times 1 = 0$ or 0×1 is not 1 Anything times zero is zero **Not acceptable examples** the correct answer is 37	

Paper: 1MA1/1F

Paper: 1MA1/1F

Question	Answer	Mark	Mark scheme	Additional guidance
26	20 or 24 or 168	B1	for identification of the range of the girls (20) **or** the range (24) **or** the median (168) of the boys	
	Comparison	C2	for a correct comparison of medians **and** a correct comparison of ranges supported by correct figures. eg the median height for girls (165) is less than the median height for boys (168) and the range for girls (20) is less than the range for boys (24) At least one comparison must be in context referring to height or quoting cm.	Simply quoting values for median, range is insufficient; they must be compared.
		(C1	for a correct comparison of medians **or** a correct comparison of ranges that could ft their incorrect figure(s))	Context not necessary for C1

Paper: 1MA1/3F

Question	Answer	Mark	Mark scheme	Additional guidance
20	4	P1	for start to process, eg 65 + 100 + 3 × 5 + 1 × 20 (= 200) **or** 3 × 80 (= 240)	May be part of an algebraic statement eg 65 + 100 +35 + 10*x*
		P1	for 65 + 100 + 3 × 5 + 1 × 20 (= 200) **and** 3 × 80 (= 240) **or** "240" – 100 – 65 (=75)	
		P1	for process to find value of £10 notes in Carl's wallet, eg "240" – "200" (= 40) **or** for "75" – 3 × 5 – 1 × 20 (=40)	
		A1	cao	NB 80 – 35 (=45) leading to 4 gets 0 marks

3	3	B1	cao	

15	(a)	774	M1	for at least three of 0×3 (= 0) or 1×57 (= 57) or 2×84 (= 168) or 3×75 (= 225) or 4×81 (= 324) **or** for $0 \times 3 + 1 \times 57 + 2 \times 84 + 3 \times 75 + 4 \times 81$	Note if 2 non zero products are seen award M1 Use of the figure 777 is enough for M1
			A1	cao	
	(b)	3	M1	for method to begin to work with the median, eg $300 \div 2$ (= 150)	Accept 301 in place of 300
			A1	cao	NB mean = 2.58

Paper: 1MA1/2F

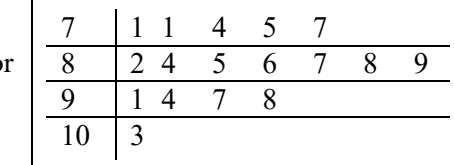
Paper: 1MA1/2F

Question	Answer	Mark	Mark scheme	Additional guidance
18	13.2	P1	process to convert decimal time, eg 25.3 × 60 (= 1518) or 0.3 × 60 (= 18) **OR** process to work with mean, eg [time] ÷ 115 (= 0.22) or 1÷ (115 ÷ [time]) (= 0.22)	[time] could be 25.3 or any other time that has been incorrectly changed from 25.3 hours
		P1	full process to work out mean time allocated for appointment, eg "1518" ÷ 115 or "0.22" × 60	
		A1	cao	

Paper: 1MA1/3F

Question	Answer	Mark	Mark scheme	Additional guidance
14 (a)	7	B1	cao	
(b)	5	B1	cao	
(c)		C2	ft for correct comparison of both medians and ranges, eg. median of boys shoe sizes is greater than the median of the girls shoe sizes and the range of the boys shoe sizes is greater than the range of the girls shoe sizes.	Simply quoting values for median, range is insufficient; they must be compared.
		(C1	ft for a correct comparison of either medians or ranges)	

Question	Answer	Mark	Mark scheme	Additional guidance
7 (a)	A	B1	cao	
(b)(i)	Cross at correct position	B1	for cross at $\frac{1}{4}$	Cross or other indication may be seen on or near line provided within tolerance
(b)(ii)	$\frac{1}{8}$	B1	for $\frac{1}{8}$ oe	Accept any equivalent fraction, decimal form 0.125 or percentage form 12.5% Do **not** accept 1 : 8 or 1 to 8 or 1 out of 8

15	(a)	Diagram	B2 (B1 B1	for a fully correct ordered diagram for a complete unordered diagram or for an ordered diagram with at most one error or omission) for correct key eg 7 | 1 or 70 | 1 represents 71 Key must be consistent with the stem	 Accept stem of 70, 80, 90, 100 Can be in reverse vertical order (with matching leaves) eg 10, 9, 8, 7 Errors can be omissions; one number in the wrong position is one error.
	(b)	86	M1 A1	for identifying the median, eg "6" circled or an answer of 6 **or** ft their list or diagram for selection of middle value (allow up to two errors or omission in listing) for 86 **or** ft their list or diagram for selection of middle value (allow up to two errors or omission in listing)	

Paper: 1MA1/2F

<table>
<tr>
<td>17</td>
<td>176</td>
<td>M1

M1

A1</td>
<td>for a method to find 5 products within intervals (including end points)

for Σ“fx” ÷ (8 + 14 + 24 + 30 + 4)
or (155×8 + 165×14 + 175×24 + 185×30 + 195×4) ÷ (8 + 14 + 24 + 30 + 4)
or (“1240” + “2310” + “4200” + “5550” + “780”) ÷ “80”
or “14080” ÷ “80”

cao</td>
<td><table><tr><th>Min fx</th><th>Max fx</th></tr><tr><td>1200</td><td>1280</td></tr><tr><td>2240</td><td>2380</td></tr><tr><td>4080</td><td>4320</td></tr><tr><td>5400</td><td>5700</td></tr><tr><td>760</td><td>800</td></tr></table>Σ“fx” must come from 5 products fx within intervals (including end points)</td>
</tr>
</table>

6	(a)	6	B1	cao	
	(b)	May, October	B1	cao	

8	(a)	102	B1	cao	
	(b)	82	M1	for a method of extracting the correct 4 numbers from the table, adding all 4 numbers and then dividing by 4 eg (143+121+45+19) ÷ 4 or “328” ÷ 4	
			A1	cao	

Paper: 1MA1/3F

28	158	P1 P1 A1	for a first step in the process eg 50×167.6 (=8380) or 20×182 (=3640) for a complete process eg $(50 \times 167.6 - 20 \times 182) \div 30$ or $\frac{8380 - 3640}{30}$ or $4740 \div 30$ cao	

Paper: 1MA1/3F

12	7	M1 A1	for (13 + 4 + 5 + 9 + 3 + 8) ÷ 6 or “42” ÷ 6 cao	Condone missing brackets for M1

Paper: 1MA1/1F

Question	Answer	Mark	Mark scheme	Additional guidance
17	540	P1	for start of process, eg 350 + 250 (= 600) **or** 3 × 380 (= 1140) **or** 380 – 350 (= 30) or 380 – 250 (= 130)	350 + 250 + another number scores no marks eg 350 + 250 + 150 or 350 + 250 + 380
		P1	for process to work with mean and number of seats in at least one cinema, eg 350 + 250 (= 600) **and** 3 × 380 (= 1140) **or** "1140" – 350 (= 790) or "1140" – 250 (= 890) **or** for an equation in x, eg 350 + 250 + x = 3 × 380 **or** 380 – 350 (= 30) and 380 – 250 (= 130)	
		P1	for process to find number of seats in cinema **C**, eg "1140" – "600" or for (x =) "1140" – 350 – 250 380 + "30" + "130"	
		A1	cao	

Paper: 1MA1/3F

Question	Answer	Mark	Mark scheme	Additional guidance
9 (a)	6	M1	for ordering the numbers or showing a complete method of (5+7) ÷ 2	
		A1	cao	
(b)	8	B1	cao	
(c)	Bar chart	B1	for correct person labels or a linear scale	Accept key in place of labels Accept unambiguous abbreviations eg Frequency or Number, X,M,K,T
		M1	for correct bars showing information for at least 2 people	Condone bars of varying widths Condone no gaps or inconsistent gaps
		A1	for a fully correct bar chart with linear scale of numbers on the vertical axis and a set of person labels on the horizontal axis	

12	(a)	Merit	B1	cao	
	(b)	24	M1	for beginning to work with proportion eg $105 \div 7$ (= 15) or $7 \div 105$ (= 0.07 or 0.06....) or 360×7 (= 2520) **or** $\frac{360}{105}$ (= 3.4…) **or** works out a quantity for one sector eg $\frac{7}{105} \times 30$ (= 2), $\frac{7}{105} \times 75$ (= 5), $\frac{7}{105} \times 150$ (= 10),	
			M1	for a complete method eg $\frac{360}{105} \times 7$ oe or "3.4…" × 7 **or** 360 ÷ "15" or 360 × "0.06.." **or** "2520" ÷ 105 **or** 7 + "2" + "5" + "10"	
			A1	cao	

Paper: 1MA1/3F

Paper: 1MA1/1F

Question	Answer	Mark	Mark scheme	Additional guidance
1	6	B1	cao	

Paper: 1MA1/1F

Question	Answer	Mark	Mark scheme	Additional guidance
8 (a)	11, 7, 6	B2	for all frequencies correct	Any discrepancy mark frequencies
		(B1	for two tallies or two frequencies correct)	
(b)	Castle	B1	Castle or ft their tallies or frequencies	Any discrepancy ft frequencies
(c)	Bar chart	B1	for correct place labels or a linear scale	Accept key in place of labels Accept unambiguous abbreviations for labels eg C, F, M
		M1	for at least two correct bars ft their table in (a)	Condone bars of varying widths Condone no gaps or inconsistent gaps
		A1	for a fully correct bar chart with linear scale of numbers on the vertical axis and a set of place labels on the horizontal axis (ft from their frequencies or tallies in (a))	Bars must be unambiguously correct for their scale

Paper: 1MA1/1F

Question	Answer	Mark	Mark scheme	Additional guidance
21 (a)	3.5	P1	for a process to find the total length of the 5 sticks, eg 4.2×5 (= 21) **or** for forming an equation, eg $\frac{7+4x}{5} = 4.2$	
		P1	for complete process to find the mean eg ("21" – 7) ÷ 4	
		A1	oe	
(b)	Explanation	C1	for explanation **Acceptable examples** it reduced the mean my answer will be less the answer will be 1 it will be 2.5 less **Not acceptable examples** the mean will be more my answer will change it would decrease the lengths of the other sticks	If figures are given as part of the answer they must be correct, but can allow ft.

<table>
<tr>
<td>22 (a)</td>
<td>24.6</td>
<td>M1

M1

A1</td>
<td>for finding 5 products within intervals (including end points) with not more than one error, may be seen near table.
eg 2 × 12.5 (= 25), 8 × 17.5 (= 140), 13 × 22.5 (=292.5),
21 × 27.5 (= 577.5), 6 × 32.5 (= 195)
or for 1230

for $\Sigma fx \div \Sigma f$
eg (“25” + “140” + “292.5” + “577.5” + “195”) ÷ “50”
or “1230” ÷ “50”

for 24.6 oe</td>
<td>
<table>
<tr><th>Min fx</th><th>Max fx</th></tr>
<tr><td>20</td><td>30</td></tr>
<tr><td>120</td><td>160</td></tr>
<tr><td>260</td><td>325</td></tr>
<tr><td>525</td><td>630</td></tr>
<tr><td>180</td><td>210</td></tr>
</table>
Σfx must come from 5 products,
fx within intervals (including end points)
</td>
</tr>
</table>

Paper: 1MA1/3F				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
22 (b)	No, with reason	C1	for No **and** reason **Acceptable** No, the median is in the interval $25 < T \leq 30$ No, the median is in the group containing the 25(.5)th temperature No, she did not take into account frequency No, the frequencies are not the same for each group. **Not acceptable** No, the median is 27.5 No, the median is higher than 22.5 $25 < T \leq 30$ Yes, …	Any incorrect statement as part of a correct response can be ignored unless it contradicts the statement,

Question	Answer	Mark	Mark scheme	Additional guidance
15 (a)	64	B1	cao	
(b)	36	M1	for identifying 81 and 45 as the key numbers, eg 81 – 45 or 45 – 81 or 45 to 81	It is insufficient to identify these on the diagram (eg as 1, 5)
		A1	cao	Answer of –36 gets M1A0
(c)	comparison	C1	for a correct comparison of medians that could ft their incorrect median in (a) **Acceptable examples** The adults were faster because they have the smaller median The adults were [11] minutes faster (on average) The adults were faster The adults took less time The children were slower The children took more time Children took [11] minutes more (on average) Children had a larger median than the adults. **Not acceptable examples** The children were faster The adults median was 64, the children's median was 75 11 minutes difference The children had more time to run than the adults	Statement must be entirely true and not contradictory Figures not required in comparison, but if seen must be correct. Where [11] is the difference between 75 and their (a). If median in (a) is greater than 75 then converse statements would be correct ft.

Paper: 1MA1/1F

Paper: 1MA1/2F

Question	Answer	Mark	Mark scheme	Additional guidance
28 (a)	$100 < w \leq 150$	B1	cao	
(b)	152	M1	for finding 5 products within the interval (including end points) with not more than one error, may be seen near table, eg 75 × 34 (= 2550), 125 × 29 (= 3625), 175 × 27 (= 4725), 225 × 19 (= 4275), 275 × 11 (= 3025) or for 18200	do not award this mark if the final answer comes from an alternative incorrect method, eg 120 ÷ 5 (= 24) or $\Sigma mp \div \Sigma f$ (875 ÷ 120 (= 7.29…)) or $\Sigma mp \div 5$ (875 ÷ 5(= 175))
				Min fx | Max fx 1700 | 3400 2900 | 4350 4050 | 5400 3800 | 4750 2750 | 3300 15200 | 21200
		M1	for $\Sigma fx \div \Sigma f$ eg ("2550" + "3625" + "4725" + "4275" + "3025") ÷ 120 or "18200" ÷ 120	Σfx must come from 5 products, fx within intervals (including end points)
		A1	for answer in the range 151 to 152	Correct midpoints must be used for the award of the A mark

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**
1		Word 'five' added 'Write the following five numbers in order.'	Standard mark scheme
6		Diagram enlarged. Wording added 'Look at the diagram for Question 6 in the separate Diagram Booklet. The diagram is a pictogram.'	Standard mark scheme
	(b)	Sentence added 'A spare tactile diagram and drawing film are available for this question.'	
7	(a)	Horizontal line now of length 8.5 cm with a short vertical line added at each end. Wording added 'Look at the diagram for Question 7 (a) in the separate Diagram Booklet. The diagram shows a line.'	B1 for answer in the range 8 to 9
	(b)	Diagram turned horizontal. Angle x now 70° Wording added 'Look at the diagram for Question 7 (b) in the separate Diagram Booklet. The diagram shows an angle marked x.'	B1 for answer in the range 65 to 75
	(c)	For Braille only: Wording added 'Look at the diagram for Question 7 (c) in the separate Diagram Booklet. The diagram shows a shape. What is the name of this shape?' Braille candidates will have a diagram of a regular hexagon with 3 cm sides.	MLP: Standard mark scheme Braille: B1 for hexagon
8		Diagram enlarged. 1.5 cm grid. Crosses on grid changed to dots. Wording added 'Look at the diagram for Question 8 in the separate Diagram Booklet. The diagram is a coordinate grid.' For Braille: (c) changed to 'On the grid, mark with a bumpon the point with coordinates (-4, 2) Label this point C. A spare tactile diagram, bumpon and sticky label C are provided for this question.'	Standard mark scheme

11		Diagram enlarged. Wording added 'Look at the diagram for Question 11 in the separate Diagram Booklet. Majid has a spinner. The diagram shows the spinner with three sections labelled 1, 2 and 3.'	Standard mark scheme
13	(a)	Letters changed: c changed to p and d changed to q	Standard mark scheme but note the change in letters
	(b)	Letter changed: x changed to w	Standard mark scheme
16		Diagram enlarged. Wording added 'Look at the diagram for Question 16 in the separate Diagram Booklet. The diagram shows a graph.'	
	(a)	6 ounces changed to 8 ounces.	B1 for answer in the range 220 to 230
17		Diagram enlarged. CB now 12cm, AC now 8cm, and AB now 11cm. Add the sentences 'Look at the diagram for Question 17 in the separate Diagram Booklet. The diagram shows triangle ABC.' Wording changed "less than 4cm from A" changed to "less than 5cm from A" For Braille: sentence added 'A spare tactile diagram, Wikki Stix, drawing film and sticky label R are available for this question.'	Standard mark scheme but note change in radius of arc to be drawn from 4cm to 5cm
20		Diagram enlarged. Wording added 'Look at the diagram for Question 20 in the separate Diagram Booklet. The diagram is NOT accurately drawn. The diagram shows a right-angled triangle labelled ABC. In the diagram: AB = 10 cm AC = 19 cm'	Standard mark scheme
21	(b)	Word 'When' added Letters changed: A changed to T and B changed to U	Standard mark scheme

24	(a)	Word 'below' added to the sentence 'Complete the table below of values for …' For Braille: answer lines added Ans: (i) _____ (ii) _____ (iii) _____	Standard mark scheme
	(b)	Diagram enlarged. Wording added 'Look at the diagram for Question 24 (b) in the separate Diagram Booklet. The diagram shows a grid.' For Braille: sentence added 'A spare tactile diagram and bumpons are provided for this question.'	Standard mark scheme
26		Diagram enlarged. Labelling of trapezium changed from ABCD to DABC. Top left now A – top right now B – bottom right now C and bottom left now D. Letter changed: x changed to y Wording added 'Look at the diagram for Question 26 in the separate Diagram Booklet. The diagram is NOT accurately drawn. The diagram shows a quadrilateral labelled ABCD. In the diagram:' All angles are measured in degrees. Angle ABC = 4y + 8 Angle BCD = 3y – 3 Angle CDA = 2y + 15 Angle DAB = 4y + 15'	Standard mark scheme but note the changes in the vertices and the change from x to y
27		Diagrams enlarged. Labelling of triangles changed - ABC now ACB, DEF now DFE. Wording added 'Look at the diagram for Question 27 in the separate Diagram Booklet. The diagrams are NOT accurately drawn. The diagram shows two similar isosceles triangles labelled ABC and DEF. In triangle ABC: AB = 8 cm AC = 8 cm CB = 6 cm In triangle DEF: DE = DF FE = 1.5 cm'	Standard mark scheme

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

Paper: 1MA1/3F

7	(a)	12	M1	for method to find mean, eg (14 + 10 + 10 + 13 + 15 + 9 + 15 + 10) ÷ 8 **or** 96 ÷ 8	Allow one error or omission but must divide by 8
			A1	cao	
	(b)	6	M1	for 15 – 9 **or** 9 – 15 **or** 9 to 15	Condone eg 9, 15 but not 9 + 15
			A1	cao	
	(c)	cross at ¼	B1	for cross (or mark) at ¼	Accept any mark near to ¼ if the intention is clear; do not accept if additional marks are shown

Paper: 1MA1/2F

Question	Answer	Mark	Mark scheme	Additional guidance
15 (a)	9.9	M1	for starting process by multiplying ages by frequencies, with at least 3 correct, eg 8×6, 9×7, 10×15, 11×11, 12×2 **or** at least 3 of 48, 63, 150, 121, 24	May be seen next to table. 406 implies this mark
		M1	(dep on M1) for $\sum fx \div \sum f$, eg $406 \div 41$ **or** $406 \div (6 + 7 + 15 + 11 + 2)$ **or** $(8 \times 6 + 9 \times 7 + 10 \times 15 + 11 \times 11 + 12 \times 2) \div 41$	$\sum fx$ must come from 5 products
		A1	Answer in the range 9.9 to 9.91	If an answer is given in the range in working and then rounded incorrectly award full marks.
(b)	No, with explanation	C1	No, with explanation, **Acceptable examples** No as the mode/modal age is 10 No it should be 10 (not 15) No because 15 is the number of children that are age 10 (not age 15) No because there are no 15 year olds No because the frequency tells us the number of children for that age No he needs to give the age of the highest frequency **Not acceptable examples** No he is not, the modal is the one that occurs the most Yes / Rohan is correct .... No, the mode is 11	

Paper: 1MA1/3F

Question	Answer	Mark	Mark scheme	Additional guidance
22	Comparison	B1	for correctly identifying the median of (School) A as 57	
		C1	(ft, dep on value for the median being stated) for making a correct comparison of median eg 'the median of (School) A is higher than the median of (School) B'	If median for school B is stated in the comparison it must be correct
		B1	for correctly identifying the range of (School) A as 49	
		C1	(ft, dep on value for the range being stated) for making a correct comparison of range eg 'the range of (School) A is higher than the range of (School) B'	If range for school B is stated in the comparison it must be correct

8 (a)	6	B1	cao	

Paper: 1MA1/2F				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
8 (b)	9	M1	for beginning to work with range, eg 14 – 5 or 5 – 14 or 5 to 14 **or** an answer of –9	Condone eg 5, 14 but not 5 + 14
		A1	cao	

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

Paper: 1MA1/3F

Question	Answer	Mark	Mark scheme	Additional guidance
19 (a)	2	B1	cao	
(b)	2.36	M1	for starting method by multiplying ages by frequencies, with at least 3 correct, eg 1×16, 2×15, 3×7, 4×9, 5×3 **or** at least three of 16, 30, 21, 36, 15	Do not award this mark if the final answer comes from an alternative incorrect method, eg $50 \div 5$ May be seen next to table 118 implies this mark
		M1	(dep on M1) for $\sum fx \div \sum f$, eg $118 \div 50$ **or** $118 \div (16 + 15 + 7 + 9 + 3)$ **or** $(1 \times 16 + 2 \times 15 + 3 \times 7 + 4 \times 9 + 5 \times 3) \div 50$	$\sum fx$ must come from 5 products
		A1	accept 2.4 from correct working	If a correct answer is shown and then incorrectly rounded award full marks

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Mark Scheme (Results)

Summer 2012

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

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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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1MA0_2F					
Question		**Working**	**Answer**	**Mark**	**Notes**
1	(a)		4216	1	B1 cao
	(b)		eight thousand	1	B1 for eight thousand or 8000
	(c)		3570	1	B1 cao
2	(i)		Cuboid	2	B1 for cuboid or (rectangular) prism
	(ii)		Pyramid		B1 for pyramid, rectangular base pyramid, square base pyramid
3	(a)		24	1	B1 cao
	(b)		10	1	B1 cao
	(c)		2 circles 3 ½ circles	2	B1 for 2 circles in Thursday B1 for 3 ½ circles oe in Friday
4		10 ÷ 0.79 =12.65… 12×79 = 948 1000 – 948	52p	3	M1 for 1000 ÷ 79 **or** 10 ÷ 0.79 (=12.65…) **or** 12 × 79 **or** 12 × 0.79 A1 for 9.48 or 948 A1 for 52p or £0.52 or £0.52p (SC if M0 then B2 for 0.52, 0.52p or 52 as answer) (SC if M0 then B1 for 12 as answer)
5	(a)		90	1	B1 cao
	(b)		correct angle marked	1	B1 for O in an obtuse angle
	(c)		2 perpendicular lines marked	1	B1 for two perpendicular lines marked

1MA0_2F					
Question		**Working**	**Answer**	**Mark**	**Notes**
6	(a)		$3c$	1	B1 $3c$ oe
	(b)		$6ef$	1	B1 $6ef$ oe
	(c)		$7p + 5t$	2	B2 for $7p + 5t$ (B1 for either $7p$ or $5t$)
7	(a)		2 lines of symmetry drawn	2	B2 for fully correct answer accept freehand lines (B1 for a correct line of symmetry drawn – ignore extra lines)
	(b)		6	1	B1 6, six
8	(a)		24	1	B1 cao
	(b)		22	1	B1 for 22
9	(a)		Kanon	1	B1 cao
	(b)		Office, Quikprint	1	B1 cao
	(c)		Smart	1	B1 cao
10	(i)	360 – 140 – 60 = 160	160 and reason	2	B1 for 160
	(ii)				C1 (indep) for Angles at a point add up to 360 (o) or angles in a full turn add up to 360 (o)

1MA0_2F					
Question		**Working**	**Answer**	**Mark**	**Notes**
11	(a)		10 30	1	B1 10 30 **or** 22 30 **or** half past ten or 10.30 etc
	(b)		16 10	1	B1 16 10 Accept 16:10 and 16.10
	(c)		6 50 am	2	M1 for attempt to add 10 mins and 15 mins and 1 hour (= 1 hr 25 min) A1 for 6 50 or 6 50 am oe **OR** M1 for attempt to subtract 10 mins and 15 mins and 1 hour from 8 15 A1 for 6 50 or 6 50 am oe
12	(a)		4.8	1	B1 for answer in range 4.6 – 5
	(b)		37.5	2	M1 for a valid method eg reading from graph for 6 km then ×10 A1 for answer in range 35 – 40 **OR** M1 for use of conversion factor $60 \times {}^{5}/_{8}$ oe A1 for answer in range 35 – 40

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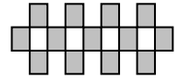
1MA0_2F					
Question		**Working**	**Answer**	**Mark**	**Notes**
13	(a)		4	1	B1 cao
	(b)	34 ÷ 10	3.4	2	M1 for attempt to sum all values and divide by 10 **or** 34 ÷ 10 A1 3.4, $3\frac{4}{10}, 3\frac{2}{5}$
	(c)		5	2	M1 for 6 – 1 **or** 1– 6, **or** –5 A1 cao
14	(a)	3.5 × 12 – 5	37	2	M1 for 3.5 × 12 – 5 or 42 - 5 A1 cao
	(b)	3.5 × –9 – –6	–25.5	2	M1 for 3.5 × –9 – –6 **or** 3.5×–9 + 6 **or** sight of –31.5 A1 for –25.5 **or** $-\frac{51}{2}$ **or** $-25\frac{1}{2}$

1MA0_2F					
Question		**Working**	**Answer**	**Mark**	**Notes**
15	(a)			1	B1 for correct pattern
	(b)		31	2	M1 for correct diagram of pattern number 10 with or without shading A1 cao **OR** M1 for any 4 consecutive terms in the sequence 4, 7, 10, ... A1 cao **OR** M1 for use of $3n + 1$ with $n = 10$ A1 cao
	(c)		No with appropriate reason	2	M1 for attempt to divide 45 by 3 A1 for 'No' and comment that this is the number needed for pattern number 15 **OR** M1 for starts at 4 and builds up correctly to 46 or 55 A1 for 'No' and comments that 55 are needed for pattern 18 or 46 are needed for pattern 15 oe **OR** M1 for use of $3n + 1$ with $n = 18$ A1 for 'No' and comments that 55 are needed for pattern 18 oe **OR** M1 for $3n + 1 = 46$ A1 for 'No' and comments 46 are needed for pattern 15 oe

1MA0_2F					
Question		**Working**	**Answer**	**Mark**	**Notes**
16			eg. 10, 12, 5, 2	3	M1 for at least 2 factors of 60 clearly identified M1 for 20 < sum of '4 distinct natural numbers' < 35 A1 cao
17	(a)	84 ÷ 7 (=12) 120 ÷ 12	10	2	M1 for 84÷7 (=12) or 7 ÷ 84 (=0.083..) A1 cao
	(b)		Don't know + reason	1	B1 'Don't know' or 'No' with reason eg. Need to know how many medals Russian Federation won **or** pie chart shows proportion not number of medals won
18	(i)		$\frac{7}{18}$	3	B1 for $\frac{7}{18}$ oe
	(ii)		$\frac{12}{18}$		B1 for $\frac{12}{18}$ **or** $\frac{2}{3}$ oe
	(iii)		0		B1 for 0 or $\frac{0}{18}$ or zero oe
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					
Question		**Working**	**Answer**	**Mark**	**Notes**
20		$250 - 0.42\times250 - 250\div5\times2$ $= 250 - 105 - 100$ **OR** $250\times\left(1-\left(\frac{42}{100}+\frac{2}{5}\right)\right) =$ $250\times\frac{9}{50}$ **OR** $250\times\left(\frac{100-42-40}{100}\right) =$ $250\times\frac{18}{100}$ **OR** $250-250\times\left(\frac{42}{100}+\frac{2}{5}\right) =$ $250-250\times\frac{41}{50} = 250-205$ **OR** $250-250\times\left(\frac{42}{100}+\frac{40}{100}\right) =$ $250-250\times\frac{82}{100} = 250-205$	45	4	M1 for $\frac{42}{100}\times 250$ oe (=105) M1 for $\frac{2}{5}\times 250$ oe (=100) M1 for 250 – '105' – '100' A1 cao **OR** M1 for $\frac{42}{100}+\frac{2}{5}\left(=\frac{82}{100}\right)$ or $\left(=\frac{41}{50}\right)$ M1 for $1-'\frac{82}{100}'$ or $1-'\frac{41}{50}'$ M1 for $'\frac{9}{50}'\times250$ A1 cao **OR** M1 for $\frac{2}{5}\times100$ or $\frac{2}{5}=\frac{2\times20}{5\times20}$ or 2×20 M1 for 100 - 42 - '40' (= 18) M1 for '0.18' × 250 A1 cao (continued overleaf)

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1MA0_2F					
Question		Working	Answer	Mark	Notes
					OR M1 for $\frac{42}{100}+\frac{2}{5}\left(=\frac{82}{100}\right)$ or $\left(=\frac{41}{50}\right)$ M1 for $'\frac{41}{50}'\times 250$ M1 for 250 - '205' A1 cao **OR** M1 for $\frac{2}{5}\times 100$ or $\frac{2}{5}=\frac{2\times 20}{5\times 20}$ or 2 × 20 M1 for '(42 + '40)'/100 × 250 M1 for 250 - '205' A1 cao

1MA0_2F					
Question		**Working**	**Answer**	**Mark**	**Notes**
21		<table><tr><td>x</td><td>-1</td><td>0</td><td>1</td><td>2</td><td>3</td></tr><tr><td>y</td><td>-5</td><td>-2</td><td>1</td><td>4</td><td>7</td></tr></table>	Straight line from (–1, –5) to (3, 7)	3	**(Table of values)** M1 for at least 2 correct attempts to find points by substituting values of x. M1 ft for plotting at least 2 of their points (any points plotted from their table must be correctly plotted) A1 for correct line between –1 and 3 **(No table of values)** M2 for at least 2 correct points (and no incorrect points) plotted **OR** line segment of $y = 3x–2$ drawn (ignore any additional incorrect segments) (M1 for at least 3 correct points plotted with no more than 2 incorrect points) A1 for correct line between –1 and 3 **(Use of y=mx+c)** M2 for line segment of $y =3x–2$ drawn (ignore any additional incorrect segments) (M1 for line drawn with gradient of 3 OR line drawn with a y intercept of –2 and a positive gradient) A1 for correct line between –1 and 3

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<table>
<tr><th colspan="6">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>22</td><td></td><td>45 ÷ (5 – 2) (=15)
‘15’×2

OR
$45 \times \frac{2}{3}$

OR
<table><tr><th>P</th><th>J</th><th>T</th><th>D</th></tr><tr><td>2</td><td>5</td><td>7</td><td>3</td></tr><tr><td>4</td><td>10</td><td>14</td><td>6</td></tr><tr><td>6</td><td>15</td><td>21</td><td>9</td></tr><tr><td>8</td><td>20</td><td>28</td><td>12</td></tr><tr><td>10</td><td>25</td><td>35</td><td>15</td></tr><tr><td>12</td><td>30</td><td>42</td><td>18</td></tr><tr><td>14</td><td>35</td><td>49</td><td>21</td></tr><tr><td>16</td><td>40</td><td>56</td><td>24</td></tr><tr><td>18</td><td>45</td><td>63</td><td>27</td></tr><tr><td>20</td><td>50</td><td>70</td><td>30</td></tr><tr><td>22</td><td>55</td><td>77</td><td>33</td></tr><tr><td>24</td><td>60</td><td>84</td><td>36</td></tr><tr><td>26</td><td>65</td><td>91</td><td>39</td></tr><tr><td>28</td><td>70</td><td>98</td><td>42</td></tr><tr><td>30</td><td>75</td><td>105</td><td>45</td></tr></table></td><td>30</td><td>3</td><td>M1 for 45 ÷ (5 – 2)
M1 for ‘15’×2
A1 cao for 30

OR
M2 for $45 \times \frac{2}{3}$ oe
(M1 for $45 \times \frac{1}{3}$)
A1 cao for 30

OR
M1 for (2, 5); 4, 10; 6, 15; 8, 20
M1 for a completly correct list up to 30, 75
A1 cao
(SC If M0 then B1 for 18 given as the answer)</td></tr>
</table>

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1MA0_2F					
Question		**Working**	**Answer**	**Mark**	**Notes**
23			Farm shop	4	M1 for 12.5 ÷ 2.5 (=5) M1 for '5'×1.83 or '5' × 183 A1 for (£)9.15 or 915(p) C1 for decision ft working shown dep on at least M1 **OR** M1 for 12.5 ÷ 2.5 (=5) M1 for 9 ÷ 5 or 900 ÷ '5' A1 for (£)1.8(0) or 180(p) C1 for decision ft working shown dep on at least M1 **OR** M1 for 9 ÷ 12.5 (=0.72) **or** 1.83 ÷ 2.5 (=0.732) M1 for 9 ÷ 12.5 (=0.72) **and** 1.83 ÷ 2.5 (=0.732) A1 for 72(p) and 73.(2)(p) or (£)0.72 and (£)0.73(2) C1 for decision ft working shown dep on at least M1 **OR** M1 for 12.5 ÷ 9 (= 1.388...) oe M1 for 2.5 ÷ 1.83 (= 1.366.)oe A1 for 1.38.... **and** 1.36... truncated or rounded to at least 3SF C1 for decision ft working shown dep on at least M1

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1MA0_2F					
Question		**Working**	**Answer**	**Mark**	**Notes**
24	(a)		Triangle with vertices (2,1) (2, 4) (4,4)	2	B2 for triangle with vertices (2,1) (2,4) (4,4) (B1 for triangle reflected in any line parallel to *x*–axis **or** for correct reflection in *y* axis (triangle at (–2,–1) (–2,–4) (–4,–4)) (B1 for a configuration which is the original triangle reflected successively in the x and y axes to give 3 triangles)
	(b)		Enlarged shape	2	M1 for any 3 sides enlarged correctly A1 for correctly enlarged shape (SC : B1 for correct enlargement with a scale factor of 2 or 4 or for a geometrically correct shape in a wrong orientation)

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1MA0_2F					
Question		**Working**	**Answer**	**Mark**	**Notes**
25	(a)		51	3	M1 200 × 25.82 (= 5164) A1 for 5164 or 5200 or 5100 or 51.64 or 51.6(0) or 5160 or 52 A1 for 51 **OR** M1 for 100 ÷ 25.82 (3.87…) and 200 ÷ '3.87…' (=51.64..) A1 for 5164 or 5200 or 5100 or 51.64 or 51.6(0) or 5160 or 52 A1 for 51 cao
	(b)		15.49	3	M1 for 400 ÷ 25.82 A1 for 15.4918… A1 for £15.49 or £15.50 **OR** M1 for 4 × '3.87…' from (a) A1 15.4918… A1 for £15.49 or £15.50

1MA0_2F					
Question		**Working**	**Answer**	**Mark**	**Notes**
26	(a)		negative	1	B1 for negative
	(b)		10.3 - 11.7	2	M1 for a single straight line segment with negative gradient that could be used as a line of best fit **or** an indication on the diagram from 2.5 on the *x* axis A1 for an answer in the range 10.3 – 11.7 inclusive
*27		(17–2.8)×9.5 =134.9 $\pi\times(3.8\div2)^2$ =11.34.. 134.9 – 2×11.34 =112.21 112.21 ÷ 25 = 4.488	5	5	M1 for (17–2.8)×9.5 (=134.9) or 17×9.5– 2.8×9.5 (=161.5 - 26.6 = 134.9) M1 for $\pi\times(3.8\div2)^2$ (=11.33 – 11.35) M1(dep on M1) for '134.9' – 2×'11.34' A1 for 112 - 113 C1(dep on at least M1) for 'He needs 5 boxes' ft from candidate's calculation rounded up to the next integer.

<table>
<tr><th colspan="6">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>*28</td><td></td><td>180 × 365 =65700
65700÷1000 =65.7
65.7×91.22 =5993.154
5993.154÷100 + 28.20= 88.13..

<table><tr><td>D</td><td>U</td><td>C</td><td>T</td></tr><tr><td>366</td><td>65880</td><td>6010</td><td>88.30</td></tr><tr><td>365</td><td>65700</td><td>5993</td><td>88.13</td></tr><tr><td></td><td>65000</td><td>5929</td><td>87.49</td></tr><tr><td></td><td>66000</td><td>6020</td><td>88.40</td></tr><tr><td>364</td><td>65520</td><td>5976</td><td>87.96</td></tr><tr><td>360</td><td>64800</td><td>5911</td><td>87.31</td></tr><tr><td>~~336~~</td><td>~~60480~~</td><td>5517</td><td>83.37</td></tr></table></td><td>Decision (Should have a water meter installed)</td><td>5</td><td>Per year
M1 for 180 × ‘365’ (=65700)
M1 for “65700”÷1000 (=65.7 or 65 or 66)
M1 for “65.7”×91.22 (=5993.....)
A1 for answer in range (£)87 – (£)89
C1(dep on at least M1) for conclusion following from working seen

OR (per day)
M1 for 107 ÷ ‘365’ (=0.293…)
M1 for 180 ÷ 1000 × 91.22 (=16.4196)
M1 for 28.2 ÷ ‘365’ + ‘0.164196’ (units must be consistent)
A1 for 29 – 30(p) and 24– 24.3(p) oe
C1(dep on at least M1) for conclusion following from working seen

OR
M1 for (107 – 28.20) ÷ 0.9122 (=86.384..)
M1 for ’86.384..’×1000 (=86384.5…)
M1 for ‘365’ × 180 (=65700)
A1 for 65700 and 86384.5..
C1(dep on at least M1) for conclusion following from working seen

NB : Allow 365 or 366 or 52×7 (=364) or 12 × 30 (=360) or 365¼ for number of days</td></tr>
</table>

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Mark Scheme (Results)

November 2012

GCSE Mathematics (2MB01) Foundation
5MB1F (Calculator) Paper 01

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

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

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

5MB1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
1	(a)		white	1	B1 cao
	(b)		medium	1	B1 cao
	(c)		43	1	B1 cao
2	(a)		24	1	B1 for 24
	(b)		6	1	B1 for 6
	(c)	Wed = 12 Thurs = 12 + 6 = 18 or 6 more = 3 extra circles		2	M1 for identifies 6 bunches as 3 circles or '12' + 6 or gives an answer of 9 circles A1 for 9 circles in two clusters of 4 and an additional circle
3	(a)(i)		7 30	3	B1 for (0)7 30 or 19 30 or half past 7 oe (ignore am or pm)
	(ii)	9.26 – 7.30 or 7 30 to 8 30 min 8 to 9 1 hour 9 to 9 26 <u>26 min</u>	1 hour 56 minutes		M1 for a valid attempt to work out the difference between '7 30' and 9 26 eg. from 9.26 – '7.30' or by splitting the interval and adding A1ft for 1 hour 56 minutes or 116 minutes or 1h 56 m or 1 h 56 or 116 m or 1:56 SC B1 for 1.56
	(b)		8.6	1	B1 for 8.6 oe
4		**Colour** / **Tally** / **Frequency** red black white silver	Data collection sheet	3	B3 for a correct data collection sheet that has at least 3 colours: the tally column and frequency column must have headings (B2 for any 2 of these aspects) (B1 for any 1 of these aspects)

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5MB1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
5		30 ÷ 3.85 = 7.7922....	7	2	M1 for 30 ÷ 3.85 oe or 7.79(22...) seen or 26.95 seen or 30.8(0) seen A1 cao
6	(a)		cross	1	B1 for cross placed less than 1 cm from 0
	(b)		cross	1	B1 for cross placed between 1 cm and 4 cm from 1
7*		Girls: 8 – 2 = 6 Boys: 6 – 1 = 5	correct with explanation	3	M1 for girls' range = 8 – 2 or boys' range = 6 – 1 or comparison of largest and smallest scores A1 for girls' range = 6 and boys' range = 5 C1 (dep on M1) ft for correct interpretation from candidate's working and where the two ranges have been correctly linked with girls and boys
8		(S, L), (S, B), (S, C), (P, L), (P, B), (P, C)	List all 6 choices	2	B2 for all 6 with no extras or repeats (B1 for at least 3 correct)
9	(a)		13	1	B1 cao
	(b)		12	2	M1 for ordering at least 16 of the original values and identifying the middle of the ordered list or indicating at least one of the middle two numbers for n =16 or 18 and the middle number for n = 17 A1 cao
10	(a)	(6+8+6+4+5+5+6+7+4+6) ÷10 = 57 ÷ 10	5.7	2	M1 for adding all the numbers and dividing by 10 A1 cao
	(b)	(3×1)+(1×2)+(4×3)+(0×4) +(2×5) = 3+2+12+0+10	27	2	M1 for (3×1)+(1×2)+(4×3)+(0×4)+(2×5) allow 1 error A1 cao

<table>
<tr><th colspan="6">5MB1F_01</th></tr>
<tr><th colspan="2">Question</th><th>Working</th><th>Answer</th><th>Mark</th><th>Notes</th></tr>
<tr><td>11</td><td>(a)</td><td></td><td>10</td><td>1</td><td>B1 cao</td></tr>
<tr><td></td><td>(b)</td><td></td><td>15</td><td>1</td><td>B1 14.8 - 15.2</td></tr>
<tr><td></td><td>(c)</td><td>(a) ÷ 6 × 64 or
Read from graph and ×</td><td>103 to 110</td><td>2</td><td>M1 for valid method eg Read from £8 and × answer by 8
<table><tr><td>£</td><td>£</td><td>Calc</td><td>CHF</td></tr><tr><td>8</td><td></td><td>8 × 13</td><td>(104)</td></tr><tr><td>6</td><td>4</td><td>6 × 16.5 + 6.5</td><td>(104.5)</td></tr><tr><td>16</td><td></td><td>4 × 26.5</td><td>(106)</td></tr><tr><td>20</td><td>4</td><td>3 × 33 + 6.5</td><td>(105.5)</td></tr></table>
A1for 103 - 110</td></tr>
<tr><td>12</td><td></td><td><table><tr><th></th><th>H</th><th>T</th><th>F</th><th>G</th></tr><tr><td>M</td><td>3</td><td>8</td><td>15</td><td>9</td></tr><tr><td>W</td><td>6</td><td>14</td><td>7</td><td>1</td></tr></table></td><td>Diagram or chart</td><td>4</td><td>B1 for a key or suitable labels to identify the men and women. The key may be ignored if unclear provided the graph is clear, ie if different colours are used to shade in the graph. Give benefit to candidate.

B1 for a diagram(s) or chart(s) set up for comparison, showing data for at least 3 sports e.g. dual bar chart, composite bar charts, etc (or frequency polygons)

B1 for correct heights for men or women or totals

C1 for a fully correct diagram or chart to include ‘frequency’ oe</td></tr>
</table>

5MB1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
13			**10 10** (3) **23** (18) **4** (9) (31) **28** (14) **12**(54)	3	B3 for all 6 correct (B2 for 4 or 5 correct) (B1 for 1 or 2 or 3 correct)
14			$\frac{3}{12}$	2	B2 for $\frac{3}{12}$ or $\frac{1}{4}$ or 0.25, or 25% (B1 for $\frac{x}{12}$, $x < 12, x \neq 3$ or $\frac{3}{x}$, $x > 3$)
15	(a)		positive	1	B1 Accept with 'positive' valid extra words eg strong positive
	(b)		46 – 54	2	B2 46 – 54 Or M1 for a single line segment with positive gradient that could be used as a line of best fit or a vertical line from 44 A1 for given answer in the range 46 – 54

5MB1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
16			18 | 9 9 19 | 0 3 5 8 20 | 0 5 6 7 7 21 | 1 2 8 22 | 3 Key	3	B2 for a correct ordered diagram (B1 for an unordered diagram with at most1 error or omission OR for an ordered diagram with 1 or 2 errors or omissions Note: 1 error can look like 2 in the diagram when 1 value is misplaced B1 (indep) for a correct key eg Key: 18| 7 represents 187 (g) NB for an ordered diagram of the form 1 | 89 89 90 93 95 98 2 | 00 05 06 07 07 11 12 18 23 award a maximum of B1 for an ordered diagram with 1 or 2 errors or omissions The B1 for a key can still be earned.
17			2 statements	2	B1 for overlapping numbers oe B1 for not exhaustive oe
18	(a)		Yes with valid reason	1	C1 for Yes with it can be cancelled to 1 in 6 oe, eg 15 out of 90 is the same as 1 out of 6 or 90 ÷ 6 = 15 or No with as this survey only has 90 cats oe or Can't tell with we do not know how many cats in the survey
	(b)	Top Cat = 35 × 4 = 140° Katkins = 30 × 4 = 120° Coolkat = 15 × 4 = 60°	Pie chart	3	M1 for 360 ÷ 90 or 4 seen or one angle (TC or Ka or Co) correct in pie chart ± 2° ignore labels, or one correct angle calculated A1 for any two angles (TC or Ka or Co) correct in pie chart. ± 2° ignore labels A1 for fully correct and labelled pie chart. All angles ±2°

<table>
<tr><th colspan="6">5MB1F_01</th></tr>
<tr><th colspan="2">Question</th><th>Working</th><th>Answer</th><th>Mark</th><th>Notes</th></tr>
<tr><td>19*</td><td></td><td>A = (78 + 52 + 165) × 2 + 236
= 295 × 2 + 236 = 590 + 236
= 826

826 × 0.95 = 784.70

B = (68 + 48 + 160) × 2 + 242
= 276 × 2 + 242 = 552 + 242
=794
794 × 0.97 = 770.18

<table>
<tr><th>Shop</th><th>A</th><th>B</th></tr>
<tr><td>Skis</td><td>156</td><td>136</td></tr>
<tr><td>Boots</td><td>104</td><td>96</td></tr>
<tr><td>S & B</td><td>260</td><td>232</td></tr>
<tr><td>Lift(Ch)</td><td>330</td><td>320</td></tr>
<tr><td>Lift (Ad)</td><td>236</td><td>242</td></tr>
<tr><td>Lift total</td><td>566</td><td>562</td></tr>
<tr><td>Total</td><td>826</td><td>794</td></tr>
<tr><td>%age off</td><td>41.3</td><td>23.82</td></tr>
</table>
</td><td>Shop B</td><td>5</td><td>M1 for finding the total cost for 1adult and 2 children for lift passes for 6 days in either shop A or shop B
e.g 236 + 2 × 165 or 242 + 2 or 2× 160 or 236 + “330” or 242 + “320” or 566 seen or 562 seen
or the total cost of 2 children only for ski hire and boot hire for 6 days in either shop A or shop B
e.g. 2× 78 + 2 × 52 or 2× 68 + 2 × 48 or “156” + “104” or “136” + “96” or 260 seen or 232 seen

M1 for a complete calculation of cost for shop A or shop B
Eg (78 + 52 + 165) × 2 + 236 or (68 + 48 + 160) × 2 + 242 or “295” × 2 + 236 or “276” × 2 + 242 or 826 or 794 seen
M1 for a correct method to find the reduced cost for shop A or for shop B
e.g. “826” × 0.95 or “794” × 0.97
A1 for (€)784(.70) or (€)785 and (€)770(.18)
C1 (dep on M1 scored) ft for ‘cheaper shop’ identified</td></tr>
</table>

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November 2013

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Unit 1: (5MB1F_01) Foundation (Calculator)

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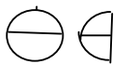
1	(a)		24	1	B1 cao
	(b)		22	2	M1 for 8 + 8 + 6 oe or "24" − 2 A1 cao
	(c)			1	B1 for drawing a circle showing 4 quadrants and a semicircle showing 2 sectors
2	(a)		evens	1	B1 cao
	(b)		unlikely	1	B1 cao
	(c)		1 marked	1	B1 for cross marked at 1
	(d)		colours	1	B1 for 2 or 3 additional counters marked red
*3	(a)		diagram or chart	4	B1 for a key or suitable labels to identify Harry and Shamus B1 for horizontal or vertical axis labelled B1 for at least 3 correct plots C1 for fully correct diagram(s) or charts(s)
	(b)		comparisons	2	B1, B1 ft for any two correct comparisons.

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$\frac{1}{4}$

PAPER: 5MB1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
4			7.31	4	M1 for a correct method to work out the total cost (= 16.92) M1 for a correct method to find $\frac{1}{4}$ of their total cost (or $\frac{3}{4}$) M1 (dep on at least M1) for subtraction from £20 A1 cao
5	(a)		2	2	M1 for attempt to order or two middle unordered numbers selected A1 cao
	(b)		4	2	M1 for 5 – 1 or 1 – 5 or 1 to 5 A1 cao
	(c)		18 11 7 3 1	1	B1 cao
	(d)		40	1	B1 for 40 or ft their frequencies
	(e)	18×0 + 11×1 + 7×2 + 3×3 + 1×4 =	38	2	M1 for Σ *fx* A1 cao [SC: no working- B1 for 56]
*6			No	2	M1 for a relevant calculation, eg 60 +30 or 95 ÷ 60 (= 1.58…) or sight of 90 C1 (dep on M1) for correct statement with correct calculations
7	(a)		(A1), A2, A3 B1, B2, B3 C1,C2 C3	2	B2 for a fully correct list (B1 for 5 or 6 more correct. Ignore repeats)
	(b)		$\frac{1}{9}$	1	B1 for $\frac{1}{9}$ oe or ft part (a)

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PAPER: 5MB1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
8	(a)		$\frac{1}{4}$	1	B1 for $\frac{1}{4}$ oe
	(b)		$2x°$	1	B1 for $2x°$ oe (condone omission of °)
	(c)		20	2	M1 for 150 ÷ 360 × 48 oe or 48 ÷ 4 + $\frac{2}{3}$ × (48 ÷ 4) oe A1 cao
*9			Investment B	4	M1 for 3×12×5 (= 180) M1 for 2500 × 3 × 2.5 ÷ 100 (= £187.50) A1 for (£)180 and (£)187.5(0) or (£)2680 and (£)2687.5(0) C1 (dep on M2) for correct conclusion for their figures Alternative method: M1 for 12 × 5 = 60 M1 for '60'÷ 2500 × 100 A1 for 2.4(%) C1 (dep on M2) for correct conclusion for their figures NB: accept comparable figures for different time periods SC: If compound interest used can score M1 M0 A0 C1 ft

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PAPER: 5MB1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
10	(a)	<table><tr><td>4</td><td>**15**</td><td>**11**</td><td>**30**</td></tr><tr><td>**12**</td><td>5</td><td>**10**</td><td>27</td></tr><tr><td>**16**</td><td>20</td><td>21</td><td>57</td></tr></table>	complete 2-way table	3	B3 cao (B2 for 4 or 5 correct entries B1 for 2 or 3 correct entries)
	(b)		5	1	B1 cao
	(c)		19	1	B1 for 19 or ft 4 + "15" or 30 – "11"
11	(a)		question + response boxes	2	B1 for appropriate question with time period B1 for at least 3 boxes that are either non-overlapping but not necessarily exhaustive, or exhaustive but not necessarily non-overlapping NB time period and/or unit of time may appear in either the question or with the response boxes; award a maximum of B1 if no units
	(b)		two correct reasons	2	B2 for 2 correct reasons from, eg only girls, (all about) the same age, same year group, same school (B1 for 1 correct reason)
12	(a)		$0.75 - x$	2	M1 for $1 - 0.25 + x$ or $0.25 + x$ A1 or $0.75 - x$ oe
	(b)		60	2	M1 for 0.25×240 oe A1 cao

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PAPER: 5MB1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
13	(a)		Positive correlation	1	B1 for positive correlation or the greater the rainfall the more umbrellas sold oe
	(b)		52 – 58	2	M1 for a single straight line segment with positive gradient that could be used as a line of best fit or an indication on the diagram from 28 on the *x*-axis A1 for an answer in the range of 52 – 58
*14		2 × 462 + 251 = 1175 0.95×1175 = 1116.25 2 × 485 + 218 = 1188 1188 – 75 = 1113.00	Jetstream	5	M1for identifying correct costs for either Highway Airlines or Jetstream Airlines M1 for attempt to calculate the costs for the family eg 2× “462” “251” or 2 × “485” + “218” M1 for a correct method to work out the discount for one company eg 0.95 × “1175” or 0.05 × “1175” or “1188” – 75 A1 for (£)1116.25 and (£)1113.00 C1 (dep on M1) for calculations clearly identified with each airline and correct decision from their figures

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

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

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

PAPER:			
Question		**Modification**	**Notes**
Q1		Circles are 2.5cm diameter. Key at top of pictogram.	Standard mark scheme
Q2	(c)	Probability scale is 16cm long.	Standard mark scheme
Q3		Grid is 2cm squares.	Standard mark scheme
Q4		No pictures just information given.	Standard mark scheme
Q10		Braille table has (i) to (vi) in spaces. 4 (i) (vi) (ii) (iv) 5 (v) 27 (iii) 2 21 57	Standard mark scheme
Q13		*x* axis 2cm for 5. *y* axis 2cm for 10. *x* changed to filled in circles. Right axis labelled.	Standard mark scheme
	(b)	Rainfall changed from 28mm to 30mm.	Standard mark scheme
Q14		On both tables top 2 rows and bottom 2 rows removed.	Standard mark scheme

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Mark Scheme (Results)

Summer 2014

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

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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 labelling conventions.

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

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

7 With working

If there is a wrong answer indicated on the answer line always check the working in the body of the script (and on any diagrams), and award any marks appropriate from the mark scheme.
If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.
If it is clear from the working that the "correct" answer has been obtained from incorrect working, award 0 marks. Send the response to review, and discuss each of these situations with your Team Leader.
If there is no answer on the answer line then check the working for an obvious answer.
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 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.
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

PAPER: 1MA0_1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
1	(a)		25, 52, 55, 102, 120	1	B1 cao
	(b)		–5, –2, 0, 3, 6	1	B1 cao
	(c)		0.06, 0.6, 0.603, 0.63, 0.633	1	B1 cao
2	(a)		red	1	B1 cao
	(b)		unlikely	1	B1 cao
	(c)		impossible	1	B1 cao
3			55	3	M1 for 29 + 17 + 19 (=65) or 34 + 43 + 43 (=120) M1 for "120" – "65" A1 cao OR M1 for 34 – 29 (=5) or 43 – 17 (=26) or 43 – 19 (=24) M1 for "5" + "26" + "24" A1 cao OR M1 for three other consistent differences found M1 adding their differences A1 cao

PAPER: 1MA0_1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
4	(a)		19	1	B1 cao
	(b)		203	1	B1cao
	(c)		Explanation	1	B1 for any correct reason, e.g. terms are all odd but 372 is even or use of *n*th term $4n - 1$ or not 1 less than a multiple of 4
5	(a)		3	1	B1 for 3, accept – 3
	(b)		1	2	M1 for evidence of adding all 7 or all 6 non zero temperatures **and** dividing by 7 A1 cao
6	(a)		0908	1	B1 cao
	(b)		15	1	B1 cao
	(c)		57	1	B1 cao
7	(a)		12	2	M1 for $48 \div 4$ or $48 \times \frac{1}{4}$ oe A1 cao
	(b)		250	3	B1 for 750 M1 for "750" ÷ 3 oe A1 cao

PAPER: 1MA0_1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
8	(a)		Pentagon	1	B1 cao
	(b)		Parallel lines marked	1	B1 cao
	(c)		Acute	1	B1 cao
	(d)		10 cm^2	2	B1 for 10 B1 (indep) for cm^2
*9			Diagram or chart	4	M1 for key or suitable labels to identify Majorca and Crete M1 for 5 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
10	(a)		2	4	M1 for 20 × 2 + 30 (=70) M1 for 20 × 1.8 + 32 (=68) M1 (dep on M1) for "70" – "68" A1 cao
	(b)		40	3	M1 for 110 – 30 ÷ 2 or 110 = ? × 2 + 30 or 110 – 30 or ÷ 2 seen as second operation M1 for "(110 – 30)" ÷ 2 A1 cao NB accept reverse flowcharts for inverse operations SC if exact rule used: B2 for "(110 – 32)" ÷ 1.8

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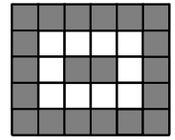
PAPER: 1MA0_1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
11	(a)		$\frac{7}{15}$	2	M1 for $\frac{14}{30}$ oe A1 cao
	(b)		2	1	B1 cao
	(c)			2	M1 for at least 3 of the 5 rows correct A1 cao SC if M0 scored: B1 for a symmetrical pattern with more than 6 squares shaded but not all shaded.
12	(a)		$3ac$	1	B1 cao
	(b)		p^3	1	B1 cao
	(c)		$8x - 7y$	2	M1 for $8x$ or $\pm 7y$ A1 cao

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PAPER: 1MA0_1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
13	(a)		Five thousand six hundred	1	B1 cao
	(b)		Rectangle drawn	2	B2 for fully correct diagram (B1 for one line of correct length within a rectangle)
	(c)		13	3	M1 for the length of one side of rectangle, e.g. 44 (mm) or 27 (mm) ±2mm (allow use of cm) M1 for 6.5(0) or size 1 clearly indicated A1 for 13(.00)
	(d)		Working shown and compared to 8 weeks	2	M1 for 13.50 × 8 or 13.50 × 7 oe or repeated subtraction of 13.50 from 100 at least 7 times A1 for arriving at a correct figure they can compare with £100 in one step eg 108, 94.5(0), 5.5(0) or -8 OR M1 for 100 ÷ 8 A1 for 12.5(0) OR M1 100 ÷ 13.50 = 7.4 A1 for 7

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PAPER: 1MA0_1F					
Question		Working	Answer	Mark	Notes
14	(a)		60	2	M1 for 300 ÷ 5 or 3 ÷ 5 oe A1 cao
	(b)		25p or £0.25	3	M1 for 100 ÷ 5 (= 20) M1 for "20" ÷ 80 or "20" × 100 ÷ 80 A1 for 25p or £0.25 OR M1 for 80 × 5 (= 400) M1 for 100 ÷ "400" or 100 × 100 ÷ "400" A1 for 25p or £0.25 OR M1 for 100 ÷ 80 (= 1.25) M1 for "1.25" ÷ 5 or "1.25" × 100 ÷ 5 A1 for 25p or £0.25 SC B2 for answer of 25 or 0.25
15			200	3	M1 for 20 × 40 × 20 (=16000) or 5 × 8 × 2 (=80) M1 (dep) for "16000" ÷ "80" A1 cao OR M1 attempt one division (eg 20 ÷ 5), may be implied by marks or number on one edge of diagram M1 (dep) for "(20 ÷ 5)" × "(40 ÷ 8)" × "(20 ÷ 2)" A1 cao

PAPER: 1MA0_1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
*16		base angles of isosceles triangle are equal **and** angles on a straight line add up to 180° **and** angles in a triangle add up to 180° OR base angles of isosceles triangle are equal **and** angles in a triangle add up to 180° OR base angles of isosceles triangle are equal **and** exterior angle of a triangle is equal to the sum of the interior opposite angles	60° with reasons	4	B1 for angle *ADB* =25 can be shown on the diagram M1 for a complete method to find *x* C2 (dep 2 previous marks) for 60 with full reasoning seen (C1 (dep 1 previous mark) for one reason) QWC: Reasons must be appropriate to the method shown.
17			168, 72, 120	4	M1 for evidence of method for at least one angle (could be implied by working or one correct angle on pie chart or in table) A2 for all angles drawn correctly ±2° (A1 for at least one angle drawn correctly or all angles correct in table) B1 for sectors labelled with results (dependent on at least one angle drawn correctly and exactly three sectors)

PAPER: 1MA0_1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
18	(a)		-7	2	M1 for 3×-5 (= -15) **and** 4×2 (=8) A1 cao
	(b)(i)		$10p$	2	B1 for $10p$ oe
	(b)(ii)		$10p - 7$		B1ft for "$10p$" – 7 Note "$10p$" MUST be an algebraic expression
19			$\frac{4}{15}$	2	M1 for attempting to use a suitable common denominator with at least one of the two fractions correct A1 for $\frac{4}{15}$ oe
20		<table><tr><td></td><td>Sq</td><td>G</td><td>S</td><td>Tot</td></tr><tr><td>F</td><td>**2**</td><td>**4**</td><td>**15**</td><td>21</td></tr><tr><td>M</td><td>6</td><td>**14**</td><td>9</td><td>**29**</td></tr><tr><td>Tot</td><td>8</td><td>18</td><td>**24**</td><td>50</td></tr></table>	4	4	M1 for a correct first step which results in a value that could be in the table: eg. 50 – 18 – 8 (= 24) or 50 – 21 (= 29) or 8 – 6 (= 2) M1 for correct method to find a second value that could be in the table using their first value eg "29"-9-6 (=14) or "24"-9 (=15) M1 for a fully correct and complete method. A1 cao
21			25.60	4	M1 for a correct method to find $\frac{1}{3}$ of 24 (=8) or $\frac{2}{3}$ of 24 (=16) M1 for a correct method to find 60% (= 7.2) or 40% (= 4.8) of 12 or 60% (= 14.4) or 40% (= 9.6) of 24 M1 (dep on at least M1) for a method to find the sum of their discounted adult ticket + 2 × their discounted child ticket A1 25.6(0)
22			Question given	2	B1 for a suitable question which includes a time frame (the time frame could appear with the response boxes) B1 for at least 3 non-overlapping exhaustive response boxes with no use of inequality symbols

PAPER: 1MA0_1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
23	(a)		$2m^2 + 6m$	1	B1 cao
	(b)		$3xy(y - 2)$	2	B2 for $3xy(y - 2)$ (B1 for $3x(y^2 - 2y)$ or $3y(xy - 2x)$ or $xy(3y - 6)$ or $3xy$(a two term algebraic expression))
*24			3	4	M1 for attempt to calculate at least one area eg 10×7 (=70) or 16×10 (=160) M1 for a method to find the total area (=124) M1 (dep on M1) for "124" ÷ 36 C1 (dep on M3) for 3 (pigs) clearly identified and supported by correct calculations Or M1 for an area of 36m² drawn with dimensions shown M1 for 3 areas of 36m² drawn with dimensions shown M1 for method to find the area left (=16) C1 (dep on M3) for 3 (pigs) clearly identified and supported by correct calculations
25			Shape drawn	2	B2 for shape with vertices at (0, –1), (–1, –3), (–2, –3), (–2, –1) (B1 for rotation of 180° about the wrong centre)

PAPER: 1MA0_1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
*26		1.18 ÷ 4 = 0.295 (118 ÷ 4 = 29.5) 1.74 ÷ 6 = 0.29 (174 ÷ 6 = 29) 1.18 ÷ 2 = 0.59 1.74 ÷ 3 = 0.58 1.74 × 4 = 6.96 1.18 × 6 = 7.08 1.74 × 2 = 3.48 1.18 × 3 = 3.54 1.18÷2×3=1.77 1.74÷3×2=1.16 4÷1.18=3.3(....) 6÷1.74=3.4(…)	6 pints	3	M1 for division of price by quantity for both bottles or division of quantity by price for both bottles or a complete method to find the price of the same quantity of milk. A1 for two correct values that could be used for a comparison C1 ft (dep on M1) for comparison of their values with a correct conclusion.

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**
Q07		scales are simplified	Standard mark scheme
Q08	(a)	dotted grid kept but made a 2 cm grid	Standard mark scheme
Q08	(d)	2 cm solid grid. Wording added “Each square on the grid represents a one centimetre square”.	Standard mark scheme
Q09		1 ½ cm grid. 14 x 14 squares	Standard mark scheme

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PAPER: 1MA0_1F			
Question		**Modification**	**Notes**
Q11	(a)	2 cm squares – dotty shading	Standard mark scheme
	(b)	2 cm squares – dotty shading – same as part (a). A shape is provided.	Standard mark scheme
	(c)	2cm squares – dotty shading	Standard mark scheme
Q13		Table size 1: 60mm x 20mm size 4: 90mm x 120mm	
	(b)	Changed to 90mm by 120mm rectangle	Apply mark scheme to the drawing of this size of rectangle
Q13	(c)	The box for David's advert is 60mm by 20mm – no writing inside	Standard mark scheme
Q15		2 models as well as a diagram	Standard mark scheme

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PAPER: 1MA0_1F			
Question		**Modification**	**Notes**
Q17		Frequencies changed: 25, 15, 20 Pie chart 9cm radius marked off in 10 degree sections on the circumference.	Angles are now 150°, 90°, 120°
Q18	(a)	x changed to e, y changed to f	Standard mark scheme
Q24		Braille only: diagram labelled A – F clockwise from the top left	Standard mark scheme

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Mark Scheme (Results)

November 2014

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

Edexcel and BTEC Qualifications

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NOTES ON MARKING PRINCIPLES

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

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

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

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

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

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

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

With working

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

8 Follow through marks

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

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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.

10 Probability

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

Linear equations

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

12 Parts of questions

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

13 Range of answers

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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: 5MB1F_01				
Question	**Working**	**Answer**	**Mark**	**Notes**
1. (a)		20	1	B1 cao
(b)		14	1	B1 cao
(c)		2 squares	2	B1 for 2 squares
		$4\frac{1}{2}$ squares		B1 for $4\frac{1}{2}$ squares
2. (a)		8	1	B1 cao
(b)	6+5+8+6+7+7+8 +8+8+6 = 69 69÷10	6.9	2	M1 for complete correct method to find mean e.g. sum ÷ 10 A1 for 6.9
(c)		3	2	M1 for 8 − 5 or 5 − 8 or −3 A1 cao
(d)		No with reason	1	B1 for No and reason e.g. 7 is between highest and lowest
3. (a)		Reed Farm	1	B1 cao
(b)		Rosewood	1	B1 cao
(c)		£545	1	B1 cao

PAPER: 5MB1F_01				
Question	**Working**	**Answer**	**Mark**	**Notes**
4.		£4.45	3	M1 for adding 3 different prices (e.g. 3.00 + 3.50 + 2.95 (= 9.45)) or selecting the 3 highest prices M1 for complete method to find difference between total of 3 highest normal prices and £5 A1 cao
*5.		Diagram or chart	4	M1 for key or suitable labels to identify max and min M1 for 5 correct day labels or a linear scale M1 for diagram or chart (combined or separate) set up for comparison, correctly showing data for at least 3 days C1 for fully correct diagram or chart with axes correctly scaled and labelled
6. (a)		1418	1	B1 cao
(b)		Correct plan showing departure times and arrival times for 2 train journeys.	4	B1 for a departure time from Cromer of 10 57, 11 57 or 12 57 M1 for an arrival time at Norwich which is no later than 13 41 M1 for adding 30 minutes to 16 55 or correct departure time. A1 all train departure and arrival times correct (10 57 and 11 41 or 11 57 and 12 41 or 12 57 and 13 41 AND 17 45 (and 18 36))
7. (a)		Cross at $\frac{3}{10}$	1	B1 for cross at $\frac{3}{10}$
(b)		Cross at 0	1	B1 for cross at 0
(c)		I	1	B1 cao
8.		3	2	M1 for working out or using a correct duration of time. A1 cao

PAPER: 5MB1F_01				
Question	**Working**	**Answer**	**Mark**	**Notes**
9.		Correct pairs 3,7 or 4,6 or 2,8 or 5,5	2	B2 for 2 pairs from 5,5 or 3,7 or 4,6 or 2,8 (B1 for one pair) (Note: Condone non-integers if correct pair(s) given)
*10		London is more expensive	4	M1 for reading from the graph, e.g. £10 = €12 or €7 = £5.80 M1 for a complete method to convert either £60 into € or €70 into £ A1 for answer in interval €71 to €72 or in interval £57 to £59 C1 ft (dep on M1) for correct conclusion for their figures using consistent units
11.		165	3	M1 for correct method to find 5% of 300 or $\frac{2}{5}$ of 300 M1 (dep) for 300 – "15" – "120" A1 cao OR M1 for 1 – 0.05 – 0.4 (= 0.55) M1 (dep) for "0.55" × 300 A1 cao

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PAPER: 5MB1F_01				
Question	**Working**	**Answer**	**Mark**	**Notes**
12. (a)		22	1	B1 cao
(b)		23	3	M1 for correct method to find total women who came by bus, e.g. 13 – 6 (=7) M1 for correct method to find women who came by train, e.g. 22 – 7 – 4 (=11) A1 cao OR M1 for correct method to find men who came by car, e.g. 28 – 6 – 12 (= 10) M1 for correct method to find total who came by car, e.g. 10 + 4 (= 14) A1 cao
(c)		$\frac{3}{7}$	2	M1 for $\frac{12}{28}$ oe A1 oe
13.		30	2	M1 for 0.6 × 50 oe A1 cao
14.		$\frac{x+x+5+2x}{3}$	2	M1 for intention to add x, $x + 5$, $2x$ or $4x + 5$ seen or ambiguous answer, e.g. "$4x + 5$" ÷ 3 A1 for $\frac{x+x+5+2x}{3}$ oe

PAPER: 5MB1F_01				
Question	**Working**	**Answer**	**Mark**	**Notes**
15. (a)		2 different reasons	2	B1 for a reason relating to: Bias – due to gender or due to railway station location Size of sample too small B1 for one other reason
(b)		Question and response boxes	2	B1 for a suitable question with time period and units in question or response boxes B1 for at least 3 non-overlapping and exhaustive response boxes
16.		12 | 3 5 9 13 | 0 3 3 5 7 8 14 | 7 7 8 9 15 | 0 1	3	B2 for a fully correct ordered diagram (B1 for correct unordered diagram or ordered with at most two errors) B1 for correct key eg 12 | 3 means 123 (cm)
17. (a)		Point at (47, 34)	1	B1 point plotted
(b)		Positive	1	Positive (correlation)
(c)		48 to 51 inclusive	2	M1 for a single straight line segment with positive gradient that could be used as a line of best fit or a horizontal line from 35 or point marked at (n, 35) A1 for given answer in the range 48 – 51

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PAPER: 5MB1F_01			
Question		**Modification**	**Notes**
1		Key top left. Pictures size x 2½	
3		Table: Location column removed	
5		Table: Friday row removed, Saturday – 17 changed to 12 Grid: Vertical axis – 15 x 2 cm squares, horizontal axis 10 x 2 cm squares Room left for labelling on the left and below.	
6		Table: North Walsham now removed from both tables. 1057 and 1557 removed from Cromer to Norwich 1445 and 1955 removed from Norwich to Cromer	
7		Probability scales lengthened	
10		1½ cm grid. Inside measurements of squares are 1.4 cm. Right axis labelled	

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PAPER: 5MB3H_01			
Question		**Modification**	**Notes**
12		Braille: (i) is put in total women and (ii) in train total	
16		Diagram enlarged. 4th horizontal line drawn in at the bottom.	
17		1½cm grid. Inside measurements of squares are 1.4 cm. Crosses changed to filled in circles. Right axis labelled	

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

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

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

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

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

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

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

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

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

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

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Mark Scheme (Results)

November 2015

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

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

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

5MB1F_01 November 2015					
Question		**Working**	**Answer**	**Mark**	**Notes**
1.	(a)		Black	1	B1 cao
	(b)		Fran	1	B1 cao
	(c)		Derek	1	B1 cao
2.	(i)		16	2	B1 cao
	(ii)		12		B1 cao
3.	(a)		A	1	B1 cao
	(b)		D	1	B1 cao
4.			£44.80 or 4480p	4	M1 for 8565 – 8437 (=128) M1 for "128" × 35 A1 for digits 448(0) C1 for £44.80 or 4480p ie clearly stated answer with correct money notation.

5MB1F 1F November 2015					
Question		**Working**	**Answer**	**Mark**	**Notes**
5.			Diagram or chart	4	B1 for a key or suitable labels to identify the Wizard and Reds. The key may be ignored if unclear provided the graph is clear, ie if different colours are used to shade in the graph. B1 for a diagram(s) or chart(s) set up for comparison showing data for at least 3 months eg dual bar chart, composite bar charts, frequency polygon, etc. B1 for correct heights for Wizards or Reds or totals C1 for a fully correct diagram or chart.
6.		(S,F), (S,M), (S,P) (J,F), (J,M), (J,P)	6 choices	2	B2 for all 6 choices with no extras or repeats (B1 for at least 3 correct; ignore extras or repeats)
7.	(a)		$\frac{3}{10}$	2	M1 for $\frac{a}{10}$ or $\frac{3}{b}$ where $a < 10$ and $b > 3$ A1 for $\frac{3}{10}$ oe
	(b)		$\frac{7}{10}$	1	B1 ft or for $\frac{7}{10}$ oe

PMT

5MB1F 1F November 2015					
Question		**Working**	**Answer**	**Mark**	**Notes**
8.	(a)		3	2	M1 for evidence of ordering A1 cao
	(b)		4	2	M1 for 6 – 2 A1 cao
	(c)		3.5	2	M1 for (3 + 6 + 2 + 2 + 5 + 3) ÷ 6 or 21 ÷ 6 A1 cao
9.			Data collection sheet	3	B1 for data illustrated for fruit (at least 3 items) or correct heading B1 for tally column or frequency column labelled B1 for suitable data collection sheet appropriate to the task e.g. with exactly 3 columns and which are all correctly labelled NB do not accept questionnaires or graphs

PMT

5MB1F 1F November 2015					
Question		**Working**	**Answer**	**Mark**	**Notes**
10.			67	2	M1 for at least three of 1 × 8, 2 × 6, 3 × 7, 4 × 4, 5 × 2 or at least three of 8, 12, 21, 16, 10 A1 cao
11.	(a)		15.86	4	M1 for 4 × 96 (= 384) or 3 × 56 (= 168) M1 for (“384” + ”168”) × 3 ÷ 4 oe or sight of 414 M1 for 20 – “4.14” or 1586 A1 cao **OR** M1 for 4 × 96 (= 384) or 3 × 56 (= 168) M1 for 20 – (“384” + ”168”) or 20 – “552” (= 1448) M1 for “1448” + (“552” ÷ 4) A1 cao NB allow work in £ or p for M marks
	(b)		7	2	M1 for 14 ÷ 1.84 or 7.60(8695…) or 12.88 and 14.72 A1 cao
12.	(a)		20 – *t*	1	B1 for 20 – *t*
	(b)		4*x* + 20*y*	2	B2 for 4*x* + 20*y* (B1 for 4*x* or 20*y*)

5MB1F 1F November 2015					
Question		**Working**	**Answer**	**Mark**	**Notes**
13.	(a)		20	2	M1 for $\frac{60}{360}\times 120$ A1 cao **OR** M1 for 360 ÷ 120 (= 3) or 60 ÷ 3 A1 cao
	(b)		50	3	M1 for 360 – (45 + 60 + 105) (= 150; could be measured) M1 for 360 ÷ 120 (= 3°) or "150" ÷ 3 A1 for 50; allow answers in the range 49-51 **OR** M1 for 360 – (45 + 60 + 105) (= 150; could be measured) M1 for $\frac{"150"}{360}\times 120$ A1 for 50; allow answers in the range 49-51 **OR** M1 for 360 – (45 + 60 + 105) (= 150; could be measured) M1 for $\frac{"150"}{60}\times "20"$ A1 for 50; allow answers in the range 49-51 **OR** M1 for working out how many in all three sectors M1 for subtraction from 120 A1 for 50; allow answers in the range 49 - 51

5MB1F 1F November 2015					
Question		**Working**	**Answer**	**Mark**	**Notes**
14.	(a)		(146, 41)	1	B1 point plotted
	(b)		Description	1	B1 for description of dynamic relationship or statement of positive correlation
	(c)		155 – 158	2	M1 for a single straight line segment with positive gradient that could be used as a line of best fit or a horizontal line from 47.5 A1 answer in the range 155 – 158 or ft from line
15.	(a)		Out: 1023/1148 Return: 1737/1918 in Colwyn 5h 49min	4	B1 for selecting 1023 train (cheapest out) B1 for selecting 1737 B1 for 5h 49min (spent in Colwyn) C1 (dep on at least B1) clearly stating departure and arrival times of both trains used and correct time in Colwyn for their trains
	(b)		133.40	3	M1 for 30% of any adult fare M1 for 2 × adult fare + 3 × child fare for at least one of their chosen trains A1 (accept 133.4) (SC B2 for £188.60)

5MB1F 1F November 2015

Question	Working	Answer	Mark	Notes
16.	<table><tr><td></td><td>Bus</td><td>Pre</td><td>Ec</td><td>Tot</td></tr><tr><td>M</td><td>(30)</td><td>28</td><td>34</td><td>(92</td></tr><tr><td>F</td><td>14</td><td>32</td><td>(62)</td><td>108</td></tr><tr><td>Total</td><td>(44)</td><td>(60)</td><td>96</td><td>(200</td></tr></table> ( ) value given	28	4	M1 for total female passengers 200 – 92 or 108 seen; or for total Economy passengers 200 – 44 – 60 or 96 seen. M1 for male passengers in Economy “96” – 62 or 34 seen; or for female Premium “108” – 62 – (44 – 30) or 32 seen M1 for 92 – 30 – “34” or for 60 – “32” A1 cao **OR** Answers may appear in a two-way table with no other method seen B1 for Female total 108 or Total Economy 96 M1 for “96” – 62 or 34 seen in Male Economy; or “108” – 62 – (44 – 30) or 32 seen in Female Premium M1 for 92 – 30 – “34” or for 60 – “32” A1 cao

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

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

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

PAPER: 5MB1F_01			
Question		**Modification**	**Notes**
Q01		Row for Gary removed.	
Q02		Diagram enlarged.	
Q03		Crosses changed to filled in circles. Diagram enlarged.	
Q05		Value on table changed: Wizard: 20 28 18 32. Reds not altered. Grid enlarged.	
Q10		Frequency column widened to allow for working.	
Q13		Diagram enlarged.	
Q14	(a)	Grid enlarged. Crosses changed to filled in circles. 146 cm changed to 150 cm. 41 kg changed to 40 kg.	
Q15		Crewe to Colwyn – First 2 columns removed. Colwyn to Crewe – First and last columns removed	

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Mark Scheme (Results)

Summer 2017

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



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General marking guidance

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

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

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

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

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

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

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

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

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

6 Follow through marks

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

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

7 Ignoring subsequent work

It is appropriate to ignore subsequent work when the additional work does not change the answer in a way that is inappropriate for the question or its context. (e.g.. an incorrectly cancelled fraction when the unsimplified fraction would gain full marks).

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

8 Probability

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

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

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

9 Linear equations

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

10 Range of answers

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

Guidance on the use of abbreviations within this mark scheme	
M	method mark awarded for a correct method or partial method
P	process mark awarded for a correct process as part of a problem solving question
A	accuracy mark (awarded after a correct method or process; if no method or process is seen then full marks for the question are implied but see individual mark schemes for more details)
C	communication mark
B	unconditional accuracy mark (no method needed)
oe	or equivalent
cao	correct answer only
ft	follow through (when appropriate as per mark scheme)
sc	special case
dep	dependent (on a previous mark)
indep	independent
awrt	answer which rounds to
isw	ignore subsequent working

Paper 1MA1: 2F				
Question	**Working**	**Answer**	**Mark**	**Notes**
1 (a)		$3p$	B1	cao
(b)		$2m^3$	B1	cao
(c)		$10 - 4c + 6d$	M1	for $-4c$ or $6d$ (accept $+-4c$)
			A1	for $10 - 4c + 6d$
2		60	B1	cao
3 (a)		Walk	B1	cao
(b)		7 on chart	B1	for bar of height 7 drawn for girls walking
(c)		4	B1	cao
(d)		96	M1	for method to find number of Year 6 students in the survey e.g. $5 + 9 + 6 + 4 + 9 + 7 + 4 + 1 + 2 + 1$ (= 48) or $14 + 10 + 16 + 5 + 3$ (= 48)
			A1	for 96 or ft from (b), eg 82 if no bar in (b)
4		$\frac{11}{30}, \frac{2}{5}, \frac{7}{15}, \frac{1}{2}$	M1	converts fractions to a common form, e.g. fractions with a denominator of 30, decimals or percentages, at least two conversions correct or any 3 fractions in correct order
			A1	correct order

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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Question 7

Part (a) was well answered with many students gaining two marks. Common errors for those who only gained one mark included arithmetic errors or misreading the height of the yellow flowers.

Part (b) was not as well answered as part (a) but many correct responses were seen. The most common incorrect response was 10 instead of white.

Question 18

In part (a) only about half the students gave the correct answer, with 5 being the most common incorrect answer, or 7 from using the frequencies rather than the number of points.

In part (b) students appeared well prepared with most showing their calculations. The main error was to calculate 0×4 as 4. Those who did not understand the concept of calculating the total number of points often added either column of numbers and gave 15 or 30 as their answer. A minority wrote out all the 30 figures but usually made an arithmetic error in adding them.

Question 26

Part (a) was not answered well, with very few able to state the correct class interval. Most common answers were to give the group above the one required.

Part (b) was another question without any distractors which was done poorly. The most common error was to misread the scales, or not join the points. Some drew a line of best fit, but this was ignored.

Question 25

Relatively few students took into account that there was more than one red brick and more than one blue brick. Many students' responses consisted of the calculation $(5 + 9 + 6) \div 10$ or $(5 + 9 + 6) \div 3$. These could not be given any marks. Some students started to find the total weight of the red bricks or of the blue bricks and scored 1 mark for doing this.

Only about ten per cent of students gained two or more marks for getting as far as calculating a value which could be used to evaluate the statement that "The mean weight of the 10 bricks is less than 7 kg." A few students calculated the total weight of the bricks but did not calculate the mean. If they compared this with a stated value of 70 they could gain full marks.

Question 9

In part (a) the majority of students knew that the median was the middle number even if they tried to find the median without ordering the list. Those who gave the answer as 8.5 (middle of the unordered list) gained one mark. Most students did order the numbers with many then able to give the correct answer. Some attempts at ordering the list omitted one of the numbers, often one of the two 4s. A common error was to identify the two middle numbers as 4 and 6 and give an answer of 4 or 6 or 4, 6 or carry out an incorrect calculation such as 6 – 4 with the two numbers. Some students confused the averages and worked out the mean or the mode. A few found the range.

Part (b) was answered very well. Those who did not give the correct probability often gained one mark for a fraction with either the correct numerator or the correct denominator. A few students used incorrect notation for probability such as 2 : 6 and were awarded the method mark only. A common incorrect answer was 1/2. There were relatively few students who gave a likelihood rather than a probability as the answer.

In part (c) many students were able to use the information about the mode to identify one of the hidden numbers as 3 and gain the first mark. They then often went on to give the correct answer.

Some students showed 3 + 3 + 8 + 5 + 6 = 25 and 25 ÷ 5 = 5 in the working space but then gave 3, 5 as the answer and gained one mark only. It was common to see 3 on the answer line with a number other than 6 and no working out shown. Some students gained the first mark for working with the mean but did not use the mode to complete the solution.

Question 13

A very well answered question. A large number of students were able to extract the correct two values from the stem and leaf diagram and find the difference for two marks. It was not uncommon for students to write the answer as a range of values, such as 31 – 74, rather than subtract, and in this case one mark was awarded. Of those who were not awarded the marks, it was often due to finding the median and on occasion, some found the mean.

Question 25

Finding an estimated mean is another question that students should be well prepared for. It was common for students to fail to gain the second method mark as they divided by 4 rather than 18. The final mark was then only gained by those students who had correctly used the midpoint values and had a complete correct method.

Question 16

Part (a) was poorly answered as many students did not refer to the median of the number of points scored, choosing to concentrate their attention on the values in the frequency column, often giving 3 as the median. The 5 in the frequency column was a clear distractor for many students. Some students said the median was 2 since 2 is the middle number of 0, 1, 2, 3 and 4. This gained no credit and often prevented the award of the mark when a correct partial explanation was given.

In part (b), many spotted the error made by Tina and earned the mark. Many said that the correct answer was 37 but never described the mistake as the question asked. Jumping ahead and thinking that a calculation of the mean was required was a common fault.

Question 26

It is very disappointing to note that only a small minority of candidates considered any measure of spread in their solutions. Finding the median of the boy's heights was often attempted with varying success, 167 cm or 167.5 cm being common errors.

Far too many students failed to answer the question and offer any comparisons in their solutions, preferring to merely state values of the girls' and boys' heights, namely the least, the greatest and the median heights. It does seem that a good number of students were not sure what 'compare' actually meant with many simply commenting on the presentation of the data, or using words such as "whereas", "but" or "only" in an attempt to compare.

Question 3

Over 80% of the cohort was able to give the correct answer. Others often gave a different statistical measure.

Question 15

Part (a) was accurately answered by about half the cohort. Several students made an arithmetic error, writing $3 \times 0 = 3$. This gave an answer of 777 which gained one mark. Where this question was not well answered, common misconceptions were the addition of the frequency column leading to 300 or the addition of the social media accounts column leading to an answer of 10. Both these responses show a lack of understanding of the meaning of the frequency column in the table. Centres should practice using frequency tables in a variety of ways.

Students found the second part of this question more challenging. There were some correct answers seen from correct methods but efficient methods were not always seen. Some students wrote out ALL of the data and then found the median from a very long list. A few students used the method of $300 \div 2 = 150$ to identify the 150th item as the median and then stated 3 as the answer.

There were many incorrect methods used for example many students ordered the number of social media accounts and found the median of those i.e. 0, 1, 2, 3, 4 with a median of 2.

Others ordered the frequencies and found the median of those i.e. 3, 57, 75, 81, 84 with a median of 75, with a few also achieving a final answer of 3 incorrectly from equating their 75 to the number of social media accounts. Another common incorrect method which sometimes led to a correct answer was the calculation of the mean using $772 \div 300 = 2.58$ and rounding to 3, this was clearly the wrong method and gained no credit. A small number of students identified the mode instead of the median.

Students need to be familiar with all the different types of averages they can be asked to find and be able to distinguish between them, using a variety of tables as well as a list of numbers.

Question 18

A range of marks were awarded for this question which tested students' ability to convert between different time units and to calculate the mean. Many were able to convert 25.3 hours

to minutes by multiplying by 60. Where this was unsuccessful it was often the case that students converted the 25 hours correctly but could not deal with the decimal part. Often 0.3 was incorrectly converted to 20 or 30 minutes, this meant that the mark for time conversion could not be awarded. However, students were able to gain a mark for working with the mean when they divided what they thought the time was, in minutes, by 115.
Students who started with $25.3 \div 115 = 0.22$ often failed to go any further and incorrectly interpreted this as 22 minutes.

A significant number of students attempted to divide the number of appointments by the total time.

Question 14

Part (a) was well answered. A minority gave the answer 7,7 without realising that only one 7 was required highlighting the misconception for how to calculate the median.

Part (b) was also well answered. Some lost the mark because, although 9 – 4 was seen, it was evaluated incorrectly.

For both parts (a) and (b) some students answered incorrectly, giving values for the mean (6.8) and the mode (8).

In part (c) most students attempted an answer. Marks were credited for comparisons using the words median and range (or the acceptable alternatives) but many students did not know that this was the required approach, instead using the words shoe size, feet or distribution. Some

simply described the data, listing it or using ‘whereas’ rather than using a comparison word such as larger, smaller.

Question 7. Part (a) was answered well, the vast majority clearly understanding the concept of mode. In part (b) also, understanding of probability scales and probability in general was good. In (ii), some simply added a cross to the probability scale, failing to quote the actual numerical probability; this gained no marks. Some students are still using terms such as unlikely in terms of describing probability.

Question 15

The marks for this question were well distributed over the full range available.

For part (a) when full marks were not scored the main issues were with the key, omission of a figure, or uncertainty around how to place '103'. Some students were unsure on how to represent this number with some choosing to use 1 in the stem instead of 10 or 100, and/or writing stem as 03. Secondly, some students were unsure of the notation needed to explain the key, with some writing in words and others using various symbols as a separator between the tens and units. Practice of examination questions and emphasise the importance of crossing out the numbers as they place them in the diagram, completing an unordered diagram first, then ordering it allowing them to order fewer integers at once. Students should always check that they have the same number of values in their diagram as there are in the original question, this is an easy way to avoid losing marks.

For part (b), if pupils understood the median, they were generally successful in gaining 1 or 2 marks. A significant number of students disregarded the stem and leaf diagram and re-wrote the list, not appreciating that the median could be read from their diagram, this method did produce many correct answers but would have been more time consuming.

There were common incorrect responses for example calculating the mode, range or mean.

Question 17

This question was not answered well with all the usual misconceptions seen.

A common approach was to find the mid-points of the intervals (usually successfully), add them together and divide by the frequency. Responses where fx was seen frequently broke down by division by 5 rather than 80.

For those students who do calculate frequency multiplied by the midpoint, it is helpful when working is shown so that credit can be given where the answer is incorrect from arithmetic error.

Understanding and checking their answer is sensible would be of benefit to candidates to avoid lots of responses being outside the range of data.

Question 6

In part (a), 6 was the most common answer, but some candidates mis-counted and gave either 5 or 7 as their answer.
Part (b) was well answered, though a small number of candidates read off April instead of May.

Question 8

Part (a) was a well answered question.
In part (b) many candidates gained both marks. Common errors included attempting the question by summing the numbers, but not always summing all of them, or by dividing by 2, 3 or 5. A few candidates found the range or median. Some candidates lost marks because they did not extract the correct numbers from the table.

Question 28

Only a few candidates were able to gain marks on this question. Those who did were only able to gain one mark for either finding the total mean height 50×167.6 (=8380) or the mean height for the 20 men (=3640). The most common mistake was to add both given mean heights (167.6 and 182), halve the sum, then multiply the result by 30. Candidates found it challenging to find the sum of the data when given the mean. Some candidates calculated both totals but then didn't know what to do with the results. A lot of answers simply wouldn't have made any sense if the candidates had actually thought about it needing to be a height.

Question 12

The majority of students understood the concept of the mean of a set of numbers and divided the sum of the six numbers by 6. Arithmetic errors here were plentiful, both in the addition and division stages.
Many students tried to find the median by ordering the list of numbers and selecting a number between 5 and 8. Fortunately a correct answer of 7 from this incorrect approach was rarely seen. The range of 10 was a common answer for weaker candidates.

Question 17

Most students managed to score the first mark for a start to the process, typically for a correct starting process of adding the number of seats in cinemas **A** and **B** (250+350). However, many failed to know how to progress from there with many dividing 600 by 2 or 3 and very few knowing they needed to calculate 3 × 380 to find the total number of seats in all three cinemas, which was also a valid start.

A lot of students worked with an embedded correct answer, showing their understanding of calculating the mean as adding then dividing, but the value 540 remained embedded with another number (e.g. 1140 or 380) given as the final answer. This scored 3 marks. A significant number of students attempted to try various values added and divided by 3 to give the desired mean but then gave up. Some had success with this approach, but students need to be reminded that where a trial and improvement method is used, all or no marks can be awarded.

Another common incorrect approach was to see the numbers as a sequence leading to an answer of 150 or even 450. Use of algebra was very rarely seen.

Often it could be seen that students understood what the mean is but do not know how to work in reverse in this question. Therefore, it would be useful for centres to ensure more exposure and practice of worded reverse mean problems.

Question 9

In part (a) the majority of candidates ordered the numbers successfully and went on to find the median correctly. A number of candidates calculated the mean instead.
Part (b) was well answered.
Part (c) was also well answered. Candidates were able to correctly scale the *y*-axis and then plot four bars, at the correct height, as well as label them. Those that did not gain full marks tended to lose a mark for an incorrect scale or missing bar labels or another mistake, such as misplacing the linear scale within the square, rather than on the grid lines, which sometimes led to confusion in drawing their own bars. Some candidates used the values from the table to label the axis, i.e 1, 5, 7, 9 without the appropriate scaling.

Question 12

In part (a) most candidates answered correctly. A common error was for candidates to write the size of the angle, 150 degrees, instead of merit and some candidates wrote no response here.
In part (b) the most common approach was to work out the angle for one student and then divide each angle separately, summing the results. Of those who didn't score full marks the method was usually correct and so an incorrect answer was due to an arithmetic error. Some found 2, 5 and 10 but added these to get 15 instead of 7, losing 2 marks.
The more efficient approach of a single calculation $\frac{360}{105} \times 7$ was rarely seen. A common incorrect expression was 360 ÷ 4. Occasionally candidates found the percentage for each sector but rounded too early, leading to the loss of the accuracy mark.

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

In part (a) the majority of candidates were able to show they understood what the table meant. Many candidates were able to find a value within the inequalities and multiply this by the frequency. In using a variety of different methods candidates used mid-points, ends and other values.

All candidates were able to pick up the two method marks if they then went on to sum their six products and divide the total by fifty to find an estimate for the mean. Those who used the correct method of using the mid-points were able to go on to achieve the correct solution and were awarded the final accuracy mark.
The usual misconceptions were seen, such as adding the frequencies, adding the midpoints or summing their chosen values from within each inequality and then finding the mean of these, all of which gained no marks.
In part (b) many candidates were unable to answer this question correctly and gain any credit. Many took the misconception offered and chose to agree that Seija was correct often justifying this by taking the ordered midpoints and finding the middle of these. Other common misconceptions seen included ordering the frequencies and then opting for the 15-20 inequality or selecting 17.5 (the midpoint from this).

Question 15

In part (a) candidates were required to find the median from the stem and leaf diagram. The majority of candidates were able to do this accurately. A common incorrect answer was 67 which was the mode. Some candidates incorrectly wrote their answer as 6|4 leaving it written in the stem and leaf structure or 4 having not appreciated the meaning of the key.
In part (b) candidates were required to find the range. This was also well answered with many candidates able to correctly identify the highest and lowest values from the diagram and work out the range. Some candidates were able to correctly identify the highest and lowest values, but did not perform the required subtraction accurately or left their answer as 45 to 81. Where candidates had identified 45 and 81 some incorrectly gave an answer of 44 from incorrect evaluation of $45 - 81$. A minority of candidates found the answer 32 having incorrectly selected 49 rather than 45 as the lowest value or gave an answer of 8 having incorrectly interpreted the values in the diagram as single digit.
It was sometimes the case that the answers for (a) and (b) were reversed with candidates calculating the range in (a) and stating the median in (b). This scored no marks.
In part (c) candidates needed to compare the median for the adults (found in (a)) with the median for the children. This was well answered with around half of candidates able to make an appropriate comparison of the value that they found in (a), be that correct or incorrect, with the given median for children. Common correct responses identified that the adults were faster, the children were slower or that the children took more time. Even where candidates had an incorrect answer in (a) they were often able to give a correct comparative interpretation. Some candidates attempted to include figures in their comparisons, but these needed to be correct if present, so errors in arithmetic were then an issue sometimes. A common response which did not gain credit was to give the difference between the two median values or to simply restate the median values for adults and children without any comparison. A small number of candidates erroneously stated that a high median meant the

children were faster. Often responses did not clearly indicate whether it was adults or children being commented on with ambiguous references to ‘they’ being seen.

Question 28

Finding the class interval containing the median in part (a) was not answered well. The most common incorrect answer was the interval in the middle of the table, giving evidence that frequencies were not considered. The working and answer for part (b) was also seen in this part which was surprising to see.

Performance in part (b) when calculating an estimate for the mean was in line with previous series with a range of incorrect methods seen and blank responses being frequent as well. Students who knew what they were doing tended to score full marks or at least one mark for finding 5 products but dividing by the wrong value, often 5 (groups) or the sum of the midpoints. A small number of students correctly found products but then rounded before adding and dividing and this approach leading to the second mark not being awarded. Some students rounded the frequencies to the nearest 10 before multiplying by the midpoint, no doubt attempting to ‘estimate’ but this was given no credit. Various other approaches that

scored no marks were seen such as totalling the minimum or maximum values of the intervals and dividing by five.

As with previous series, choice of method was a common issue. Whilst many students correctly found products within the interval, a large number were ultimately not awarded the first mark due to using an alternative incorrect method as noted in the additional guidance on the mark scheme.

Summary

Based on their performance on this paper, students should:

- read questions carefully, including checking whether the magnitude of an answer is sensible, units are appropriate, and the level of accuracy required is shown;
- practise questions involving ratio and forming algebraic expressions;
- practise using equipment such as rulers, protractors and compasses;
- practise using calculator functions and negative numbers;
- use formal methods when working with fractions or percentages.

Question 7

Part (a) was answered well with most students gaining the 1 mark for correctly identifying “Bus” as the mode. Of those that didn’t, a variety of incorrect answers were seen; with either “Car” or “9” given the most often.

In part (b) most were able to gain 1 mark for an answer of 5; of those that didn’t 6 and 8 were often given as the answer or some students added rather than subtracted.

Question 7

There were occasions in this question where learners confused the statistical terms mean, mode, median and range, resulting in an incorrect method being used in either part (a) or more commonly in part (b).

Part (a) was answered well, with many learners aware of the need to sum the ages and divide the total by 8. There were a few arithmetic errors when adding, but if the full method was shown, learners could still gain 1 mark.

A variety of incorrect answers were seen, and very often these seemed to be statistics other than the mean. The most common errors seen were 10 (the mode), 11.5 (the median) and 6 (the range), all of which gained no marks.

Part (b) also had many correct answers from working out the range. Sometimes either the maximum or minimum was incorrectly chosen, and as in part (a) we also saw some incorrect statistics, most often the mean.

Less success was evident in part (c), with a larger than expected number of learners not being able to show the probability correctly on the scale provided. The most common incorrect response was to misinterpret the divisions shown on the scale and mark at $\frac{1}{8}$ rather than $\frac{1}{4}$.

Question 15

Part (a) saw varied success as many of this cohort were not able to gain 3 marks. For those that didn't, it was common to see learners unable to make a correct start at all, often finding the sum of the ages column and dividing this by 5, as well as dividing 41 by 5. Some learners successfully found the sum of the products as 406 but divided by 5 instead of 41. Some learners began with the correct method and then started a different, incorrect method and pursued this to gain 0 marks. Part (b) saw more success, with a good number of learners gaining 1 mark for an acceptable example as listed in the mark scheme or something equivalent. The most common incorrect answers were those listed in the mark scheme under not acceptable examples.

Question 22

This question saw the full range of marks awarded. Some learners managed to gain 3 or 4 marks, usually for two correct values for median and range and at least one correct comparison. It should be noted that simply writing the value of two medians or ranges is not enough for comparison, some sort of statement relating to their sizes like the two examples in the mark scheme is required. Some learners used a method to find the median from the stem and leaf diagram but failed to extract 57 from it, leaving the 7 circled, which was not enough to gain B1.

Question 8

The mode was regularly identified in part (a) to gain the mark available. Incorrect responses included finding the median or mean but both incorrect answers were rarely seen.

In part (b), the first mark was awarded for beginning to work with range, ideally for subtracting the maximum and minimum values, but also for identifying 5 and 14 and not incorrectly using

these two values in operations such as 5 + 14 or 5 × 14, as these contradicted the correct method of finding the range.

Some responses showed a calculation of mean or median either in part (a) or in part (b) or showed the range in part (a) and the mode in part (b) which unfortunately scored no marks.

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 19

In part (a), B1 was awarded for an answer of 2. Common incorrect responses included 3, 7, and 9.
In part (b), full marks were awarded for calculating five correct products, summing them, and dividing by 50 to give an answer of 2.36 (2.4 was also accepted if supported by correct working). Two marks were awarded where five products were calculated with one or two errors, followed by summing and dividing by 50. One mark was awarded for at least three correct products, with the most frequent error being division by an incorrect value, typically 5 or 15.
It was common to see correct working shown in the table and workspace, worth 1, 2, or 3 marks, followed by abandonment of the method in favour of an incorrect approach such as $50 \div 5 = 10$, with 10 placed on the answer line. In line with general marking guidance point 4, these responses were awarded 0 marks.



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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