



2010 Mathematics

Intermediate 1 Units 1, 2 & 3 Paper 1

Finalised Marking Instructions

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Part One: General Marking Principles for Mathematics Intermediate 1 Units 1, 2 & 3 Paper 1

This information is provided to help you understand the general principles you must apply when marking candidate responses to questions in this Paper. These principles must be read in conjunction with the specific Marking Instructions for each question.

1. Marks for each candidate response must always be assigned in line with these general marking principles and the specific Marking Instructions for the relevant question. If a specific candidate response does not seem to be covered by either the principles or detailed Marking Instructions, and you are uncertain how to assess it, you must seek guidance from your Team Leader/Principal Assessor. You can do this by posting a question on the Marking Team forum or by e-mailing/phoning the emarker Helpline. Alternatively, you can refer the issue directly to your Team Leader by checking the 'Referral' box on the marking screen.
2. Marking should always be positive ie, marks should be awarded for what is correct and not deducted for errors or omissions.
3. Award one mark for each 'bullet' point shown in the Marking Instructions.
4. Working subsequent to an error must be followed through with the possibility of awarding all remaining marks for the subsequent working, provided the question has not been not simplified as a result of the error. In particular, the answer to one part of a question, even if incorrect, must be accepted as a basis for subsequent dependent parts of the question. Full marks in the dependent part(s) may be awarded provided the question has not been not simplified.
5. Solutions which seem unlikely to include anything of relevance must nevertheless be followed through. Candidates still have the opportunity of gaining one mark or more provided the solution satisfies the criteria for the marks.
6. The following should not be penalised:
 - working subsequent to a correct answer (unless it provides firm evidence that the requirements of the question have not been met)
 - omission or misuse of units (unless marks have been specifically allocated for the purpose in the Marking Instructions)
 - bad form, eg $\sin x^\circ = 0.5 = 30^\circ$
 - legitimate variation in numerical values/algebraic expressions.
7. Full credit should only be given where the solution contains appropriate working. Where the correct answer may be obtained by inspection or mentally, credit may be given, but reference to this will be made in the Marking Instructions.
8. In general only give credit for answers if working is shown. A wrong answer without working receives no credit unless specifically mentioned in the Marking Instructions. The rubric on page one of the question paper states that 'full credit will be given only where the solution contains appropriate working'.
9. Sometimes the method to be used in a particular question is explicitly stated; no credit should be given where a candidate obtains the correct answer by an alternative method.
10. Where the method to be used in a particular question is not explicitly stated, full credit must be given for alternative methods which produce the correct answer.

11. Do not penalise the same error twice in the same question.
12. Do not penalise a transcription error unless the question has been simplified as a result.
13. Where a solution has been scored out and not replaced then provided the solution is legible marks should be awarded in line with the Marking Instructions for that question.
14. Where more than one solution is given, mark them all and award the least mark.
15. The symbols ✓ and ✕ are used in the Marking Instructions to give guidance regarding the awarding of marks for specific candidate responses to some questions, eg 'award 2/4 ✓✕✕✓' indicates that the 1st & 4th marks should be awarded but the 2nd & 3rd marks should not.

Part Two: Mathematics Intermediate 1: Paper 1, Units 1, 2 and 3

Question		Expected Answer/s	Max Mark	Additional Guidance
1	a	<p>Ans: 3.92</p> <p>•¹ calculate $9.22 - 5.3$: 3.92</p>	1	
1	b	<p>Ans: 1.76</p> <p>•¹ calculate $528 \div 300$: 1.76</p>	1	
1	c	<p>Ans: 150</p> <p>•¹ calculate 60% of 250: 150</p>	1	
2	a	<p>Ans: £1.40</p> <p>•¹ interpret line graph: 1.40</p>	1	
2	b	<p>Ans: Increased spending on fruit and decreased spending on sweets</p> <p>•¹ interpret trends in line graph: spending on fruit went up and spending on sweets went down</p>	1	<ol style="list-style-type: none"> Disregard numerical errors in an otherwise correct answer Answer must clearly show that candidate is not just comparing spending on fruit and sweets in December e.g. Accept “Over the year she spent more on fruit and less on sweets.” Do not accept “She spent more on fruit and less on sweets.” Accept “Fruit went up and sweets went down.”

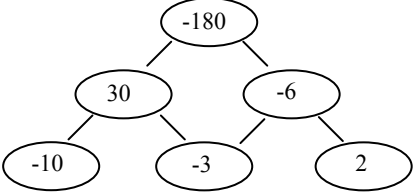
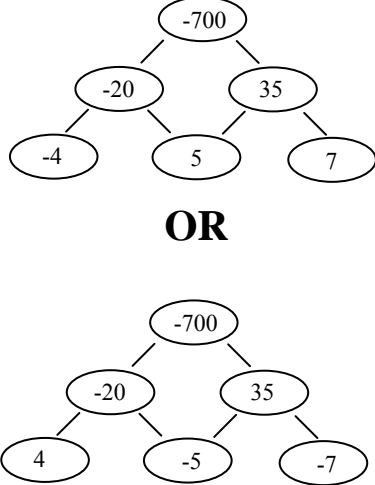
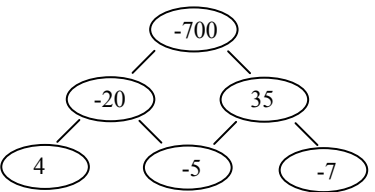
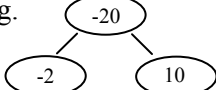
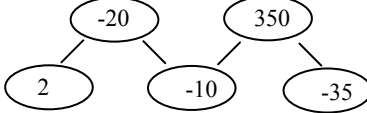
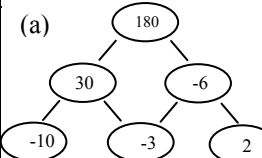
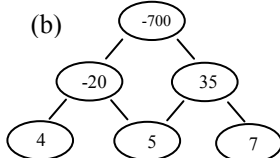
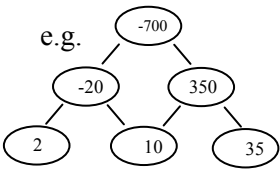
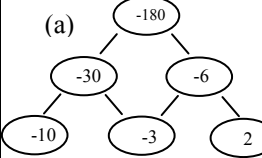
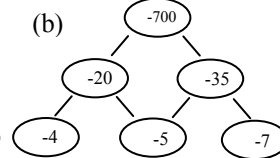
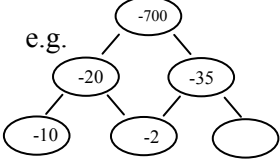
Question		Expected Answer/s	Max Mark	Additional Guidance
3	a	<p>Ans: $7a + 20$</p> <ul style="list-style-type: none"> •¹ multiply out bracket: $22a + 20 - 15a$ or $20 - 15a$ •² collect like terms: $7a + 20$ 	2	<ol style="list-style-type: none"> 1. Correct answer without working award 2/2 2. 2nd mark is not available if there is invalid subsequent working eg $7a + 20 \rightarrow 27a$ award 1/2 $7a + 20 \rightarrow 20/7$ award 1/2
3	b	<p>Ans: $4(9 + 2n)$</p> <ul style="list-style-type: none"> •¹ identify highest common factor: 4 or $9 + 2n$ •² factorise: $4(9 + 2n)$ 	2	<ol style="list-style-type: none"> 1. $2(18 + 4n)$, $8(4 \cdot 5 + n)$ award 1/2 $\times \checkmark$

Question		Expected Answer/s	Max Mark	Additional Guidance																																				
4	a	<p>Ans: A(-5,-2) and B(3,-2) plotted</p> <ul style="list-style-type: none"> •¹ plot (-5,-2) and (3,-2) 	1	1. Points need not be labelled, but if they are then they must be labelled correctly																																				
4	b	<p>Ans: (-1,4) or (-1,-8) plotted</p> <ul style="list-style-type: none"> •¹ plot 3rd vertex of any isosceles triangle ABC •² plot 3rd vertex of any triangle ABC with area 24 square units 	2	1. Where C is plotted disregard any wrong coordinates stated by candidate 2. Where (y,x) is consistently plotted both marks are available on follow through																																				
5		<p>Ans:</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>120</th> <th>105</th> <th>100</th> <th>95</th> <th>80</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td>✓</td> <td>✓</td> <td>✓</td> <td>275</td> </tr> <tr> <td></td> <td>✓</td> <td>✓</td> <td></td> <td>✓</td> <td>285</td> </tr> <tr> <td>✓</td> <td></td> <td></td> <td>✓</td> <td>✓</td> <td>295</td> </tr> <tr> <td>✓</td> <td></td> <td>✓</td> <td></td> <td>✓</td> <td>300</td> </tr> <tr> <td></td> <td>✓</td> <td>✓</td> <td>✓</td> <td></td> <td>300</td> </tr> </tbody> </table> <ul style="list-style-type: none"> •¹ complete one row correctly •² complete another two rows correctly •³ complete final two rows correctly 	120	105	100	95	80	Total			✓	✓	✓	275		✓	✓		✓	285	✓			✓	✓	295	✓		✓		✓	300		✓	✓	✓		300	3	1. Where there are missing totals a maximum of 2 marks is available (a) 5 rows otherwise “correct” award 2/3 (b) 2 rows otherwise “correct” award 1/3
120	105	100	95	80	Total																																			
		✓	✓	✓	275																																			
	✓	✓		✓	285																																			
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	✓	✓	✓		300																																			

Question	Expected Answer/s	Max Mark	Additional Guidance
6	<p>Ans: 10.45 am</p> <ul style="list-style-type: none"> •¹ know to multiply 3.5 by 40 then add 25: $3.5 \times 40 + 25$ •² multiply then add correctly: 165 •³ convert cooking time into hours and minutes: 2h45m •⁴ correctly subtract time involving hours and minutes from 1.30pm: 10.45(am) 	4	<p>1. Correct answer without working award 4/4</p> <p>2. Some common answers (no working necessary)</p> <p>(a) 2.45 award 3/4 ✓✓✓x</p> <p>(b) 10.45pm award 3/4 ✓✓✓x</p> <p>(c) $3.5 \times (40 + 25) = 227.5 = 3\text{h}47\text{m}$ or $3\text{h}48\text{m} \rightarrow 9.43$ or 9.42 award 3/4 x✓✓✓</p> <p>(d) $3.5 \times 40 + 3 \times 25 = 215 = 3\text{h}35\text{m} \rightarrow 9.55$ award 3/4 x✓✓✓</p> <p>(e) $1.5 \times 40 + 25 = 85 = 1\text{h}25\text{m} \rightarrow 12.05$ award 3/4 x✓✓✓</p> <p>(f) $3 \times 40 + 25 = 145 = 2\text{h}25\text{m} \rightarrow 11.05$ award 2/4 xx✓✓</p> <p>(g) $3.5 \times 40 = 140 = 2\text{h}20\text{m} \rightarrow 11.10$ award 2/4 xx✓✓</p> <p>3. Alternative method (repeated subtraction)</p> <p>•¹•² correct method: 1.30–40–40–40–20–25 (award 1 for 1.30–40–20–25 or 1.30–40–40–20–25 or 1.30+40+40+40+20+25)</p> <p>•³•⁴ subtract (or add) correctly: (must involve 40, 20 and 25) (award 1 for correct method with one error in calculation or correct subtraction (or addition) of 40,20 and 25 from (to)1.30)</p> <p>4. Some common answers using alternative method (no working necessary)</p> <p>(a) $1.30 - 40 - 20 - 25 = 11.05$ award 2/4 xx✓✓</p> <p>(b) $1.30 - 40 - 25 = 12.25$ award 0/4</p>

Question		Expected Answer/s	Max Mark	Additional Guidance
7		<p>Ans: -16</p> <ul style="list-style-type: none"> •¹ carry out calculations in correct order: square, then multiply by 4, then subtract from 20 •² correct square calculation: 9 •³ subtract correctly: -16 	3	<ol style="list-style-type: none"> 1. Correct answer without working award 3/3 2. Stating $20-4\times 3^2$ alone is insufficient for awarding the 1st mark 3. 3rd mark only available for correctly carrying out a subtraction with a negative answer 4. Some common answers (working must be shown) <ul style="list-style-type: none"> (a) $20-4\times 3^2 = 20-36 (= 16)$ award 2/3 ✓✓x (b) $20-4\times 3^2 = 20-4\times 6 = 20-24 = -4$ award 2/3 ✓x✓ (c) $20-4\times 9$ award 1/3 x✓x (d) $20-(4\times 3)^2 = 20-144 = -124$ award 2/3 x✓✓ (e) $(20-4)\times 3^2 = 16\times 9 = 144$ award 1/3 x✓x (f) $(20-4)\times 3^2 = 16\times 6 = 96$ award 0/3 xxx 5. Special case: $20-4\times 3 = 20-12 = 8$ award 1/3

Question	Expected Answer/s	Max Mark	Additional Guidance
8	<p>Ans: $t = 7$</p> <ul style="list-style-type: none"> •¹ start to collect like terms: $8t = 56$ •² collect like terms and equate: $8t = 56$ •³ solve equation for t: $t = 7$ 	3	<ol style="list-style-type: none"> 1. For the award of the 3rd mark an answer of the form '$t =$' is required 2. Alternative Strategy $-8t = -56 \rightarrow t = 7$ award 3/3 3. For answers without valid working eg <ol style="list-style-type: none"> (a) $60 = 8t + 4 \rightarrow 56 \div 8 \rightarrow t = 7$ award 2/3 ✓×✓ (b) $t = 7$ without working award 1/3 ××✓ (c) $56 \div 8 = 7$ award 1/3 ✓×× (d) $3 \times 7 + 60 = 11 \times 7 + 4 \rightarrow t = 7$ award 1/3 ××✓ 4. Answers acceptable for partial credit (valid working must be shown) <ol style="list-style-type: none"> (a) $8t = 56 \rightarrow 7$ ✓✓× (b) $8t = 64 \rightarrow t = 8$ award 2/3 ✓×✓ (c) $14t = 56 \rightarrow t = 4$ ✓×✓ (d) $14t = 64 \rightarrow t = 4.6$ or $4.5\dots$ award 1/3 ××✓ (disregard incorrect rounding)

Question		Expected Answer/s	Max Mark	Additional Guidance
9	a	<p>Ans:</p>  <ul style="list-style-type: none"> •¹ 30 correctly entered •² -180 correctly entered 	2	<p>1. All entries must be positive or negative whole numbers.</p> <p>2. All candidate entries positive in (a) & (b)</p>
9	b	<p>Ans:</p>  <p style="text-align: center;">OR</p>  <ul style="list-style-type: none"> •¹•²•³ pyramid completed correctly. <p>award 1 mark for one consistent triangle e.g.</p>  <p>award 2 marks for two consistent triangles e.g.</p> 	3	<p>(a)  award 1/2</p> <p>(b)  award 2/3</p> <p>e.g.  award 1/3</p> <p>3. All candidate entries negative in (a) & (b)</p> <p>(a)  award 0/2</p> <p>(b)  award 2/3</p> <p>e.g.  award 1/3</p>

TOTAL MARKS FOR PAPER 1

30

[END OF MARKING INSTRUCTIONS]



2010 Mathematics

Intermediate 1 Units 1, 2 & 3 Paper 2

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Part Two: Mathematics Intermediate 1: Paper 2, Units 1, 2 and 3

Question		Expected Answer/s	Max Mark	Additional Guidance
1		<p>Ans: 220 km</p> <ul style="list-style-type: none"> •¹ know how to find distance: $80 \times 2\text{h}45\text{m}$ •² calculate distance: $80 \times 2.75 = 220$ 	2	<ol style="list-style-type: none"> 1. Correct answer without working award 2/2 2. Answers acceptable for partial credit (no working necessary) <ul style="list-style-type: none"> (a) $196 [80 \times 2.45]$ award 1/2 ✓× (b) $13200 [80 \times 165]$ award 1/2 ✓× (c) $29(.09)[80 \div 2.75]$ award 1/2 ×✓
2		<p>Ans: £702</p> <ul style="list-style-type: none"> •¹ find monthly premium: $1.30 \times 45 = 58.5(0)$ •² find annual premium: $58.5(0) \times 12 = 702$ 	2	<ol style="list-style-type: none"> 1. Correct answer without working award 2/2 2. Answer acceptable for partial credit (no working necessary) $15.6(0) [1.30 \times 12]$ award 1/2 3. 2nd mark is not available if there is invalid subsequent working $45702 [702 + 45000]$ award 1/2 $45058.5 [58.5 + 45000]$ award 1/2
3		<p>Ans: 9×10^{-2} mm</p> <ul style="list-style-type: none"> •¹ find thickness of one sheet : $45 \div 500 = 0.09$ •² express answer in standard form: 9×10^{-2} •³ consistent power of ten: 9×10^{-2} 	3	<ol style="list-style-type: none"> 1. Correct answer without working award 3/3 2. Some common answers (no working necessary) <ul style="list-style-type: none"> (a) 0.9×10^{-1} award 2/3 ✓×✓ (b) $2.25 \times 10^4 [45 \times 500]$ award 2/3 ×✓✓ (c) $9 \times 10^{-3}\text{cm}$, $9 \times 10^{-5}\text{m}$ with units shown award 3/3 3. $500 \div 45 = 11.1\dots = 1.1 \times 10^1 = 1.1 \times 10^{(1)}$ award 2/3 ×✓✓ but $11.1\dots = 1 \times 10^1 = 1 \times 10^{(1)}$ award 1/3 ××✓

Question		Expected Answer/s	Max Mark	Additional Guidance																		
4		<p>Ans: $x > 13$</p> <ul style="list-style-type: none"> •¹ collect constants: $5x > 65$ •² solve inequality for x: $x > 13$ 	2	<p>1. For answers without valid working award 1/2 eg</p> <p>(a) $x > 13$ without working x✓</p> <p>(b) $5 \times 13 - 12 > 53 \rightarrow x > 13$ x✓</p> <p>(c) $5x = 65 \rightarrow x > 13$ x✓</p> <p>2. Answers acceptable for partial credit (valid working must be shown) award 1/2</p> <p>(a) $5x > 65 \rightarrow > 13$ ✓x</p> <p>(b) $5x > 65 \rightarrow x = 13$ ✓x</p> <p>(c) $5x = 65 \rightarrow x = 13$ x✓</p> <p>(d) $5x > 41 \rightarrow x > 8.2$ x✓</p>																		
5		<p>Ans: 180 000</p> <ul style="list-style-type: none"> •¹ complete table: $\begin{array}{r} 1400 \\ 1125 \\ 750 \\ \hline 7200 \end{array}$ •² know to divide $\sum fx$ by 40: $7200 \div 40$ •³ divide $\sum fx$ correctly and give answer in full: 180000 or 180 thousand 	3	<p>1. Award of 1st mark: 1400, 1125, 750 and 7200 need not appear in table but must be shown in working</p> <p>2. 2nd mark may only be awarded for attempting $\sum fx \div 40$</p> <p>3. 3rd mark may only be awarded for correctly dividing $\sum fx$ and giving answer in full</p> <p>4.</p> <table border="0"> <thead> <tr> <th><u>Answer</u></th> <th><u>With evidence for 1st mark</u></th> <th><u>Without evidence for 1st mark</u></th> </tr> </thead> <tbody> <tr> <td>180 000</td> <td>3/3 ✓✓✓</td> <td>2/3 x✓✓</td> </tr> <tr> <td>180[7200÷40]</td> <td>2/3 ✓✓x</td> <td>1/3 x✓x</td> </tr> <tr> <td>1 200 000</td> <td></td> <td></td> </tr> <tr> <td>[7200÷6 = 1200]</td> <td>2/3 ✓x✓</td> <td>1/3 xx✓</td> </tr> <tr> <td>1 200 [7200÷6]</td> <td>1/3 ✓xx</td> <td>0/3</td> </tr> </tbody> </table>	<u>Answer</u>	<u>With evidence for 1st mark</u>	<u>Without evidence for 1st mark</u>	180 000	3/3 ✓✓✓	2/3 x✓✓	180[7200÷40]	2/3 ✓✓x	1/3 x✓x	1 200 000			[7200÷6 = 1200]	2/3 ✓x✓	1/3 xx✓	1 200 [7200÷6]	1/3 ✓xx	0/3
<u>Answer</u>	<u>With evidence for 1st mark</u>	<u>Without evidence for 1st mark</u>																				
180 000	3/3 ✓✓✓	2/3 x✓✓																				
180[7200÷40]	2/3 ✓✓x	1/3 x✓x																				
1 200 000																						
[7200÷6 = 1200]	2/3 ✓x✓	1/3 xx✓																				
1 200 [7200÷6]	1/3 ✓xx	0/3																				

Question			Expected Answer/s	Max Mark	Additional Guidance								
6	a		<p>Ans:</p> <table border="1" style="margin-left: 20px;"> <tr> <td>x</td> <td>-9</td> <td>0</td> <td>6</td> </tr> <tr> <td>y</td> <td>-1</td> <td>2</td> <td>4</td> </tr> </table> <ul style="list-style-type: none"> •¹ calculate y when $x = -9$: -1 •² calculate y when $x = 0$ and 6: 2 and 4 	x	-9	0	6	y	-1	2	4	2	
x	-9	0	6										
y	-1	2	4										
	b	i	<p>Ans: straight line graph of $y = \frac{1}{3}x + 2$</p> <ul style="list-style-type: none"> •¹ correctly plot all three points from the table •² draw straight line through the three points shown in the table 	2	<ol style="list-style-type: none"> 1. If the line $y = \frac{1}{3}x + 2$ is drawn (even if this is not consistent with the points in the table) award 2/2 [minimum acceptable length: line joining (-9,-1) to (3,3)] 2. Where the points in the table satisfy $y=x$, the points are plotted and a line is drawn through them award 1/2 3. Where the three points plotted are consistent with the table and are not collinear, the 2nd mark is unavailable 4. Where (y, x) is consistently plotted, answer should be followed through with the possibility of awarding the 2nd mark 								
6	b	ii	<p>Ans: straight line graph of $x = 4$</p> <ul style="list-style-type: none"> •¹ draw the line $x = 4$ 	1	<ol style="list-style-type: none"> 1. If line is definitely correct award 1/1; if line is definitely wrong award 0/1; in other cases key in – (dash) and when you finish marking click on the ‘Exception Script SQA’ icon. Beware: answer may not be visible until you zoom in. 2. Where (y,x) is consistently plotted in b(i), the mark is only available for drawing the line $y=4$. 								

Question	Expected Answer/s	Max Mark	Additional Guidance
7	<p>Ans: 39 cm</p> <ul style="list-style-type: none"> •¹ find dimensions of screen: 33 and 21 •² correct form of Pythagoras Theorem: $33^2 + 21^2$ •³ calculate sum (or difference) of squares: 1530 •⁴ calculate square root of sum (or difference) of squares: 39(.1....) 	4	<ol style="list-style-type: none"> 1. Correct answer without working award 4/4 2. Final answer may be rounded or truncated. 3. Final mark is not available if there is invalid subsequent working e.g. $39 \div 2 = 19.5$ 4. Some common answers (working must be shown) <ul style="list-style-type: none"> (a) $\sqrt{(37^2 + 25^2)} = 45, 44.7, 44.6(\dots)$ award 3/4 x✓✓✓ (b) $\sqrt{(35^2 + 23^2)} = 42, 41.9, 41.8(\dots)$ award 3/4 x✓✓✓ (c) $\sqrt{(33^2 - 21^2)} = 25, 25.5, 25.4(\dots)$ award 3/4 ✓x✓✓ (d) $\sqrt{(37^2 - 25^2)} = 27, 27.3, 27.2(\dots)$ award 2/4 xx✓✓ 5. Example of alternative strategy involving trigonometry <ul style="list-style-type: none"> •¹ 33 and 21 •² $a^\circ = \tan^{-1}(21/33) = 32.47^\circ$ •³ $\cos 32.47^\circ \dots \dots = 33/x$ •⁴ $x = 33 / \cos 32.47^\circ \dots = 39(.1\dots)$ 6. Do not penalise inadvertent use of radians or grads if trigonometry is used.

Question	Expected Answer/s	Max Mark	Additional Guidance
8	<p>Ans: £4.14</p> <ul style="list-style-type: none"> •¹ know how to convert \$50 into sterling: $50 \div 1.62$ •² divide correctly and round or truncate to nearest penny: 30.86 •³ calculate saving: $35 - 30.86 = 4.14$ 	3	<ol style="list-style-type: none"> 1. 4.14 (no working necessary) award 3/3 2. Alternative strategy <ul style="list-style-type: none"> •¹ calculate saving in dollars: $35 \times 1.62 - 50 = 6.7(0)$ •² know how to convert saving into sterling: $6.7(0) \div 1.62$ •³ convert saving in sterling: 4.14 or 4.13 3. Some ways of obtaining 4.13 as answer <ol style="list-style-type: none"> (a) $35 - 30.864\dots (= 4.136) = 4.13$ award 3/3 (b) $35 - 30.87 = 4.13$ award 2/3 ✓×✓ (c) 4.13 with no working award 2/3 4. The 2nd mark is only available where the answer to the division has to be rounded or truncated to the nearest penny eg Do not award the mark for $50 \div 1.6 = 31.25$ 5. (a) $35 \div 1.62 = 21.60$ award 1/3 ×✓× (b) $50 - 35 \div 1.62 = 28.40$ award 2/3 ✓×✓ (c) $35 - 35 \div 1.62 = 13.40$ award 1/3 ×✓× (d) $50 \times 1.62 = 81$ award 0/3 (e) $35 - 50 \times 1.62 = -46$ award 1/3 ××✓ (f) $50 \times 1.62 - 35 = 46$ award 0/3 (g) $50 - 50 \times 1.62 = -31$ award 0/3

Question	Expected Answer/s	Max Mark	Additional Guidance
9	<p>Ans: £40.95</p> <p>•¹•² know how to calculate interest: $\frac{1.3}{100} \times 4200 \times \frac{9}{12}$ (award 1 for $\frac{1.3}{100} \times 4200$ or $\frac{9}{12} \times 1.3$ or $\frac{9}{12} \times 4200$)</p> <p>•³ carry out percentage and fraction calculations correctly: 40.95</p>	3	<ol style="list-style-type: none"> 1. Correct answer without working award 3/3 2. If answer is 4240.95 [4200 + 40.95] (no working necessary) <ol style="list-style-type: none"> (a) award 3/3 if candidate states that interest is 40.95 (b) award 2/3 if candidate does not state that interest is 40.95 3. Acceptable answers for partial credit (no working necessary) <ol style="list-style-type: none"> (a) 54.6(0) [1.3% of 4200] award 1/3 (b) 0.975 [$\frac{9}{12} \times 1.3$] award 1/3 (c) 3150 [$\frac{9}{12} \times 4200$] award 1/3 (d) 491.4(0) [$54.6(0) \times 9$] award 1/3 4. 3rd mark is not available where premature rounding leads to an incorrect answer e.g. $\frac{9}{12} \times 1.3 = 0.975$ $\rightarrow \frac{0.98}{100} \times 4200 = 41.16$ award 2/3 ✓✓✗

Question		Expected Answer/s	Max Mark	Additional Guidance
10		<p>Ans: 7.4 cm</p> <ul style="list-style-type: none"> •¹ know to divide 1369 by 25: $1369 \div 25$ •² know to find square root of: answer to above: $\sqrt{(1369 \div 25)}$ •³ calculate $\sqrt{(1369 \div 25)}$ correctly: 7.4 $[(1369 \div 25) \div 4 = 13.69]$ is the only other calculation for which this mark is available] 	3	<ol style="list-style-type: none"> 1. Correct answer without working award 3/3 2. 54.76, 54.8 or 54.7 (no working necessary) award 1/3 3. Some common answers (working must be shown) (a) $54.76 \div 4 = 13.69$ award 2/3 (b) $1369 \div 100 = 13.69$ award 0/3 4. Alternative strategy <ul style="list-style-type: none"> •¹ find $L \times L \times 25$ for any L: eg $4 \times 4 \times 25 = 400$ •² show that $7 < L < 8$: eg $7 \times 7 \times 25 = 1225$ and $8 \times 8 \times 25 = 1600$ •³ find length of base: 7.4
11		<p>Ans: 12%</p> <ul style="list-style-type: none"> •¹ know to express 90 as a fraction of 750: $\frac{90}{750}$ •² know to multiply fraction by 100: $\frac{90}{750} \times 100$ •³ carry out all calculations correctly: 12 	3	<ol style="list-style-type: none"> 1. Correct answer without working award 3/3 2. 3rd mark is only available for calculations of the form $\frac{a}{b} \times c$ where a,b,c = 90 or 750 or 100 or 660 or 840 3. Some common answers (working must be shown) <ul style="list-style-type: none"> (a) $833(3\dots)$ [$\frac{750}{90} \times 100$] award 2/3 $\times \checkmark \checkmark$ (b) $8.3(3\dots)$ [$\frac{750}{90}$] award 0/3 (c) 675 [$\frac{90}{100} \times 750$ or $\frac{750}{100} \times 90$] award 1/3 $\times \times \checkmark$ (d) 88 [$\frac{(750-90)}{750} \times 100$] award 2/3 $\times \checkmark \checkmark$ (e) 8112 [$\frac{(750+90)}{750} \times 100$] award 2/3 $\times \checkmark \checkmark$

Question		Expected Answer/s	Max Mark	Additional Guidance
12	a	<p>Ans: £23.50</p> <ul style="list-style-type: none"> •¹ order numbers: 17 18 18 19 20 21 23 24 26 27 27 27 28 31 •² find median: 23.5 	2	<ol style="list-style-type: none"> 1. Correct answer without working award 2/2 2. 21 [numbers not ordered] (a) with valid working award 1/2 (b) without valid working award 0/2 3. If “correct” median is found from ordered list with one missing or one extra number award 1/2 4. Accept ordered list written in part (a) or part (b)
12	b	<p>Ans: £14</p> <ul style="list-style-type: none"> •¹ find range: $31 - 17 = 14$ 	1	
12	c	<p>Ans: 5C collected more on average. Amounts collected by 5M are more varied.</p> <ul style="list-style-type: none"> •¹ interpret statistics: 5C collected more. (or equivalent) •² interpret statistics: Amounts collected by 5M varied more. (or equivalent) 	2	<ol style="list-style-type: none"> 1. Answer must be consistent with answers to parts (a) and (b) 2. Do not accept e.g. 5C has a higher median 5M has a higher range

Question		Expected Answer/s	Max Mark	Additional Guidance
13		<p>Ans: 29 m</p> <ul style="list-style-type: none"> •¹ use correct sine ratio: $\sin 65^\circ = \frac{h}{32}$ •² know how to solve equation: $h = 32 \times \sin 65^\circ$ •³ carry out trig. calculation: 29 (-0018....) 	3	<ol style="list-style-type: none"> 1. Correct answer without working award 2/3 2. Do not penalise inadvertent use of radians or grads 26(-458...) (radians used) award 3/3 27(-284...) (grads used) award 3/3 3. Disregard premature rounding or truncation eg $32 \times \sin 65^\circ = 32 \times 0.9 = 28.8$ award 3/3 4. Where an incorrect trig ratio is used, working should be followed through with the possibility of awarding 2/3. [Disregard premature rounding or truncation] (a) $32 \times \cos 65^\circ = 13.5(23...)$ award 2/3 x✓✓ (b) $32 \times \cos 65^\circ = 32 \times 0.4 = 12.8$ award 2/3 x✓✓ (c) $32 \times \tan 65^\circ = 68.6(24...)$ award 2/3 x✓✓ (d) $32 \times \tan 65^\circ = 32 \times 2.1 = 67.2$ award 2/3 x✓✓

Question	Expected Answer/s	Max Mark	Additional Guidance
14	<p>Ans: 306 cm</p> <ul style="list-style-type: none"> •^{1,2} know how to calculate circumference of semi-circle: $\frac{1}{2} \times \pi \times 80$ (award 1 for $\frac{1}{2} \pi d$ or $\pi \times 80$ or $\frac{1}{2} \times \pi \times 40^2$) •³ know to add $\frac{1}{2} \pi d + 180$: $\frac{1}{2} \times \pi \times 80 + 30 + 50 + 20 + 50 + 30$ •⁴ carry out all calculations correctly: $305.6(6\dots)$ (must include a calculation involving π followed by an addition or a subtraction) •⁵ round to nearest centimetre: 306 	5	<ol style="list-style-type: none"> 1. 306 without working award 0/5 2. (a) 5th mark is only available where the candidate is required to round final answer or answer to circle calculation to nearest whole number. (b) Versions of the answers below which are not rounded, incorrectly rounded or not requiring to be rounded should not be awarded the 5th mark. BEWARE: although $\pi \times 40^2$ needs to be rounded 3·14 $\times 40^2$ does not. 3. Some common answers (working must be shown) <ol style="list-style-type: none"> (a) 256 [$\frac{1}{2} \times \pi \times 80 + 130$] award 4/5 ✓✓×✓✓ (b) 431 [$\pi \times 80 + 180$] award 4/5 ×✓✓✓✓ (c) 2693 [$\frac{1}{2} \times \pi \times 40^2 + 180$] award 4/5 ×✓✓✓✓ (d) 3513 [$\frac{1}{2} \times \pi \times 40^2 + 20 \times 50$] award 4/5 ×✓✓✓✓ (e) 5207 [$\pi \times 40^2 + 180$] award 3/5 ××✓✓✓ (f) 6027 [$\pi \times 40^2 + 20 \times 50$] award 3/5 ××✓✓✓ (g) 1251 [$\pi \times 80 + 20 \times 50$] award 3/5 ×✓×✓✓ (i) 126 [$\frac{1}{2} \times \pi \times 80$] award 3/5 ✓✓××✓ (j) 251 [$\pi \times 80$] award 2/5 ×✓××✓ (k) 2513 [$\frac{1}{2} \times \pi \times 40^2$] award 2/5 ×✓××✓ (l) 5027 [$\pi \times 40^2$] award 1/5 ××××✓

Question		Expected Answer/s	Max Mark	Additional Guidance
15	a	<p>Ans: $\frac{1}{5}$</p> <ul style="list-style-type: none"> •¹ find probability: $\frac{3}{15}$ •² simplify fraction: $\frac{1}{5}$ 	2	<ol style="list-style-type: none"> 1. Correct answer without working award 2/2 2. Award 1/2 for 1:5, 3:15, 1 out of 5, 3 out of 15, 1 in 5, 3 in 15, 1-5, 3-15, 0.2(0), 20% 3. Award 1/2 (no working necessary) for $\frac{1}{4} [\frac{3}{12}]$, $\frac{4}{5} [\frac{12}{15}]$
	b	<p>Ans: 6</p> <ul style="list-style-type: none"> •¹ experiment: eg $\frac{4}{16}$ •² continue until correct answer is found: 6 	2	<ol style="list-style-type: none"> 1. The only acceptable valid methods are <ol style="list-style-type: none"> (a) Write down any fraction of the form $\frac{3+n}{15+n}$ e.g. $\frac{4}{16}$ (b) write down any two fractions equivalent to $\frac{1}{3}$ (c) evidence that $\frac{1}{3}$ of any number >15 is more than 5 e.g. $\frac{1}{3}$ of 16 = 5.3..., 5r1, 5.1 2. (a) 6 without working award 1/2 (b) 6 with invalid working award 0/2 3. $\frac{6}{18}$ (no working necessary) award 1/2

TOTAL MARKS FOR PAPER 2
50

TOTAL MARKS FOR
PAPER 1 & 2
80

[END OF MARKING INSTRUCTIONS]