Question			Answer	Marks	Part marks and guidance	
1	(a)		–2, 1	1		
	(b)		12	1		
2	(a)		1 3 5 15	2	**B1** for 2 correct and no incorrect factors or 4 correct and 1 incorrect or 1×15 and 3×5	
	(b)		15	1		
3	(a)		8	1		$\frac{8}{60}$ scores 0
	(b)		25	1		$\frac{25}{60}$ scores 0
4			169	2	**B1** for answer figs 169 or **M1** for $(1.3 \times 10)^2$ oe or $\sqrt{169} = 13 \div 10 = 1.3$	May be flow diagram
5			682.2	3	**M1** for 18×10.4 oe soi by 187.2 **M1** for 360 + 90 + 45 + *their* 187.2 oe	e.g. 180×1.04 May be ratio method with $\times 18$ oe seen *Their* 187.2 from attempt at first M1 and $\neq 180$ Addition may be a series of sums or implied by a vertical list with number below Accept 495 + *their* 187.2

<table>
<tr><th colspan="3">Question</th><th>Answer</th><th>Marks</th><th>Part marks and guidance</th><th></th></tr>
<tr><td>6</td><td>(a)</td><td></td><td>5 [×] 70 or 5 [×] 0.7

and

3.5[0]</td><td>M1

A1</td><td></td><td>Not from 73 × 4.9 and rounded to 360 or truncated 350
Accept e.g. 70+70+70+70+70 for M1
Condone units included in product
Condone answer 350p with £ crossed through or £3.50p</td></tr>
<tr><td></td><td>(b)</td><td></td><td>Recognition that the figures are not all to the same number of sig fig
e.g. They’re not all the same accuracy oe</td><td>1</td><td></td><td>See appendix

Allow complete and correct example(s)</td></tr>
<tr><td>7</td><td>(a)</td><td></td><td>$x = y - 3$ final answer</td><td>1</td><td></td><td>Accept $y - 3 = x$</td></tr>
<tr><td></td><td>(b)</td><td></td><td>$w = \frac{p}{3}$ or $w = p \div 3$ final answer</td><td>1</td><td></td><td>Accept $\frac{p}{3} = w$ or $p \div 3 = w$</td></tr>
<tr><td>8</td><td></td><td></td><td><table><tr><th>Statement</th><th>Value of x</th><th>True</th><th>False</th></tr><tr><td>$x > -1$</td><td>5</td><td>✓</td><td></td></tr><tr><td>$x \leq -1$</td><td>-1</td><td>✓</td><td></td></tr><tr><td>$\frac{x}{10} = 0.7$</td><td>70</td><td></td><td>✓</td></tr><tr><td>$x - 2 \neq 5$</td><td>3</td><td>✓</td><td></td></tr><tr><td>$-1 < x < 0.7$</td><td>0</td><td>✓</td><td></td></tr></table></td><td>3</td><td>B2 for three correct
or
B1 for two correct</td><td></td></tr>
<tr><td>9</td><td>(a)</td><td>(i)</td><td>6</td><td>1</td><td></td><td></td></tr>
<tr><td></td><td>(a)</td><td>(ii)</td><td>24</td><td>2</td><td>M1 for 36 ÷ 2 soi 18
or ÷ 2 and +6 written under appropriate parts of machine</td><td>May draw their own machine</td></tr>
</table>

<table>
<tr><th colspan="3">Question</th><th>Answer</th><th>Marks</th><th colspan="2">Part marks and guidance</th></tr>
<tr><td></td><td>(b)</td><td></td><td>x × 3 + 8 y</td><td>2</td><td>B1 for two of x × 3 + 8 y correctly placed</td><td></td></tr>
<tr><td>10</td><td></td><td></td><td>45</td><td>3</td><td>M1 for [1 share =] $\frac{100-1}{3+8}$ oe

and

M1 for their 9 × (5 or 8 and 3) oe

or

M1 for one from
<table>
<tr><th>[Jamal]</th><th>[Layla]</th></tr>
<tr><td>15</td><td>40</td></tr>
<tr><td>18</td><td>48</td></tr>
<tr><td>21</td><td>56</td></tr>
<tr><td>24</td><td>64</td></tr>
</table></td><td>M1 may be implied by 9

[Jamal] 27 and [Layla] 72 implies M1M1

Their 9 from $\frac{100-1}{3+8}$ or
$\frac{100+1}{3+8}$ or $\frac{100}{3+8}$ may be decimal</td></tr>
</table>

Question			Answer	Marks	Part marks and guidance	
11	(a)		December and two correct values in comparable form	3	Allow B and M marks, even if not used in final reason or November chosen **B2** for 0.56 to 0.57 and 0.58[0] to 0.58[1] or 56% to 57% and 58[.0]% to 58[.1]% or $\frac{17\times31}{30\times31}$ and $\frac{18\times30}{30\times31}$ or better or **M1** for $\frac{17}{30}$ or 17÷30 soi by 0.56 to 0.57 or $\frac{18}{31}$ or 18÷31 soi by 0.58[0] to 0.58[1]	Values may be in working isw attempts to change form once correct value seen Condone $0.\dot{5}8$ for 0.58 Condone any missing % signs Accept 527 and 540 for $\frac{17\times31}{30\times31}$ and $\frac{18\times30}{30\times31}$ <u>Alternatively accept for all marks</u> $\frac{13}{30}$ and $\frac{13}{31}$ soi by 0.43[3] or $0.4\dot{3}$ and 0.41 to 0.42 etc or $\frac{30}{17}$ and $\frac{31}{18}$ soi by 1.76 or $1.\dot{7}6$ and 1.72 or $1.7\dot{2}$ etc May also be $\frac{30}{13}$ and $\frac{31}{13}$ oe and division e.g. 30 ÷ 13
	(b)		Relative frequency can be used as an estimate of probability Probability/proportion of rainy days is the same as last year	1		See appendix Do not accept amount / number of times / rain / weather for “number of rainy days”

<table>
<tr><th colspan="3">Question</th><th>Answer</th><th>Marks</th><th>Part marks and guidance</th><th></th></tr>
<tr><td>12</td><td>(a)</td><td></td><td>
<table>
<tr><th>Number</th><th colspan="2">...as a power of 2</th></tr>
<tr><td>4</td><td>2×2</td><td>2^2</td></tr>
<tr><td>16</td><td>$2\times2\times2\times2$</td><td>2^4</td></tr>
<tr><td>64</td><td>$2\times2\times2\times2\times2\times2$</td><td>$2^6$</td></tr>
</table>
</td><td>2</td><td>B1 for 2^4
B1 for 2^6

OR

B1 for $2\times2\times2\times2$ or $2\times2\times2\times2\times2\times2$</td><td></td></tr>
<tr><td></td><td>(b)</td><td></td><td>2^{40} cao</td><td>1</td><td></td><td></td></tr>
<tr><td>13</td><td>(a)</td><td></td><td>1.025×10^{-3}</td><td>1</td><td></td><td></td></tr>
<tr><td></td><td>(b)</td><td></td><td>9.93×10^4</td><td>4</td><td>B3 for 99 300
or
B2 for figs 993
or
M2 for $\frac{1.655\times10^{12}\times6\times10^{-5}}{1000}$ oe
or
M1 for $1.655\times10^{12}\times6\times10^{-5}$ oe</td><td>May be in stages

May be seen as product of two st form numbers converted</td></tr>
<tr><td>14</td><td>(a)</td><td></td><td>300×8 [=2400]</td><td>1</td><td></td><td>Condone also doing the reverse $2400\div8$ or
$2400\div300$ as a check</td></tr>
</table>

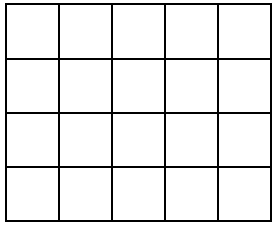
Question			Answer	Marks	Part marks and guidance	
	(b)		$\frac{1}{3}$	**3**	**B2** for $\frac{1200}{3600}$ oe or **M2** for $1 - \frac{2400}{3600}$ oe or **B1** for $\frac{2400}{3600}$ oe or $\frac{3600}{2400}$ oe or 1200	May be $\frac{3600}{1200}$ oe Answers of 33.3[3...]% or 0.333[3...] or 3 score B2 May be $1 - \frac{1}{1.5}$ or $1 - \frac{x}{1.5x}$ or $\frac{3600-2400}{3600}$ etc e.g. $\frac{2}{3}$ or $\frac{3}{2}$ 66% to 67% or 0.66 to 0.67 or $\frac{300}{450}$ or 1.5 A time may be chosen e.g. 1 hour 3600 in 60 min, 60 per min 2400 in 60 min, 40 per min B1 for $\frac{40}{60}$, M2 for $1 - \frac{40}{60}$ etc
15	**(a)**		$1.25 \times 3 + 2 \times 1.25$ oe	**1**		Addition implied by column with answer at bottom Accept 1.25×5 or 1.25 +1.25 +1.25 +1.25 +1.25 Condone $6 \times 1.25 - 1.25$ If working in pence must change 625 to 6.25

Question			Answer	Marks	Part marks and guidance	
	(b)		A 5[p] with 23.75 and 23.8[0] seen	**5**	**B2** for [total price A] 23.75 or **M2** for $6 \times 3 \times 1.25 + 1.25$ oe or **M1** for $25 \div 4$ or 6 [lots] or $\frac{1.25 \times 3}{4}$ soi 0.9375 AND **B2** for [total price B] 23.8[0] or **M2** for $8 \times 2 \times 1.4[0] + 1.4[0]$ oe or **M1** for $25 \div 3$ or 8 [lots] or $\frac{2.80}{3}$ soi 0.93 If **0, 1 or 2** scored, instead award **SC3** for Shop A and 5[p] or If **0 or 1** scored, instead award **SC2** for *their* cheapest shop and correct difference between *their* prices in pence	 3 × 1.25 = (3.75) then *their* 3.75 × 6 = (22.5) + 1.25 or $\frac{1.25 \times 3}{4} \times 24 + 1.25$ oe or 19×1.25 oe May be 4+4+4+4+4+4 or 1.4[0] × 2 = 2.8[0] then *their* 2.80 × 8 = (22.4) + 1.4[0] or $\frac{2.80}{3} \times 24 + 1.40$ or 17×1.4 oe May be 3+3+3+3+3+3+3+3 *Their* two total prices must be clearly identifiable Allow £ sign added to give e.g. £2.05[p]

Question			Answer	Marks	Part marks and guidance	
16	**(a)**		9 10 12 13 14	**2**	**B1** for 3 or 4 correct	
	(b)		$\frac{5}{12}$	**2**	$\frac{5}{12}$ or **FT** *their* table **B1FT** for *their* correct numerator **B1FT** for *their* correct denominator If **0** scored, **SC1** for answer only rounding to 0.42 or 42% without $\frac{5}{12}$ seen or answer $\frac{7}{16}$	*Their* table may be complete or incomplete eg $\frac{4}{7}$ after NR in **(a)** scores 2 Ignore attempts to change form once correct answer seen Do not accept ratio or words
17			6.25	**3**	**M2** for $\frac{\mathbf{340-320}}{\mathbf{320}}$ [× 100] oe or $\frac{\mathbf{340}}{\mathbf{320}}$ [× 100] oe or **M1** for 340 – 320 may be implied by 20	Implied by 0.0625, 1.0625 or 106.25

Question			Answer	Marks	Part marks and guidance	
18			12 000 with correct working	**6**		Correct working requires evidence of at least 3 M marks
					M3 for $\frac{x \times 1.5 \times 5}{100} - \frac{x \times 1.1 \times 6}{100} = 108$ oe or better or **M1** for $\frac{x \times 1.5 \times 5}{100}$ oe **M1** for $\frac{x \times 1.1 \times 6}{100}$ oe AND **M1FT** for correctly removing fractions **M1FT** for correct single *x* term isw If **0**, **1** or **2** scored, instead award **SC3** for answer 12 000 with no or insufficient working	Accept any letter for *x* e.g. M3 for *x* × [0].015 × 5 = *x* × [0].011 × 6 + 108 or [0].075*x* = [0].066*x* + 108 e.g. [0].015*x* × 5 or $\frac{7.5x}{100}$ or 0.075*x* e.g. [0].011*x* × 6 or $\frac{6.6x}{100}$ or 0.066*x* If both equations seen but only one used allow M1, M1 to stand FT *their* equation in one variable e.g. [0].009*x* [= 108] Note: [0].075*x*–[0].066*x*=108 scores M4 Any calculation of 1.5% or 1.1% of 108 scores 0 See appendix for alternative methods

Question			Answer	Marks	Part marks and guidance	
19	(a)		$\frac{2}{4}$ oe $\frac{1}{4}$ oe $\frac{3}{5}$ oe $\frac{2}{4}$ oe $\frac{1}{4}$ oe	3	**B2** for all red and yellow correct or **B1** for $\frac{3}{5}$ correctly placed **B1** for both red or both yellow correct	Accept equivalent fractions or decimals 0.6, 0.5 and 0.25 or 60%, 50% and 25% red $\frac{2}{4}$ oe yellow $\frac{1}{4}$ oe
	(b)		$\frac{1}{10}$ oe	2	**M1** for $\frac{2}{5} \times \frac{1}{4}$ oe	Accept 0.1 and 10% and equivalent fractions e.g. $\frac{2}{20}$ M1 do not accept 40% × 25%
20	(a)		54	2	**M1** for $\frac{9 \times 12}{2}$ oe	

Question			Answer	Marks	Part marks and guidance	
	(b)		828 with correct working	**5**	**B2** for [hypotenuse =] 15 or **M1** for $9^2 + 12^2$ AND **M2** for 2 from $2 \times$ *their* **part(a)**, 20×9, 20×12, $20 \times$ *their* $\sqrt{9^2 + 12^2}$ or **M1** for 1 from $2 \times$ *their* **part(a)**, 20×9, 20×12, $20 \times$ *their* $\sqrt{9^2 + 12^2}$ If **0** or **1**, scored instead award **SC2** for 828 with no or insufficient working	Correct working requires evidence of at least M1or B2 (Pythagoras) and M2 (area) Allow restart for area of triangle May be implied by 108, 180 , 240 , 300
	(c)		Reason that recognises the loss of part of the surface [of the triangular prisms] e.g. [The value of] two rectangular areas are lost /no longer on the surface oe	**1**		Accept e.g. faces/rectangles/slanting faces/sections for rectangular areas less/reduced for lost
21	**(a)**		Rectangle 4 by 5 correctly orientated 	**1**		Does not need shading nor internal lines

<table>
<tr><th colspan="3">Question</th><th>Answer</th><th>Marks</th><th>Part marks and guidance</th><th></th></tr>
<tr><td></td><td>(b)</td><td></td><td>
<table>
<tr><th>Pattern number</th><th>Calculation</th><th>Number of tiles</th></tr>
<tr><td>1</td><td>1 × 2</td><td>2</td></tr>
<tr><td>2</td><td>2 × 3</td><td>6</td></tr>
<tr><td>3</td><td>3 × 4</td><td>12</td></tr>
<tr><td>4</td><td>4 × 5</td><td>20</td></tr>
<tr><td>5</td><td>5 × 6</td><td>30</td></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td>10</td><td>10 × 11</td><td>110</td></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td>n</td><td>n × (n + 1)</td><td>n² + n</td></tr>
</table>
</td><td>4</td><td>B2 for first four cells correct
or
B1 for two of the first four cells correct

B1 for 10 × 11 and 110

B1 for n × (n + 1)</td><td>Allow 5 × 4

Allow 6 × 5

Condone n × n + n</td></tr>
<tr><td></td><td>(c)</td><td></td><td>4160</td><td>3</td><td>M2 for 4096 + $\sqrt{4096}$ oe
or $\sqrt{4096} \times (\sqrt{4096} + 1)$

or
M1 for $\sqrt{4096}$</td><td>Accept 64 × 65
May be
$\sqrt{4096}$ = y then y × (y + 1)
Accept
64 × 64 for 4096
and 64 for $\sqrt{4096}$ in M2 and M1</td></tr>
</table>

<table>
<tr><th colspan="3">Question</th><th>Answer</th><th>Marks</th><th>Part marks and guidance</th><th></th></tr>
<tr><td>22</td><td></td><td></td><td>228</td><td>4</td><td>B3 for 133, 57 and 38
or
M3 for $\frac{76}{7-3}$ × their (7 + 3 + 2) oe
or
M2 for $\frac{76}{7-3}$ × n oe where n = 2, 3 or 7

or
M1 for $\frac{76}{7-3}$ implied by 19
or correct trial with blue >76 and difference between blue and green shown</td><td>Trials
<table><tr><th>B</th><th>G</th><th>R</th><th></th><th>Dif</th><th>Tot</th></tr><tr><td>77</td><td>33</td><td>22</td><td></td><td>44</td><td>132</td></tr><tr><td>84</td><td>36</td><td>24</td><td></td><td>48</td><td>144</td></tr><tr><td>91</td><td>39</td><td>26</td><td></td><td>52</td><td>156</td></tr><tr><td>98</td><td>42</td><td>28</td><td></td><td>56</td><td>168</td></tr><tr><td>105</td><td>45</td><td>30</td><td></td><td>60</td><td>180</td></tr><tr><td>112</td><td>48</td><td>32</td><td></td><td>64</td><td>192</td></tr><tr><td>119</td><td>51</td><td>34</td><td></td><td>68</td><td>204</td></tr><tr><td>126</td><td>54</td><td>36</td><td></td><td>72</td><td>216</td></tr><tr><td>133</td><td>57</td><td>38</td><td></td><td>76</td><td>228</td></tr></table></td></tr>
<tr><td>23</td><td>(a)</td><td></td><td>3.45</td><td>4</td><td>B1 for at least three of 1.5, 2.5, 3.5, 4.5

M1 FT for Σmf where m is a consistent value within each group
1.5 × 5 + 2.5 × 8 + 3.5 × 32 + 4.5 × 15 soi by 7.5 + 20 + 112 + 67.5 or 207

M1 FT dep on M1 for their 207 ÷ 60</td><td>May be implied by three correct products (7.5, 20, 112, 67.5) or [total =] 207

FT their “midpoints” seen
M1 may be implied by
Lower: 5+16+96+60 (177)
Upper: 10+24+128+75 (237)
Allow one error in calculation

FT from lower 2.95, upper 3.95</td></tr>
<tr><td></td><td>(b)</td><td></td><td>Exact heights are not known oe</td><td>1</td><td></td><td>See appendix
Do not accept comments on the method used
Do not accept “estimate” unless clarified in comment</td></tr>
</table>

Question			Answer	Marks	Part marks and guidance	
24	(a)		$\begin{pmatrix}3\\-1\end{pmatrix}$ drawn with correct arrow	2	**B1** for $\begin{pmatrix}3\\-1\end{pmatrix}$ drawn with no or incorrect arrow or $\begin{pmatrix}3\\1\end{pmatrix}$ drawn with an arrow in either direction	Accept freehand Ignore BC on diagram Accept as part of triangle
	(b)		$\begin{pmatrix}5\\5\end{pmatrix}$	2	**B1** each value	Penalise by 1 mark first appearance of vinculum or poor form in vector but condone second use
	(c)		$\begin{pmatrix}-3\\1\end{pmatrix}$	1		
25			Accurate ruled perpendicular bisector of AB that reaches both horizontal boundaries, with correct supporting arcs	2	**B1** for accurate ruled perpendicular bisector of AB including with no or incorrect arcs	Condone perpendicular bisector going beyond rectangle