

GCSE

Applications of Mathematics (Linked Pair Pilot)

93701F

Unit 1: Foundation Tier

Mark scheme – Additional Guidance

9370

June 2014

Version 1.0 Final

General Points.

1 **Completely crossed out responses**

Examiners should mark a candidate's final attempt even if crossed out.

2 **Answers not written on answer line**

If answer line is blank, mark working space for up to full marks.

If fully correct working seen or answer seen followed by a transcription error onto the answer line, award full marks.

3 **Candidate indicates they have completed a solution on an additional sheet**

If the candidate has written that they have continued or replaced the response on an additional sheet you should **still mark what you see** (A senior examiner will record any additional marks seen on the additional sheet at a later stage.)

Do NOT escalate these clips.

4 **Candidate seems to have continued a solution outside the area you can see**

If a candidate indicates that they have written further work somewhere else on the paper e.g. an arrow going below your clip or 'see back page'.

Senior examiners are able to view these other areas and pages **so please DO escalate in this situation.**

5 **Marking Using Alternate Schemes**

Choose the scheme that gives the candidate the most marks.

Do **not** combine marks from different schemes.

6 **Special Cases (SC)**

Special Case (SC) marks are **not** added to any other marks awarded but replace them where it would benefit the candidate.

- a response is worthy of no marks from scheme but gets SC1 the final mark is SC1.
- a response is worthy of M1 and SC1 the final mark for this response is M1.
- a response is worthy of M2 and SC1 the final mark for this response is M2.
- a response is worthy of M1 and SC2 the final mark for this response is SC2

7 Percentage Build-up methods

The general rule is that build-up methods must be complete and either correct method must be shown or values used must be correct (without truncation or rounding).

For example: 35% of 600

- (a) 10% = 60 *Value correct so method not needed*
3.5 × 60 = 220 Value incorrect but correct method shown so M mark gained
1% = 6 *Value correct so method not needed*
35 × 6 = 220 Value incorrect but correct method shown so M mark gained
- (b) **10% = 50 Value incorrect and no method shown so M mark lost here**
10% = 60 *Value correct so method not needed*
1% = 5 Value incorrect and no method shown so M mark lost here
- (c) 10% = 600 ÷ 10 = 50 *Value incorrect but method shown*
20% = 100 *Value correct for their 10% so method not needed*
5% = 25 *Value correct for their 10% so method not needed*
35% = 175 Value correct for their 10% so M mark gained
3.5 × 50 = 175 Value correct for their 10% so M mark gained
1% = 5 *Value correct for their 10% so no method needed*
35 × 5 = 175 Value wrong but correct method shown so M mark gained

8 Money notation

Where an answer line showspence

Accept 20p or £0.20 on answer line but do not accept 0.20 on answer line

Accept £0.20p on answer line (except on QWC question) unless otherwise instructed.

Where an answer line shows £.....

Accept 525p on answer line with £ sign crossed out

Accept £5.25p on answer line (except on QWC question) unless otherwise instructed.

On a QWC question, where an answer line showspence

Do **NOT** accept £0.20p on answer line for Q mark

On a QWC question, where an answer line shows £.....

Do **NOT** accept £5.25p on answer line for Q mark

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Q	Additional Guidance
1(a)	Condone if frequencies are given as fractional relative frequencies 4/15 etc, but not if given as decimals.
1(b)	Accept if different symbol used consistently throughout, provided key not changed. For the 'half' symbol accept an 'open' symbol, such as < If it is not clear that the 'half symbol' is half, then penalise.
1(d)	Do not penalise further work. Eg $2/15 = 1/3$ or $2/15 / 1/3$ gain B1
2(a)	Those using the method in alt 1 may not show full working out. An answer of 6960 only implies one of the M marks. An answer of 7020 only implies one of the M marks. This is exemplified in script S3. Those who do not use all the information given, and so do not compare like with like, are awarded the special case marks. Cost per week for house A is $580/4 = 145$ and then compare with 135 and conclude B is cheapest. Cost per month for house B is $135 \times 4 = 540$ and then compare with 580 and conclude B is cheapest.
3(a)	For the 3 rd mark, their 760 could be 660
3(b)	Don't accept it's cheaper or she pays less.
4(b)	Ignore any words, such as students, with the value 10.
4(d)	For M marks - check the graph for numbers on the bars (either as heights or as differences) Correct rectangle drawn on graph gains 4 marks.
5	Alternative method 1
	For M1dep allow any indication of subtraction eg number line, counting on/back
	Adding on all 4 times will gain 1 mark for intention to add all 4 together. Eg trial start time of 8:00 with all times added on gains M1 For 2 nd M mark allow 10:30 – 1.40 Special case is for 12.10, from 10:30 + 1:40, which with working would have gained first M mark.
	Alternative method 2
	Attempting to subtract all 4 times gains 1 mark.
6(a)	If a 'build up' method is used it must be complete Eg $1\% = 635$, $2\% = 635 \times 2$

7(b)	Working may be seen next to the table 23 May be seen in the working, and does not have to be seen on the answer line.
8(a)	30 seen implies 5 hours $6 + 6 + 6 + 6 + 6$ implies 5 hours
8(b)	Special case. This is from $23.75 - 3 \times 6$, where $23.75 - 3$ is calculated first
9	The M1 is for having at least one correct value with the other value in the correct range and attempting subtraction. The values 42 and 58 may be 'tested', so $42 + 1 = 43$ or $58 - 1 = 57$ gains B1
10(a)	For Q mark the leaves must be approximately aligned to show the shape of the distribution. This can be awarded for an unordered diagram or one with up to 2 values missing providing appropriate key is given. Any 3 digit number may be used in the key, for example, 10 4 means 104.
10(d)	View parts b and c and ft their values. For 'average comment' They do not need to mention average to gain the mark. Medians are the same/similar gains B0 Averages are the same gains B0 Jane got a better score B0 Performances are similar (to each other) following a median of 122.5 B1 Janes' performance is a little better (than Phils' scores) following a median of 124 B1 'On average they are the same' gains B1 Jane is a better player/Janes' performance is better following a median of 124 B1 For 'range comment' 'Jane's range is bigger' gains B0 'Bigger range of scores for Jane' B0 Scores that Phil got were close, or closer B0 Greater range of scores for Jane B0 Phils' range is smaller than Janes so the distance between the highest and lowest scores is smaller (same as range of scores is smaller) B0 Scores that Phil got were closer together B1 Janes' scores were further apart from each other B1 'Wider range of scores for Jane' B1
11(a)	0 may be missing for A1 Incorrectly used formula mark as follows: $17650 - 10300 / 4 = 15075$, So 15080 gains M1 A0 B1 Without working these will gain the SC marks.

<p>11(b)</p>	<p>Condone $D2 = (A2 - B2) / C2$ as correct. But do not condone anything else before the '=' Allow '=' $(A2 - B2) C2$ as correct. The following will each gain B1 only, as there is one error. $= \frac{A2-B2}{C2}$, $= \frac{(A2-B2)}{C2}$, $= (A2 - B2) \div C2$, $= (A2 - B2) \setminus C2$, $(A2 - B2) / C2 =$, $(A2 - B2) / C2 = D2$ If missing '=' and missing brackets then award B0</p>												
<p>12</p>	<p>Zeros for pence may be omitted throughout the method but a missing zero for the answer is A0</p> <p>150 x35p + 20 would achieve M1 but units must be added consistently for the A mark The units may be seen or implied later eg 5250 seen at the beginning but 52.5(0) used later would gain the first A mark</p> <p>168 seen gets 2 marks or 198 seen gets 3 marks (2nd, 3rd and 4th method marks) For the final method mark all values must be in the same monetary units.</p> <p>Beware $150 \div 5 = 30$ does not get the 4th M mark automatically. It may be just part of their working to get to $\frac{4}{5}$. If this 30 is multiplied by (£)1 or added on to 168 then this implies that they understand that it is the other 30 cakes and can then be awarded M1</p> <p>For example</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px;">$150 \times 0.35 + 20 = 72.50$</td> <td style="padding: 2px; text-align: right;">M1A1</td> </tr> <tr> <td style="padding: 2px;">$150 \div 5 = 30$</td> <td></td> </tr> <tr> <td style="padding: 2px;">$30 \times 4 = 120$</td> <td style="padding: 2px; text-align: right;">M1</td> </tr> <tr> <td style="padding: 2px;">$120 \times 1.40 = 168$</td> <td style="padding: 2px; text-align: right;">M1</td> </tr> <tr> <td style="padding: 2px;">$168 - 72.50$</td> <td style="padding: 2px; text-align: right;">M0M0</td> </tr> <tr> <td style="padding: 2px;">95.50</td> <td style="padding: 2px; text-align: right;">A0</td> </tr> </table>	$150 \times 0.35 + 20 = 72.50$	M1A1	$150 \div 5 = 30$		$30 \times 4 = 120$	M1	$120 \times 1.40 = 168$	M1	$168 - 72.50$	M0M0	95.50	A0
$150 \times 0.35 + 20 = 72.50$	M1A1												
$150 \div 5 = 30$													
$30 \times 4 = 120$	M1												
$120 \times 1.40 = 168$	M1												
$168 - 72.50$	M0M0												
95.50	A0												
<p>13</p>	<p>6, 6, 4, 3 or 6, 6, 4, 2 or 6, 6, 4, 1 or 5, 5, 3, 2 or 5, 5, 3, 1 or 4, 4, 2, 1 gains 2 marks (all in any order)</p>												

	<p>Mark the answer line first. If there is a set of 4 numbers on the answer line award B2 or B1 if possible. Do not consider any working.</p> <p>If there are less than 4 numbers on the answer line (usually its a single digit) look in the working to award a possible B1</p> <p>Example 5 5 3 1 in working then answer 5 is B1 B0</p>
	<p>A set of 4 numbers with 2 modes is B0 unless they identify the median</p> <p>A set of 4 numbers with 2 modes is SC1 if the median is one less than one of the modes. Otherwise award B0 unless they identify the median</p> <p>Example 1 1 5 5 B0</p> <p>Example 1 1 5 5 median 3 B1</p> <p>Example 1 1 ↓ 5 5 B1 3</p>
14	<p>The accuracy mark is for showing that more than 3 are needed. This can be implied by an answer of 4 if correct working is seen</p> <p>Example 5000 seen then $5000 \div 1500$ Answer 4 award M1M1A1B1</p>
	<p>An answer of 4 with no working or invalid working scores SC2</p> <p>4 can come from division by 11 ($=3.66$ rounded up to 4) If working is seen it would be awarded M1 for 5000 and B1ft for the rounding</p> <p>Sight of 5500 can imply use of 11</p>
	<p>Remember that the final B1 mark is a ft mark for rounding. Their answer must be a decimal or fraction and must be rounded up to the nearest integer</p>

15(a)	<p>Allow £ signs in either or both terms eg £10 -6x, £10 -£6x, £10 – 6£x</p> <p>Allow $10 - 6 \times x$ or $10 - (6 \times x)$ Do not allow $10 - x6$</p>
15(b)	<p>Check working carefully. An answer of 1.25 does not imply full marks in this question.</p> <p>The algebraic method must be convincing and clearly used to find the value of x</p> <p>Beware of those who set up the equation correctly but then cannot solve it so revert to T&I. Only award 3 marks.</p> <p>Some are also finding 1.25 by T&I then using $6x$ and $4x$ to check their answer. Again award 3 marks</p>
	<p>Alternative method 1</p>
	<p>The first M1 is for a correct equation stated relating Bens change to twice Marys change</p> <p>The 2nd M mark is for dealing with the bracket correctly.</p> <p>The 3rd M mark is for simplification to $ax = b$, allow one error in finding either a or b</p>

	<p>Mutlplying the wrong equation by 2 can gain 2 marks</p> $10 - 6x = 2(10 - 4x) \quad \text{M0}$ $10 - 6x = 20 - 8x \quad \text{M1}$ $2x = 10 \quad \text{M1}$ $x = 5 \quad \text{A0}$
	<p>Using $10 + 6x$ and $10 + 4x$ leads to an answer of -1.25. this can score M0M1M1A0</p> <p>But beware those students who realise that the answer cannot be negative and give 1.25 as the answer from this incorrect equation.</p>
	<p>Alternative method 2</p>
	<p>The first M1 is for a correct pair of simultaneous equations. Allow any letter except x to represent the change</p> <p>The 2nd M1 is for equating coefficients</p> <p>The 3rd M1 is for subtracting the equations</p>
	<p>Alternative method 3</p>
	<p>Note a maximum of 3 marks are available for a T& I solution.</p> <p>A possible alternative for a trial is to try a price for Mary, find the change, double the change and then see if this gives the same price for Ben's bars. A very long winded approach.</p> <p>Example- tries £1.50 for Mary $10 - 6 \times 1.50 = 9$ so £1 change</p> <p>Ben £2 change $10 - 4x = 2$</p> <p>$4x = 8$ so $x = 2$ not the same as Mary This is just one trial so only award M1</p>
<p>16</p>	<p>Conclusion must be based on the correct method seen.</p> <p>Students may work with any consistent number of washing machines and cookers. They must state the number of units they are using.</p> <p>Example</p> <p>For 100 of each</p> $0.269 \times 54 \times 100 = 1452(.6)$ $0.143 \times 86 \times 100 = 1229(.8)$ <p>Washing machine M1A2Q1</p> <p>The same example without stating they are considering 100 of each gains M1A1A1Q0</p>

	<p>Penalise further work (eg multiplying again by 54 and 86) by loss of accuracy marks. The Q mark can still be awarded for the comparison of their new totals.</p>
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Penalise further work (eg multiplying again by 54 and 86) by loss of accuracy marks. The Q mark can still be awarded for the comparison of their new totals.