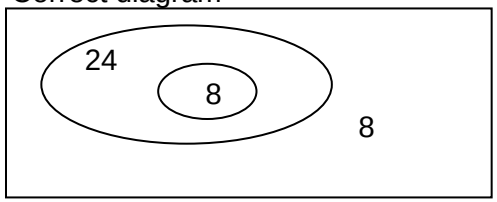
Question			Answer	Marks	Part Marks and Guidance	
1	**(a)**	**(i)**	Chord	**1**		Condone poor spelling
	(a)	**(ii)**	Circumference	**1**		Condone poor spelling
	(b)		Straight line drawn joining two points on circumference and through centre	**1**		Accept good freehand but no daylight with centre blob and finishing at circumference ± 2mm by eye.
2	**(a)**	**(i)**	4400 cao	**1**		
	(a)	**(ii)**	5.37 cao	**1**		
	(b)		520	**2**	**M1** for 80 [× 65] or 8 [× 65] If 0 scored, **SC1** for answer 481 or 455	Accept money as e.g. 520.0 or 520.00
3	**(a)**		5^6	**1**		Allow slightly lowered 6 but not 56
	(b)		1 cao	**1**		Not 1 × 1 × 1 …
	(c)		37	**2**	**B1** for 64 or 27	

Question			Answer	Marks	Part Marks and Guidance	
4	(a)		[0].01	1		
	(b)		$\frac{7}{20}$	2	**B1** for $\frac{35}{100}$	Allow equivalent proper fraction for B1 e.g. $\frac{350}{1000}$ but not $\frac{3.5}{10}$
	(c)		300	3	**M2** for 0.15 × 2000 oe OR **M1** for 0.15 × figs 2 oe or **B1** for **[**2 litres =] 2000 [ml] If 0 or 1 scored, instead award **SC2** for 0.15 × 200 oe with answer 30	See appendix for non-calculator methods
5			Correct shape, orientation and location	2	**B1** for correct enlargement, wrong centre or correct centre, one vertex out of tolerance or all correct vertices but no/some lines drawn	Mark the vertices ± 2mm Accept good freehand. Ignore lines used for construction and small extensions/gaps
6	(a)		122	2	**M1** for 180 – 40 – 82 oe or for 40 + 82	Answer 58 with no working scores 0 M1 may be implied by 58 e.g. seen in correct position on diagram Must be explicit with no extras
	(b)		< 180	1		Mark answer line. If line blank accept any clear indication e.g. ringed, others deleted in list

Question			Answer	Marks	Part Marks and Guidance	
7			12.8[0]	3	**M2** for 448 ÷ 5 ÷ 7 oe or **M1** for 448 ÷ 5 may be implied by 89.6[0] or 448 ÷ 7 may be implied by 64 or 35 [hours]	If working in minutes/pence calculations must be equivalent to award M marks Accept 1280 p as answer with £ crossed through for 3 marks
8	(a)		48	2	**M1** for 4×8 or for $x \rightarrow -16 \rightarrow \div 4 = 8$ oe or for $\frac{x-16}{4} = 8$	M1 may be implied by 32 or (48 – 16) ÷ 4 [= 8] Flow diagram may be reversed Accept any letter for x May be $(x - 16) \div 4 = 8$ Do not allow missing brackets
	(b)		24	2	**M1** for correct method reaching figs(24 or 12) e.g. $\frac{36}{1.5}$ or $\frac{36}{150}$ or $\frac{36}{3}$	See appendix for non-calculator methods
9				2	Allow working in pence/cents then both amounts must be seen with correct units e.g. 12 075 c and 12 600 c	
			No oe and [£105 =] 120.75 OR No oe and [€126 =] 109.5 to 109.6		**M1** for 105 × 1.15 or 120.75 OR **M1** for 126 ÷ 1.15 or 109.5 to 109.6	Mark working wherever seen and "no" oe M1 may be implied by "No and he needs an extra [€] 5.25 oe" M1 may be implied by "No and it is [£]4.50 to [£]4.60 too much oe"

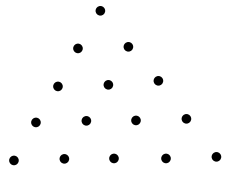
Question			Answer	Marks	Part Marks and Guidance	
10	(a)	(i)	7.5 or $7\frac{1}{2}$ oe cao	1		Ignore trailing zeros
	(a)	(ii)	43	2	**B1** for 24×2 soi 48	
	(b)		[a =] 6 [b =] 13	3	**M2 for** $26 \div 2$ or $26 \div 13$ **or** **M1** for $\frac{26}{8-a}$ oe where a = 1, 2, 3, 4, 5 If 0 or 1 scored, instead award **SC2** for • answer – 6 **and** ×13 or • correct answers reversed	M2 may be implied by seeing 2, 13 and 26 linked e.g $(8 – 6) \times 13 = 26$ or factor tree For M1 "8 – a number" must be seen oe may be e.g. $8 – 4 = k$ then $k \times 6.5$ or $8 – 4 = k$ then k doesn't go into 26 oe
11	(a)		0.6 or 60% or $\frac{6}{10}$	1		Accept any equivalent fraction Do not accept in words or ratio
	(b)	(i)	**1** 0.1 + *their* 0.6 + 0.4 or **2** 1 – (0.1 + *their* 0.6) oe or **3** 0.6 + 0.4 = 1 and A valid comment implying not equal to 1 or 0.4 matching the calculation used	**B1** **B1**	 **Dep** on relevant calculation with correct answer seen	May be fractions or percentages Case **1** or **2:** An answer does not need to be seen/correct to award first B1 Case **1** or **2: a**n answer must be seen and correct to award comment **Example comments** **1** The total should be 1 **2** It should be 0.3 (not 0.4) **3** Nothing left for B See appendix

<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>(ii)</td><td>Arrow drawn at 0.3 cao</td><td>1</td><td></td><td>No FT
Mark intention</td></tr>
<tr><td></td><td>(c)</td><td></td><td>The spinner was spun many times oe</td><td>1</td><td></td><td></td></tr>
<tr><td>12</td><td>(a)</td><td></td><td>Correct rows only<table><tr><td>A : B = 3 : 10</td><td></td></tr><tr><td>A : B = 3 : 7</td><td>✓</td></tr><tr><td>A is $\frac{3}{10}$ of the rectangle</td><td>✓</td></tr><tr><td>A is $\frac{3}{7}$ of the rectangle</td><td></td></tr></table></td><td>2</td><td>B1 for one correct row only
or
B1 for one or two correct rows and one incorrect row only</td><td>Accept any clear indication e.g. ✖
rows 1 and 4 ruled out</td></tr>
<tr><td></td><td>(b)</td><td></td><td>42k</td><td>2</td><td>M1 for [1 share =] 18[k] ÷ 3 or 6[k]
or
B1 for answer 42 or B = 42k</td><td>M1 may be seen as 3 × 6</td></tr>
<tr><td>13</td><td></td><td></td><td>Correct diagram

</td><td>3</td><td>B2 for 8 correctly placed twice
or

M2 for x + x + 32 – x = 40 or better
or
M1 for 32 – x

If 0 scored, SC1 for three numbers with two equal in correct position that sum to 40
e.g. 32 4 4</td><td>
Accept any symbol for x [= n(S)] for M marks
M2 may be 32 + x = 40

If more than one number written in a subset, treat as choice and mark the worst</td></tr>
</table>

Question			Answer	Marks	Part Marks and Guidance	
14	(a)	(i)	16	1		
	(a)	(ii)	Square [numbers]	1		Accept e.g. squared Do not accept n^2 oe
	(b)	(i)	All the dots in the triangle should be filled in/counted oe or There should be 10 [dots] oe or 9 is not a triangular number oe	1		
	(b)	(ii)	Correct diagram of 15 dots 	1		Ignore any numbers and mark diagram Diagram correct by eye with 15 dots drawn in correct arrangement. Ignore connecting lines, wobbles, different size dots but not extra dots unless clearly discarded/erased

<table>
<tr><th colspan="3">Question</th><th>Answer</th><th>Marks</th><th colspan="2">Part Marks and Guidance</th></tr>
<tr><td>15</td><td>(a)</td><td></td><td>Correct row only
<table><tr><td>Heidi gets a larger answer than Ben</td><td></td></tr><tr><td>Heidi gets a smaller answer than Ben</td><td>✓</td></tr><tr><td>Heidi gets the same answer as Ben</td><td></td></tr></table>and
$\left[\frac{5}{8}=\right]$ 0.625</td><td>2</td><td>B1 for correct statement only selected

B1 for correct conversion isw

or

correctly finding 0.63 and $\frac{5}{8}$ of the same amount isw</td><td>Accept any clear indication

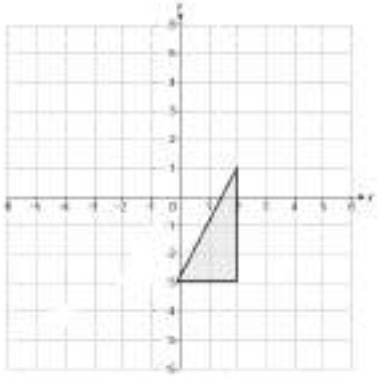
For second B1
Mark converted value(s) on the answer line first
If insufficient converted value(s) on line, mark converted value(s) in body

Accept both converted to comparable form e.g. 63% and 62.5%
or $\frac{630}{1000}$ and $\frac{625}{1000}$.
Condone $\frac{63}{100}$ and $\frac{62.5}{100}$
condone rounding/truncation to a level to compare quantities</td></tr>
<tr><td></td><td>(b)</td><td></td><td>$k \times 10^2$ where k is one from 3.1415927, 3.141593, 3.1416, 3.142 leading to 314.15927, 314.1593, 314.16, 314.2</td><td>2</td><td>B1 for $k \times 10^2$ where k is one from 3.1415927, 3.141593, 3.1416, 3.142</td><td>For 1 or 2 marks
• Accept 100 for 10^2
• must see value of π not just $\pi \times 10^2$
Do not accept answer giving rounded value from use of accurate π
e.g 314.1592654 = 314.2 [to 1dp]</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>16</td><td>(a)</td><td></td><td>
<table>
<tr><td>×</td><td>3</td><td>4</td><td>5</td><td>6</td></tr>
<tr><td>3</td><td>9</td><td>12</td><td>15</td><td>18</td></tr>
<tr><td>4</td><td>12</td><td>16</td><td>20</td><td>24</td></tr>
<tr><td>5</td><td>15</td><td>20</td><td>25</td><td>30</td></tr>
<tr><td>6</td><td>18</td><td>24</td><td>30</td><td>36</td></tr>
</table>
</td><td>1</td><td></td><td></td></tr>
<tr><td></td><td>(b)</td><td></td><td>$\frac{3}{16}$ oe</td><td>2FT</td><td>Strict FT their table for multiples of 8

M1 for 16 and both 24s and any FT multiples of 8 identified with no extras or omissions
or for $\frac{\textit{their}\ 3}{n}$ where $n \geq 13$</td><td>Do not accept ratio or words
Accept 0.187[5], 0.188, 18.7[5]% or 18.8%
If scoring fraction seen in body isw attempt to change form or cancel to final answer

Note: If (a) is NR
(b) $\frac{3}{16}$ scores 2 marks
and $\frac{3}{n}$ where $n \geq 13$ scores 1 mark</td></tr>
</table>

Question			Answer	Marks	Part Marks and Guidance	
17			Correct translation 	2	**B1** for a translation $\begin{pmatrix}3\\k\end{pmatrix}$ or $\begin{pmatrix}k\\-2\end{pmatrix}$ or three correct points not joined or three joined points and one just out of tolerance	*k* can be 0 mark intent (vertices within ±2 mm of correct position by eye) Ignore “counting” dots, intermediate position dots and dots on perimeter To be considered for the mark **one** point would need to be less than half way to the next gridline and the others in tolerance

Question			Answer	Marks	Part Marks and Guidance	
18	(a)		15	3	**M2** for $\left(1-\frac{382.5[0]}{450}\right)$ [× 100] oe or $\left(\frac{450-382.5[0]}{450}\right)$ [× 100] oe or $\left(\frac{382.5[0]-450}{450}\right)$ [× 100] oe or **M1** for $\frac{382.5[0]}{450}$ [× 100] oe	Condone −15 for 3 marks M2 may be implied by ±0.15 or $\pm\left(\frac{67.5}{450}\right)$ or $\pm\frac{3}{20}$ M1 may be implied by 0.85 or 85 or $\frac{17}{20}$ Non-calculator methods score 3 marks for correct answer or M2 when equivalent to main scheme e.g. (second M2 method) 100(%) = 450 10(%) = 45 1(%) = 4.5 M2 (450 – 382.5[0]) ÷ 4.5
	(b)		Vertical axis doesn't start from 0 oe or Jan price looks [less than] half Dec price oe or the difference between 382[.50] and 450 looks much bigger than it really is oe	1		Ignore • any reference to the horizontal axis • any insufficient reason that does not contradict the correct reason (if two reasons given) BUT, if two reasons offered and one reason clearly incorrect, mark the worst See Appendix

Question			Answer	Marks	Part Marks and Guidance	
19			7.5 with correct working	4	**M3** for $5 \times \frac{6}{4}$ oe or $5 \div \frac{4}{6}$ oe OR **B2** for [base lengths] 4 and 6 or **B1** for [base lengths] 4 or 6 and **M1** for $5 \times \frac{their\ 6}{their\ 4}$ oe or $5 \div \frac{their\ 4}{their\ 6}$ oe If **0** scored, **SC1** for answer 7.5 with no or insufficient working	Correct working requires M3 or B2M1 If working in rounded decimals with 2 dp seen allow M marks but A0 if 7.5 rounded from inexact value May be implied by [5] × 1.5 or e.g. as arrow from X to Y with "× 1.5" on it or, in parts e.g. 5 × 6 = *k* then *k* ÷ 4 May be on diagram 4 and 6 **not** number of edges so 16 ÷ 4 and 36 ÷ 4 score B0 or base edges 4 **and** 9 score B0 *Their* 4 and *their* 6 are their chosen base lengths and not 16 and 36 **Alternative** **M2** for [length factor] $\sqrt{\frac{36}{16}}$ or $\frac{6}{4}$ oe or $\sqrt{\frac{16}{36}}$ or $\frac{4}{6}$ oe or **M1** for area factor oe = $\frac{36}{16}$ oe or $\frac{16}{36}$ oe **M1** for $5 \times \frac{their\ 6}{their\ 4}$ oe or $5 \div \frac{their\ 4}{their\ 6}$ oe

Question			Answer	Marks	Part Marks and Guidance	
20	(a)		$\frac{5}{12}$ or equivalent fraction	2	**M1** for [1–] $\frac{1}{3}+\frac{1}{4}$ oe isw	M1 May be implied by $\frac{7}{12}$ or 0.58[3…] M1 may be seen as decimals or percentages allowing incorrect/inexact conversions if clearly from $\frac{1}{3}$ and/or $\frac{1}{4}$ e.g. $\frac{1}{3}$ = 1.3 and $\frac{1}{4}$ = 1.4 **and** 1.3 + 1.4
20	(b)		84 with correct working	5	**B3** for 35 [yellow cupcakes] or 5040 [g icing] OR **M2** for (700 + 1400) ÷ 60 or 700 ÷ 20 or [yellow cupcakes =] figs 35 or (700 + 1400) × *their* $\frac{12}{5}$ FT (a) or **B1** for figs 14 or 20 [g of butter per cake] or 0.02 [kg of butter per cake] AND **M1** for *their* 35 × *their* $\frac{12}{5}$ FT (a) or *their* 5040 ÷ 60 If **0** or **1** scored, instead award **SC2** for answer 84 with no or insufficient working	Correct working requires evidence of at least M2 or B3 Allow in kg or (0.7 + 1.4) ÷ 0.06 or 0.7 ÷ 0.02 May be ratio in which butter is 20 e.g. [butter : sugar] 20 : 40 *Their* 35 any integer understood to be the number of yellow cupcakes

Question			Answer	Marks	Part Marks and Guidance	
21			796 or 795.67 to 796.4	4	**M2** for [r =] $\frac{50}{2\pi}$ oe or **B2** for 7.96 or 7.956 to 7.958 or **M1** for $2\pi r = 50$ oe and **M1** for $4 \times \pi \times (\textit{their } r)^2$ oe or $4 \times \pi \times \left(\frac{50}{2\pi}\right)^2$ oe	Accept $\frac{2500}{\pi}$ or 253.3[...]π for 4 marks May be $50 \div \pi \div 2$ or $25 \div \pi$ Note $\frac{50}{2\pi} = 7.956 \approx 8$ then $4 \times \pi \times 8^2$ scores M2 M1 A0 For M1 substitution of *their r* must be explicit *Their r* may be any value from 3 to 10 understood to be *their* radius π may be substituted with 3.142 or calculator value, allowing 3.14 and $\frac{22}{7}$

<table>
<tr><th colspan="3">Question</th><th>Answer</th><th>Marks</th><th colspan="2">Part Marks and Guidance</th></tr>
<tr><td>22</td><td></td><td></td><td>[diamond =] 8
[ruby =] 5
with correct working</td><td>5</td><td>B4 for one correct answer with correct working

OR

M1 for 4d + 3r = 47 oe
M1 for 3d + 5r = 49 oe

M1 for correct method to equate coefficients of one variable allowing one arithmetic error

M1 for correct method to eliminate one variable allowing one arithmetic error

If 0 or 1 scored, instead award
SC2 for [diamond =] 8 and [ruby =] 5 with no or insufficient working

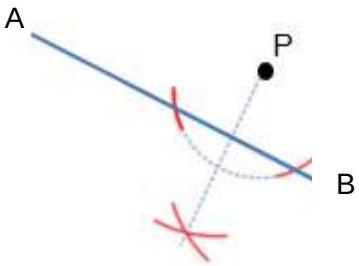
If 0 scored, instead award
SC1 for two integer answers which satisfy one of the original conditions</td><td>Correct working requires evidence of at least M1 M1 M1
Mark the method leading to answer. If no answer, treat different methods as choice and mark the worst
Accept other letters and “diamonds/rubies” seen in equations
The last two M marks are dependent on first M1M1 (two correct equations)
e.g.12d + 9r = 141 and 12d + 20r = 196 or 20d + 15r = 235 and 9d + 15r = 147

e.g. 11r = 55 or 11d = 88
Note: A sign error is not an arithmetic error

If substitution method used apply first two M1s then, if M1M1 awarded,
M1 for correctly rearranging an equation
M1 for correct substitution into other equation</td></tr>
<tr><td colspan="5"><u>Alternative method of Trials</u>
4×8 + 3×5 = 47 and 3×8 + 5×5 = 49 and correct answer scores 5
or
4×8 = 32 then (47 – 32) ÷ 3 = 5 and 3×8 = 24 then (49 – 24) ÷ 5 = 5 (or 3×8 + 5×5 = 49)
(5 may be substituted and used to find 8)
or
M1 for one correct trial of integer values for d and r in one case
e.g. 4×6 + 3×5 = 39 oe or 3×6 + 5×5 = 43 oe
oe may be substitution of an integer value into one relationship and “solving” to find the second value, which may be non-integer e.g 4×6 = 24 then (47 – 24) ÷ 3 = 7.6...

SC still available if Trials used</td></tr>
</table>

Question			Answer	Marks	Part Marks and Guidance	
23			One rectangle 8 cm by 4 cm	2	**B1** for one rectangle 8 by *n* or *m* by 4	Accept in any orientation, good freehand, tolerance for length ± 2 mm by eye Additional shapes/lines or a net score 0 Other shapes/lines must be clearly deleted to allow 1 or 2 marks
24	**(a)**		69.5 [≤ *w* <] 70.5	2	**B1** for each If **0** scored **SC1** for • correct but reversed or • 69.50 [≤ *w* <] 70.50	
	(b)		Accept any correctly matched pair of values in which space < fridge from these ranges 69.5 ≤ space < 69.55 and 69.5 < fridge < 69.55 e.g. s = 69.5 and f = 69.54	2	**B1** for one value for space or fridge where 69.5 ≤ space < 69.55 e.g s = 69.5 or 69.5 < fridge < 69.55 e.g. f = 69.51	Error interval (e.g. ...≤ space < ...) alone scores 0 Only mark candidate's chosen value(s) Measurements used must be clearly associated with space and/or fridge Space < fridge does not need to be stated For B1 if one or multiple values for fridge/space seen and no clear choice all must be in correct ranges

Question			Answer	Marks	Part Marks and Guidance	
25			Ruled line through P and perpendicular to AB constructed with correct arcs (one pair intersecting AB)	2	**B1** for correct arcs (one pair intersecting AB) only but no line or for correct ruled line but no, or incomplete, construction arcs  	Condone dotted lines Set protractor to 90° and check 88° to 92° at AB Correct construction arcs as shown (may be two pairs of arcs used to draw line through P) Ignore other arcs if correct arcs clearly used to construct line Condone perpendicular extending beyond AB but must pass through P and reach AB (no daylight) **Alternative (eg constructing a kite)** Arc centred on A length AP and arc centred on B length BP meeting below AB (may also pass through P). Candidates may use points on AB other than A and B for this construction. In such cases check radii of arcs using on-line ruler to judge See appendix for exemplars
26	(a)		7	3	**M2** for $8x - 6x = 3 + 11$ oe OR **M1** for $2x - 11 = 3$ or for $2x = k$ or for $8x = 14 + 6x$ or for $kx = 14$ **M1** for $x = \frac{b}{a}$ FT *their* $ax = b$ seen	Embedded 7 scores M2 e.g. $8 \times 7 - 11 = 6 \times 7 + 3$ [= 45] identified as final working or written on answer line e.g. 2x = -8 and answer line –4 with no other working scores M1 and M1FT

Question			Answer	Marks	Part Marks and Guidance	
	(b)		$(x + 16)(x – 1)$	**M2**		Condone final bracket missing Accept $x + 16 = 0$ and $x – 1 = 0$ for M2
					M1 for $(x + a)(x + b)$ where $ab = ^-16$ or $a + b = 15$ or $x(x + 16) – [1](x + 16)$ or $x(x – 1) +16(x – 1)$	Allow correctly completed grid for M1
			–16 and 1	**B1FT**	For correct solutions from *their* quadratic factors (strict FT) If **0** scored, instead award **SC1** for answers ±16 and ±1	$(x – 16)(x + 1)$ with answers –16 and 1 scores M1B0