



2013 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

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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:
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 - 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 Units 1, 2 & 3

Paper 1

Question		Expected Answer/s	Max Mark	Additional Guidance
1	a	<p>Ans: 22.53</p> <p>•¹ calculate $16 \cdot 7 + 5 \cdot 83$: 22.53</p>	1	
1	b	<p>Ans: 19.17</p> <p>•¹ calculate $9 \times 2 \cdot 13$: 19.17</p>	1	
1	c	<p>Ans: 238</p> <p>•¹ calculate 70% of 340: 238</p>	1	
2	a	<p>Ans: line of best fit drawn</p> <p>•¹ draw line of best fit</p>	1	<p>1. Accept straight lines with $1 \leq \text{gradient} \leq 2$ and $(\text{points above line}) - (\text{points below line}) \leq 2$</p>
2	b	<p>Ans: consistent with line of best fit</p> <p>•¹ consistent with line of best fit</p>	1	<p>1. You may have to extend candidate's line to check answer</p>
3		<p>Ans: $x > 9$</p> <p>•¹ collect constants: $8x > 72$</p> <p>•² solve inequality for x: $x > 9$</p>	2	<p>1. For answers without valid working award 1/2 eg</p> <p>(a) $x > 9$ without working $\times \checkmark$</p> <p>(b) $8 \times 9 - 5 > 67 \rightarrow x > 9$ $\times \checkmark$</p> <p>(c) $8x = 72 \rightarrow x > 9$ $\times \checkmark$</p> <p>2. Answers acceptable for partial credit (valid working must be shown) award 1/2</p> <p>(a) $8x > 72 \rightarrow > 9$ $\checkmark \times$</p> <p>(b) $8x > 72 \rightarrow x = 9$ $\checkmark \times$</p> <p>(c) $8x = 72 \rightarrow x = 9$ $\checkmark \times$</p> <p>(d) $8x > 62 \rightarrow x > 7.75$ $\times \checkmark$</p>

Question		Expected Answer/s	Max Mark	Additional Guidance								
4		<p>Ans: £94</p> <ul style="list-style-type: none"> •¹ subtract $700 - 136$ correctly: 564 •² know to divide above by 6: $564 \div 6$ •³ divide correctly: $564 \div 6 = 94$ 	3	<ol style="list-style-type: none"> 1. Correct answer without working award 3/3 2. Some common answers [working must be shown] <ul style="list-style-type: none"> (a) 139.33 [$(700 + 136) \div 6$] award 2/3 $\times\checkmark\checkmark$ (b) 116.67 or 116.66 [$700 \div 6$] award 1/3 $\times\times\checkmark$ (c) 22.67 or 22.66 [$136 \div 6$] award 1/3 $\times\times\checkmark$ (d) 3384 [564×6] award 1/3 $\checkmark\times\times$ (e) 1516 [$700 + 136 \times 6$] award 0/3 3. 3rd mark is only available for correct division rounded or truncated to nearest penny where appropriate 								
5	a	<p>Ans:</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>x</td> <td>-2</td> <td>0</td> <td>4</td> </tr> <tr> <td>y</td> <td>-7</td> <td>-3</td> <td>5</td> </tr> </table> <ul style="list-style-type: none"> •¹ calculate y when $x = -2$: -7 •² calculate y when $x = 0$ and 4: -3 and 5 	x	-2	0	4	y	-7	-3	5	2	
x	-2	0	4									
y	-7	-3	5									
5	b	<p>Ans: straight line graph of $y = 2x - 3$</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 $y = 2x - 3$ is drawn (even if this is not consistent with the points in the table) award 2/2 [minimum acceptable length: line joining $(-1, -5)$ to $(2, 1)$] 2. Where the three points plotted are consistent with the table and are not collinear, the 2nd mark is unavailable [check gradients] 3. Where (y, x) is consistently plotted, answer should be followed through with the possibility of awarding the 2nd mark 								

Question		Expected Answer/s	Max Mark	Additional Guidance
6	a	<p>Ans: $\begin{array}{r} 168 \\ 54 \\ \underline{50} \\ 385 \end{array}$</p> <p>•¹ complete table $\begin{array}{r} 168 \\ 54 \\ \underline{50} \\ 385 \end{array}$</p>	1	
6	b	<p>Ans: 7·7</p> <p>•¹ know to divide $\sum fx$ by 50: $385 \div 50$</p> <p>•² correctly divide $\sum fx$ by 50: $385 \div 50 = 7\cdot7$</p>	2	<ol style="list-style-type: none"> 1. Correct answer without working subsequent to part (a) award 2/2 2. 1st mark may only be awarded for attempting $\sum fx \div 50$ 3. Award 0/2 for e.g. $385 \div 6 = 64$ or $64\cdot2$ or $64\cdot1(6\dots)$ 4. Accept $\sum fx \div 10 \times 5$ or $\sum fx \div 5 \times 10$ as evidence of knowing to divide $\sum fx$ by 50 5. For $385 \div 5 = 77$ award 0/2
7	a	<p>Ans: $\frac{2}{15}$</p> <p>•¹ find probability: $\frac{2}{15}$</p>	1	<ol style="list-style-type: none"> 1. Accept 2:15, 2 out of 15, 2 in 15, 2-15, 0·13(3...), 13(·3....)%
7	b	<p>Ans: $\frac{7}{13}$</p> <p>•¹ correct numerator or denominator: $\frac{7}{/}$ or $/13$</p> <p>•² find probability: $\frac{7}{13}$</p>	2	<ol style="list-style-type: none"> 1. Correct answer without working award 2/2 2. Accept 7:13, 7 out of 13, 7 in 13, 7-13, 0·53(8...), 0·54, 53(·8....)%, 54% 3. For (a) = $\frac{15}{2}$ followed by (b) = $\frac{13}{7}$ award 0/1 for (a) and 2/2 for (b)

Question	Expected Answer/s	Max Mark	Additional Guidance
8	<p>Ans: 0250 or 2.50am</p> <p><u>Method 1</u></p> <ul style="list-style-type: none"> •¹ correct method $2125 - 1650 + 2215$ •² calculate time interval correctly: $2125 - 1650 = 4\text{h}35\text{m}$ •³ add time correctly $2215 + 4\text{h}35\text{m} = 0250$ <p><u>Method 2</u></p> <ul style="list-style-type: none"> •¹ correct method $2215 - 1650 + 2125$ •² calculate time interval correctly: $2215 - 1650 = 5\text{h}25\text{m}$ •³ add time correctly: $2125 + 5\text{h}25\text{m} = 0250$ 	3	<p>1. Correct answer without working award 3/3</p> <p>2. Some answers (no working necessary) (a) 250, 2.50 award 3/3 (b) 2650, 2.50pm, 1450 award 2/3 ✓✓×</p> <p>3. The 1st mark may only be awarded where there is evidence of a complete correct method</p> <p>e.g. <u>Method 1</u> (a) 4h35m and no subsequent working award 1/3 ×✓× (b) 4h35m and subsequent working (i) $2215 + 4\text{h}35\text{m} =$ incorrect answer award 2/3 ✓✓× (ii) $2125 + 4\text{h}35\text{m} = 0200$ award 2/3 ×✓✓</p> <p>e.g. <u>Method 2</u> (c) 5h25m and no subsequent working award 1/3 ×✓× (d) 5h25m and subsequent working (i) $2125 + 5\text{h}25\text{m} =$ incorrect answer award 2/3 ✓✓× (ii) $2215 + 5\text{h}25\text{m} = 0340$ award 2/3 ×✓✓</p> <p>4. The 2nd mark may be awarded for e.g. <u>Method 1</u> 10m → 4h → 25m <u>Method 2</u> 10m → 5h → 15m</p>

Question		Expected Answer/s	Max Mark	Additional Guidance
9		<p>Ans: - 50</p> <ul style="list-style-type: none"> •¹ know to multiply $2 \times (-10) \times 4$: $2 \times (-10) \times 4$ •² multiply three integers correctly (see note 2): $2 \times (-10) \times 4 = -80$ •³ subtract - 30 correctly: $-80 - (-30) = -50$ 	3	<ol style="list-style-type: none"> 1. Correct answer without working award 2/3 2. 2nd mark is only available for correctly multiplying at least three of the numbers 2, -10, 4 and -30. 3. Some common answers <ul style="list-style-type: none"> (a) -80 award 2/3 ✓✓× (b) $-80-30 = -50$ award 2/3 ✓✓× (c) $-80-30 = -110$ award 2/3 ✓✓× (d) $2 \times (-10) \times 4 = 80 \rightarrow 80 - (-30) = 110$ award 2/3 ✓×✓ (e) $2 \times 10 \times 4 = 80 \rightarrow 80 - (-30) = 110$ award 1/3 ××✓ (f) $2 \times (-10) + 2 \times 4 = -12$ award 0/3
10		<p>Ans: AU\$3160</p> <ul style="list-style-type: none"> •¹ know to multiply 1.58×2000: 1.58×2000 •² multiply correctly: $1.58 \times 2000 = 3160$ 	2	<ol style="list-style-type: none"> 1. Correct answer without working award 2/2 2. $2000 \div 1.58 = 1265.82$ award 1/2 ×✓
10	b	<p>Ans: £1 = AU\$1.55</p> <ul style="list-style-type: none"> •¹ know to divide $620 \div 400$: $620 \div 400$ •² divide correctly: $620 \div 400 = 1.55$ 	2	<ol style="list-style-type: none"> 1. Correct answer without working award 2/2 2. Do not accept $400 \times ? = 620$ alone, as evidence of knowing to divide $620 \div 400$ 3. Accept $620 \div 100 \times 4$ or $620 \div 4 \times 100$ as evidence of knowing to divide $620 \div 400$

TOTAL MARKS FOR PAPER 1
30

[END OF MARKING INSTRUCTIONS]



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Part Two: Mathematics Intermediate 1 Units 1, 2 & 3

Paper 2

Question		Expected Answer/s	Max Mark	Additional Guidance
1		<p>Ans: £114</p> <ul style="list-style-type: none"> •¹ find price per gram: $95 \div 20 = 4.75$ •² find price for 24 grams: $4.75 \times 24 = 114$ 	2	<ol style="list-style-type: none"> 1. Correct answer without working award 2/2 2. Alternative strategies <ul style="list-style-type: none"> (a) •¹ $95 \div 20 = 4.75$ •² $95 + 4 \times 4.75 = 114$ (b) •¹ $24 \div 20 = 1.2$ •² $1.2 \times 95 = 114$ (c) •¹ $95 \div 5 = 19$ [price for 4g] •² $19 \times 6 = 114$ (d) •¹ $24 \div (20 \div 95)$ •² 114 [$20 \div 95$ is not enough for the 1st mark] 3. A common answer (no working necessary) $99.75 [95 + 4.75]$ award 1/2 ✓ x
2	a	<p>Ans: $12n - 7$</p> <ul style="list-style-type: none"> •¹ multiply out bracket: $12n - 18$ •² collect like terms: $12n - 7$ 	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 $12n - 7 \rightarrow 5n$ award 1/2 $12n - 7 \rightarrow 7/12$ award 1/2
2	b	<p>Ans: $5(4s + 9)$</p> <ul style="list-style-type: none"> •¹ identify common factor: 5 or $4s + 9$ •² factorise: $5(4s + 9)$ 	2	<ol style="list-style-type: none"> 1. $20(s + 2.25), 10(2s + 4.5)$ award 1/2

Question		Expected Answer/s	Max Mark	Additional Guidance
3	a	<p>Ans: 2006</p> <ul style="list-style-type: none"> •¹ interpret bar graph: 2006 	1	
3	b	<p>Ans: 7</p> <ul style="list-style-type: none"> •¹ interpret bar graph: 7 	1	
4		<p>Ans: d = 17</p> <ul style="list-style-type: none"> •¹ start to collect like terms: $3d$ or 51 •² collect like terms and equate: $3d = 51$ •³ solve for d: $d = 17$ 	3	<p>1. For answers without valid working award 1/3 eg (i) $d = 17$ without working (ii) $8 \times 17 + 7 = 5 \times 17 + 58 \rightarrow d = 17$</p> <p>2. For the award of the 3rd mark an answer of the form '$d =$' is required</p> <p>3. Answers acceptable for partial credit (valid working must be shown)</p> <p>(a) $3d = 51 \rightarrow 17$ award 2/3 ✓✓×</p> <p>(b) $3d = 65 \rightarrow d = 21.7$ or $21.6(\dots)$ award 2/3 ✓×✓</p> <p>(c) $13d = 51 \rightarrow d = 3.9(\dots)$ award 2/3 ✓×✓</p> <p>(d) $13d = 65 \rightarrow d = 5$ award 1/3 ××✓</p>

Question	Expected Answer/s	Max Mark	Additional Guidance
5	<p>Ans: 12.5 m/s</p> <ul style="list-style-type: none"> •¹ know how to find speed: $S = D/T$ •² Use $D = 3000$ or $T = 240$ in speed calculation: $3000/T$ or $D/240$ •³ correctly calculate speed in m/s: $3000 \div 240 = 12.5$ 	3	<ol style="list-style-type: none"> 1. Correct answer without working award 3/3 2. Some common answers (no working necessary, rounding or truncation is acceptable) <ul style="list-style-type: none"> (a) 750 [3000 \div 4] award 2/3 ✓✓x (b) 2.1, 2.08... [500 \div 240] award 2/3 ✓✓x (c) 125 [500 \div 4] award 1/3 ✓xx (d) 1.5 [6 \div 4] award 1/3 ✓xx (e) 20.83... [(500 \div 6) \div 4] award 1/3 ✓xx (f) 720000 [3000 \times 240] award 2/3 x✓✓ (g) 12000 [3000 \times 4] award 1/3 x✓x (h) 2000 [500 \times 4] award 0/3

Question		Expected Answer/s	Max Mark	Additional Guidance
6	a	<p>Ans: 1 352 000 000</p> <p>•¹ write 1.352×10^9 in full: 1 352 000 000</p>	1	
6	b	<p>Ans: 260</p> <p>•¹ write 5.2 million in full: 5 200 000</p> <p>•² divide 1352000000 by 5200000 correctly: $1352000000 \div 5200000 = 260$</p>	2	<p>1. Correct answer without working award 2/2</p> <p>2. Alternative strategy: •¹ 5.2×10^6 •² $(1.352 \times 10^9) \div (5.2 \times 10^6) = 260$</p> <p>3. Answer to (b) must be consistent with answer to (a)</p> <p>4. 1 346 800 000 or 1.3468×10^9 [difference of populations] no working necessary award 1/2 ✓✗</p>
7		<p>Ans: £126</p> <p>•¹ know to multiply $l \times b \times h$: evidence of $l \times b \times h$ involving 7, 3 and 10</p> <p>•² find volume in m^3: $7 \times 3 \times 0.1 = 2.1$</p> <p>•³ find total cost: $2.1 \times 60 = 126$</p>	3	<p>1. Correct answer without working award 2/3</p> <p>2. BEWARE: mixed units in volume calculation and incorrect volume conversion factor $7 \times 3 \times 10 = (210 \div 100) = 2.1$ $2.1 \times 60 = 126$ award 2/3 ✓✗✓</p> <p>3. Some common answers [working must be shown] (a) 12 600 [$(7 \times 3 \times 10) \times 60$] award 2/3 ✓✗✓ (b) 1 260 000 [$(70 \times 30 \times 10) \times 60$] award 2/3 ✓✗✓ (c) 126 000 000 [$(700 \times 300 \times 10) \times 60$] award 2/3 ✓✗✓ (d) 1260 [$(7 \times 3) \times 60$, area of patio] award 1/3 ✗✗✓</p> <p>4. Special cases: $V = l + b + h$ [working must be shown] (a) 606 [10.1×60] = 606 award 2/3 ✗✓✓ (b) 1200 [20×60] = 1200 award 1/3 ✗✗✓</p>

Question		Expected Answer/s	Max Mark	Additional Guidance
8	a	<p>Ans: 41</p> <ul style="list-style-type: none"> •¹ order numbers: 19 21 22 39 43 45 46 53 •² find median: 41 	2	<ol style="list-style-type: none"> 1. Correct answer without working award 2/2 2. 49 [numbers not ordered] award 1/2 3. If 'correct' median is found from ordered list with one missing or one extra number award 1/2
8	b	<p>Ans: 34</p> <ul style="list-style-type: none"> •¹ find range: $53 - 19 = 34$ 	1	<ol style="list-style-type: none"> 1. 34 is the only acceptable answer, even with an unordered list.
8	c	<p>Ans: On average Steven scored less than John. Steven's scores varied less than John's.</p> <ul style="list-style-type: none"> •¹ interpret statistics: Steven scored less or equivalent •² interpret statistics: Steven's scores varied less 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 eg Steven has a lower median Steven has a lower range 3. A common answer: John scored more than Steven as his median and range were higher. award 1/2 ✓ ✗

Question	Expected Answer/s	Max Mark	Additional Guidance
9	<p>Ans: 122m</p> <ul style="list-style-type: none"> •¹ use correct sin ratio: $\sin 24^\circ = \frac{d}{300}$ •² know how to solve equation: $d = 300 \times \sin 24^\circ$ •³ carry out trig. calculation: 122(.02....) 	3	<ol style="list-style-type: none"> 1. Correct answer without working award 3/3 2. Do not penalise inadvertent use of radians or grads -272, 271(.67 ...) (radians used) award 3/3 110(.4...) (grads used) award 3/3 3. Where an incorrect trig ratio is used, working should be followed through with the possibility of awarding 2/3. (a) 274(.06...) [$300 \times \cos 24^\circ$] award 2/3 ×✓✓ (b) 134, 133(.568...) [$300 \times \tan 24^\circ$] award 2/3 ×✓✓ 4. In awarding the 3rd mark, the trig. ratio should not be rounded to any less than 2 decimal places, eg (a) $300 \times \sin 24^\circ = 300 \times 0.41 = 123$ award 3/3 (b) $300 \times \sin 24^\circ = 300 \times 0.4(0) = 120$ award 2/3 ✓✓× 5. Do not award the 3rd mark if there is invalid subsequent working e.g. $300 \sin 24^\circ = 122 \rightarrow \sqrt{122} = 11(\dots)$ award 2/3 ✓✓×

Question	Expected Answer/s	Max Mark	Additional Guidance
10	<p>Ans: 97.5</p> <ul style="list-style-type: none"> •¹ know how to evaluate numerator: $25 \times (1.5 + 6.3)$ or $25 \times 1.5 + 25 \times 6.3$ •² evaluate numerator: 195 •³ divide numerator by 2 correctly: $195 \div 2 = 97.5$ 	3	<p>1. Correct answer without working award 3/3</p> <p>2. Some common answers (working must be shown)</p> <p>(a) $116.25 [(25 \times 1.5) + (25 \times 6.3) \div 2]$ $= 37.5 + 157.5 \div 2$ $= 37.5 + 78.75]$ award 2/3 ✓✓x</p> <p>(b) $48.75 [(25 \times 7.8) \div 2 = 12.5 \times 3.9]$ award 2/3 ✓✓x</p> <p>(c) $21.9 [(25 \times 1.5 + 6.3) \div 2]$ award 2/3 x✓✓</p> <p>(d) $40.65 [25 \times 1.5 + 6.3 \div 2]$ award 1/3 x✓x</p> <p>(e) $16.4 [(25 + 1.5 + 6.3) \div 2]$ award 1/3 xx✓</p> <p>(f) $118.125 [25 \times 1.5 \times 6.3 \div 2]$ award 0/3</p> <p>(g) $29.65 [25 + 1.5 + 6.3 \div 2]$ award 0/3</p>

Question	Expected Answer/s	Max Mark	Additional Guidance
11	<p>Ans: £76</p> <ul style="list-style-type: none"> •¹•² know how to calculate interest: $\frac{2.4}{100} \times 4750 \times \frac{8}{12}$ (award 1 for $\frac{2.4}{100} \times 4750$ or $\frac{8}{12} \times \frac{2.4}{100}$ or $\frac{8}{12} \times 4750$) •³ carry out percentage and fraction calculations correctly: 76 	3	<ol style="list-style-type: none"> 1. Correct answer without working award 3/3 2. If answer is 4826 [4750 + 76] (no working necessary) <ol style="list-style-type: none"> (a) award 3/3 if candidate states that interest is 76 (b) award 2/3 if candidate does not state that interest is 76 3. Acceptable answers for partial credit (no working necessary) <ol style="list-style-type: none"> (a) 114 [2.4% of 4750] award 1/3 (b) 1.6 [$\frac{8}{12} \times 2.4$] award 1/3 (c) 3166.67 or 3166.66 [$\frac{8}{12} \times 4750$] award 1/3 (d) 912 [114 × 8] award 1/3 4. The following common wrong answers illustrate where the 3rd mark is/is not available to candidates, working must be shown. (note: answer must be rounded or truncated to nearest penny) <ol style="list-style-type: none"> (a) 131944.44 [$4750 \times \frac{100}{2.4} \times \frac{8}{12}$] x✓✓ (b) 1319.44 [$4750 \div 2.4 \times \frac{8}{12}$] x✓x (c) 171 [$4750 \times \frac{2.4}{100} \times \frac{12}{8}$] ✓x✓ (d) 1710 [$4750 \times 0.24 \times \frac{12}{8}$] xx✓

Question	Expected Answer/s	Max Mark	Additional Guidance
12	<p>Ans: 122 cm</p> <ul style="list-style-type: none"> •¹ find dimensions of triangle: 100 and 70 •² correct form of Pythagoras' Theorem: $100^2 + 70^2$ •³ calculate sum (or difference) of two squares: 14900 •⁴ calculate the square root of a calculated value: 122 (.06..) 	4	<ol style="list-style-type: none"> 1. Correct answer without working award 4/4 2. 2nd mark can only be awarded for using Pythagoras in a right-angled triangle Some examples (working must be shown) <ul style="list-style-type: none"> (a) $71(\cdot 41\dots) [\sqrt{100^2 - 70^2}]$ award 3/4 ✓×✓✓ (b) $131(\cdot 24\dots) [\sqrt{100^2 + 85^2}]$ award 3/4 ××✓✓ (c) $217(\cdot 31\dots) [\sqrt{200^2 + 85^2}]$ award 3/4 ××✓✓ (d) $86(\cdot 31\dots) [\sqrt{15^2 + 85^2}]$ award 2/4 ××✓✓ (e) $141(\cdot 42\dots) [\sqrt{100^2 + 100^2}]$ award 2/4 ××✓✓ 3. Final mark is not available if there is invalid subsequent working e.g. $122 - 30 = 92$ award 3/4 ✓✓✓× 4. Example of alternative strategy involving trigonometry <ul style="list-style-type: none"> •¹ dimensions of triangle = 100 and 70 •² $a^\circ = \tan^{-1}(100/70) = 55^\circ \dots\dots$ •³ $\cos 55^\circ \dots\dots = 70/\text{length}$ •⁴ $\text{length} = 70 \div \cos 55^\circ = 122$ 5. Do not penalise inadvertent use of radians or grads if trigonometry is used

Question	Expected Answer/s	Max Mark	Additional Guidance
13	<p>Ans: 6%</p> <ul style="list-style-type: none"> •¹ find delivery charge: 21 •² know to express delivery charge as a fraction of 350: $\frac{21}{350}$ •³ know to multiply fraction by 100: $\frac{21}{350} \times 100$ •⁴ carry out all calculations correctly: 6 	4	<ol style="list-style-type: none"> 1. Correct answer without working award 2/4 2. 4th mark is only available for calculations of the form $\frac{a}{b} \times c$ where a, b, c = delivery charge or 350 or 371 or 100. 3. Some common answers (working must be shown) <ul style="list-style-type: none"> (a) 5.7, 5.6(6...) [$\frac{21}{371} \times 100$] award 3/4 ✓×✓✓ (b) 106 [$\frac{371}{350} \times 100$] award 3/4 ×✓✓✓ (c) 94(.3...) [$\frac{350}{371} \times 100$] award 2/4 ××✓✓ (d) 73.5 [$\frac{21}{100} \times 350$] award 2/4 ✓××✓ (e) 1298.5 [$\frac{350}{100} \times 371$ or $\frac{371}{100} \times 350$] award 1/4 ×××✓
14	<p>Ans: 150 cm²</p> <p><u>Method 1</u></p> <ul style="list-style-type: none"> •¹ find base of triangle: $80 \div 4 = 20$ •² find height of triangle: $45 \div 3 = 15$ •³ find area of triangle: $\frac{1}{2} \times 20 \times 15 = 150$ <p><u>Method 2</u></p> <ul style="list-style-type: none"> •¹ find area of rectangle: $80 \times 45 = 3600$ •² find number of triangles: 24 •³ find area of triangle: $3600 \div 24 = 150$ 	3	<ol style="list-style-type: none"> 1. Correct answer without working award 1/3 2. A common answer (no working necessary) 1800 [$\frac{1}{2} \times 80 \times 45$] award 1/3 3. Award 2/3 for correctly calculating $3600 \div t$, $t \neq 2$ or 24 [incorrect number of triangles] (working must be shown) e.g. $3600 \div 21 = 171(\dots)$ (Do not penalise incorrect rounding)

Question	Expected Answer/s	Max Mark	Additional Guidance
15	<p>Ans: 42 cm</p> <ul style="list-style-type: none"> •¹ know how to calculate length of semi-circle: $\frac{1}{2}\pi d$ or πr •² substitute correct diameter into formula: $\frac{1}{2} \times \pi \times 10$ or $\pi \times 5$ •³ know to add lengths of straight edges to previously calculated value: previously calculated value + 10 + 6 + 10 •⁴ carry out all calculations correctly: $15.7... + 26 = 41.7...$ (must include a circle calculation followed by an addition) •⁵ round to nearest whole number: 42 	5	<ol style="list-style-type: none"> 1. Correct answer without working award 0/5 2. Where no formula is stated accept <ol style="list-style-type: none"> (a) $\frac{1}{2} \times \pi \times 10$ or $15.7...$ as evidence of $\frac{1}{2}\pi d$ being used (b) $\frac{1}{2} \times \pi \times 5^2$ or $39.2...$ as evidence of $\frac{1}{2}\pi r^2$ being used 3. Some common answers (working must be shown) <ol style="list-style-type: none"> (a) $32 [\frac{1}{2} \times \pi \times 10 + 16]$ award 4/5 ✓✓x✓✓ (b) $57 [\pi \times 10 + 26]$ award 4/5 x✓✓✓✓ (c) $65 [\frac{1}{2} \times \pi \times 5^2 + 26]$ award 4/5 x✓✓✓✓ (d) $99 [\frac{1}{2} \times \pi \times 5^2 + 60]$ award 3/5 x✓x✓✓ (e) $183 [\frac{1}{2} \times \pi \times 10^2 + 26]$ award 3/5 xx✓✓✓ (f) $34 [\frac{1}{2} \times \pi \times 5 + 26]$ award 4/5 ✓x✓✓✓ (g) $16 [\frac{1}{2} \times \pi \times 10]$ award 3/5 ✓✓xx✓ (h) $31 [\pi \times 10]$ award 2/5 x✓xx✓ (i) $39 [\frac{1}{2} \times \pi \times 5^2]$ award 2/5 x✓xx✓ (j) $39 [\frac{1}{2} \times 5^2 + 26]$ award 2/5 xx✓x✓ (k) $79 [\pi \times 5^2]$ award 2/5 x✓xx✓ <p>3. (a) 5th mark is only available where the answer to circle calculation requires rounding (b) Where premature rounding leads to incorrect answer, a maximum of 4/5 is available.</p>

TOTAL MARKS FOR PAPER 2

50

**TOTAL MARKS FOR
PAPER 1&2**

80

[END OF MARKING INSTRUCTIONS]