Chhetri Academy

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GCSE MATHS

Statistics

Edexcel 1MA1 | Subtopic collection Topic 56

Charts, diagrams and time series

Higher tier

Answers and examiner comments

77	2009-2025	Higher
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
1	(a)		8	1	B1 cao
	(b)		3	1	B1 cao
	(c)		3 circles 2.5 circles	2	B1 cao B1 cao

Question		Working	Answer	Mark	Notes
5	(a)	3 | 3 8 7 4 | 6 1 4 5 | 4 1 5 1 5 2 6 | 0 2 3	3| 3 7 8 4| 1 4 6 5| 1 1 2 455 6| 0 2 3	3	M1 for unordered diagram (condone one error, eg an omitted value or an incorrect value or a duplicated value or a misplaced value) A1 cao B1 for key (eg 4 | 6 = 46, 30 | 6 = 36)
	(b)		$\frac{10}{15}$	2	M1 numerator of 10 ft table or for denominator of 15 A1 $\frac{10}{15}$ oe

6	(a)		Polygon	2	B2 Fully correct polygon. Points plotted at the midpoint ±2mm (B1 All points plotted accurately not joined, or one error in plotting but joined) or all points plotted accurately with first joined to last, or all points at the correct heights and consistently within or at the ends of the intervals and joined (Includes joining last to first to make a polygon)). NB: ignore polygon before 1st point, and after last point. Ignore any histograms.
	(b)		$20 < t \leq 30$	1	B1 $20 < t \leq 30$ or ft from graph..Accept any unambiguous description of the correct interval e.g 20 – 30

1380 3H

1380/3H

Question		Working	Answer	Mark	Notes
1			**43** **25** (19) **87** (36) (42) **35** **113** (79) **67** (54) (200)	3	B3 for all 6 correct (B2 for 4 or 5 correct) (B1 for 2 or 3 correct)

2			4 | 3 5 7 7 5 | 0 3 3 5 6 7 8 8 8 6 | 1 2 2 Key Eg. 4 | 3 means 43g	3	B2 for a fully correct diagram. Accept a stem of 40, 50, 60 (the order of the numbers in the stem may be reversed) (B1 for ordered or unordered leaves, with just one error or omission) B1 for a correct key (units may be omitted)

8	(a) (b)		15 – 19 Freq polygon through (2, 8), (7, 11), (12, 9), (17, 14) and (22, 18)	1 2	B1 for 15 – 19 oe (eg 15 to 19) B2 for a complete and correct polygon (ignore any histograms, any lines below a mark of 2 or above a line of 22, but award B1 only if there is a line joining the first to last point) (B1 for one vertical or one horizontal plotting error OR for incorrect but consistent error in placing the midpoints horizontally (accept end points of intervals) OR for correct plotting of mid-interval values but not joined) Plotting tolerance ± ½ square Points to be joined by lines (ruled or hand-drawn but **not** curves)

1380_3H
Summer 2010

10	(a)		6 | 9 7 | 2 4 7 7 7 8 8 | 0 1 2 3 3 6 9 | 1 2 Key: 7 | 2 = 72	3	M1 for unordered stem and leaf diagram (condone 2 errors, 1 number misplaced counts as one error) A1 for correctly ordered and fully correct diagram NB: ignore commas between leaves, stems could be 60,70,80,90 B1 for key e.g. 7 | 2 = 72
	(b)		77	1	B1 ft

1380_3H

1380/3H

Question	Working	Answer	Mark	Notes
7	8 ÷ 20 × 100	40	2	M1 for 8 ÷ 20 × 100 or $\frac{8}{20}=\frac{8\times5}{20\times5}$ oe or $\frac{40}{100}$ A1 cao
8 (a)		10 to 19	1	B1 cao
(b)		20 to 29	1	B1 for acceptable reason eg correct answer is 20 to 29 eg $30^{th}/31^{st}$ person not in this interval
(c)			2	B2 for complete polygon (ignore histograms and any lines below an age of 4.5 or above an age of 65, but award B1 if there is a line joining the first to the last point.) (B1 for one vertical or horizontal error OR incorrect but consistent error in placing the midpoints horizontally OR correct plotting but not joined. In this case ignore a line joining the first to the last.) Plotting tolerance: ± 1 square Points to be joined by lines (ruled or handdrawn, but not curves.)

1380_4H

1380/4H

3		Types Tally Frequency	3	B3 for correct table with all three aspects **Aspect 1**:'method of travel' or for at least 3 of bus, car, walk, other etc. **Aspect 2**: 'tally' or tally marks or 'frequency' or 'number of people' **Aspect 3**: 'frequency' or frequencies or 'total' or totals or 'number of people' (B2 for two aspects, B1 for one aspect)

5MB1H_01
November 2010

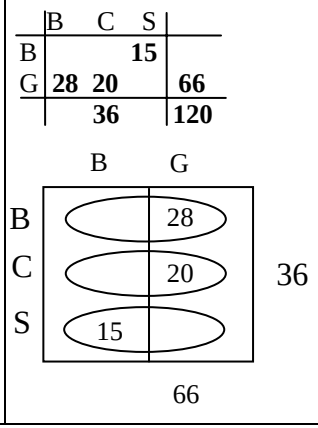
5MB1H/01

Question	Working	Answer	Mark	Notes
4	Median (before) $= 67$ Median (after) $= 78$ Mean (before) = 69.6 Mean (after) = 80.8(6...) Range (before) $= 84 - 58 = 26$ Range (after) $= 102 - 65 = 37$ IQR (before) $= 78 - 61 = 17$ IQR (after) $= 91 - 69 = 22$	Comparison of 1. medians / means 2. range / IQR	6	B2 for median (before) = 67 and median (after) = 78 (B1 for one correct median) OR B2 for mean (before) = 69.6 and mean (after) = 80.9 /80.8(6..) (B1 for one correct mean) B2 for range (before) = 26 and range (after) = 37 OR B2 for IQR (before) = 17 and IQR (after) = 22 (B1 for one correct range/IQR) OR B2 for fully correct diagram/chart to compare, e.g. box plots, cumulative frequency diagrams, etc (B1 for diagram/chart with one error in presentation) C1 for median (after) > median (before) oe or ft their medians OR for mean (after) > mean (before) oe or ft their means OR C1 for range (after) > range (before) oe or ft their ranges OR for IQR (after) > IQR (before) oe or ft their IQRs

5MB1H_01
November 2010

5MB1H/01				
Question	Working	Answer	Mark	Notes
4				C1 for comments, in context, relating to an average and to the spread of the data (dep on B3). QWC: Decisions should be justified and calculations attributable SC If no marks scored, B1 for a correct comparison (eg Heart rates are faster after walking up the stairs)
5* (a)	13.55 × 1.65 = 22.3575 3.10 ÷ 160 × 1000 = 19.375 OR 13.55 × 1.65 = 22.3575 22.3575 ÷ 1000 × 160 = 3.5772 OR 3.10 ÷ 1.65 = 1.8787... 1.8787...÷ 160 × 1000per kg OR $1355 \div 1000 = 1.355$p/g 3.10 ÷ 1.65 = 187.87...p 187.87...÷ 160 = 1.1742...p/g OR 3.10 ÷ 160 = 0.019375 SF/g 13.55 × 1.65 ÷ 1000 =0.0223575SF/g	Switzerland, with correct explanation	4	M1 for a correct method to obtain two comparable weights e.g. cost of 1kg in Switzerland, ÷ 160 × 1000, × 6.25 (cost of 1 kg in England given) or cost of 160g in England, ÷ 1000 × 160 (cost of 160g in Switzerland given) or cost per gram in each country, ÷ 160 and ÷ 1000 or cost of 800g in each country M1 for converting £ to Swiss francs or Swiss francs to £ (other than £1 = 1.65 SFr) A1 for two correct values (using same units) for comparison. C1 for country identified from a clear attempt to use comparable weights and prices. QWC: Decision must be stated, with calculations clearly attributable

5MB1H/01

Question	Working	Answer	Mark	Notes
6		51	4	M1 for a two-way table or Venn diagram with bowling, cinema, skating, boys and girls labelled or list of at least two combinations clearly labelled. M1 for attempt to find the value of an unknown entry in the table oe eg 66 – 28 – 20, 120 – 66, 36 – 20 A1 for 16 or 18 or 54 or 23 or 33 A1 cao (Note: 36 + 15 = 51 scores no marks)

5MB1H_01

<table>
<tr><th>Question</th><th>Working</th><th>Answer</th><th>Mark</th><th>Notes</th></tr>
<tr>
<td>4</td>
<td>30 - 17 = 13
5 - 3 = 2
13 -2 - 7 = 4
4 + 4

OR
17 – 4 – 3 = 10
10 + 7 = 17
30 – 5 – 17

OR
17 – 4 = 13
13 + 7 = 20
20 + (5-3) = 22
30 - 22

<table>
<tr><th></th><th>B</th><th>G</th><th>Total</th></tr>
<tr><td>Packed</td><td>4</td><td></td><td></td></tr>
<tr><td>School lunch</td><td></td><td>7</td><td></td></tr>
<tr><td>Home</td><td>3</td><td></td><td>5</td></tr>
<tr><td>Total</td><td>17</td><td></td><td>30</td></tr>
</table>
</td>
<td>8</td>
<td>4</td>
<td>M1 for calculation of total girls 30 - 17 (= 13)
M1 for calculation of girls going home 5 - 3 (= 2)
M1 for calculation of girls having packed lunch
"13" - "2" - 7 (= 4)

M1 for 17 – 4 – 3 (= 10)
M1 for “10”+ 7 (= 17)
M1 for 30 – 5 – “17”

M1 for 17 – 4 + 7 (= 20)
M1 for “20” + (5 – 3)
M1 for 30 – “22”

A1 cao

[Interim answers may appear in a 2-way table or Venn diagram]
M1 for a 2-way table or diagram, with clear labeling, showing at least 3 pieces of the given information correctly placed
A1 for 13 (girls) or 10 (boys, school lunch)
A1 for 2 (girls, home) or 17 (total school lunch)
A1 cao
[Note: for the award of the final A1, the 8 in any diagram must be highlighted, in some way, to be the required answer]</td>
</tr>
</table>

5MB1H_01

13			Points plotted at (2,10), (6,17), (10,28), (14,25), (18,20) and joined with line segments	2	B2 for correct plotting of 5 points (± 1/2 sq) and joining with line segments (B1 for points plotted correctly at midpoints of intervals OR joining points with line segments at the correct heights and consistent within the class interval (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

1380_3H

Question		Working	Answer	Mark	Notes
6	(a)		1 | 6 8 2 | 1 5 7 8 8 3 | 0 6 6 6 8 4 | 1 5 8 8 Key: 1 | 6 = 16	3	B2 for a fully correct ordered diagram (B1 for correct unordered diagram or ordered with at most two errors or omissions) B1 for a correct key (Accept stem written as 10, 20 etc but key only acceptable if consistent with this)
	(b)	Middle numbers = 30 and 36	33	2	B2 for 33 or ft from ordered stem and leaf diagram (B1 for '30,36' written or both ringed in the ordered stem and leaf diagram or in a fully ordered list ft or indicated in an unambiguous way)

Question	Working	Answer	Mark	Notes
1 (i)	<table><tr><td></td><td>Y4</td><td>Y5</td><td>Y6</td><td>Tot</td></tr><tr><td>S</td><td></td><td>21</td><td>18</td><td></td></tr><tr><td>NS</td><td>11</td><td></td><td></td><td>37</td></tr><tr><td>Tot</td><td></td><td></td><td>30</td><td>96</td></tr></table> OR 96 – 37 = 59 children can swim 18 + 21 = 39 children in Y5 or Y6 can swim 59 – 39	20	4	M1 for including 4 of the 6 pieces of information given in a clearly labeled two-way table A1 for 20 or 20 out of 96 or 20/96 OR M1 for a correct method that leads to the number of children in year 4 that can swim eg 96 – 37 (= 59) children can swim 18 + 21 = (39) children in Y5 or Y6 can swim '59' – '39' A1 for 20 or 20 out of 96 or 20/96
(ii)	<table><tr><td></td><td>Y4</td><td>Y5</td><td>Y6</td><td>Tot</td></tr><tr><td>S</td><td>20</td><td>21</td><td>18</td><td>59</td></tr><tr><td>NS</td><td>11</td><td>14</td><td>12</td><td>37</td></tr><tr><td>Tot</td><td>31</td><td>35</td><td>30</td><td>96</td></tr></table> OR 20 + 11 = 31children in Y4 30 + 31 = 61 children in Y4 or Y6 96 – 61	35		M1 for one correct calculation leading to a 'new', piece of information in a clearly labeled two-way table A1 for 35 or 35 out of 96 or $\frac{35}{96}$ OR M1 for a correct method that leads to the total number of children in year 5 eg '20' + 11 (= 31) children in Y4 30 + '31' (=61) children in Y4 or Y6 96 – '61' children in Y5 A1 for 35 or 35 out of 96 or $\frac{35}{96}$ SC If M1 not earned then award B1 if ans(ii) = 55 – ans (i)

5MB1H_01

Question	Working	Answer	Mark	Notes
4 (a)		14 | 8 15 | 2 4 16 | 0 2 4 4 8 17 | 0 3 4 9 14 | 8 = 148 cm	3	B2 for a fully correct ordered diagram (B1 for correct unordered diagram or ordered with at most two errors) B1 for a correct key eg 14 | 8 = 148 cm (cm not required)
(b) *	Boy's Median = 170 Girl's Media = 164 Boy's Mean = 170(.38) Girl's Mean= 164 Boy's Range = 27 Girl's Range = 31 Boy's IQR = 14 Girl's IQR = 14.5 – 15.25 15 | 7 9 16 | 2 6 8 9 17 | 0 3 4 6 6 18 | 1 4	Compares: medians/means + Range + Spread	3	A maximum 2B marks from: B1 for a correct mean or median for either the boys or the girls. B1 for a correct measure of spread for either the boys or the girls. B1 for a correct stem and leaf diagram drawn for the boys (no need for a key) C1 for any correct comparison based on 2 medians(ft) or 2 means(ft) or 2 ranges(ft) or 2 IQRs (ft) or a correct statement following from comparing the correct stem and leaf diagrams. This comparison must be a general statement which compares the boys' heights with the girls' heights.

4			3.1	2	M1 sight of 11th value or digits 31 A1 3.1

1380_3H

15	(a)	(34 + 46 + 28) ÷ 3 (46 + 28 + 40) ÷ 3	36 38	2	M1 for either (34 + 46 + 28) ÷ 3 or (46 + 28 + 40) ÷ 3 (condone missing brackets) **or** one of 36 or 38 in correct position on answer lines A1 cao (SC: If no marks scored B1 for 38, 36)
	(b)		increasing	1	B1 for upwards or increasing oe or ft from part (a)

Question		Working	Answer	Mark	Notes
5	(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)		92.5	1	B1 for 92.5 or ft from ordered diagram

7		900 ÷ 360 2.5 × 100 900 − 250 − 225 − 125 − 162.50	£250, £137.50	3	M1 for (900÷360) × 100 or (100÷360)×900oe or (55÷360) × 900oe or implied by one correct value A1 for (£)250 or (£)137.5(0) seen A1 for (£)250 and (£)137.5(0) in correct positions

5MB1H_01

11	(a)		eg How many times do you go out to eat each month? 0, 1, 2, 3 or more	2	B1 for a suitable question including a time period (may appear with response boxes) B1 for at least 3 non-overlapping boxes which are exhaustive for their question
	(b)	$\frac{10}{127} \times 50$	4	2	M1 for $\frac{10}{127} \times 50$ (=3.937…) oe A1 for 3 or 4
	(c)		2 valid reasons	2	B2 for 2 reasons, eg not able to get a zero response oe, ages/genders not representive oe, only does it on one day/evening oe (B1 for 1 reason)

5MB1H_01

Original question 1

The full source mark scheme begins on page 115. Use the original paper code, tier and question number shown above.

Original question 4

The full source mark scheme begins on page 115. Use the original paper code, tier and question number shown above.

Question		Working	Answer	Mark	Notes
5	(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 Note: stem could be 5,6,7,8 or 50,60,70,80 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	Comparison	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]

5MB1H_01

Question	Working	Answer	Mark	Notes
4	<table><tr><th>Bird</th><th>Frequency</th><th>Angles</th></tr><tr><td>Magpie</td><td>15</td><td>75</td></tr><tr><td>Thrush</td><td>10</td><td>50</td></tr><tr><td>Starling</td><td>20</td><td>100</td></tr><tr><td>Sparrow</td><td>27</td><td>135</td></tr></table> Angles $\frac{15}{72}\times 360$, $\frac{10}{72}\times 360$, $\frac{20}{72}\times 360$, $\frac{27}{72}\times 360$ OR 360 ÷ 72 = 5 5 ×15 = 75 etc	Correct pie chart	3	M1 for any one of $\frac{15}{'72'}\times 360$, $\frac{10}{'72'}\times 360$, $\frac{20}{'72'}\times 360$, $\frac{27}{'72'}\times 360$ oe ('72' must clearly come from adding frequencies) A1 for 75 seen from correct working **or** 50 seen **or** 100 seen **or** 135 seen **or** one sector of angle 50° or 100° or 135° labelled correctly with bird's name **or** all sectors correctly drawn A1 for correct pie chart fully labelled with birds' names **OR** M1 for $\frac{'75'}{15}\times 10$ **or** $\frac{'75'}{15}\times 20$ **or** $\frac{'75'}{15}\times 27$ ('75' should be in the range 73 - 77) A1 for 50 seen **or** 100 seen **or** 135 seen **or** one sector of angle 50° or 100° or 135° labelled correctly with bird's name **or** all sectors correctly drawn A1 for correct pie chart fully labelled with birds' names **NB. Allow a tolerance of ±2° on all drawn angles**

1MA0_2H

9	(a)		32	1	B1 cao
	(b)	LQ = 21 UQ = 45	24	2	M1 for 45 **or** 21 **or** 43.5 **or** 19.5 **or** 7.75^{th} **or** 8th **or** 23.25^{th} **or** 24th (all of above may be seen in working space or indicated on S&L) **or** clear attempt to find UQ and LQ from a list of values or in stem and leaf diagram A1 cao

1MA0_2H

Question		Working	Answer	Mark	Notes
12	(a)		Correct Frequency Polygon	2	B2 Fully correct polygon. Points plotted at the midpoint (B1 All points plotted accurately not joined, **or** one error in plotting but joined **or** all points plotted accurately and joined with, additionally, first joined to last **or** all points at the correct heights and consistently within or at the ends of the intervals **and** joined (Includes joining last to first to make a polygon)) NB: ignore polygon before 1st point, and after last point. Ignore any histograms.
	(b)		$30 < t \leq 40$	1	B1 Allow any notation eg, 30-40 ft polygon
	(c)	$(6 + 2) = 8$, $(4 + 8 + 14 + 16 + 6 + 2) = 50$	$\frac{8}{50}$ oe	2	M1 $(6 + 2) \div (4 + 8 + 14 + 16 + 6 + 2)$ **or** ft figures from polygon **or** $\frac{8}{a}$ with $a > 8$ **or** $\frac{c}{50}$ with $c < 50$ **or** 8 and 50 used but notation incorrect (eg. 8:50 , 8 out of 50) A1 $\frac{8}{50}$ oe (eg. 0.16) **or** ft figures from polygon

1MA0_2H

Question		Working	Answer	Mark	Notes
1			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.

4		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°

Question		Working	Answer	Mark	Notes
6		<table><tr><td></td><td>**A**</td><td>**G**</td><td>**T**</td><td>total</td></tr><tr><td>**F**</td><td>**77**</td><td>(26)</td><td>**13**</td><td>(116)</td></tr><tr><td>**M**</td><td>**53**</td><td>**9**</td><td>(22)</td><td>**84**</td></tr><tr><td>total</td><td>(130)</td><td>**35**</td><td>**35**</td><td>(200)</td></tr></table> ( ) value given	53	4	M1 for calculation of total male students 200 – 116 or 84 seen M1 for Graphics total or Textiles total = (200 – 130) ÷ 2 or 70 ÷ 2 or 35 seen M1 for calculation of male students choosing Graphics, "35" – 26 or male Graphics 9 or female students choosing Art, 116 – 26 – ("35" – 22) or " 90" – "13" or 77 A1 cao or Answers may appear in a two-way table with no methods seen B1 for male total, 84 B1 for Graphics total or Textiles total, 35 M1 for male Graphics, 9 or (**dep** on B1) for a table that balances (condone 77 and/or 13 missing or 9 missing) A1 in table or on answer line

Question		Working	Answer	Mark	Notes
1			1 | 7 8 8 9 2 | 0 0 1 2 3 5 9 3 | 3 7 7 4 | 2 1 | 8 represents 18	3	B2 for a fully correct ordered diagram (B1 for correct unordered diagram or ordered with at most two errors or omissions) B1 for a correct key Accept stem written as 10, 20 etc but key only acceptable if consistent with this
*2			No + comparison	3	M1 for a correct start to the process eg. $\frac{225}{9}$ **or** $\frac{\mathbf{475}}{\mathbf{225}}$ **or** $\frac{\mathbf{20}}{\mathbf{9}}$ **or** $\frac{475}{20}$ M1 for completion of a fully correct method that will lead to an appropriate comparison C1 (dep on M2) for a correct statement with conclusion with 500 g **or** 25g more needed **or** 19 cakes **or** 25g **and** 23.75g SC :If **no** working then B1 for a correct statement with correct figures and units

1MA0_2H

Question		Working	Answer	Mark	Notes
4		<table><tr><td></td><td>TT</td><td>D</td><td>S</td><td></td></tr><tr><td>B</td><td>7</td><td>12</td><td>4</td><td>23</td></tr><tr><td>G</td><td>4</td><td>8</td><td>5</td><td>17</td></tr><tr><td></td><td>11</td><td>20</td><td>9</td><td>40</td></tr></table>	11	4	M1 for a 2-way table or diagram showing at least 3 pieces of information correctly placed M1 17 girls or 4 boys with slalom skis M1 12 boys with downhill skis or 4 girls with twin tips A1 cao OR M1 for 40-23 (=17) M1 for one part subtraction ie '17'-8 or '17'-5 M1 for ('17'-8) -5 or ('17' - 5) - 8 A1 cao
*5			Yes and £1562	6	B1 283 or 285 M1 for working out the total cost of 2 adults 1 way or 1 adult both ways M1 for a correct method for calculating 75% of an adult fare for 1 journey or for 1 journey there and back. M1 for working out the total cost of 2 adults and 1 child A1 1562 or 38 C1 Dep on a previous M1, correct conclusion ft for their total cost (identified) providing it is written with a £ sign

5MB1H_01

Question		Working	Answer	Mark	Notes
6		2 | 6 7 9 3 | 0 4 4 | 2 2 4 7 7 5 | 3 6 7 8 8 6 | 3 4 6	Stem and leaf 2 | 6 means 26 Key	3	B2 for a fully correct ordered diagram (B1 for a correct unordered diagram or ordered with at most two errors or omissions) B1 for a correct key Accept stem written as 20,30 etc but key only acceptable if consistent with this.

Question		Working	Answer	Mark	Notes
3			2| 4 7 8 3| 0 3 3 5 7 8 8 4| 1 1 2 4 4 5 Key,eg 4|1 is 4.1(kg)	3	B2 for correct ordered stem and leaf (B1 for fully correct unordered or ordered with one error or omission) B1 (indep) for key (units not required)

2		0 5 5 8 2 4 5 7 9 2 5 8 4 6 2 5	Ordered stem and leaf diagram	3	M1 for an unordered stem and leaf diagram with no errors or omissions **OR** an ordered stem and leaf diagram condoning two errors or omissions A1 for a correctly ordered stem and leaf diagram B1 for an appropriate key

5			Points plotted at (5, 6), (15, 9), (25, 8), (35, 7), (45,5) and joined with line segments	2	B2 for correct plotting of 5 points and joining with line segments (B1 for points plotted correctly at midpoints of intervals **OR** joining points with line segments at the correct heights and consistent within the class interval (including end values) **OR** correct frequency polygon with one point incorrect **OR** correct frequency polygon with first and last points joined) NB Ignore any histogram drawn and any part of frequency polygon outside range of first and last points plotted

PAPER: 5MB1H_01

8		<table><tr><td></td><td>B</td><td>G</td><td>Tot</td></tr><tr><td>F</td><td>10</td><td>35</td><td>45</td></tr><tr><td>H</td><td>12</td><td>26</td><td>38</td></tr><tr><td>T</td><td>8</td><td>29</td><td>37</td></tr><tr><td>Tot</td><td>30</td><td>90</td><td>120</td></tr></table> <table><tr><td></td><td>F</td><td>H</td><td>T</td><td>Tot</td></tr><tr><td>B</td><td>10</td><td>12</td><td>8</td><td>30</td></tr><tr><td>G</td><td>35</td><td>26</td><td>29</td><td>90</td></tr><tr><td>Tot</td><td>45</td><td>38</td><td>37</td><td>120</td></tr></table>	29	4	M1 for a complete correct method to find the total number of girls eg 120 – 30 (=90) M1 for complete correct method to find the number of girls who play football or hockey eg 26 + 35 (=61) M1 for ‘90’ – ‘61’ A1 for identifying 29 as the answer **OR** M1 for a complete correct method to find the total number playing tennis M1 for a complete correct method to find the number of boys playing tennis M1 for ‘total for tennis’-‘boys playing tennis’ A1 for identifying 29 as the answer

PAPER: 5MB1H_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
*9		**Cost of villa** 2600 + 200 = £2800 **Cost of hotel** 180 × 7×2 = 2520 $\frac{40}{100}\times 180 = 72$ 72 × 7 = 504 2520 + 504 = 3024	Comparison	6	B1 for identifying 2600 or 180 from the table M1 for a complete correct method to find 40% of their adult price for either one day or one week. **OR** the total cost of the adult(s) at the hotel ie 2×'180' or 7×'180' or 2×7×'180' M1 for a complete correct method to find the total price of the hotel for their two adults and their one child (40% of adult) for either a week or a day M1 for finding the total of the villa ie '2600'+200 A1 for 2800 and 3024 **OR** 400 and 432 C1 (Dep on M2) for a clear conclusion from comparing their results.

6		19	4	M1 for 130 − 96 (=34) M1 for 73 − 55 (=18) M1 for '34' − 9 − '18' + 12 A1 cao **OR** M1 for 96 − 55 − 12 (=29) M1 for 9 + '29' (=38) M1 for 130 − 73 − '38' A1 cao

PAPER: 1MA0_2H				
Question	**Working**	**Answer**	**Mark**	**Notes**
*7		Small with correct figures for comparison	4	M1 for one calculation eg 6.5 ÷ 30 (=0.216...) **or** 8.95 ÷ 40 (=0.22375) **or** 10.99 ÷ 50 (=0.2198) M1 for all three calculations eg 6.5 ÷ 30 (=0.216...) **and** 8.95 ÷ 40 (=0.22375) **and** 10.99 ÷ 50 (=0.2198) A1 for 0.216(6...) **and** 0.223(75) **and** 0.219(8...); can be rounded or truncated as long as they remain different C1 (dep on M1) for conclusion ft from three comparable figures [could use different figures relating to 30, 40, 50] **OR** M1 for one calculation eg 6.5 × 20 (=130) **or** 8.95 × 15 (=134.25) **or** 10.99 × 12 (=131.88) M1 for three calculations eg 6.5 × 20 (=130) **and** 8.95 × 15 (=134.25) **and** 10.99 × 12 (=131.88) A1 for 130 **and** 134(.25) **and** 131(.88); can be rounded or truncated as long as they remain different C1 (dep on M1) for conclusion ft from three comparable figures eg cost of 600 plants or comparing small and medium and small and large e.g. 120 plants and 150 plants separately] **OR** M1 for one calculation e.g 30 ÷ 6.5 (= 4.615…) **or** 40 ÷ 8.95 (= 4.469…) **or** 50 ÷ 10.99 (= 4.549…) M1 for three calculations e.g. 30 ÷ 6.5 (= 4.615…) **and** 40 ÷ 8.95 (= 4.469…) **and** 50 ÷ 10.99 (= 4.549…) A1 for 4.6(15…) **and** 4.4(69…) **and** 4.5(49…) can be rounded or truncated as long as they remain different C1 (dep on M1) for conclusion ft from three comparable figures [or any other calculations leading to comparable figures]

PAPER: 1MA0_2H

PAPER: 1MA0_2H

Question	Working	Answer	Mark	Notes
14 (a)		$20 < T \leq 24$	1	B1 for $20 < T \leq 24$
(b)	$6\times10 + 8\times14 + 13\times18 + 21\times22 + 2\times26 = 920$ $920 \div 50$	18.4	4	M1 for finding fx with x consistent within intervals (including the end points) allow 1 error; implied by 820, 1020 M1 (dep) for use of all correct mid-interval values eg 920 M1 (dep on 1st M1) for $\sum fx \div \sum f$ A1 for 18.4 oe
(c)		correct frequency 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

3	(a)		14 | 8 9 15 | 0 2 4 6 8 16 | 1 3 5 6 7 17 | 0 1 4	3	B2 for fully correct diagram (The order of the numbers in the stem may be reversed) (B1 for ordered or unordered leaves with one error or omission) B1 for correct key (units may be omitted)
	(b)		15	2	M1 for 167 – 152 or 167 or 152 identified A1 for 15 or ft their stem and leaf diagram

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Question		**Working**	**Answer**	**Mark**	**Notes**
*4			Jack with comparison	3	M1 for per gallon cost: 52÷8 (=6.50) or 58÷8.8 (=6.59) A1 for 6.50 and 6.59 C1 (dep on M1) for correct decision from their figures if comparable OR M1 for per litre cost: 8÷40 (=1.45) or 52÷36 (=1.44) A1 for 1.45 and 1.40−1.44 C1 (dep on M1) for correct decision from their figures if comparable NB accept equivalent methods

2			0 | 5 9 1 | 3 5 6 8 9 9 2 | 1 2 3 3 5 7 8 9 3 | 1 2 4 4 | 0	3	B2 for fully correct diagram. Accept a stem of 10, 20, etc. (B1 for ordered with at most 2 errors or omissions or for correct unordered diagram) B1 for a correct key (units may be omitted) consistent with diagram.

3		<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 a 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

<table>
<tr>
<td>7</td>
<td>(a)</td>
<td>
1 | 8 9
2 | 0 1 7 9
3 | 2 4 5 6 9 9
4 | 2 4 5
</td>
<td>
1 | 0 3 4 5 6 8
2 | 0 3
3 | 2 6
4 | 2 3 5 5 6
5 | 4
</td>
<td>3</td>
<td>B2 for a fully ordered diagram
(B1 for a correct unordered diagram or ordered with at most two errors)
B1 for a correct key</td>
</tr>
<tr>
<td></td>
<td>*(b)</td>
<td>
<table>
<tr><td></td><td>Gym</td><td></td><td>Pool</td></tr>
<tr><td>HV</td><td>45</td><td><</td><td>54</td></tr>
<tr><td>LV</td><td>18</td><td>></td><td>10</td></tr>
<tr><td>Mean</td><td>32</td><td>></td><td>29.5</td></tr>
<tr><td>Median</td><td>34</td><td>></td><td>27.5</td></tr>
<tr><td>Range</td><td>27</td><td><</td><td>44</td></tr>
</table>
</td>
<td>Compares:
medians/means
+
Spread</td>
<td>3</td>
<td>A maximum of two B marks from:
B1 for a correct mean or median for either the gym ages or the pool ages.
B1 for a correct range for either the gym ages or the pool ages.
B1 for a correct stem and leaf diagram drawn for the gym ages (no need for a key)

C1 for any correct comparison which relates to the context of the gym ages and pool ages, of either medians means or ranges from correct figures, or from stem & leaf diagrams</td>
</tr>
</table>

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3		<table><tr><td>8</td><td>4 8 9</td></tr><tr><td>9</td><td>0 0 1 1 2 3 5 7 8</td></tr><tr><td>10</td><td>2 3 6 8</td></tr><tr><td>11</td><td>0 5</td></tr></table> 8 | 4 represents 84(cm)	correct stem and leaf with key	3	B2 for a fully correct ordered diagram (B1 for a correct unordered diagram or ordered with at most two errors or omissions with stems 8, 9, 10 and 11 present) B1 for a correct key (units not necessary) Accept stem written as 80, 90, etc. but key only if consistent with this

PAPER: 1MA0_2H

Question		Working	Answer	Mark	Notes
8			Polygon drawn	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.

PAPER: 1MA0_2H					
Question		**Working**	**Answer**	**Mark**	**Notes**
*9			Decision (No the attendance target was not met)	3	M1 for attempting to find total number of students or 1210 seen M1 for $\frac{'1092'}{'1210'} \times 100$ oe or $\frac{'118'}{'1210'} \times 100$ oe C1 for correct decision with 90.(2479...) or correct decision with 6 and 9.(752...) **OR** M1 for attempting to find total number of students or 1210 seen M1 for $\frac{94}{100} \times$ '1210' oe C1 for correct decision with 1137 (.4) and 1092 or correct decision with 72(.6) and 118 **OR** M1 for a correct % method for one year, e.g. $\frac{192}{208} \times 100$ or $\frac{94}{100} \times 208$ M1 for a correct % method for each year C1 for correct decision with 92.(30...), 90.(87...), 89.(31...), 89.(27...), 89.(91...) or 195(.5..), 226.(9…), 246.(2..), 245.(3…), 223.(7…)

PAPER: 1MA0_2H

Question		Modification	Notes
1		Size x 1½. 4th horizontal line drawn in.	

4		Grid: 2 cm squares both axes, right axes labelled. Horizontal axis – heavier lines at 120, 140, 160, 180, and 200 Vertical axis heavier lines at 5, 10 and 15	

Question		Working	Answer	Mark	Notes
1	(a)		15 | 6 9 16 | 4 5 7 7 8 9 17 | 2 3 6 6 8 9 18 | 0 2 3 8 19 | 0 2 with key	3	B2 for a correct ordered stem and leaf diagram (B1 for fully correct unordered or ordered with one error or omission) B1 (indep) for key (units not required)
	(b)		15	2	M1 for a method to find "3" as a percentage of the total number of men, eg $\frac{"3"}{"20"}\times 100$ oe $\frac{"3"\times 5}{100}$ or ft from their diagram A1 for 15 cao

PAPER: 1MA0_2H

Question		Working	Answer	Mark	Notes
9	(a)		Polygon drawn	2	B2 for correct plotting of 5 points and joining with line segments (B1 for points plotted correctly at midpoints of intervals **OR** joining points with line segments at the correct heights and consistent within the class interval (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
	*(b)		Yes with reason	2	M1 for finding a quarter of 51 and for finding how many teachers sent more than 30 emails C1 for 12.75 or 13 compared to 15 and yes she is correct OR M1 for finding how many teachers sent more than 30 emails and '15'× 4 C1 for comparing 60 with 51 and yes she is correct OR M1 for 15 ÷ 51 (= 0.29...) or $\frac{15}{51}$ × 100 (= 29…%) C1 for comparing 0.29.. with $\frac{1}{4}$ or 0.25 OR 29….% with 25% and yes she is correct

6	(a)		0 8 9 1 4 7 8 8 2 0 1 1 2 2 5 6 3 0 3	3	B2 for a fully correct ordered stem and leaf diagram [B1 for a complete unordered diagram or for an ordered diagram with at most 2 errors] B1 (indep) key
	(b)		20	2	M1 for 36 ÷ (5 + 4) (=4) A1 cao

1MA0 1H November 2015

Question		Working	Answer	Mark	Notes
8		2p 1p ½ p Tot Sat 7 16 (31) 54 Sun (15) 14 17 (46) Tot (22)(30) 48 (100)	14	4	M1 for total Sat bottles 100 – 46 (=54) or for total ½ pint bottles 100 – 22 – 30 (=48) or (total 2 pint bottles on Sat) 22 – 15 (=7) M1 for total Sun bottles of ½ pint "48" – 31 (=17) or for total Sat bottles of 1 pint: "54" – 31 – (22 −15) (=16) M1 for 46 – 15 – "17" or for 30 – "16" A1 cao NB: any of the above figures could be shown in a 2-way table
*9			NO with evidence	4	M1 for 50 × 40 × 30 (=60000) M1 for "60000" ÷ 3000 (=20) M1 for "20" × £3.50 C1 eg for 70 and comparison resulting in NO OR M1 for £60 ÷ 3.50 (=17 bottles) M1 for "17" × 3000 (=51000) M1 for 50 × 40 × 30 (=60000) C1 eg for 51000 and 60000 and comparison resulting in NO

1MA0 1H November 2015

Question		Working	Answer	Mark	Notes
1		2 3 5 8 9 3 2 5 7 8 9 4 1 2 4 5 1 6 1 3	Stem and leaf with key	3	B2 for a fully correct ordered stem and leaf (B1 for a correct unordered stem and leaf or for an ordered stem and leaf with at most 1 error or omission) B1 (indep) for a correct key (units not required)

Original question 3

The full source mark scheme begins on page 135. Use the original paper code, tier and question number shown above.

11	<table><tr><td></td><td>S</td><td>A</td><td>B</td><td></td></tr><tr><td>M</td><td>4</td><td>9</td><td>10</td><td>23</td></tr><tr><td>F</td><td>6</td><td>11</td><td>26</td><td>43</td></tr><tr><td></td><td>10</td><td>20</td><td>36</td><td>66</td></tr></table>	11	4	M1 for a correct first step which results in a value that could be in the table: ie. 66 – 10 – 20 (= 36) or 66 – 43 (= 23) or 10 – 4 (= 6) M1 for correct method to find a second value that could be in the table using their first value eg “23” – 4 - 10 (= 9) or “36” - 10 (= 26) M1 for a fully correct and complete method. A1 cao

PAPER: 1MA0_2H

Question		Working	Answer	Mark	Notes
1	(a)		1 | 4 6 8 9 2 | 1 2 3 5 7 9 3 | 0 4 6 8 8 4 | 1 3 6 6 8	3	B2 for correct ordered stem and leaf (B1 for fully correct unordered, or ordered with one error or omission) B1 (indep) for key (units not required but must be correct if stated) eg. 1 | 4 = 14 (marks)
	(b)		$\frac{9}{20}$ oe	2	B2 for $\frac{9}{20}$ oe or ft from stem and leaf diagram (B1 for $\frac{x}{20}$ where $x < 20$, $x \neq 9$ or $\frac{9}{y}$ where $y > 9$ or ft from stem and leaf diagram)

6			Tulip 130 Hyacinth 90 81° and 162° sectors	4	M1 for 360 ÷ 400 (= 0.9) or 400 ÷ 360 (= 1.1..) M1 for 117 ÷ "0.9" (=130) or 117 × "1.1.." (=130) or 400 – 180 – 130 (= 90) M1 for "90" × "0.9" (=81) or "90" ÷ "1.1.." (=81) or 180 × "0.9" (=162) or 180 ÷ "1.1.." (=162) A1 2 correct angles drawn on pie chart ± 2° with labels.

Question	Working	Answer	Mark	Notes
6 (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.

Question	Working	Answer	Mark	Notes
1	3 | 1 3 7 4 | 1 4 4 7 8 8 5 | 1 2 3 5 6 6 6 6 | 0 1 3 4	Diagram and key	3	B2 for fully correct diagram (accept a stem of 30, 40, 50, 60, the order of the numbers in the stem may be reversed) (B1 for one error or omission or unordered diagram with no errors) B1 for a correct key (units may be omitted but must be correct if stated) eg 3 | 1 = 31 (mm)

17	(a)		Question and responses	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 response boxes which are exhaustive for their question NB Do not accept inequality signs
	(b)		53 or 54	2	M1 for $\frac{460}{1709} \times 200$ (= 53.8...) oe A1 for 53 or 54

PAPER: 1MA0/2H				
Question	**Working**	**Answer**	**Mark**	**Notes**
*18		28°	4	M1 for angle *ABD* = 62° M1 for angle *BAD* = 90° C2 for angle *ADB* = 28° with full, appropriate reasons given angles in the same segment are equal; angles in a semicircle are 90°; angles in a triangle add up to 180° (C1 (dep on relevant M1) for one correct and appropriate reason relating to a circle theorem) OR M1 for angle *AOD* = 62° × 2 (= 124°) M1 for (180° − 124°) ÷ 2 C2 for angle *ADB* = 28° with full, appropriate reasons given the angle at the centre of a circle is twice the angle at the circumference; base angles of an isosceles triangle are equal; angles in a triangle add up to 180° (C1 (dep on relevant M1) for one correct and appropriate reason relating to a circle theorem)

PAPER: 1MA0/2H

Question	Working	Answer	Mark	Notes
1		4 | 7 8 8 5 | 0 0 1 3 5 7 8 6 | 1 2 4 6 6 9 7 | 3 5 8 4 | 7 represents 47 grams	3	B2 for fully correct ordered diagram (B1 for correct unordered diagram or ordered with at most 2 errors) B1 for correct key, eg 4 | 7 represents 47 (grams)

Question	Working	Answer	Mark	Notes
8	<table><tr><td></td><td>Co</td><td>Ju</td><td>Wa</td><td>Total</td></tr><tr><td>B</td><td>25</td><td></td><td>17</td><td></td></tr><tr><td>G</td><td></td><td>16</td><td></td><td>45</td></tr><tr><td>Total</td><td></td><td></td><td>37</td><td>99</td></tr></table> OR 37 – 17 = 20 45 – (20 + 16) = 9 25 + 9 =34 OR 99 – 45 =54 54 – (17 + 25) =12 99 – (37 + 12 + 16) = 34	34	4	M1 for a two-way table with clear labelling showing at least 3 values of the given information correctly placed M1 for 54 or 20 M1 for 9 or 12 A1 cao OR M1 for 37 – 17 (=20) M1 for 45 – (‘20’ + 16) (= 9) M1 for 25 + ‘9’ (=34) A1 cao OR M1 for 99 – 45 (=54) M1 for 54 – (17 + 25) (=12) M1 for 99 – (37 + 12 + 16) (=34) A1 cao

Paper: 1MA1/1H

Question	Working	Answer	Mark	Notes
3 (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 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 frequency polygon

11		0.119	P1 P1 A1	for starting the process, eg finds area 25π or 16π oe, or finds angle for town A, 0 – 19 (70°), may be on diagram for a complete process, eg $\frac{70}{360} \times \frac{25\pi}{41\pi}$ 0.118 – 0.119 or 11.8% - 11.9%

Paper: 1MA1/2H

Paper: 1MA1/3H

Question	Working	Answer	Mark	Notes
1 (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: 1MA1/3H

Question	Answer	Mark	Mark scheme	Additional guidance
7	Diagram drawn	B2 (B1	for correct frequency polygon for points plotted at correct midpoints of intervals **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)	Plotting at (5,14), (15,18), (25,26), (35,12) Must use line segments for B2 Joining must be with line segments NB ignore any histogram drawn and any part of frequency polygon outside range of first and last points plotted

Paper: 1MA1/3H

Question	Answer	Mark	Mark scheme	Additional guidance
3 (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: 1MA1/3H

Question	Answer	Mark	Mark scheme	Additional guidance
4	statement	B2	Two different statements **Acceptable** eg should be joined with straight lines (not curve)/should use a ruler 1st (quarter) not shown/plotted/labelled/not all quarters labelled does not show all 4 seasons 9.5 missing from vertical axes/not linear vertical (number) axis does not start at 0/the *y* axis starts at 6 the graph does not begin at 0, it starts at 6 it is not clear what 2, 3, 4 on the *x*-axis mean the scale of years doesn't make sense there is lack of clarity about what the numbers on the *x* axis represent graph is curved line **Not acceptable** eg no value plotted for 2 in 2016 it does not start at 0 (no reference to vertical axis)/missing 0 they should not have connected the dots like that the numbers on the *x* axis are repeated the numbers along the *x* axis 2, 3, 4 the years on the *x* axis have not been written properly does not follow a sequence it needs a discontinuity wiggle on the axis no title	Ignore additional statements provided no contradiction
	statement	(B1	One statement eg from those above.)	

Paper: 1MA1/3H

Question	Answer	Mark	Mark scheme	Additional guidance
21	210	M1	for method to find total frequency, 60 × 2 (= 120) + 30 × 5 (= 150) + 30 × 9 (= 270) + 15 × 6 (= 90) + 45 × 2 (= 90) or 720 **OR** for method to find the total area, 4 + 5 + 9 + 3 + 3 (= 24 cm^2)	Accept one error in total for the award of the method marks 24 must be from adding areas of bars not heights of bars
		M1	for finding the number of onions less than 60g or greater than 120 g = 120 + 90 + 90 (= 300), **OR** for finding the number of onions between 60g and 120g = 150 + 270 (= 420) **OR** for finding the area under the graph less than 60 or greater than 120 = 4 + 3 + 3 (= 10 cm^2) **OR** for finding the area under the graph between 60 and 120 = 5 + 9 (= 14 cm^2)	14 must be from adding areas of bars not heights of bars
		M1	(dep M2) for $1 - \frac{"300"}{"720"} \left(= \frac{7}{12}\right)$ oe OR for $\frac{"420"}{"720"} \left(= \frac{7}{12}\right)$ oe OR for $\frac{"14"}{"24"} \left(= \frac{7}{12}\right)$ oe	Accept 58.3...%
		A1	cao	

Paper: 1MA1/3H

Paper: 1MA1/2H

Question	Answer	Mark	Mark scheme	Additional guidance
1	Two statements	C2	Two different statements **Acceptable** There is no 'frequency' label / *y*-axis is not labelled / no title for the *y*-axis The polygon should not be closed / have a line at the bottom / have first and last points connected (15, 6) has been plotted incorrectly / at (15, 8) / (The first point is at) 8 rather than 6 / First point is on an incorrect frequency **Not acceptable** There is no title / Points should be joined with a curve / *x*-axis doesn't start at 0 There is no label / The axes have not been labelled (*x* and *y*) The points haven't (all) been plotted correctly $10 < w \leq 20$ and $30 < w \leq 40$ have been plotted wrong The first point is plotted incorrectly, its at (15, 7) not (15, 6) The points have been joined up wrong / Points should not be joined in the shape of a triangle / They've connected all the points Done the midpoints rather than the numbers on the right side / The points are in the middle	Ignore additional statements provided no contradiction
		(C1	for one statement eg from those above)	

12	Box plot	M1 M1 A1	for correctly identifying one of the LQ (188), median (197) or UQ (209) from the stem leaf for showing a box and at least 3 correctly plotted values from 173, 188, 197, 209, 219 for a fully correct box plot	May be implied by one of these values being correctly plotted.

Paper: 1MA1/1H

Question	Answer	Mark	Mark scheme	Additional guidance
7	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: 1MA1/3H

Question	Answer	Mark	Mark scheme	Additional guidance
5	40 missing from frequency scale Incorrect point (50, 5)	C2	Two different statements **Acceptable** eg (50, 5) / the last point is incorrect the last point should be at (45,5) the last point plotted was placed incorrectly for his last point he has plotted by the end of the data and for the rest he has plotted by the middle he did not use the midpoint, he used 50 instead of 45 40 missing (from vertical axis) vertical scale is not linear the frequency doesn't increase in the same intervals the vertical axis is not right **Not acceptable** eg the last point should be at (40, 5) bottom of the polygon should be connected he didn't start the graph at the origin he did not draw a polygon he has plotted the first 4 points at midpoint	Ignore additional statements provided no contradiction
		(C1	One acceptable statement)	

3	22	P1 P1 A1	for process to find total German eg 200 – 104 – 70 (= 26) for complete process to find boys choosing Spanish eg 90 – (60 + (“26” – 18)) cao	for process to find girls choosing French, eg 104 – 60 (= 44) or girls total, eg 200 – 90 (= 110) for complete process to find boys choosing Spanish eg 70 – (“110” – “44” – 18)	

	F	S	G	total
girls	**44**	48	18	**110**
boys	60	**22**	**8**	90
total	104	70	**26**	200

Paper: 1MA1/3H

4	Frequency polygon drawn	B2	for fully correct frequency polygon with points plotted at the midpoints	Joining must be with line segments Accept points plotted within half a small square Ignore any histogram drawn and any part of a frequency polygon outside range of first and last points plotted
	(2.5, 8), (7.5, 24) (12.5, 13) (17.5, 11) (22.5, 4)	(B1	for all points plotted correctly but not joined with line segments **or** points plotted at correct heights not at midpoints but consistently within each interval and joined with line segments **or** correct frequency polygon with one point incorrect **or** correct frequency polygon with first and last points joined directly)	for example, at 0, 5, 10,…or at 5, 10, 15,…

Paper: 1MA1/1H

Question	Answer	Mark	Mark scheme	Additional guidance
1	Points plotted at (130, 12) (150, 28) (170, 30) (190, 22) (210, 8) and joined with line segments	B2 (B1	for correct plotting of 5 points and joining with line segments for points plotted correctly at midpoints **or** for a frequency polygon with one point incorrect **or** for a frequency polygon with first and last point joined directly **or** for joining the points with line segments at the correct heights consistent within intervals (including end points))	Ignore any histogram drawn Ignore any part of the frequency polygon outside of the range of the first and last point plotted. for example, at 120, 140, 160, 180, 200 or at 140, 160, 180, 200, 220

Paper: 1MA1/3H

Question	Answer	Mark	Mark scheme	Additional guidance
6	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

Question	Answer	Mark	Mark scheme	Additional guidance
1	Points plotted at (5, 12) (15, 25) (25, 10) (35, 8) (45, 5) and joined with line segments	B2 (B1	for correct plotting of all 5 points at midpoints **and** joining with line segments for correct plotting of all 5 points at midpoints joined with a curve or missing / no line segments **or** for a frequency polygon with one point incorrect **or** for a frequency polygon with first and last point joined directly **or** for plotting of all 5 points at the correct heights consistent within intervals (including end points) **and** joining with line segments	Ignore any histogram drawn Ignore any part of the frequency polygon outside of the range of the first and last point plotted. for example, at 0, 10, 20, 30, 40 or at 10, 20, 30, 40, 50

Paper: 1MA1/3H

PMT

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Mark Scheme (Results)

Summer 2012

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

PMT

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NOTES ON MARKING PRINCIPLES

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

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

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

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

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

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

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

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

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

7 With working

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

8 Follow through marks

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

9 Ignoring subsequent work

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

10 Probability

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

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

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

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

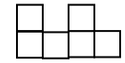
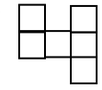
Guidance on the use of codes within this mark scheme
M1 – method mark A1 – accuracy mark B1 – Working mark C1 – communication mark QWC – quality of written communication oe – or equivalent cao – correct answer only ft – follow through sc – special case dep – dependent (on a previous mark or conclusion)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

PMT

1MA0_1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
1	(a)		380	1	B1 cao
	(b)		6.2	1	B1 cao
	(c)		Arrow at 34	1	B1 cao
2	(a)		8	1	B1 for 8 ± 0.2
	(b)		35	1	B1 for 35 ± 2°
	(c)		Circle drawn	1	B1 for all parts within ± 2mm, (use overlay)
3	(a)		4, 7, 4, 3, 2	2	M1 for at least 3 correct tallies **or** at least 3 correct frequencies A1 for all frequencies correct
	(b)		7	1	B1 for 7 **or** ft from frequencies in (a) or tallies if no frequencies
	(c)		Diagram drawn	3	M1 for bar chart or other suitable chart with at least 3 correct heights for their scale (can f.t.) A1 for all 5 bars correctly labelled and vertical axis correctly scaled A1 for fully correct **or** ft frequencies in (a) **OR** M1 for pictogram with at least 3 correct rows (can f.t.) A1 for correct labels on all 5 rows and correctly key A1 for fully correct **or** ft frequencies in (a) **OR** M1 for pie chart with at least 3 correct sectors ± 2° (can f.t.) A1 for all 5 sectors correctly labelled A1 for fully correct **or** ft frequencies in (a)

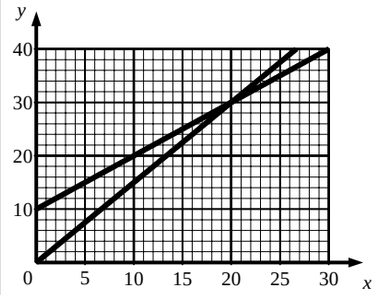
PMT

1MA0_1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
4		£1.18 + 94p = £2.12 £5 – £2.12 – 30p = £2.58 £2.58 ÷ 2 =	1.29	3	M2 for (5 – 1.18 – 0.94 – 0.30) ÷ 2 oe **or** digits 129 (M1 for 1.18 + 0.94 **or** 2.12 seen **or** 1.18 + 0.94 + 0.30 oe **or** 2.42 seen **or** 5 – 1.18 – 0.94 oe **or** 2.88 seen **or** (5 – 1.18 – 0.94) ÷ 2 **or** 1.44 seen **or** 5 – 1.18 – 0.94 – 0.30 oe **or** 2.58 seen) A1 cao **NOTE**: Accept working in £ or pence
5	(a)(i)		(2, 3)	2	B1 cao
	(ii)		(–3, 1)		B1 cao
	(b)		Point plotted at (3, –4)	1	B1 cao
6	(a)		– 5	1	B1 cao
	(b)		6	1	B1 for 6 or – 6
	(c)		3	1	B1 cao
7			(P, B), (P, S), (P, L) (M, B), (M, S), (M, L) (H, B), (H, S), (H, L)	2	M1 for any 3 combinations with no incorrect combinations A1 for all 9 combinations with no duplicates or extras
8	(a)		Walk	1	B1 cao
	(b)	24 ÷ 4 =	6	2	M1 for 24 ÷ 4 oe or ¼ oe seen A1 cao

1MA0_1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
9	(a)		Isosceles triangle	1	B1 for isosceles triangle
	(b)		Rectangle with area 12 cm^2	2	M1 for rectangle drawn A1 cao
10	(a)		A marked at 0	1	B1 for A marked at 0 (within overlay)
	(b)		B marked at 1/4	1	B1 for B marked at 1/4 (within overlay)
11	(a)		9	1	B1 cao
	(b)		33	2	M1 for 5 × 5 **or** 25 seen in the working **or** 2 × 2 × 2 **or** 8 seen in the working A1 cao
12	(a)		20	2	M1 3 × 3 × 3 oe seen or drawn or 27 seen or use of 3 layers A1 cao
	(b)			2	B2 for correct view (B1 for  or )
13	(a)(i)		07 29	2	B1 for 07 29
	(ii)		36		B1 for 36 or ft difference between (i) and 06 53
	(b)		07 51	1	B1 cao
	(c)		09 55	1	B1 for 09 55 or 9 55 or five to ten

1MA0_1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
14		2 + 8 + 2 + 8 = 20 20 ÷ 4 =	5	4	M2 for 2 + 8 + 2 + 8 oe **or** 20 seen **or** (2 + 8) ÷ 2 oe (M1 for the sum of 3 sides of the rectangle) M1 (dep) for the sum of 3 or 4 sides of the rectangle ÷ 4 **or** an attempt to evaluate (2 + 8) ÷ 2 oe to get the length of one side A1 cao **SC**: B1 for an answer of 4 coming from $\sqrt{2\times 8}$ oe
15	(a)		4	1	B1 cao
	(b)	9.5 – 4.75 = **OR** 9.5 ÷ 2 =	4.75	2	M1 for 9.5 – 4.75 **or** 9.5 ÷ 2 **or** 4.75 – 9.5 A1 cao
	(c)		6	1	B1 cao
	(d)	12 × 4 =	48	2	M1 for × 4 seen **or** identifying + 0.5 for every 2 inches **or** 12 + 12 + 12 + 12 oe **or** build up method eg 12, 24, 36, 48 allow one error A1 cao
16	(a)		trapezium	1	B1 for trapezium or isosceles trapezium
	(b)			2	B2 for correct tessellation (at least 5 more shapes) (B1 for at least 4 shapes (including initial shape) correctly tessellating)

1MA0_1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
17*		S: 35 ÷ 100 × 40 = 14 W: 40 ÷ 8 × 3 = 15 **OR** D: 16 ÷ 40 (× 100) = 0.4 (40%) W: 3 ÷ 8 (× 100) = 0.375 (37.5%) **OR** D: $\frac{16}{40} = \frac{80}{200}$ S: $\frac{35}{100} = \frac{70}{200}$ W: $\frac{3}{8} = \frac{75}{200}$	Debbie and correct calculations	4	**Compares Marks out of 40 or fractions with denominator of 40** M1 for 35 ÷ 100 × 40 oe **or** 14 seen (or 14/40 seen) M1 for 40 ÷ 8 × 3 **or** 15 seen (or 15/40 seen) A1 for 14 and 15 **or** $\frac{14}{40}$ and $\frac{15}{40}$ C1 (dep on M1) for correct conclusion for their working QWC with 3 comparable marks: Decision and justification should be clear with working clearly presented and attributable. **OR Decimals (or Percentages)** M1 for 16 ÷ 40 (× 100) oe **or** 0.4 (or 40) seen M1 for 3 ÷ 8 (× 100) oe **or** 0.375 (or 37.5) seen A1 for 0.4 and 0.375 (**or** 40 and 37.5) C1 (dep on M1) for correct conclusion for their working QWC: with 3 comparable decimals (or percentages: Decision and justification should be clear with working clearly presented and attributable. **OR Compares Fractions with denominator other than 40** M1 for attempt to convert all to fractions with a common denominator other than 40 M1 for at least 1 correct A1 for $\frac{80}{200}$ and $\frac{70}{200}$ and $\frac{75}{200}$ oe C1 (dep on M1) for correct conclusion for their working QWC with 3 comparable fractions: Decision and justification should be clear with working clearly presented and attributable.

1MA0_1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
18*	(a)		10	1	B1 cao
	(b)	 **Miles** 0 10 20 30 40 50 **Ed** 0 15 30 45 60 75 **Bill** 10 20 30 40 50 60	Ed is cheaper up to 20 miles, Bill is cheaper for more than 20 miles	3	M1 for correct line for Ed intersecting at (20,30) ±1 sq tolerance **or** $10 + x = 1.5x$ oe C2 (dep on M1) for a correct full statement ft from graph eg. Ed cheaper up to 20 miles **and** Bill cheaper for more than 20 miles (C1 (dep on M1) for a correct conclusion ft from graph eg. cheaper at 10 miles with Ed ; eg. cheaper at 50 miles with Bill eg. same cost at 20 miles; eg for £5 go further with Bill **or** A general statement covering short **and** long distances eg. Ed is cheaper for shorter distances **and** Bill is cheaper for long distances) **OR** (continued on next page)

1MA0_1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
18 (contd)					**OR** M1 for correct method to work out Ed's delivery cost for at least 2 values of n miles where $0 < n \leq 50$ **or** for correct method to work out Ed and Bill's delivery cost for n miles where $0 < n \leq 50$ C2 (dep on M1) for 20 miles linked with £30 for Ed and Bill with correct full statement eg. Ed cheaper up to 20 miles **and** Bill cheaper for more than 20 miles (C1 (dep on M1) for a correct conclusion eg. cheaper at 10 miles with Ed; eg. cheaper at 50 miles with Bill eg. same cost at 20 miles; eg for £5 go further with Bill **or** A general statement covering short **and** long distances eg. Ed is cheaper for shorter distances **and** Bill is cheaper for long distances) SC: B1 for correct full statement seen with no working eg. Ed cheaper up to 20 miles **and** Bill cheaper for more than 20 miles QWC Decision and justification should be clear with working clearly presented and attributable

1MA0_1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
19		1,96 × 2.25 = 4.41 **OR** 4.23 ÷ 9 = 0.47 1.96 ÷ 4 = 0.49 **OR** 4.23 × 4 = 16.92 1.96 × 9 = 17.64 **OR** 4.23 ÷ 9 = 0.47 0.47 × 4 = 1.88 **OR** 1.96 ÷ 4 = 0.49 0.49 × 9 = 4.41 **OR** 9 ÷ 4.23 = 2.12 4 ÷ 1.96 = 2.04	Pack of 9	3	M2 for a fully correct method to enable a conclusion eg 1.96 × 2¼ **OR** M1 for 4.23 ÷ 9 or 423 ÷ 9 **or** 0.47 seen **or** 47 seen M1 for 1.96 ÷ 4 or 196 ÷ 4 or 0.49 seen or 49 seen **OR** M1 for 4.23 × 4 **or** 423 × 4 **or** 16.92 seen **or** 1692 seen M1 for 1.96 × 9 **or** 196 × 9 **or** 17.64 seen **or** 1764 seen **OR** M1 for 4.23 ÷ 9 **or** 423 ÷ 9 **or** 0.47 seen **or** 47 seen M1 for 0.47 × 4 **or** 47 × 4 **or** 1.88 seen **or** 188 seen **OR** M1 for 1.96 ÷ 4 **or** 196 ÷ 4 **or** 0.49 seen **or** 49 seen M1 for 0.49 × 9 **or** 49 × 9 **or** 4.41 seen **or** 441 seen **OR** M1 for 9 ÷ 4.23 **or** 2.12(...) seen **or** 2.13 seen M1 for 4 ÷ 1.96 **or** 2.04(...) seen A1 for Pack of 9 and fully correct calculations **NOTE:** B0 for an answer of 9 not supported by working.
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**
22	(a)	360 ÷ 60 = 6 300 ÷ 60 = 5 6 × 5 =	Yes and 30	3	M1 for dividing side of patio by side of paving slab eg 360 ÷ 60 **or** 300 ÷ 60 **or** 3.6 ÷ 0.6 **or** 3 ÷ 0.6 **or** 6 and 5 seen **or** 6 divisions seen on length of diagram **or** 5 divisions seen on width of diagram M1 for correct method to find number of paving slabs eg (360 ÷ 60) × (300 ÷ 60) oe **or** 6 × 5 **or** 30 squares seen on diagram (units may not be consistent) A1 for Yes **and** 30 (or 2 extra) with correct calculations **OR** M1 for correct method to find area of patio **or** paving slab eg 360 × 300 **or** 108000 seen **or** 60 × 60 **or** 3600 seen **or** 3.6 × 3 **or** 10.8 seen **or** 0.6 × 0.6 **or** 0.36 seen M1 for dividing area of patio by area of a paving slab eg. (3.6 × 3) ÷ (0.6 × 0.6) oe (units may not be consistent) A1 for Yes **and** 30 (or 2 extra) with correct calculations **OR** M1 for method to find area of patio and area of 32 slabs eg. 60 × 60 × 32 **or** 360 × 300 M1 for method to find both areas eg. 60 × 60 × 32 **and** 360 × 300 (units may not be consistent) A1 for Yes **and** 115200 **and** 108000 **OR** Yes **and** 11.52 **and** 10.8 **NB :** Throughout the question, candidates could be working in metres or centimetres

1MA0_1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
22	(b)	1726 25890 27616 **8 6 3** **2** 2 4 1 8 9 **3** **7** 1 6 1 2 6 **2** 6 1 6 800 60 3 30 24000 1800 90 2 1600 120 6 24000 + 1800 + 90 + 1600 + 120 + 6 = 27616	276.16	3	M1 for complete correct method with relative place value correct. Condone 1 multiplication error, addition not necessary. **OR** M1 for a complete grid. Condone 1 multiplication error, addition not necessary. **OR** M1 for sight of a complete partitioning method, condone 1 multiplication error. Final addition not necessary. A1 for digits 27616 A1 ft (dep on M1) for correct placement of decimal point after addition (of appropriate values) (SC: B1 for attempting to add 32 lots of 8.63)
23	(a)		30	2	M1 for 25 ÷ 10 **or** 2.5 seen **or** 10 ÷ 25 **or** 0.4 seen **or** 12+12+6 oe **or** a complete method eg. 25×12÷10 oe A1 cao
	(b)	1000 ÷ 200 × 12	60	2	M1 for 500 ÷ 50 **or** 1000 ÷ 200 **or** 500 ÷ 10 **or** correct scale factor clearly linked with one ingredient eg 10 with sugar or 5 with butter or flour or 50 with milk **or** an answer of 120 or 600 A1 cao

1MA0_1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
24		Acton after 24, 48, 72, 96, .. Barton after 20, 40, 60, 80, .. LCM of 20 and 24 is 120 9:00 am + 120 minutes **OR** Acton after 24, 48, 1h 12 min... Barton after 20, 40, 1 h LCM is 2 hours 9:00 am + 2 hours **OR** Times from 9:00 am when each service leaves the bus station Acton at 9:24, 9:48, 10:12.. Barton at 9:20, 9:40, 10:00.. **OR** 20 = 2 × 2 × 5 24 = 2 × 2 × 2 × 3 2 × 2 × 2 × 3 × 5 = 120	11:00 am	3	M1 for listing multiples of 20 and 24 with at least 3 numbers in each list ; multiples could be given in minutes or in hours and minutes (condone one addition error in total in first 3 numbers in lists) A1 identify 120 (mins) **or** 2 (hours) as LCM A1 for 11:00 (am) **or** 11(am) **or** 11 o'clock **OR** M1 for listing times after 9am when each bus leaves the bus station, with at least 3 times in each list (condone one addition error in total in first 3 times after 9am in lists) A1 for correct times in each list up to and including 11:00 A1 for 11:00 (am) **or** 11(am) **or** 11 o'clock **OR** M1 for correct method to write 20 and 24 in terms of their prime factors 2, 2, 5 and 2, 2, 2, 3 (condone one error) A1 identify 120 as LCM A1 for 11:00 (am) **or** 11(am) **or** 11 o'clock

1MA0_1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
25	(a)		$6y - 15$	1	B1 cao
	(b)		$4x(2x + y)$	2	B2 cao (B1 for $x(8x + 4y)$ **or** $2x(4x + 2y)$ **or** $4(2x^2 + xy)$ **or** $4x(ax + by)$ where a, b are positive integers **or** $ax(2x + y)$ where a is a positive integer **or** $4x(2x \quad y)$)
	(c)	$10t = gh$ $h = \frac{10t}{g}$	$\frac{10t}{g}$	2	M1 for clear intention to multiply both sides of the equation by 10 (eg. ×10 seen on both sides of equation) **or** clear intention to divide both sides of the equation by g (eg. ÷ g seen on both sides of equation) **or** $10t = gh$ **or** $\frac{t}{g} = \frac{h}{10}$ **or** fully correct reverse flow diagram eg. ← ×10 ← ÷g ← A1 for $\frac{10t}{g}$ oe

1MA0_1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
26	(a)	$2 \times 5 \times 2 = 20$ $300 \div 20 =$	15	3	M2 for $300 \div (2 \times 5 \times 2)$ oe (M1 for $2 \times 5 \times 2$ **or** 20 seen **or** $300 \div (2 \times 5)$ **or** 30 seen A1 cao
	(b)	$c = \frac{30 \times 40}{150}$ =	8	2	M1 for $\frac{30 \times 40}{150}$ **or** 1200 seen A1 cao
27		$3x - 15 = 2x + 24$ $x = 39$ **OR** $2x + 3x - 15 + 2x + 2x + 24 = 360$ $9x + 9 = 360$ $9x = 351$ $x = 39$ **OR** $2x + 2x + 24 = 180$ $4x + 24 = 180$ $4x = 156$ $x = 39$ **OR** $2x + 3x - 15 = 180$ $5x - 15 = 180$ $5x = 195$ $x = 39$	39	3	M1 for forming an appropriate equation eg $3x - 15 = 2x + 24$ **or** $2x + 3x - 15 + 2x + 2x + 24 = 360$ oe **or** $2x + 2x + 24 = 180$ oe **or** $2x + 3x - 15 = 180$ oe **or** $2x + 3x - 15 = 2x + 2x + 24$ M1 (dep) for correct operation(s) to isolate x and non-x terms in an equation to get $ax = b$ A1 cao **OR** M2 for $\frac{351}{9}$ **or** $\frac{195}{5}$ **or** $\frac{156}{4}$ oe A1 cao

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Mark Scheme (Results)

November 2015

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

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NOTES ON MARKING PRINCIPLES

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

2 Mark schemes should be applied positively.

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

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

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

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

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

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

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

7 With working

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

8 Follow through marks

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

9 Ignoring subsequent work

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

10 Probability

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

11 Linear equations

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

12 Parts of questions

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

13 Range of answers

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

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

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

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5MB1H_01 November 2015					
Question		**Working**	**Answer**	**Mark**	**Notes**
1.	(a)		0.2	2	M1 for 1 – (0.15 + 0.41 + 0.24) A1 cao
	(b)		12	2	M1 for 50 × 0.24 oe A1 cao
2.	(a)		(146, 41)	1	B1 for 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

<table>
<tr><th colspan="5">5MB1H_01 November 2015</th></tr>
<tr><th colspan="2">Question</th><th>Working</th><th>Answer</th><th>Mark</th><th>Notes</th></tr>
<tr><td>3.</td><td></td><td><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</td><td>28</td><td>4</td><td>M1 for total female students 200 – 92 or 108 seen; or for total Economy passengers 200 – 44 – 60 or 96 seen.
M1 for total male passengers in Economy “96”-62 or 34 seen; or for total 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</td></tr>
<tr><td>4.</td><td>(a)</td><td></td><td>Out: 1023/1148
Return: 1737/1918
in Colwyn 5h 49min</td><td>4</td><td>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</td></tr>
<tr><td></td><td>(b)</td><td></td><td>133.40</td><td>3</td><td>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)</td></tr>
</table>

5MB1H_01 November 2015					
Question		**Working**	**Answer**	**Mark**	**Notes**
5.			Reasons	2	B1 for one reason eg no quantity (units), no time frame, overlapping intervals, not exhaustive B1 for second (different) reason
6.			$\frac{5x+4}{3}$	2	M1 $x + x + 4 + 3x$ $(= 5x + 4)$ A1 for $(x + x + 4 + 3x) \div 3$ oe
7.		2500 + 2500 × 3.5÷100 = 2500 + 87.50 = 2587.50 2587.50 + 2587.50 × 3.5 ÷ 100 = 2587.50 + 90.5625	2678.06	3	M1 for 2500 × 1.035 or 2500 + 2500 × 0.035 oe or for 2587.5(0) or 87.5(0) or 8750 or 2412.5(0) M1 (dep) for "2587.5" × 1.035 or for "2587.5" + "2587.5" × 0.035 or for "2578.5" + "90.56(25)" or for 2678 or 2678.1(0) or 2678.07 or 2678.06… A1 cao NB: if correct answer seen then ignore any extra years Alternative method: M2 for 2500×1.035^n where $n \geq 2$ or for 2678 or 2678.07 or 2678.06… A1 cao

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5MB1H_01 November 2015					
Question		**Working**	**Answer**	**Mark**	**Notes**
8.	(a)		$10 < n \leq 20$	2	M1 for use of cf to find the 20.5^{th} or 21st value A1 cao
	(b)	$(5 \times 14) + (15 \times 13) + (25 \times 8)$ $+ (35 \times 4) + (45 \times 2)$ $70 + 195 + 200 + 140 + 90$ $695 \div 41$	16.95	4	M1 for $\sum fx$ with consistent values within interval (including end points); accept one error M1 for $\sum fx$ with correct midpoint values M1 (dep M1) for "$\sum fx$" $\div 41$ or "695" $\div 41$ A1 for 16.95(12….)
9.			Box plot	3	M1 for UQ = 1.7 + 2.7 (= 4.4) or 4.4 shown on box plot B1 for box plot with at least 3 pieces of information correctly plotted B1 for fully correct box plot NB: there must be a box
10.	(a)		5, 23, 35, 39, 40	1	B1 for all correct
	(b)		cf graph	2	B1 for 4 or 5 "points" plotted consistently dep on sensible table (condone 1 addition error) B1 correct graph
	(c)		3	2	M1 for evidence of reading off from 187 (eg vertical line) on cf graph or $35 + \frac{2}{5} \times 4$ A1 ft from cf graph

5MB1H_01 November 2015					
Question		**Working**	**Answer**	**Mark**	**Notes**
11.			20 shown	5	B1 for 3 combinations (1 + 8, 5 + 4, 7 + 2) spacing amended M1 for partial working $\frac{3}{20}\times 80$ or $\frac{3}{20}\times 3$ oe or 80 × 3 (= 240) M1 for complete working $\frac{3}{20}\times 80\times 3$ oe M1 (income) 80 × 70 (= 5600) or 80 × 0.7 (= 56) C1 for "56 – 36=20" clearly stated
12.	(a)		3	2	M1 for $\frac{50}{600}\times 40$ oe or for 3.33… oe A1 cao
	(b)		75	2	M1 for $\frac{n}{600}\times 40$ or for $\frac{5\times 600}{40}$ where '5' can be 4.5 to 5.5 A1 for 75; accept answers in the range 68 – 82 supported by working.

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5MB1H_01 November 2015					
Question		**Working**	**Answer**	**Mark**	**Notes**
13.			400 and correct assumption	4	M1 for partial working eg $\frac{60}{12}$ oe or 20% or $\frac{1}{5}$ seen or 80 ÷ 12 (= 6.66..) or $\frac{12}{80}$ oe M1 for complete method eg $\frac{80\times 60}{12}$ or 80 × 5 or 6.66..× 60 or $\frac{12}{60}=\frac{80}{n}$ oe or 80 ÷ 0.2 oe A1 cao C1 for a correct mathematical assumption eg population has not changed overnight or mark which does not wear off or sample is random etc

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5MB1H_01 November 2015					
Question		**Working**	**Answer**	**Mark**	**Notes**
14.			$\frac{56}{110}$	4	M1 for use of 10 as denominator of second probability M1 for a correct method to find the probability of at least one possible combination, $\frac{4}{11}\times\frac{7}{10}$ or $\frac{7}{11}\times\frac{4}{10}$ M1 for complete and correct method shown, eg $\frac{4}{11}\times\frac{7}{10}+\frac{7}{11}\times\frac{4}{10}$ A1 for $\frac{56}{110}$ oe **Alternative scheme for replacement** M1 for $\frac{4}{11}\times\frac{7}{11}$ or $\frac{7}{11}\times\frac{4}{11}$ M1 for $\frac{4}{11}\times\frac{7}{11}+\frac{7}{11}\times\frac{4}{11}$ OR B2 for $\frac{56}{121}$
15.		Frequency densities of 8 ÷ 10 = 0.8 16 ÷ 10 = 1.6 15 ÷ 5 = 3 12 ÷ 5 = 2.4 6 ÷ 20 = 0.3	Fully labelled histogram	3	B3 for fully correct histogram (B2 for 4 correct blocks) (B1 for 3 correct blocks) (If B0 then SC B1 for correct key eg $1cm^2$=2 birds or frequency ÷ class interval for at least 3 frequencies) NB apply the same mark scheme if a different frequency density is used

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: 5MB1H_01			
Question		**Modification**	**Notes**
Q02	(a)	Grid enlarged. Crosses changed to filled in circles. 146 cm changed to 150 cm. 41 kg changed to 40 kg.	
Q04		Crewe to Colwyn – First 2 columns removed. Colwyn to Crewe – First and last columns removed.	
Q06		MLP only: x → f.	
Q09		Weights changed to 1.5 kg, 6.5 kg, 2.5 kg, 1.5 kg, 3.5 kg. Grid enlarged.	
Q10	(b) (c)	Frequencies changed to 5, 15, 10, 5, 5. Grid enlarged. 187 cm changed to 182.5 cm.	
Q15		Frequencies changed to 5, 15, 15, 10, 10. Grid enlarged.	

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Question 3

A majority of students scored full marks on this question. The most common error seen in part (a) was to give $30 < h \leq 40$ as the class in which the median lies. Common errors in drawing the frequency polygon included plotting points at the upper or lower boundary of each interval instead of the midpoint and joining the points with a curve, not straight lines. Points were generally carefully plotted at the correct heights.

Question 4

This question was quite well answered and descriptions of the things wrong with the time series graph were generally well described. There were a variety of possible acceptable answers but students needed to state them clearly and unambiguously. For example, "the axis does not start at 0" would not be worthy of any credit but "the y axis does not start at 0" would score a mark. Similarly, "the scale on the x axis" would not be enough but "it is not clear what the 2, 3, 4 on the x axis means" would get a mark. A number of students stated there should be a line of best fit drawn. This was not an acceptable response.

Question5

A good discriminator, this question attracted many concise and fully correct solutions. Despite there being a number of possible routes that students could take, there were also many incorrect or incomplete solutions. The most common approach was to use the total of the angles in a hexagon together with the relationship between angles BCE and CDE to work out the size of angle AFE. The most commonly seen alternative route was to use the symmetry of the hexagon to form two pentagons and work from there. A minority of students joined the points F and C and found the size of angle BCE. These students did not usually make significant further progress beyond labelling angles BCD and CDE as $2x$ and x respectively. A surprising number of students marked angles BCD and CDE as x and $2x$ respectively. In most cases, however, labelling of the diagram proved to be a help to students and is to be encouraged. About two in every five of students obtained full marks for their solution to this question.

Question 21

Though a significant number of students did not attempt this question, a good proportion of those students who did attempt it scored full marks for a complete and correct solution. The most common errors made by those students who followed a correct method, that of finding the total number of onions weighing less than 60g or more than 120g, usually involved obtaining an incorrect frequency for the number of onions weighing between 120g and 135g or for the number of onions weighing between 135g and 180g, or both. This usually arose because of using an incorrect class interval . Students who used the strategy of finding that there were 420 onions weighing between 60g and 120g were generally more successful. Some students opted to work with percentages, either giving their final answer as a percentage, or rounding a recurring decimal to 1decimal place and hence introducing a rounding error. In these cases the final accuracy mark was usually lost. There were a significant number of students who used the heights of the bars to represent frequencies. This approach could not be awarded any credit.

Question 1

This was generally well answered, with many gaining the two marks. Marks were usually lost for statements that were vague or ambiguous like “points incorrectly plotted” or “should not join all the dots up”. There were a few who thought that they should not have used midpoints for plotting.

Question 12

The majority of students were able to interpret the stem and leaf diagram well, most were able to find the median but the quartiles were less well identified.

For the box plot, most plotted the end points accurately, but fewer plotted the box correctly. Frequently students obtained two marks by showing 3 correctly plotted values usually the minimum, maximum and median. The most common incorrect response involved misplacing the lower quartile.

It was rare to see a student state the median or quartiles and not successfully mark them on the scale.

Question 7

The first mark was awarded most often for finding the median of the boys' heights as 168. A common mistake was to work out the median as 167 or 167.5. The ranges were seen far less often. Relatively few students were able to give both a correct comparison of medians and a correct comparison of ranges supported by correct figures. Students should be aware that the standard method to compare two data sets is to compare a measure of central tendency, the mean or the median, and to compare the spread of data using the range or the IQR. The typical response involved comparisons of the lowest

heights, of the medians and of the greatest heights because these were the values given in the table. Statements that just referred to least heights or greatest heights were ignored. Many students scored two of the three marks for this question because they made no comparison of ranges or because one of the figures used in their comparisons was incorrect. Some students quoted values for the median and/or the ranges but made no comparison and could be awarded at most the first mark for a correct value. Figures did not need to appear in the comparisons if they were clearly shown with the diagrams but when no figures at all were seen the comparisons could be awarded no marks.

Question 5

This question was quite well answered and descriptions of the mistakes made when the frequency polygon was drawn were generally clearly described. There were two mistakes to identify and students needed to describe them both to score the full 2 marks. Examiners were surprised that more students gained the mark for stating that the point plotted at (50, 5) should have been plotted at (45, 5) than gained the mark for stating that 40 had been omitted from the scale on the frequency axis. Any statement equivalent to one of these, and which was unambiguously stated, earned a mark. The most commonly seen unacceptable statements included not joining the polygon to (0, 0) and not joining the ends of the polygon.

Question 3

A good discriminator between lower attaining candidates, this question attracted many fully correct solutions. However, there were also many errors made. The most common approach was to use a 2-way table. A frequency tree diagram approach was also seen quite often. These more structured approaches were generally more successful than attempts where candidates tried to work with the figures without a table or diagram. A few candidates who used a two-way table completed it correctly but then transferred the wrong entry to the answer line. Lower attaining candidates often limited themselves to earning one mark for working out the number of girls (choosing one language to study). This question did sometimes seem to attract working written randomly around the working space and without any indication of what it was for. This made it difficult for examiners to track the processes a candidate had followed.

Question 4

Points were generally carefully plotted at the correct heights and many fully correct frequency polygons were seen although the number of students scoring full marks was not as high as might have been expected. Most students joined their points with line segments although some joined them with a curve and some did not join them at all. A very common error was plotting points at the ends of the intervals rather than at the midpoints and some students plotted at the beginnings of the intervals. Some otherwise correct frequency polygons were spoilt by students joining the first point to the last point to form a closed polygon. A number of students drew histograms, which scored no marks unless the correct points were marked at the centre top of each bar which gained one mark or the correct frequency polygon was drawn which gained both marks.

Question 1

A standard question with the majority of learners scoring at least one mark for making at most one error in their diagram. The main single error was correct points being plotted but were either joined with a curve or the first and last point were also directly joined. Learners who did not plot the points correctly often gained a mark for plotting the points consistently at either the beginning or end of the interval and joining them with straight line segments.

Question 6

Learners gained full marks for correctly stating the median and range for school A and making a correct comparison such as “the median for School A is greater than School B” and “School A has a greater range”. There were some who did not find the median correctly, working it out as 56 or 56.5, these learners often gained the mark for a correct comparison following through their value for the median. It should be noted that to gain the mark for a median of 57 this needed to be clearly stated, only indicating the 7 in the stem and leaf diagram through circling or crossing out was not sufficient. Similarly, when making a comparison it is not sufficient just to state the difference in the values, it needs to be clear which is greater.

Question 1

This question on drawing a frequency polygon required plotting frequencies at the midpoints of each interval and joining these points with straight lines. Responses with a single error were awarded one of the two available marks, the most common error being plotting at the end of the interval rather than the midpoint. Other observed errors included plotting a frequency at the wrong height, using a curve instead of straight lines, or incorrectly connecting the first and last points. Responses with multiple errors did not gain credit. In some cases, a histogram was drawn instead; no marks were awarded for this unless the correct midpoints were also plotted. It is recommended that points are joined with straight lines using a ruler rather than freehand.