



GCSE MARKING SCHEME

MATHEMATICS - LINEAR

SUMMER 2014

INTRODUCTION

The marking schemes which follow were those used by WJEC for the Summer 2014 examination in GCSE MATHEMATICS - LINEAR. They were finalised after detailed discussion at examiners' conferences by all the examiners involved in the assessment. The conferences were held shortly after the papers were taken so that reference could be made to the full range of candidates' responses, with photocopied scripts forming the basis of discussion. The aim of the conferences was to ensure that the marking schemes were interpreted and applied in the same way by all examiners.

It is hoped that this information will be of assistance to centres but it is recognised at the same time that, without the benefit of participation in the examiners' conferences, teachers may have different views on certain matters of detail or interpretation.

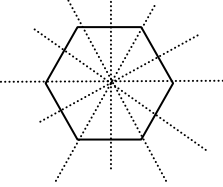
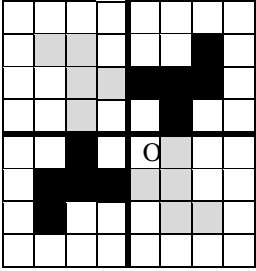
WJEC regrets that it cannot enter into any discussion or correspondence about these marking schemes.

Paper 1 - Foundation Tier	1
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PAPER 1 - FOUNDATION TIER

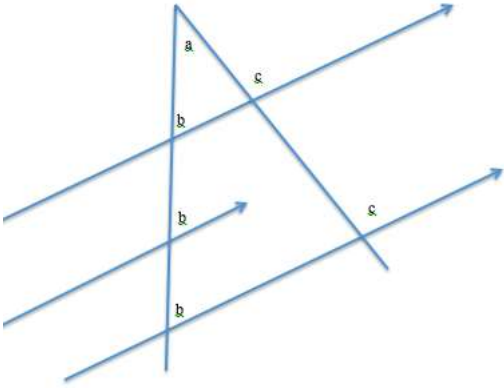
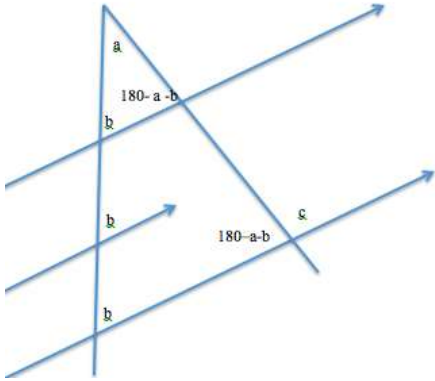

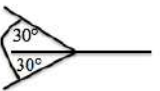
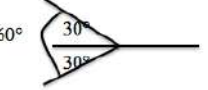
Summer 2014 Paper 1 (Non calculator) Foundation Tier	Marks	Comments
1. (a) (i) 3 411 002	B1	
1. (a) (ii) seventy two thousand <u>(no hundreds) (and)</u> sixty five	B1	
1. (b) (i) 17 and 63	B1	B0 for 40+40.
1. (b) (ii) 39	B1	
1. (b) (iii) 63	B1	
1. (b) (iv) 6	B1	Allow $48/8 = 6$, $6 \times 8 = 48$ but B0 for $48/6 = 8$
1. (b) (v) 81	B1	
1. (c) 12 or 16	B1	For 12, 16 or both. Allow 12×8 OR 16×6 <u>As always, B0 for a choice of answers with at least one answer incorrect</u>
1. (d) (i) 6570	B1	
1. (d) (ii) 6600	B1	
2. (a) (i) 7652	B1	
2. (a) (ii) 2576	B1	
2. (b) (i) <u>0</u> .06	B1	
2. (b) (ii) 2.92	B1	
2. (c) 2.9×100 OR 3×98 OR 3×100 $= 290$ OR 294 OR 300	M1 A1	Only these three estimates. <u>M1,A1 for unsupported answers of 290, 294 OR 300</u>
<p>3. Hours = 20×15 (minutes) $20 \times \frac{1}{4}$ (hours) $= 300$ (minutes) $= 5$ (hours) Payment = $8 \times 5 + 12$ $= (£) 52$</p> <p>Look for</p> <ul style="list-style-type: none"> • spelling • clarity of text explanations, • the use of £s, hours and minutes <p>QWC2: Candidates will be expected to</p> <ul style="list-style-type: none"> • present work clearly, with words explaining process or steps <p>AND</p> <ul style="list-style-type: none"> • make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer <p>QWC1: Candidates will be expected to</p> <ul style="list-style-type: none"> • present work clearly, with words explaining process or steps <p>OR</p> <ul style="list-style-type: none"> • make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer 	<p>✓ M1 A1 M1 A1</p> <p>QWC 2</p>	<p>'hours' not required at this stage F.T. 'their time' (must be an attempt to convert to hours).</p> <p><u>Special cases</u> <u>Candidates who do</u> $8 \times 20 + 12$ get <u>SC1 for the (£)172</u> <u>Similarly SC1 for</u> <u>(£)132 from $8 \times 15 + 12$</u></p> <p>QWC2 Presents relevant material in a coherent and logical manner, using acceptable mathematical form, and with few if any errors in spelling, punctuation and grammar.</p> <p>QWC1 Presents relevant material in a coherent and logical manner but with some errors in use of mathematical form, spelling, punctuation or grammar. OR Evident weaknesses in organisation of material but using acceptable mathematical form, with few if any errors in spelling, punctuation and grammar.</p> <p>QWC0 Evident weaknesses in organisation of material, and errors in use of mathematical form, spelling</p>

Summer 2014 Paper 1 (Non calculator) Foundation Tier	Marks	Comments																											
4. (a) certain	B1	<u>(Welsh is sicr)</u>																											
4. (b) unlikely	B1	<u>(Welsh is annhebygol)</u>																											
4. (c) even chance	B1	Do not accept 'even' but B1 for 'evens'. <u>(Welsh is siawns deg)</u>																											
5. (a) (i) 39 (ii) 44	B1 B1	B0 for $6n+9$																											
5. (b) Divide the previous term by 4	B1	Accept $\div 4$. Accept $\times \frac{1}{4}$. <u>Accept quarterly.</u> <u>Accept 'halve and halve again'</u> <u>B0 for dividing into quarters</u> B0 for $n/4$																											
5. (c) ($p= 3 \times 2 + 4 \times 3 - 6 \times -1 =$) $6+12+6 = 24$	M1 A1	Award only when a correct substitution is assured Unsupported 24 gets M1,A1. Any other unsupported answer gets M0,A0. SC1 for seeing $6+12-6 = 12$																											
5. (d) $4x$ <u>ISW</u>	B1																												
<u>All parts (a) – (b) marked at the same time</u> <u>To be viewed with diagram</u> 6. (a) Missing inside segment = 2 Perimeter = $9+9+8 \times 3+2 \times 2$ = 46 (cm) <u>To be viewed with diagram</u> (b) Area = $8 \times 3+4 \times 3 \times 3$ OR $8 \times 9 - 2 \times 3 \times 2$ (= $24 + 36$) (= $72 - 12$) = 60 cm^2	✓ S1 M1 A1 M1 A1 U1	<u>You must also check the diagram for any working.</u> <u>Must be seen in part (a).</u> Attempt to <u>add all sides</u> of the shape. <u>Use $42+2x$ for M1 where x stands for 'their 2'</u> <u>S1, M1 for methods that imply the '2', e.g. $9 \times 2+8 \times 2+4 \times 3$</u> C.A.O. Attempt to add all areas of the shape OR difference of areas C.A.O. Independent of all other marks.																											
7. A(-4, 2), B(-1, -5) and C(4, 3) plotted.	B3	B1 for each. Reversed coordinates get B0. <u>Condone missing letters or A, B and C used instead of dots, as long as the points are identifiable.</u> <u>Ignore triangles joining the points.</u>																											
8. (a) <u>Use overlay</u> $\hat{X}YZ = 62^\circ (\pm 2^\circ)$ $\hat{X}ZY = 47^\circ (\pm 2^\circ)$ Completed triangle.	M1 M1 A1	Dependent on at least one M1. SC2 for a 'reversed' triangle (see overlay).																											
8. (b) Obtuse (Aflen)	B1	Accept misspellings.																											
<u>To be viewed with diagram</u> 9. Volume = $20 \times 15 \times 10 (\times \frac{1}{2})$ = $1500 (\text{cm}^3)$ = $1500/1000$ = 1.5 litres	✓ M1 A1 M1 A1	No need for the $\frac{1}{2}$ for the M1. CAO FT 'their 1500/1000' 'litres' not required but A0 for incorrect units.																											
<u>To be viewed with table</u> 10. (a) (£) 8.40 and 10:35 <u>(a.m.)</u>	B2	B1 for each B0 for 10 minutes																											
<u>To be viewed with table</u> 10. (b) Taxi fare is (£)17 - (£)27 Tube tickets cost (£)20 Compares (£)17 with (£)20 Compares (£)27 with (£)20	✓ B1 B1 B1 B1	<table border="0"> <tr> <td></td> <td><u>Per person solutions</u></td> <td></td> </tr> <tr> <td></td> <td><u>Taxi fare is (£)17 - (£)27</u></td> <td><u>B1</u></td> </tr> <tr> <td></td> <td><u>Divides any taxi fare by 5</u></td> <td><u>B1</u></td> </tr> <tr> <td></td> <td><u>Compares (£)3.40 with (£)4</u></td> <td><u>B1</u></td> </tr> <tr> <td></td> <td><u>Compares (£)5.40 with (£)4</u></td> <td><u>B1</u></td> </tr> <tr> <td></td> <td><u>2 taxis (Maximum 3 marks available)</u></td> <td></td> </tr> <tr> <td></td> <td><u>Taxi fare is (£)34 - (£)54</u></td> <td><u>B1</u></td> </tr> <tr> <td></td> <td><u>Tube tickets cost (£)20</u></td> <td><u>B1</u></td> </tr> <tr> <td></td> <td><u>Taxi (always) more than tube</u></td> <td><u>B1</u></td> </tr> </table> F.T. their figures		<u>Per person solutions</u>			<u>Taxi fare is (£)17 - (£)27</u>	<u>B1</u>		<u>Divides any taxi fare by 5</u>	<u>B1</u>		<u>Compares (£)3.40 with (£)4</u>	<u>B1</u>		<u>Compares (£)5.40 with (£)4</u>	<u>B1</u>		<u>2 taxis (Maximum 3 marks available)</u>			<u>Taxi fare is (£)34 - (£)54</u>	<u>B1</u>		<u>Tube tickets cost (£)20</u>	<u>B1</u>		<u>Taxi (always) more than tube</u>	<u>B1</u>
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Summer 2014 Paper 1 (Non calculator) Foundation Tier	Marks	Comments	
11. (a) 	B2	B1 for 3 or more correct lines drawn AND no incorrect lines.	
11. (b) 	B2	B1 for each of 1st and 3rd quadrants	
12. $(3/8) = 8)3.000$ <u>(0).375 ISW</u>	M1 A1	Any valid method. Must show a division method being implemented <u>M0, A0 for unsupported (0).38</u>	
<p><u>All parts (a) – (b) marked at the same time</u></p> <p>13. (a) (62) <u>62</u> (63) <u>64</u> (52) <u>52</u> <u>53</u> (54) (42) (42) <u>43</u> (44) (32) (32) (33) <u>34</u></p> <p>(b) (i) $\frac{6}{16}$ I.S.W.</p> <p>(ii) $\frac{6}{16}$ of 400 = 150</p>	B2 B2 M1 A1	<p>B1 for at least 3 correct entries</p> <p>F.T. their table B1 for a numerator of 6 in a fraction less than 1. B1 for a denominator of 16 in a fraction less than 1. <u>Penalise -1 once only for wrong notation, e.g. 6 out of 16 OR 6:16</u></p> <p>F.T. their (b)(i) if a fraction less than 1. (<u>$\neq 1/2$</u>) M1,A0 for $\frac{6}{16}$ of 400 if it is F.T. from their table 150 out of 400 gets the M1, A1 but 150/400 gets M1, A0. A0 if using an incorrect reduction of the fraction from (b)(i)</p>	
<u>To be viewed with diagram</u> 14. (a) $(x =) 180 - 53 - 53$ = 74°	M1 A1		
<u>To be viewed with diagram</u> 14. (b) $360 - (112 + 67 + 78)$ OR $360 - 257$ 103° (y =) 77°	M1 A1 B1	y= 103° as final answer gets M1,A1,B0 FT 180 – ‘their 103’	<u>General principle</u> <u>$257 - 360 = 103$ gets M1,A1</u> <u>$257 - 360 \neq 103$ gets M0,A0</u>

Questions 15 – 21 except 19(a) are common with the Higher Tier.
This Mark Scheme will be amended to match the Higher Tier throughout the conference.

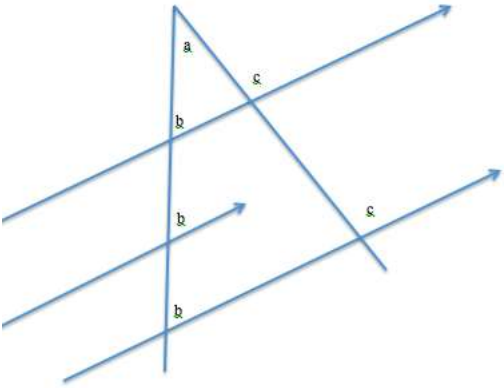
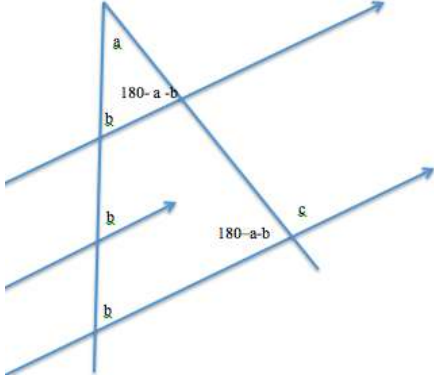
Summer 2014 Paper 1 (Non calculator) Foundation Tier	Marks	Comments
<p>All parts (a) – (e) marked at the same time</p> <p>15.(a) All points plotted correctly</p> <p>(b) Positive</p> <p>To be viewed with graph</p> <p>(c) Line of best fit with points above and below</p> <p>To be viewed with graph</p> <p>(d) Their estimate, from use of their line of best fit, or an answer in inclusive interval $390 \leq \text{'their estimate'} \leq 410$</p> <p>(e) Explanation, that it doesn't tell you, e.g. 'only know how many attend, not how many spent money on ice cream', or 'don't know how many ice creams were sold'</p>	<p>B2</p> <p>B1</p> <p>B1</p> <p>B1</p> <p>E1</p>	<p>Intention: closer to the correct intersection than to any others B1 for indication of at least 3 correct points <i>Penalise joining point to point -1</i></p> <p>Do not accept descriptions</p> <p>The line must be fit for purpose, it should not pass through the intersection of the axes <i>Ignore also joining point to point</i></p> <p>Accuracy to the nearest £10 FT for their incorrect line of best fit with accuracy to the nearest £10</p> <p>Ignore incorrect statements given with a correct response. Accept answers that state or imply, don't know: <ul style="list-style-type: none"> • how many ice cream sold, or • how many people bought ice cream Allow answers that state or imply, don't know: <ul style="list-style-type: none"> • different costs of ice cream (days or ice creams) <p>e.g. accept 'different ice creams cost different amounts', 'don't know who bought what', 'sellers change prices on different days'</p> </p>
<p>To be viewed with diagram</p> <p>16. Area trapezium = $\frac{1}{2} \times 5 \times (6 + 10)$ = 40 (cm²)</p> <p>Triangle: $\frac{1}{2} \times 10 \times x = 40$ (x =) 8 (cm)</p>	<p>✓</p> <p>M1</p> <p>A1</p> <p>M1</p> <p>A1</p>	<p>For equating 'their 40' (any value) with $\frac{1}{2} \times 10 \times x$ FT correct evaluation from 'their 40' (their value) SC2 for an answer 8(cm) from <u>area of trapezium = $5 \times (6 + 10) = 80$</u> followed by <u>area of triangle = $10 \times x = 80$</u> <i>or</i> SC1 for a 2 stage method equating $10 \times x$ with $5 \times (6 + 10)$ with error in calculating x A full one stage method $10 \times x = 5 \times (6 + 10)$ <u>or equivalent</u> is correct for 3 marks.</p>
<p>To be viewed with diagram</p> <p>17. Class A has 12 girls Class B has 18 girls</p> <p>There are twice as many girls as boys in class B, or $\frac{1}{3}$ of class B boys, or $\frac{2}{3}$ of class B girls</p> <p>Class B has 9 boys</p>	<p>✓</p> <p>B1</p> <p>B1</p> <p>B1</p> <p>B1</p>	<p>FT $1\frac{1}{2} \times \text{'their 12'}$ correctly evaluated (but NOT $1\frac{1}{2} \times 4$) <i>Sight of 18 implies first B1, B1</i> OR Class B: Angle girls $240^\circ \pm 2^\circ$ and angle boys $120^\circ \pm 2^\circ$ This may be implied from their numbers of girls and boys in class B. <i>Note: $\frac{1}{3}$ of 18 does not imply $\frac{1}{3}$ of class B boys, hence B0</i> <i>'18 is $\frac{2}{3}$', implies B1</i> CAO</p>
<p>18.(a) $x/2 = 26 - 18$ OR $x + 18 \times 2 = 26 \times 2$ $x = 16$</p>	<p>M1</p> <p>A1</p>	<p>OR alternative full correct method Mark final answer . <i>Accept embedded answer, e.g. $16/2 + 18 = 26$</i></p>
<p>18. (b) $y^3 + 4y$</p>	<p>B2</p>	<p>B1 for a correct term. Mark final answer for B2.</p>
<p>19. n (black) 2n + 1 or equivalent (white)</p>	<p>B1</p> <p>B2</p>	<p>Accept use of N</p> <p>B1 for 2n or equivalent <i>Penalise use of other letters -1 only</i></p>

<p style="text-align: center;">Summer 2014 Paper 1 (Non calculator) Foundation Tier</p>	<p style="text-align: center;">Marks</p>	<p style="text-align: center;">Comments</p>
<p><u>To be viewed with diagram</u> 20. An appropriate angle $180 - a - b$ or $180 - (a+b)$, or an appropriate b or c angle indicated on the diagram</p>  <p><u>(c =)</u> $180 - (180 - a - b)$ <u>(c =)</u> $a + b$</p>	<p>B1</p> <p>M1 A1</p>	<p>Must be shown or stated</p> <p>OR</p>  <p>Or equivalent rearrangement, e.g. $a + b + 180 - c = 180$</p> <p>For answer only $(c =) a + b$ <u>without</u> working or indication of any appropriate b or c angles award B0, M1 and A1. For answer $(c =) a + b$ <u>with</u> working or indication of any appropriate b or c angles award B1, M1 and A1.</p>
<p>21. 12 sided shape: exterior angle $360/12 (= 30^\circ)$ interior angle $(180^\circ - 30^\circ =) 150^\circ$ OR sketch showing one 30° exterior angles, e.g.</p>  <p>Gap is $360 - 150 - 150$ OR sketch implying the sum of the 2 angles of 30° is the remaining exterior angle, e.g.</p>  <p>Appropriate 60° or sketch showing 60° e.g.</p>  <p>Third shape: 3 (sides)</p>	<p>B1 B1</p> <p>M1</p> <p>A1</p> <p>A1</p>	<p>OR M1 Interior $10 \times 180 \div 12$ A1 $= 150^\circ$ OR B2 for interior angle found to be 150°</p> <p>FT for use of 'their 150'</p> <p>CAO. Allow (equilateral) triangle</p> <p><u>If correct answer with sight of angles:</u> <u>Sight of 150° or 30° AND 60° followed by an answer 3 (sides) or triangle is awarded 5 marks</u></p> <p>or <u>Sight of 150° or 30° followed by an answer 3 (sides) or triangle is awarded 4 marks only (as working is incomplete)</u></p> <p>or <u>Sight of $360^\circ/12$ followed by an answer 3 (sides) or triangle is awarded 3 marks only (as working is incomplete)</u></p> <p><u>OR if no working or errors in calculations:</u> <u>Award SC2 for an answer of 3 sides or (equilateral) triangle.</u> OR <u>Award SC2 for a diagram of a tessellation of a number of sides of two 12-sided polygons showing a triangle.</u></p> <p><u>Award SC1 for a diagram of an attempt at a tessellation of a number of sides of two 12-sided polygons showing a triangle.</u></p>


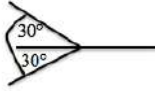
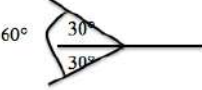
PAPER 1 - HIGHER TIER

Summer 2014 Paper 1 Higher Tier	Marks	Comments
1(a) 3 values which could lead to simple calculations Correct evaluation for their figures	M1 A1	e.g. $\frac{43.3 \times 50}{200}$, $\frac{40 \times 49.8}{200}$ Do not accept $\frac{43 \times 49}{200}$ Accept decimals OR rounded or truncated answers <i>(Common responses include 10 here)</i>
1(b) 2	B1	Accept other reasonable estimations, with answer given to no more than 2dp <i>Allow 2/1</i>
1(c)(i) 3.9528	B1	
1(c) (ii) 73200	B1	
1(d) $7/2 \times 1/2$ OR $7/2 \div 2$ OR sight of $3/2 + 1/4$ $1\frac{3}{4}$ or 1.75 or $7/4$ or single value equivalent	M1 A1	e.g. $1.5 + 0.25$ CAO
2(a) All points plotted correctly	B2	Intention: closer to the correct intersection than to any others B1 for indication of at least 3 correct points <i>Penalise joining point to point -1</i>
2(b) Positive	B1	Do not accept descriptions
2(c) Line of best fit with points above and below	B1	The line must be fit for purpose, it should not pass through the intersection of the axes <i>Ignore also joining point to point</i>
2(d) Their estimate, from use of their line of best fit, or an answer in inclusive interval $390 \leq \text{'their estimate'} \leq 410$	B1	Accuracy to the nearest £10 FT for their incorrect line of best fit with accuracy to the nearest £10
2(e) Explanation, that it doesn't tell you, e.g. 'only know how many attend, not how many spent money on ice cream', or 'don't know how many ice creams were sold'	E1	Ignore incorrect statements given with a correct response. Accept answers that state or imply, don't know: <ul style="list-style-type: none"> • how many ice cream sold, or • how many people bought ice cream Allow answers that state or imply, don't know: <ul style="list-style-type: none"> • different costs of ice cream (days or ice creams) e.g. accept 'different ice creams cost different amounts', 'don't know who bought what', 'sellers change prices on different days'
3(a) (-1, 4) and (-7, -2) and (-1, 0)	B2	All 3 coordinates correct B1 for any 2 of these 3 coordinates correct <i>If no marks SC1 for correct quadrilateral shown</i> <i>Coordinates can be given in any order in the answer space. No marks for reversed coordinates. However award SC1 for showing the correct points in the quadrilateral</i>
3(b) (2, 1) and (4, 5) and (-1, 5) and (7, 1)	B2	All 4 coordinates correct B1 for any 3 of these 4 coordinates correct <i>If no marks SC1 for correct quadrilateral shown</i> <i>Coordinates can be given in any order in the answer space. No marks for reversed coordinates. However award SC1 for showing the correct points in the quadrilateral</i>

Summer 2014 Paper 1 Higher Tier	Marks	Comments
4. Area trapezium = $\frac{1}{2} \times 5 \times (6 + 10)$ = 40 (cm ²) Triangle: $\frac{1}{2} \times 10 \times x = 40$ (x =) 8 (cm)	M1 A1 M1 A1	For equating 'their 40' (any value) with $\frac{1}{2} \times 10 \times x$ FT correct evaluation from 'their 40' (their value) SC2 for an answer 8(cm) from a two stage method: Area trapezium $5 \times (6 + 10) = 80$ followed by area triangle $10 \times x = 80$, or SC1 for a 2 stage method equating $10 \times x$ with $5 \times (6 + 10)$ with error in calculating x A full one stage method $10 \times x = 5 \times (6 + 10)$ is correct
5. Class A has 12 girls Class B has 18 girls There are twice as many girls as boys in class B, or $\frac{1}{3}$ of class B boys, or $\frac{2}{3}$ of class B girls Class B has 9 boys	B1 B1 B1 B1	FT $1\frac{1}{2} \times$ 'their 12' correctly evaluated (but NOT $1\frac{1}{2} \times 4$) <u>Sight of 18 implies first B1, B1</u> OR Class B: Angle girls $240^\circ \pm 2^\circ$ and angle boys $120^\circ \pm 2^\circ$ This may be implied from their numbers of girls and boys in class B Note: $\frac{1}{3}$ of 18 does not imply $\frac{1}{3}$ of class B boys, hence B0 '18 is $\frac{2}{3}$ ', implies B1 CAO
6(a) $6x - 4x = 27 - 13$ $2x = 14$ $x = 7$	B1 B1 B1	FT until 2 nd error, then stop marking Must be simplified if possible for this final B1 mark
6(b) $x/2 = 26 - 18$ OR $x + 18 \times 2 = 26 \times 2$ $x = 16$	M1 A1	OR alternative full correct method Mark final answer Accept embedded answer, e.g. $16/2 + 18 = 26$
6(c) $y(y - 5)$	B1	
6(d) $y^3 + 4y$	B2	B1 a correct term. Mark final answer
6(e) $5x < 36$ or $5x < 30 + 6$ $x < 36/5$ or $x < 7.2$ or $x < 7\frac{1}{5}$	B1 B1	Do not accept '=' FT from 1 error only. Mark final answer If '=' used but replaced by '<' to give final correct answer, allow B2
7. n^2 or equivalent (black) $2n + 1$ or equivalent (white)	B1 B2 3	Accept use of N B1 for 2n or equivalent Penalise use of other letters -1 only

Summer 2014 Paper 1 Higher Tier	Marks	Comments
<p>8. An appropriate angle $180 - a - b$ or $180 - (a+b)$, or an appropriate b or c angle indicated on the diagram</p>  <p>(c =) $180 - (180 - a - b)$ (c =) $a + b$</p>	<p>B1</p> <p>OR</p>  <p>M1 A1</p>	<p>Must be shown or stated</p> <p>OR</p> <p>Or equivalent rearrangement, e.g. $a + b + 180 - c = 180$</p> <p>For answer only (c =) $a + b$ <u>without</u> (or incorrect) working or indication of any appropriate b or c angles award B0, M1 and A1.</p> <p>For answer (c =) $a + b$ <u>with</u> working or indication of any appropriate b or c angles award B1, M1 and A1.</p>
<p>9(a) (Millet) $3 \times 850/10$ 255(g)</p>	<p>M1 A1</p>	<p>CAO</p>

Summer 2014 Paper 1 Higher Tier	Marks	Comments																								
<p>9(b) Attempt to find unit cost e.g. for 1kg (For the 250g bag, 1kg costs) £1.96 (For the 300g bag, 1kg costs) £1.80 (For the 4kg bag, 1kg costs) £1.90</p> <p>Considering buying 10 or more 300g bags</p> <p>Working with or choice of 15 of the 300g bags, or $5000 \div 300$ with an answer of 16(.666...), 17 or 16, or trials including 15 or 16 or 17 of the 300g bags</p> <p>(Cheapest way to buy 5kg is 15 (300g bags) at 54(p) + 2 (250g bag) at 49(p) = (£)8(.)10 + 98(p)) = (£)9(.)08</p> <p>Look for</p> <ul style="list-style-type: none"> • correct units used • spelling in at least 1 statement/sentence • clarity of text explanations • clearly linking working with size of bag <p>QWC2: Candidates will be expected to</p> <ul style="list-style-type: none"> • present work clearly, with words or quantities shown for clarity of process or steps <p>AND</p> <ul style="list-style-type: none"> • make few if any mistakes in mathematical form, spelling, punctuation and grammar in their answer <p>QWC1: Candidates will be expected to</p> <ul style="list-style-type: none"> • present work clearly, with words or quantities shown for clarity of process or steps <p>OR</p> <ul style="list-style-type: none"> • make few if any mistakes in mathematical form, spelling, punctuation and grammar in their answer 	<p>B1</p> <p>S1</p> <p>M1</p> <p>A1</p> <p>QWC 2</p>	<p>OR for one correct costing for 5kg e.g. (£)7(.)60 + 4×49(p) = (£)9(.)56 OR At least 2 combinations of bags to a total of 5kg</p> <p>OR any 2 correct costings for buying 5kg OR stating any 3 possible combinations of bags to 5kg</p> <table border="1" data-bbox="879 365 1458 524"> <thead> <tr> <th>250g</th> <th>300g</th> <th>4kg</th> <th>Cost £</th> </tr> </thead> <tbody> <tr> <td>4</td> <td>0</td> <td>1</td> <td>1.96 + 7.60 = 9.56</td> </tr> <tr> <td>20</td> <td>0</td> <td>0</td> <td>9.80</td> </tr> <tr> <td>14</td> <td>5</td> <td>0</td> <td>6.86 + 2.70 = 9.56</td> </tr> <tr> <td>8</td> <td>10</td> <td>0</td> <td>3.92 + 5.40 = 9.32</td> </tr> <tr> <td>2</td> <td>15</td> <td>0</td> <td>0.98 + 8.10 = 9.08</td> </tr> </tbody> </table> <p>OR equivalent, e.g. repeated additions or multiples,</p> <p>QWC2 Presents relevant material in a coherent and logical manner, using acceptable mathematical form, and with few if any errors in spelling, punctuation and grammar.</p> <p>QWC1 Presents relevant material in a coherent and logical manner but with some errors in use of mathematical form, spelling, punctuation or grammar OR evident weaknesses in organisation of material but using acceptable mathematical form, with few if any errors in spelling, punctuation and grammar.</p> <p>QWC0 Evident weaknesses in organisation of material, and errors in use of mathematical form, spelling, punctuation or grammar.</p>	250g	300g	4kg	Cost £	4	0	1	1.96 + 7.60 = 9.56	20	0	0	9.80	14	5	0	6.86 + 2.70 = 9.56	8	10	0	3.92 + 5.40 = 9.32	2	15	0	0.98 + 8.10 = 9.08
250g	300g	4kg	Cost £																							
4	0	1	1.96 + 7.60 = 9.56																							
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8	10	0	3.92 + 5.40 = 9.32																							
2	15	0	0.98 + 8.10 = 9.08																							

Summer 2014 Paper 1 Higher Tier	Marks	Comments
<p>10. 12 sided shape: exterior angle $360/12 (= 30^\circ)$ interior angle ($180^\circ - 30^\circ = 150^\circ$) OR sketch showing one 30° exterior angles, e.g.</p>  <p>Gap is $360 - 150 - 150$ OR sketch implying the sum of the 2 angles of 30° is the remaining exterior angle, e.g.</p>  <p>Appropriate 60° or sketch showing 60° e.g.</p>  <p>Third shape: 3 (sides)</p>	<p>B1 B1</p> <p>M1</p> <p>A1</p> <p>A1</p>	<p>OR M1 Interior $10 \times 180 \div 12$ A1 = 150° OR B2 for interior angle found to be 150°</p> <p>FT for use of 'their 150'</p> <p>CAO. Allow (equilateral) triangle</p> <p><u>If correct answer with sight of angles:</u> <u>Sight of 150° or 30° AND 60° followed by an answer 3 (sides) or triangle is awarded 5 marks</u></p> <p>or <u>Sight of 150° or 30° followed by an answer 3 (sides) or triangle is awarded 4 marks only (as working is incomplete)</u></p> <p>or <u>Sight of $360^\circ/12$ followed by an answer 3 (sides) or triangle is awarded 3 marks only (as working is incomplete)</u></p> <p><u>OR if no working or errors in calculations:</u> Award SC2 for an answer of 3 sides or (equilateral) triangle. OR Award SC2 for a diagram of a tessellation of a number of sides of two 12-sided polygons showing a triangle. Award SC1 for a diagram of an attempt at a tessellation of a number of sides of two 12-sided polygons showing a triangle.</p>
<p>11. Equations $2b+3s = 2(\cdot)04$ and $4b + (1)s = 2(\cdot)48$ Method, equating coefficients or alternative</p> <p>First variable correct Method to find second variable Second variable correct</p>	<p>S1 M1</p> <p>A1 m1 A1</p>	<p>Accept other variables Allow 1 slip, but not in equated coefficients FT their equations in 2 variables provided at least 1 equation is correct</p> <p>Blackcurrant 54(p) or (£)0.54 Soda water 32(p) or (£)0.32</p> <p><i>Do not accept trial & improvement, maximum mark S1</i></p>
<p>12(a) $3(6 + x) + 2(2 - 3x) = 31$ or equivalent</p> <p>$-3x + 22 = 31$ $x = -3$</p>	<p>M2</p> <p>A1 A1</p>	<p>M1 for 2 of these 3 terms correct e.g. $3(6 + x) + 2(2 - 3x) = 31/6$, or for $\frac{3(6 + x) + 2(2 - 3x)}{6} = \frac{31}{6}$ or equivalent</p> <p>FT from M1 for A1 only CAO (Must be simplified)</p>
<p>12(b) $2(x + 3)(x + 1)$</p>	<p>B2</p>	<p>B1 for $2(x + 3)(x + 3 - 2)$ or $(2x + 6)(x + 1)$ or $(x + 3)(2x + 2)$ or $2(x^2 + 4x + 3)$</p>
<p>13(a) $8 \times 8 + \frac{1}{2} \times \pi \times 4^2$ $64 + 8\pi$ OR $8(8 + \pi)$ (cm^2)</p>	<p>M1 A1</p>	<p>Accept with a value inserted for π ISW. Must be an expression in terms of π <i>If no marks, SC1 for final answer:</i></p> <ul style="list-style-type: none"> • use of radius 8 giving $64 + 32\pi$, or • full circle included giving $64 + 16\pi$
<p>13(b) 1</p>	<p>B1</p>	
<p>13(c) 5×10^{-5}</p>	<p>B2</p>	<p>B1 for 0.00005 or 0.5×10^{-4} or 0.05×10^{-3} or similar form</p>

Summer 2014 Paper 1 Higher Tier	Marks	Comments								
14(a)(i) 2950 (miles) 3050 (miles) 79.5(hours) or 79 ½ (hours) or 79 h 30 min 80.5(hours) or 80½(hours) or 80 h 30 min	B2	All 4 correct entries B1 for any 2 correct entries Do not accept 79.3 or 80.3 as 2 correct entries, allow this as equivalent to counting 1 correct entry								
14(a)(ii) 3050 ÷ 79.5	B1	FT their greatest distance divided by their least time, provided distance >3000 and time < 80 Accept sight of $\frac{3050}{79.5}$								
14(b) $(59 + x) \div (2 + y)$ or $\frac{59+x}{2+y}$ (mph) or equivalent unsimplified	B2	OR equivalent with use of minutes, e.g. $\frac{59+x}{120+60y}$ B1 for intention clear but any necessary brackets omitted, or for $\frac{59.5+x}{2+y}$ or $\frac{60+x}{2+y}$ or $\frac{59.5+x}{120+60y}$ or $\frac{60+x}{120+60y}$ <i>SC1 for sight of 59.5 AND x - 0.5, or for sight of 59+x.</i>								
15. Volume scale factor ×27 Length scale factor ×3 Number of larger pebbles needed (15/3 =) 5	B1 B1 B1	Allow for sight of 54/2 or 27 provided not connected to irrelevant working Accept $\sqrt[3]{27}$. Allow for sight of 3 provided not connected to irrelevant working Award of the 2 nd B1 implies also the 1 st B1 <i>SC2 only for an answer of 5 without relevant working</i>								
16(a)(i) 0.021	B1									
16(a)(ii) 0.05	B2	B1 for 1/20								
16(b) 0.12 ••	B2	Accept 0.1212... or dots as for recurring notation Otherwise B1 for 0.12(1...)								
16(c) 35√2	B2	B1 for $\sqrt{70} = \sqrt{2} \times \sqrt{35}$ seen or implied, OR $7\sqrt{5}\sqrt{10}$ or $5\sqrt{7}\sqrt{14}$								
17(a) $y \propto 1/x$ OR $y = k/x$ 50 = k/2 y = 100/x	B1 M1 A1	FT non linear only Maybe implied in part (b)								
17(b) <table border="1" style="margin-left: 20px;"> <tr> <td>x</td> <td>½</td> <td>2</td> <td>8</td> </tr> <tr> <td>y</td> <td>200</td> <td>50</td> <td>12.5</td> </tr> </table>	x	½	2	8	y	200	50	12.5	B2	FT their non linear expression B1 for each value
x	½	2	8							
y	200	50	12.5							
18(a) Axis labelled frequency density with a uniform scale from 0 to 5(minimum) Frequency densities 1.8, 2.2, 5, 0.6, 0.2 Correct histogram	B1 M2 A1	Do not accept a scale using less than half the paper or for scales to ≥100 FT for their uniform scale M1 for any 3 correct frequency densities								
18(b) Explanation: <ul style="list-style-type: none"> Median is in the group 40<t≤60 Estimate so we don't know, or (Estimate of the) median is 44, or It (may be) is nearer 40 than 60 	E1 E1	Each E mark is independent. Accept 'median is in same group' Accept 'median could be towards the lower end of the median group'.								
19. Idea that need to find P(not strawberry, strawberry) and P(strawberry, not strawberry) and P(strawberry, strawberry) OR P(not strawberry, not strawberry) then subtract from 1 $\frac{15}{20} \times \frac{5}{19} + \frac{5}{20} \times \frac{15}{19} + \frac{5}{20} \times \frac{4}{19}$ OR $1 - \frac{15}{20} \times \frac{14}{19}$ $\frac{75}{380} + \frac{75}{380} + \frac{20}{380}$ OR $1 - \frac{210}{380}$ OR equivalent 380 380 380 $\frac{170}{380} (= \frac{17}{38})$	S1 M1 A1 A1	Allow selection with replacement for S1 only								

PAPER 2 - FOUNDATION TIER

Summer 2014 Paper 2 (Calculator allowed) Foundation Tier	Marks	Comments
<p>1. Parts (a) & (b) marked at the same time</p> <p>(a) <u>7.44</u> (butter) <u>3.44</u> (sugar) <u>3</u> (packs) (£4.62) (currants)</p> <p><u>15.5(0)</u></p> <p>(b) (10% =) (£) 1.55 (20% =) (£) 1.55×2 (£) 3.1(0) ISW</p>	<p>B1 B1 B1 B1 M1 A1</p>	<p>For the 3</p> <p>F.T. unless <u>both</u> 7.44 AND 3.44 are incorrect An answer of 15.5 only gets 4 only if ALL answers are correct</p> <p>F.T. their total Any complete correct method for finding 20%. If (£)3.1(0) not given then (£) 12.4(0) gains M1 A1 3.1% OR 3.1p OR £3.1p get M1,A0 but condone £3.1</p>
<p>2.</p> <p>170 km 170 m 170 mm <u>170 cm</u></p> <p><u>28 kg</u> 28 g 28 mg 280 g</p> <p>60 cm³ 600 ml <u>60 litres</u> 6000 litres</p> <p><u>18 m²</u> 18 cm² 18 mm² 18 cm³</p>	<p>✓ B1 B1 B1 B1</p>	<p><u>Tick marked question</u></p>
<p>To be viewed with diagram Parts (a) & (b) marked at the same time</p> <p>3. (a) Pointer showing 320g</p> <p>3. (b) Reading 620 (g)</p> <p>One cube weighs (620–320)/5 = 60 (g)</p> <p>Look for</p> <ul style="list-style-type: none"> • spelling • clarity of text explanations, • the use of notation (watch for the use of ‘=’, g) <p>QWC2: Candidates will be expected to</p> <ul style="list-style-type: none"> • present work clearly, with words explaining process or steps <p>AND</p> <ul style="list-style-type: none"> • make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer <p>QWC1: Candidates will be expected to</p> <ul style="list-style-type: none"> • present work clearly, with words explaining process or steps <p>OR</p> <ul style="list-style-type: none"> • make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer 	<p>B2 ✓ B1 M1 A1 QWC 2</p>	<p>B1 if calculation shown and F.T. their pointer. OR B1 for sight of 320 in the working but nothing on their diagram OR 260 shown on their diagram. Pointer drawn takes precedence over written value(s) Pointer nearer correct mark than the ones each side of it</p> <p>Complete method, subtraction and division FT 'their 620 and 320' Allow B1, SC1 for 620/5 = 124 (g) Unsupported 124 (g) gets M0,A0</p> <p>QWC2 Presents relevant material in a coherent and logical manner, using acceptable mathematical form, and with few if any errors in spelling, punctuation and grammar.</p> <p>QWC1 Presents relevant material in a coherent and logical manner but with some errors in use of mathematical form, spelling, punctuation or grammar OR evident weaknesses in organisation of material but using acceptable mathematical form, with few if any errors in spelling, punctuation and grammar.</p> <p>QWC0 Evident weaknesses in organisation of material, and errors in use of mathematical form, spelling, punctuation or grammar.</p>

Summer 2014 Paper 2 (Calculator allowed) Foundation Tier	Marks	Comments
<u>To be viewed with diagram</u> 4. (a) Evidence of square counting 57 – 63 inclusive 456 – 504 inclusive (m ²)	M1 A1 B1	Inside the shape. Condone answers like 60 ² here. F.T. 'their number of squares' × 8 Unsupported answers in the range 456 – 504 inclusive get all 3 marks, <u>Mark final answer</u>
		57 456 58 464 59 472 60 480 61 488 62 496 63 504
<u>To be viewed with diagram</u> 4. (b) Lines Arc	B1 B1	F.T. correct curvature up to the start of 'their line' <u>Maximum of B1 if extra parts drawn</u>
5. (a) radius chord	B1 B1	
<u>To be viewed with diagram</u> 5. (b) (i) <u>141 (mm) to 145 (mm) inclusive</u>	B1	
<u>To be viewed with diagram</u> 5. (b) (ii) Perpendicular through C	B1	<u>Allow from the leftmost 'e' in 'millimetres' to the 'e' in 'the' in 'the length' inclusive.</u> <u>Welsh: from the first 'm' to the 'a' in milimetrau</u>
<u>To be viewed with diagram</u> <u>Parts (a) to (e) marked at the same time</u> 6. (a) (Day) 2 (b) 3 (days) (c) 2 (days) (d) 17.5 (mm) <u>OR 17½ (mm)</u> (e) 3.5 (mm)	B1 B1 B1 B1 B1	Allow 'on day 1, day 2 and day 4' Allow 'on day 1 and day' 4
7. (a) $\left(\frac{8}{20}\right) \frac{1}{4} \left(\frac{2}{5}\right) \frac{10}{40} \frac{5}{20}$	B2	B1 for either one correct AND none incorrect OR for both correct and 1 incorrect
7. (b) 3 shaded sectors	B1	
7. (c) $\frac{5}{6} - \frac{2}{6}$ (= 3/6) = 1/2	M1 A1	Or equivalent correct method Must be ½. Unsupported 3/6 gets M1, A0 M1, A1 for (0).5
8. (a) (i) 1	B1	
8. (a) (ii) -4	B1	
8. (b) $87/100 \times 58$ = 50.46	M1 A1	Any correct method for finding 87%. 50.46% gets M1, A0, but M1, A1 for £50.46 Unsupported 50.4 OR 50.5 gets M1, A0 <u>50.46 seen then with further rounding still gets M1,A1</u>
8. (c) (i) 1.6	B2	B1 for 1.55(44819 ...). All places given must be correct rounded or truncated. B1 for 1.5
8. (c) (ii) 14.1	B2	B1 for 14.10(10627 ...) All places given must be correct rounded or truncated.

Summer 2014 Paper 2 (Calculator allowed) Foundation Tier	Marks	Comments	
9. (a) (i) Add 7 to the previous term	B1	Accept +7, 'goes up in 7s', 'a gap of 7' B0 for $n+7$ OR $7n-5$	
9. (a) (ii) Multiply the previous term by -3	B1	Accept $\times -3$. B0 for $-3n$ OR $n \times -3$ B1 for 'multiply by 3 and change the sign'.	
9. (b) (i) $100t$ (p)	B1	Accept $t \times 100$, $100 \times t$, $t100$, and e.g. $t \times 100 = t$ Condone change of letters. Ignore £ or p. B1 for $100tp$ but B0 for $100p$	
9. (b) (ii) $h - 3$ (cm)	B1	Condone change of letters. Allow $h = h-3$ Ignore cm	
9. (b) (iii) $8w$ (kg)	B1	Accept $8 \times w$, $w8$, $w \times 8$, and e.g. $8w = w$ Condone change of letters. Ignore kg. B0 for $8000w$, B1 for $8000w$ g	
9. (c) (i) $(x=)$ 5	B1	Accept embedded answers such as $3 \times 5 = 15$ but B0 for 3×5 only. B0 for $x = 3 \times 5 = 15$	
9. (c) (ii) $(x=)$ 11	B1	Accept embedded answers such as $11 + 5 = 16$. B0 for $11 + 5 = 16x$ OR $11x$ OR B0 for only 11 + 5	
Parts (a) & (b) marked at the same time 10. (a) (i) 23 (years) (a) (ii) 23 (years) The 24 becomes 23 and the 47 becomes 46 O R Both ends are 1 less (b) Sum of the numbers (272) Sum/8 = 34 (years)	B1 B1 E1 M1 M1 A1	Comes from $47 - 24$ F.T. 'their (a)(i)' $46 - 23 = 23$ gets the B1 and E1 B1, E1 for a list of the ages (each 1 less) and correct answer E0 for 'they are the same people' For attempt to add the numbers For dividing a number in the range 220 – 320 inclusive by 8. C.A.O.	<u>Notes</u> In part (a)(ii) accept For example, 23 because everyone would be 1 year younger OR 23 because the difference in their ages hasn't changed
11. Parts (a) & (b) marked at the same time (a) 11.8 (cm) 11.8×10 = 118 (km) To be viewed with diagram (b) Use Overlay Bearing 097° from A Bearing 342° from B Point (X)	B1 M1 A1 M1 M1 A1	Allow $11.6 - 12.0$ inclusive (Ignore km here) FT 'their 11.8×10 km not required but A0 for incorrect units Unsupported answers within $116-120$ inc get B1,M1,A1. Unsupported answers outside $116-120$ inclusive get 0. Allow $\pm 2^\circ$ Allow $\pm 2^\circ$ F.T. if at least M1 awarded. Unambiguous dots within the boundaries of the overlay can get the M1s. One unambiguous dot within the 'box' gets all 3 marks. Watch out for line segments. An unambiguous point of intersection does not require X.	
Parts (a) & (b) marked at the same time 12. (a) (Number of dollars =) 1200×1.52 = (\$) 1824 ISW (b) $(1824 - 1649) \div 1.52$ OR $175 \div 1.52$ = (£)115.13 ISW	M1 A1 M1 A1	\$ not required but £ gets A0. F.T. 'their (\$)1824' £ not required but \$ gets A0. Accept (£)115 but A0 for (£)115.1	

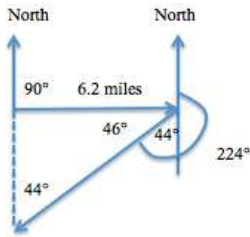
Summer 2014 Paper 2 (Calculator allowed) Foundation Tier	Marks	Comments
<p>Use Overlay 13. (a) Arcs to show 60° or 120° Arcs to bisect the 60° Line to show angle of 30°</p>	<p>M1 <u>m1</u> A1</p>	<p>We need to watch out for the case where there is no arc on the line. Candidates could have used the length of the line to set their compass length and placed the compass point at the end of the line. In this case there will only be arcs above the line. If not drawn at A – mark as if at A and penalise –1</p>
<p>Use Overlay 13. (b) Correct intersecting arcs Perpendicular line</p>	<p>M1 A1</p>	<p>There must be 2 pairs of intersecting arcs for M1. (Some candidates draw 1 pair of arcs and join up the intersection of these to the midpoint of the line (found by measurement?) which is incorrect M0,A0). 2 arcs drawn with radius 0.5PQ and centred at P and Q is incorrect and gets 0 marks.</p>
<p>14.(a) Correct reflection</p>	<p>B2</p>	<p>B1 for the sight of the line $y = 1$, or a reflection in any horizontal line B0 if more than one triangle drawn, unless all are reflections in a horizontal line</p>
<p>Use overlay 14.(b) Correct enlargement Correct position</p>	<p>B2 B1</p>	<p>B1 for any two adjacent lines correct Intention of correct placement, i.e. with appropriate rays seen, or correct positioning of at least two vertices <i>Penalise consistent incorrect scale factor -1</i></p>
<p>To be viewed with diagram 15.(a) (maximum width is $2 \times 45 = 90$ (m) AND (minimum length is $\frac{3}{4} \times 120 = 90$ (m) (maximum area is $90 \times 120 = 10800$ (m²) AND (minimum area is $45 \times 90 = 4050$ (m²) $4050 \times 1.5 = 6075$ (m² <10800 m²) OR $100 \times 10800 / 4050 = 266.6(6.. \% >150\%)$ OR $100 \times (10800 - 4050) / 4050 = 166.6(6.. \% >50\%)$ OR similar appropriate check against Susan’s statement, e.g. $2 \times 4050 = 8100$ (<10800m²) Conclusion that Susan is correct based on calculations, e.g. ‘it is at least 50% greater, in fact it is (much) more’ following from an appropriate calculation, or ‘6075 (m²) < 10800 (m²)’, or ‘$100 \times (10800 - 4050) / 4050 = 166.6(6.. \% >50\%)$, or ‘$100 \times 10800 / 4050 = 266.6(6.. \% >150\%)$’, or ‘Twice 4050 is less than 10800’</p>	<p>✓ B1 B1 B1 E1</p>	<p>Sight of 90(m) TWICE if unlabelled (max width & min length) Both areas correct FT ‘their 2×45’ $\times 120$ correctly evaluated AND $45 \times$ ‘their $\frac{3}{4} \times 120$’ correctly evaluated <i>If neither of the previous B1s awarded, then award SC1 for sight of 90(m) and one correct (FT) area</i> <u>The award of this mark requires a correct evaluation of the candidate’s check. Must show correct evaluation</u> FT ‘their 4050×1.5 correctly evaluated, or $100 \times$ ‘their max area’ / ‘their min area’ correctly evaluated, or similar appropriate check. <i>Do not accept 50% of 10800 or 5400, B0, unless applied appropriately. Allow FT from this type of comparison. However, sight of $4050 < 5400$ is an appropriate comparison, hence B1 (and may also gain E1)</i> Allow ‘is correct’ implied, do not accept ‘not correct’ Accept that there may be errors in calculations, but that it is a conclusion based on attempting to work with area <i>Watch for incorrect conclusion following correct working.</i> FT appropriate conclusion based on their working provided the candidate has attempted to work with area. No working shown, then E0 <i>Alternative:</i> $2 \times 4/3$ B2 $= 8/3$ B1 <i>Appropriate conclusion</i> E1 <u>Allow responses that clearly engage with the concept that doubling the width will result in an area that is at least 50% greater.</u></p>

Summer 2014 Paper 2 (Calculator allowed) Foundation Tier	Marks	Comments
16. Taxable income ($52250 - 9205 =$) (£)43045 40% tax to be paid on (£)10790 $0.2 \times 32255 (=6451)$ $0.4 \times 10790 (=4316)$ (£) 6451 AND (£)4316 Claudia's tax should be (£)10767	B1 B1 M1 M1 A1 A1	FT 'taxable income' – 32255, i.e. 'their 52250 -9205' – 32255 correctly evaluated FT $0.4 \times$ ('their 43045' – 32255) provided 'their 43045' > 32255, also FT ($52250 - 32255 =$) giving $0.4 \times 19995 (=7998)$ FT sum of 'their 6451' + 'their 4316' provided at least 1 of these values is correct and M2 awarded <i>(Note: 6451 + 7998 = 14449)</i>
17.(a) 246/365 ISW	B1	Allow 247/366
17.(b) Total for 12 months ($= 12 \times 4 =$) 48(°C) 11 months $48 - 26 (=22)$ $\div 11$ $= 2(^{\circ}\text{C})$	B1 M1 m1 A1	FT 'their 12×4 ' <i>Award B4 for an unsupported answer of 2(°C)</i> <i>Sight of $48 - 26/12$ is B1 only,</i> <i>Sight of $(48-26)/12$ is B1, M1 only</i>
17.(c) Mid points -1, -3, -5, -7, -9, -11 $-11 \times 1 + -9 \times 3 + -7 \times 5 + -5 \times 8 + -3 \times 4 + -1 \times 10$ ($\Sigma fx = -135$) their $\Sigma fx/31$ $-4.3548\dots(^{\circ}\text{C})$ rounded or truncated to 1 or more d.p.	B1 M1 m1 A1	Sight of any 3 correct values, with no incorrect values FT their mid points from within appropriate groups, or at bounds of the groups FT their $\Sigma fx/31$ correctly evaluated. Must be negative. Accept -4, -4.4 or -4.3 only from correct working Award B4 unsupported -4.35 Omitted negative sign, penalise -1 only, then follow mark scheme as above.
17.(d) Any correct 10% of a value seen in working $251850 - 0.10 \times 251850 (= 251850 - \mathbf{25185})$ $226665 - 0.10 \times 226665 (= 226665 - \mathbf{22666.5})$ 47851.5(0 Russian roubles)	B1 M1 A2	OR B1 and M1 for 251850×0.90^2 B1 and M0 for 251850×0.90 Two different 10% OR sight of 0.10×251850 AND 0.10×226665 (25185 AND 22666.5) Accept 47851 or 47852 (roubles) A1 for 203998.5(0), 203998 or 203999 (roubles) <i>Appreciate: B1 and SC1 for 304738.5(0) and 52888.5(0)</i> <i>Simple interest, accept a correct 20% for B1 only (50370)</i>

PAPER 2 - HIGHER TIER

Summer 2014 Paper 2 Higher Tier	Marks	Comments
1(a) Correct reflection	B2	B1 for the sight of the line $y = 1$, or a reflection in any horizontal line B0 if more than one triangle drawn, unless all are reflections in a horizontal line
1(b) Correct enlargement Correct position	B2 B1	B1 for any two adjacent lines correct Intention of correct placement, i.e. with appropriate rays seen, or correct positioning of at least two vertices <i>Penalise consistent incorrect scale factor -1</i>
2(a) (maximum width is $2 \times 45 \Rightarrow 90$ (m) AND (minimum length is $\frac{3}{4} \times 120 \Rightarrow 90$ (m) (maximum area is $90 \times 120 \Rightarrow 10800$ (m ²) AND (minimum area is $45 \times 90 \Rightarrow 4050$ (m ²) $4050 \times 1.5 = 6075$ (m ² < 10800 m ²) OR $100 \times 10800 / 4050 = 266.6(6\dots\%) > 150\%$ OR $100 \times (10800 - 4050) / 4050 = 166.6(6\dots\%) > 50\%$ OR similar appropriate check against Susan's statement, e.g. $2 \times 4050 = 8100$ (< 10800 m ²) Conclusion that Susan is correct based on calculations, e.g. 'it is at least 50% greater, in fact it is (much) more' following from an appropriate calculation, or ' 6075 (m ²) < 10800 (m ²)', or ' $100 \times (10800 - 4050) / 4050 = 166.6(6\dots\%) > 50\%$ ', or ' $100 \times 10800 / 4050 = 266.6(6\dots\%) > 150\%$ ', or 'Twice 4050 is less than 10800' Look for <ul style="list-style-type: none"> • spelling • clarity of text explanations, • the use of notation (watch for the use of '=', m, m² being appropriate) QWC2: Candidates will be expected to <ul style="list-style-type: none"> • present work clearly, with words explaining process or steps AND <ul style="list-style-type: none"> • make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer QWC1: Candidates will be expected to <ul style="list-style-type: none"> • present work clearly, with words explaining process or steps OR <ul style="list-style-type: none"> • make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer 	<p>B1 Sight of 90(m) TWICE if unlabelled (max width & min length)</p> <p>B1 Both areas correct FT 'their $2 \times 45 \times 120$ correctly evaluated AND $45 \times$ 'their $\frac{3}{4} \times 120$' correctly evaluated <i>If neither of the previous B1s awarded, then award SC1 for sight of 90(m) and one correct (FT) area</i></p> <p>B1 <u>The award of this mark requires a correct evaluation of the candidate's check.</u> Must show correct evaluation FT 'their 4050×1.5 correctly evaluated, or $100 \times$ 'their max area' / 'their min area' correctly evaluated, or similar appropriate check. <i>Do not accept 50% of 10800 or 5400, B0, unless applied appropriately. Allow FT from this type of comparison. However, sight of $4050 < 5400$ is an appropriate comparison, hence B1 (and may also gain E1)</i></p> <p>E1 Allow 'is correct' implied, do not accept 'not correct' Accept that there may be errors in calculations, but that it is a conclusion based on attempting to work with area <i>Watch for incorrect conclusion following correct working.</i> FT appropriate conclusion based on their working provided the candidate has attempted to work with area. No working shown, then E0</p> <p><i>Alternative:</i> $2 \times 4/3$ B2 $= 8/3$ B1 <i>Appropriate conclusion</i> E1</p> <p>QWC 2 <i>Allow responses that clearly engage with the concept that doubling the width will result in an area that is at least 50% greater.</i></p> <p>QWC2 Presents relevant material in a coherent and logical manner, using acceptable mathematical form, and with few if any errors in spelling, punctuation and grammar.</p> <p>QWC1 Presents relevant material in a coherent and logical manner but with some errors in use of mathematical form, spelling, punctuation or grammar OR evident weaknesses in organisation of material but using acceptable mathematical form, with few if any errors in spelling, punctuation and grammar.</p> <p>QWC0 Evident weaknesses in organisation of material, and errors in use of mathematical form, spelling, punctuation or grammar.</p>	
2(b) $(\times)2.67$	B2	Must be to 2 decimal places B1 for sight of 10800/4050 or 2.6(66\dots) or 2.7 or $2\frac{2}{3}$ or $\frac{8}{3}$ For B2, FT ' $100 \times$ their max area / their min area' (%) expressed as a decimal to 2 decimal places, or for B1, FT if truncated, unrounded or given as a fraction

Summer 2014 Paper 2 Higher Tier	Marks	Comments
3(a) 246/365 ISW	B1	Allow 247/366, 246.25/365.25
3(b) (Total for 12 months $12 \times 4 =$ 48(°C) 48 - 26 (=22) $\div 11$ = 2(°C)	B1 M1 m1 A1	FT 'their 12×4' <i>Award B4 for an unsupported answer of 2(°C)</i> <i>Sight of 48 – 26/12 is B1 only,</i> <i>Sight of (48-26)/12 is B1, M1 only</i>
3(c) Mid points -1, -3, -5, -7, -9, -11 $-11 \times 1 + -9 \times 3 + -7 \times 5 + -5 \times 8 + -3 \times 4 + -1 \times 10$ ($\Sigma fx = -135$) their $\Sigma fx/31$ -4.3548...(°C) rounded or truncated to 1 or more d.p.	B1 M1 m1 A1	Sight of any 3 correct values, with no incorrect values FT their mid points from within appropriate groups, or at bounds of the groups FT their $\Sigma fx/31$ correctly evaluated. Must be negative. Accept -4, -4.4 or -4.3 only from correct working Award all 4 marks for unsupported -4.35 Omitted negative sign, penalise -1 only, then follow mark scheme as above
3(d)(i) Any correct 10% of a value seen in working $251850 - 0.10 \times 251850 (= 251850 - \mathbf{25185})$ $226665 - 0.10 \times 226665 (= 226665 - \mathbf{22666.5})$ 47851.5(0 Russian roubles)	B1 M1 A2	OR B1 and M1 for 251850×0.90^2 B1 and M0 for 251850×0.90 Two different 10% OR sight of 0.10×251850 AND 0.10×226665 (25185 AND 22666.5) Accept 47851 or 47852 (roubles) A1 for 203998.5(0), 203998 or 203999 (roubles) <i>Appreciate: B1 and SC1 for 304738.5(0) and 52888.5(0)</i> <i>Simple interest, accept a correct 20% for B1 only (50370)</i>
3(d)(ii) Boris's car cost 251850/50.37 (£)5000 Angharad paid (£)250 (more)	M1 A1 B1	<i>Treat use of 203998.5, 203998 or 203999 as MR-1</i> FT 5250 – 'their 5000' correctly evaluated provided M1 previously awarded OR (Angharad's car $5250 \times 50.37 = 264442.5$ roubles) AND Difference $264442.5 - 251850 =$ 12592.5 (roubles) B1 (Difference, Angharad paid) $12592.5 \div 50.37$ M1 (£)250 (more) A1 <i>For the M1 A1, FT 'their 12592.5' provided appropriate calculations are shown in the first 2 stages</i>
4(a) 5 and 14	B2	B1 for each
4(b) Plots correct, allowing one error or the 2 omissions ($x=-1$ and $x=2$) All 6 points correct & joined with a curve	B1 B1	FT from (a) FT from (a). Need to have all 6 plots no omissions
4(c) Sight of $y = 10$ including the intersection, or marking the intersection and $y = 10$ with a point, or a vertical line to the point of intersection with $y = 10$	B1	FT their graph. Unambiguous answer on the graph
5. Taxable income ($52250 - 9205 =$) (£)43045 40% tax to be paid on (£)10790 $0.2 \times 32255 (=6451)$ $0.4 \times 10790 (=4316)$ (£) 6451 AND (£)4316 Claudia's tax should be (£)10767	B1 B1 M1 M1 A1 A1	FT 'taxable income' – 32255, i.e. 'their 52250 -9205' – 32255 correctly evaluated FT $0.4 \times$ ('their 43045' – 32255) provided 'their 43045' > 32255, also FT $(52250 - 32255 =)$ giving $0.4 \times 19995 (=7998)$ FT sum of 'their 6451' + 'their 4316' provided at least 1 of these values is correct and M2 awarded <i>(Note: 6451 + 7998 = 14449)</i>
6. Correct region shaded (major segment)	B3	Mark intention. B1 for line, B1 for any arc radius 4cm centre B, B1 for shading (FT from a circle centre B and a straight line crossing AB)

Summer 2014 Paper 2 Higher Tier	Marks	Comments
7(a) $y = 3x + 6$	B2	B1 for $y = \frac{3}{1}x + 6$ or equivalent, or for $m = 3$ (must be clear that this is the gradient), or for $c = 6$ (must be clear that this is the intercept)
7(b) Correct straight line drawn (gradient -2, passing through (0,-1))	B2	B1 for any straight line drawn with gradient -2, or a straight line passing through (0, -1) with either gradient 2 or with a negative gradient
8(a) 78	B1	
8(b) 0, 5, 25, 49, 83, 113, 120	B2	B1 for any three correct values, OR FT cumulative from 1 error finding 3 further cumulative values accurately
8(c) 3 unique vertical plots correct at upper bounds All plots correct and joined, including to zero at $t=2.5$	M1 A1	Only FT their <u>cumulative table</u> to (c) and (d) Accuracy of plotting: time on the grid line, cumulative frequency within the appropriate square with 1 st & last plots on the grid lines <i>Ignore bars only if intention clear that line or curve is being used in (d)</i>
8(d) (i) Median from cumulative graph (10.8 minutes)	B1	FT from their cumulative graph in (c)
8(d)(ii) Attempt, (using the reading on the horizontal) UQ - LQ (5 minutes)	M1 A1	<i>If (b) is not cumulative then do not FT to (c) & (d)</i>
9. Appropriate 46° or appropriate 44° seen or implied, e.g.  Distance = $6.2 \times \tan 46^\circ$ OR Distance = $6.2 \div \tan 44^\circ$ = 6.4(2... miles)	B1 M2 A1	At least 1 relevant angle 44° or 46° seen or implied Sight of 224° is insufficient Do not FT for an angle of 45° as this is a simplified problem FT for M1 only, their 44° or their 46° provided it is $<90^\circ$ M1 for $\tan 46^\circ = \text{distance}/6.2$ or $\tan 44^\circ = 6.2/\text{distance}$ CAO <i>Unsupported answers gets no marks</i>
10(a) $(x - 6)(x + 2)$ $x = 6$ AND $x = -2$	B2 B1	B1 for $(x + 6)(x - 2)$ OR $(x - 6)(x - 2)$ STRICTLY FT their pair of brackets
10(b)(i) $5n - 1$	B2	Accept $5N - 1$. Allow ' $n(\text{th}) = 5n - 1$ ' B1 for $5n$ <i>Penalise incorrect letter -1 only</i>
10(b)(ii) $n^2 + 1$	B1	CAO. Accept $n \times n + 1$ <i>Do not penalise change of letter</i>
11(a)(i) Using $0.6 \times \dots = 0.18$ or sight of $0.18 \div 0.6$ or $0.18/0.6$ P(drink) = 0.3	M1 A1	
11(a)(ii) Tree completed correctly (0.4, 0.3, 0.7, 0.3, 0.7 on appropriate branches)	B2	FT their '0.3', this could be 0.18 and 0.82 on second pairs of branches B1 for 0.4 with at least one other pair of branches total of 1
11(b) 0.4×0.7 = 0.28	M1 A1	FT attempt to multiply appropriate probabilities, provided no probability >1 FT for correct evaluation, provided not >1
12(a) $(x + 3)(2x + 3) + x(x + 3) = 70$ $2x^2 + 6x + 3x + 9 + x^2 + 3x = 70$ Convincing lead to $3x^2 + 12x - 61 = 0$	M1 A1 A1	Accept $3x^2 + 12x = 61$

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12(b) $x = \{-12 \pm \sqrt{(12^2 - 4 \times 3 \times -61)}\} / (2 \times 3)$ $= \{-12 \pm \sqrt{876}\} / 6$ $x = 2.93(288\dots)$ (and $x = -6.9328\dots$) Parallel side is 5.93 (cm)	M1 A1 A1 B1	Allow one slip in the substitution, but with correct formula Ignore if negative answer is also given. Allow rounded or truncated for A1, but 2 d.p. accuracy is required then for B1 Must be to 2d.p. From 2 d.p value of x. FT their positive $x + 3$ evaluated to 2d.p. provided at least M1 awarded. B0 if negative response also given
13. Strategy: Use of right angled triangle (OAM or OMB) with either AM or MB = 10.4(cm) Sight of OM = radius – 1.5 or equivalent OR $\text{Radius}^2 = \text{OM}^2 + 10.4^2$ $R^2 = 10.4^2 + (R - 1.5)^2$ OR $(\text{OM}+1.5)^2 = 10.4^2 + \text{OM}^2$ $R^2 = 108.16 + R^2 - 1.5R - 1.5R + 2.25$ OR $\text{OM}^2 + 3\text{OM} + 2.25 = 108.16 + \text{OM}^2$ $3R = 110.41$ OR $3\text{OM} = 105.91$ or $\text{OM} = 35.3033\dots$ $R = 36.8(033\dots \text{cm})$ or 37(cm)	S1 B1 M1 M1 A1 A1	Allow 1 slip FT from their 1 slip CAO <i>Alternative:</i> Strategy: Use of triangle MAP or PMB with 1.5cm and 10.4cm S1 Tan MPA(MPB) = 10.4/1.5 leading to 81.792...° B1 (FT provided tanP=10.4/1.5 seen) $180 - 2 \times 81.792\dots^\circ (=16.41\dots^\circ)$ M1 (Allow FT from 1 slip) $\sin 16.41\dots^\circ = 10.4/\text{radius}$ M1 $\text{Radius} = 10.4/\sin 16.41\dots^\circ$ A1 $\text{Radius} = 36.8(033\dots \text{cm})$ or 37(cm) A1 CAO Also allow application of other circle theorem
14. $\cos PBA = \frac{6.2^2 + 5.8^2 - 8.6^2}{2 \times 6.2 \times 5.8}$ $91.4978\dots(^\circ)$ $\sin QBC = \frac{\sin 72^\circ \times 4.1}{7.5}$ $31.326\dots(^\circ)$ Angle PBQ = 57(°)	M2 A1 M2 A1 B1	M1 for $8.6^2 = 6.2^2 + 5.8^2 - 2 \times 6.2 \times 5.8 \times \cos PBA$ Rounded or truncated M1 for $\frac{\sin QBC}{4.1} = \frac{\sin 72^\circ}{7.5}$ or $\frac{4.1}{\sin QBC} = \frac{7.5}{\sin 72^\circ}$ Rounded or truncated Do not FT from premature rounding or truncation. Do not accept 58(°) or 57.2(°), must be correct and whole FT provided at least M1 for each of cosine and sine rule awarded
15(a) 0	B1	
15(b) Tangent drawn at $t = 3.5$ Method, difference y / difference x Evaluated estimated answer from their reasonable tangent	B1 M1 A1	The values used must be correct, do not allow 27/3.5 May not be from a tangent, but must be from use of differences, e.g. curve used to form a 'right-angled triangle' (Approximately 3.3 (m/min ²))
15(c)(i) Finding v values: (0,) 14, 29, 26, 30 Split into 4 areas and attempt to sum Correct substitution into trapezium rule 168 (metres)	B1 M1 M1 A1	Sight of (0,) 14, 29, 26, 30 Sight of the sum of 4 products or an attempt substitution of their 5 values in the trapezium rule Or equivalent. (14 + 43 + 55 + 56) or (0+28+ 58+52+30) FT their values for v provided at least 3 values are correct, OR 2 areas correct in sum of 4 possible
15(c)(ii) 0.168(km)	B1	FT their (i)/1000 evaluated correctly



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