

Question		Answer	Marks	Part marks and guidance	
1	(a)	$\frac{27}{100}$ 27 [0].8[0] 80 $\frac{3}{100}$ [0].03	3	B1 for each row	
	(b)	$\frac{9}{20}$ final answer	2	B1 for $\frac{45}{100}$ or equivalent fraction	
	(c)	$\frac{1}{5}$ or equivalent fraction	1	Ignore attempts to simplify if, for example, $\frac{10}{50}$ given. Must be a vulgar fraction not 0.2 or 20%	

Question		Answer	Marks	Part marks and guidance	
2		11 424	3	<p>B2 for 3024</p> <p>OR</p> <p>M1 for $8400 \times [0].12$ or 1008</p> <p>M1 for $[8400 +] \textit{their} 1008 \times 3$</p> <p>If 0 scored SC1 for 11 801[. ..]</p>	<p>M0 if used for compound interest</p> <p><i>Their</i> 1008 must be seen to come from a calculation with 8400 and 12</p> <p>Non-calculator methods Candidates must have equivalent, correct, processes at each stage to score M marks Eg 10% so $\div 10$ and 2% so $\div 5$ then add Answers may be incorrect but process may be implied by correct values Eg (10%) 840 + (2%) 168</p> <p>From compound interest</p>
3	(a)	7	1		Not 5^7
	(b)	14 -14	2	B1 for each	<p>± 14 with no other incorrect answer scores 2 marks</p> <p>± 14 with an incorrect answer scores 1 mark</p>
4	(a)	$3x - 2$ final answer	2	<p>M1 for $5x - 10$ or $-2x + 8$ or B1 for $3x + j$ or $kx - 2$ ($k \neq 0$) final answer</p>	<p>$3x + - 2$ scores 1 mark</p> <p>j can be 0</p>
	(b)	$2x(5x + 3)$	2	B1 for $2(5x^2 + 3x)$ or $x(10x + 6)$	

Question		Answer	Marks	Part marks and guidance	
	(c)	x^{10}	1		Not, $x \times x \times \dots$
5	(a)	62 cao	2	B1 for 48 or 14 or M1 for $3 \times 16 + 2 \times 7$	
	(b)	11 cao	2	M1 for $2 + 6 \times 1.5$ If 0 scored SC1 for answer -7	
	(c)	$d = \frac{c}{7}$ oe	1	Accept $d = c \div 7$ and $\frac{c}{7} = d$	$\frac{c}{7}$ or $c \div 7$ with no subject scores 0
6	(a) (i)	certain	1		
	(ii)	evens	1		
	(b) (i)	6	1		
	(ii)	$\frac{21}{55}$ oe	1		Condone correct probability and unlikely for 1 mark Accept [0].3818 to [0].382 or 38.18% to 38.2% but not ratio or in words
	(iii)	$\frac{28}{55}$ oe	1		Condone correct probability and likely for 1 mark Accept [0].509 to [0].51 or 50.9% to 51% but not ratio or in words

Question		Answer	Marks	Part marks and guidance	
7		9.64	4	<p>B2 for 231.36</p> <p>OR</p> <p>M1 for 11×15.65 soi 172.15 M1 for $403.51 - \textit{their}$ 172.15</p> <p>AND</p> <p>M1 for <i>their</i> $231.36 \div 24$</p>	Condone £9.64p for 4 marks
8	(a)	576	2	<p>M1 for [$\\$1=$] $40 \div 50$ or [0].8 or $720 \div 50$ soi 14.4[0] or $50 \div 40$ or 1.25 oe</p> <p>or M1 for full scaling method with correct processes (may be implied by correct values) at each stage</p>	<p>eg [$\\$]50 is [£][40] (process) 100 is [80] ($\times 2$) 200 is [160] ($\times 2$) 20 is [16] ($\div 10$) And sum 200, 200, 200, 100 and 20</p>

Question		Answer	Marks	Part marks and guidance	
	(b)	282 or 282.03 or 282.04 or 282.05 final answer	4	<p>M1 for multiplying four note values by the correct number of notes soi by values shown in final column of scheme</p> <p>M1 for dividing a value in euros by 1.17 soi by values shown in final column of scheme</p> <p>M1 for adding four sums of money of the same currency (one from each note value)</p>	<p>Find total of euros $50 \times 2 (= 100) \div 1.17 (=85.47\dots)$ $20 \times 4 (= 80) \div 1.17 (=68.37\dots)$ $10 \times 9 (= 90) \div 1.17 (=76.92\dots)$ $5 \times 12 (=60) \div 1.17 (=51.28\dots)$ $100 + 80 + 90 + 60 = [€]330$ $330 \div 1.17 (=282.05\dots)$</p> <p>Find each denomination in £ $50 \div 1.17 (=42.73\dots)$ 42.73 or 42.74 $20 \div 1.17 (=17.09\dots)$ 17.09 or 17.10 $10 \div 1.17 (=8.54\dots)$ 8.54 or 8.55 $5 \div 1.17 (=4.273\dots)$ 4.27 or 4.28 $42.74 \times 2 (=85.48)$ $17.09 \times 4 (=68.36)$ $8.55 \times 9 (=76.95)$ $4.27 \times 12 (=51.24)$ Total = 282.03</p>

9	(a)		7.31 cao	1		
	(b)	(i)	408 000 cao	1		
		(ii)	[0].006 14 cao	1		
10	(a)	(i)	15 11	1		
		(ii)	38 193	1		
	(b)		$4n + 1$ oe	2	B1 for $4n + k$ k may be 0	Accept $n4$ (if clear this is not n^4), and $n \times 4$ and $4 \times n$ oe $5 + (n - 1) \times 4$ scores 2 marks Condone $x = \dots$ and $n^{\text{th}} = \dots$ for 2 marks Condone $n = 4n + 1$ for 1 mark
11	(a)		[0].76 cao	2	M1 for $\frac{380}{1000} \times 2$ oe or B1 for figs 76 as answer	Condone 0.76p for 2 marks Eg 0.38×2 If using a method of scaling, must be complete method eg $1000\text{g} = \text{£}2$ $100\text{g} = 20\text{p}$ $20\text{g} = 4\text{p}$ <i>Their 20p</i> $\times 3$ + <i>their 4p</i> $\times 4$
	(b)		$\frac{300}{20}$ or $\frac{280}{20}$ 15 or 14	M1 A1	15 dep on $\frac{300}{20}$ and 14 dep on $\frac{280}{20}$ If 0 scored SC1 for one of 300 or 280 or 20	Answers from $280.25 \div 19$, and rounded, score 0 Accept 15 (14) and 15.00 (14.00) but not 15.0 (14.0) or 15.00p (14.00p)

12		68.8	3	<p>M2 for $2 \times (12 + 15 + 7.4)$</p> <p>OR</p> <p>M1 for $15 - 5.8 - 6.3$ soi 2.9</p> <p>M1 for $12 + 15 + 12 + 6.3 + 7.4 +$ <i>their</i> $2.9 + 7.4 + 5.8$ oe</p>	<p>Accept any other complete and correct methods</p> <p>May be $15 - 12.1$</p> <p>If not 2.9 then <i>their</i> 2.9 must be seen on diagram in correct place or come from $15 - 5.8 - 6.3$</p>
13	(a)	12.65 12.75	2	B1 for one correct or both correct and reversed	For B1 , correct value must be in correct place
	(b)	<p>Accept any correctly matched pair in which wood > metal</p> <p>from</p> <p style="padding-left: 40px;">$8.45 < \text{wood} \leq 8.49[9\dots]$</p> <p>and</p> <p style="padding-left: 40px;">$8.45 \leq \text{metal} \leq 8.49[9\dots]$</p>	2	<p>Wood > metal does not need to be stated but it must be clear which measurement refers to wood and which to metal</p> <p>B1 for one measurement in range $8.45 < \text{wood} \leq 8.49[9\dots]$ seen or $8.45 \leq \text{metal} \leq 8.49[9\dots]$ seen</p>	<p>Eg “Wood 8.46 [m] but Metal 8.45 [m]” scores 2 marks</p> <p>Wood or 8 Metal or 8.5</p> <p>For B1, measurement must be correctly associated with either wood or metal, as appropriate</p> <p>8.45 seen as end of range Eg $8.45 \leq 8.5 < 8.55$ scores 1 mark</p>
14	(a)	Correct triangle	2	B1 for a correct horizontal or a correct vertical movement of A	Vertices in circles of overlay. Accept good freehand.
	(b)	<p>Rotation</p> <p>[centre] (0,0) oe</p> <p>90 clockwise oe</p>	<p>B1</p> <p>B1</p> <p>B1</p>	<p>Not turn</p> <p>Accept origin or O but not vector</p> <p>Accept $\bar{90}$ or 270 [anti-clockwise]</p>	<p>Second and third marks may still be scored if “Rotation” incorrect</p> <p>0 marks for evidence of a second transformation</p>

<p>15</p>		<p>42 or 41.66.... or 41.7 isw</p>	<p>4</p> <p>Accept 41.6̇ but do not accept 41.6</p> <p>B2 for 12 correct options shown or B1 for options shown with at most 2 errors or omissions or repeats</p> <p>OR</p> <p>B1 for [4 × 3 =] 12 [combinations]</p> <p>B1 for FG, FH, AS, MS, ES only</p> <p>AND</p> <p>M1 for $\frac{\textit{their 5}}{\textit{their 12}}$ [× 100] shown</p> <p>AND</p> <p>B1 for <i>their</i> stated fractional probability, with denominator less than 25, correctly converted to percentage</p>	<table border="1" data-bbox="1675 201 1809 453"> <tr><td>F</td><td>S</td></tr> <tr><td>F</td><td>G</td></tr> <tr><td>F</td><td>H</td></tr> <tr><td>A</td><td>S</td></tr> <tr><td>A</td><td>G</td></tr> <tr><td>A</td><td>H</td></tr> </table> <table border="1" data-bbox="1872 201 2007 453"> <tr><td>M</td><td>S</td></tr> <tr><td>M</td><td>G</td></tr> <tr><td>M</td><td>H</td></tr> <tr><td>E</td><td>S</td></tr> <tr><td>E</td><td>G</td></tr> <tr><td>E</td><td>H</td></tr> </table> <p>Choices with only 1 language</p> <p>Implied only by [0].416[6..] or [0].417 <i>Their</i> (5 and 12) must come from list or 3 × 4 and <i>their 12</i> ≠ <i>their 5</i></p> <p>Exact or correctly rounded to nearest integer or 1dp</p> <p>Alternative method</p> <p>B3 for $\frac{1}{4} + \frac{2}{12}$</p> <p>or</p> <p>B2 for $\frac{1}{4}$ oe and $\frac{2}{12}$ oe</p> <p>or</p> <p>B1 for $\frac{2}{12}$ oe</p>	F	S	F	G	F	H	A	S	A	G	A	H	M	S	M	G	M	H	E	S	E	G	E	H
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16	(a)	(i)	Point (0.8, 120) indicated	1		
		(ii)	No oe and Correct supporting value(s) and justification	2	B1 for 200 to 260 visitors expected or about 0 to 1 mm and 320 or line of best fit within overlay or negative trend/correlation or markings in relevant region above 2mm or 2 or more values within overlay and surrounding 2mm	Justification includes Reference to line of best fit (drawn or not) or trend or negative correlation or markings in relevant region above 2mm or surrounding values See Appendix
		(iii)	Outside range of data [collected]	1		Accept "The data (or diagram) only goes to 5.5 (or 6)" oe Do not accept "by 6 to 7 it would give no visitors" oe or There is no data around 9 mm oe The line of best fit does not reach 9 mm oe Condone "[Because] there would be a negative number of people" See Appendix
	(b)		Total number or number of children is not known oe or The chart only shows proportions/percentages oe	1	Mark the best bit so long as no contradiction	See Appendix
17	(a)	(i)	9.6	1		
		(ii)	2500	1		Condone 1 : 2500

	(b)	<p>Arc centre B radius 6 cm meeting AB and CB or AB and bisector of ADC</p> <p>Ruled bisector of angle ADC to reach BC with construction arcs or Bisector with construction arcs from BC to <i>their</i> arc centre B</p> <p>Correct region shaded</p>	<p>2</p> <p>2</p> <p>1</p>	<p>B1 for any arc centre B meeting AB and BC or short arc (at least 1cm) radius 6 cm centre B</p> <p>B1 for correct ruled bisector at least 2cm long by eye with no construction arcs or correct construction arcs with no bisector drawn</p> <p>Dep on B1 and B1</p> <p>If 0 scored SC1 for 6 [cm] [= 150] [m] seen</p>	<p>Accept dashed or dotted for all marks Freehand, all within template, max B1 Allow beyond AB and BC for 1 or 2 marks Tolerance 5.8 to 6.2 cm</p> <p>Tolerance $\pm 2^\circ$</p> <p>Construction arcs on AD and on DC and two intersecting arcs from these</p>
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18			725	4	<p>M1 for $\frac{4200}{700}$ soi 6</p> <p>M1 for 800×2 soi 1600</p> <p>M1 for $\frac{4200 + \textit{their} 1600}{\textit{their}6 + 2}$</p> <p>Alt method</p> <p>M3 for $\frac{\frac{4200}{700}}{8} \times 700 + \frac{2}{8} \times 800$</p> <p>or M2 for $\frac{\frac{4200}{700}}{8} \times 700$</p> <p>or M1 for $\frac{2}{8} \times 800$</p>	<p><i>Their</i> 1600 must come from calculation with 800 and 2</p> <p>Expect $5800 \div 8$</p> <p>soi 525 + 200</p> <p>soi 525</p> <p>soi 200</p>
19			12 and 30	3	<p>M2 for a complete factor list of 60 e.g. [1] 2,3,4,5,6,10,12,15,20,30 [60]</p> <p>or M1 for the list with at most two errors or [6] 12, 18, 24, 30 [36, ...]</p> <p>or B1 for 2 numbers with a HCF of 6 or LCM of 60</p>	<p>May be seen as products eg 2×30</p> <p>Error, omission or repeat</p> <p>Eg 6 and 12, 12 and 18, 18 and 24 Eg 4 and 15, 10 and 12, 20 and 30</p>

20	(a)	(i)	<table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>×</th> <th>1</th> <th>2</th> <th>2</th> <th>3</th> <th>4</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>1</td> <td>2</td> <td>2</td> <td>3</td> <td>4</td> </tr> <tr> <td>2</td> <td>2</td> <td>4</td> <td>4</td> <td>6</td> <td>8</td> </tr> <tr> <td>2</td> <td>2</td> <td>4</td> <td>4</td> <td>6</td> <td>8</td> </tr> <tr> <td>3</td> <td>3</td> <td>6</td> <td>6</td> <td>9</td> <td>12</td> </tr> <tr> <td>4</td> <td>4</td> <td>8</td> <td>8</td> <td>12</td> <td>16</td> </tr> </tbody> </table>	×	1	2	2	3	4	1	1	2	2	3	4	2	2	4	4	6	8	2	2	4	4	6	8	3	3	6	6	9	12	4	4	8	8	12	16	2	B1 for table completed with no more than 5 errors or omissions	Ignore negative signs
×	1	2	2	3	4																																					
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4	4	8	8	12	16																																					
		(ii)	$\frac{9}{25}$ oe	2	B1FT for <i>their</i> correct numerator B1 for fraction with denominator 25	Ignore attempts to convert form or simplify Accept [0].36 or 36% but not ratio or in words																																				
	(b)		Spinner completed with 3 negative numbers and 2 positives or 2 negatives and 3 positives	3	M1 for $\frac{12}{25}$ soi eg by 12 [out of 25] B1 for spinner with 5 numbers inserted, at least one negative	Do not accept 0 for 3 marks Not just 12 as a number on the spinner Condone 0 (as positive) for B1																																				

21	(a)		8	1		
	(b)		Correct curve	2	B1FT for 4, 5 or 6 points plotted correctly	½ square tolerance B1 max if line ruled (between any points)
	(c)		-0.9 to -0.6 2.6 to 2.9	2	B1 for each If 0 scored SC1 for (-0.9 to -0.6, 2) and (2.6 to 2.9, 2) If 0 scored SC1 for answer as an inequality Eg $-0.8 \leq x \leq 2.7$	If more than two answers mark the worst two Condoned for 2 marks when both answers in body but only one given on answer line
22			4.653 to 4.655 or 4.65 or 4.7 or 5	5	Volume of cuboid M1 for $90 \times 90 \times 150$ soi 1 215 000 Volume of cylinder M1 for $\pi \times 45^2 \times 80$ soi 508 680 to 509 004 Total volume M1 for <i>their</i> 1 215 000 + <i>their</i> 508 938.1 soi 1 723 680 to 1 723 938.1 Find mass using density M1 for any of <i>their</i> volumes $\times 2.7$	Answers of 4.7 or 5 require supporting working Answers from values of π $\pi = 508\,938.0099$ $3.142 = 509\,004$ $3.14 = 508\,680$ <i>Their</i> volumes must be seen to come from the product of three relevant lengths Dependent on a calculated volume for cuboid, cylinder or total If total consists of one volume and one non-volume but is $\times 2.7$, final M1 scored