Q	Answer	Mark	Comments
1(a)	16	B1	
	Additional Guidance		
	Ignore further terms		

Q	Answer	Mark	Comments
1(b)	–1	B1	
	Additional Guidance		
	Ignore further terms		

Q	Answer	Mark	Comments
1(c)	× 2	B1	oe eg double, multiply by 2, add to itself
	Additional Guidance		
	Times 2	B1	
	2n	B0	
	Ignore any attempt to continue the sequence		

Q	Answer	Mark	Comments
2(a)	13.65	B1	
	Additional Guidance		
	13.65p	B1	

Q	Answer	Mark	Comments
2(b)	**Alternative method 1**		
	2 + 3.8(0) + 1.75 or 7.55	M1	oe
	7.55 and No	A1	
	Alternative method 2		
	7.5(0) – 2 – 3.8(0) or 1.7(0)	M1	oe
	1.7(0) and No	A1	
	Alternative method 3		
	7.5(0) – 2 – 3.8(0) – 1.75 or –0.05	M1	oe
	(–)0.05 and No	A1	
	Additional Guidance		
	No may be indicated by selecting the box or a statement in the working lines		
	May work in pence		
	In alts 1 and 2 ignore any attempt to evaluate differences once the correct value is seen Eg No ticked and 7.55 seen, followed by he is 0.5 short		M1A1

Q	Answer	Mark	Comments
3(a)	6	B1	
	Additional Guidance		
	Embedded answer without 6 being selected eg 5 × 6 = 30		B0

Q	Answer	Mark	Comments
3(b)	12	B1	
	Additional Guidance		
	Embedded answer without 12 being selected eg –2 + 12 = 10		B0

Q	Answer	Mark	Comments
3(c)	5	B2	B1 correct partial simplification eg $\frac{20}{4}$ or $\frac{5}{1}$ or $\frac{10w}{2w}$ or $\frac{5w}{w}$ SC1 $5w$
	Additional Guidance		
	Correct partial simplification followed by incorrect further work eg $\frac{10w}{2w}$, Answer $8w$		B1
	Correct answer followed by further work		B1

Q	Answer	Mark	Comments
4(a)	(2, –2)	B1	
	Additional Guidance		
	Condone x and y written above the coordinates		
	Do not condone ($2x$, $–2y$)		

Q	Answer	Mark	Comments
4(b)	(2, 1)	B1	
	Additional Guidance		
	Condone x and y written above the coordinates		
	Do not condone ($2x$, $1y$)		

Q	Answer	Mark	Comments
4(c)	Point plotted at (6, 1)	B1	allow missing label
	Additional Guidance		
	Ignore point marked or working for part (b)		
	Mark intention		
	The correctly drawn rhombus implies the point has been plotted correctly		

Q	Answer	Mark	Comments
5(a)	3.8	B1	

Q	Answer	Mark	Comments
5(b)	(14.2 + 15.1 + 16.5 + 16.7 + 18) ÷ 5 or 80.5 ÷ 5	M1	oe
	16.1	A1	SC1 66.1
	Additional Guidance		
	Condone missing brackets in working for M1		
	Condone 16 after 16.1 seen		

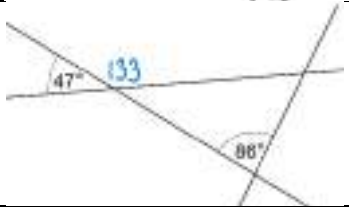
Q	Answer	Mark	Comments
6(a)	35	B1	

Q	Answer	Mark	Comments
6(b)	360 – (35 + 160)	M1	oe
	165	A1	

<table>
<tr><th>Q</th><th>Answer</th><th>Mark</th><th>Comments</th></tr>
<tr><td rowspan="15">6(c)</td><td>Opposite angle to 47 = 47
and
3rd angle = 47
and
isosceles</td><td>B3</td><td>B2
opposite angle to 47 = 47
and
3rd angle = 180 – 47 – 86 or 47
with type of triangle blank or incorrect

B1
opposite angle to 47 = 47</td></tr>
<tr><td colspan="3">Additional Guidance</td></tr>
<tr><td colspan="2">Angles may be seen in the correct places on the diagram for B3, B2 or B1</td><td></td></tr>
<tr><td colspan="2">Ignore incorrect spelling of isosceles so long as intention is clear</td><td></td></tr>
<tr><td colspan="2">Ignore any reasons stated</td><td></td></tr>
<tr><td colspan="2">180 – 47 – 86 does not need to be evaluated correctly for B2</td><td></td></tr>
<tr><td colspan="2">3rd angle = (180 – 86)/2 = 47 does not gain credit unless opposite angle = 47 is also seen</td><td></td></tr>
<tr><td colspan="2">Examples of responses:</td><td></td></tr>
<tr><td colspan="2"> 

Answer Isosceles</td><td>B3</td></tr>
<tr><td colspan="2">Angles in the triangle are both 47, answer isosceles</td><td>B3</td></tr>
<tr><td colspan="2">Opposite angles are 47, 47 + 47 + 86 = 180, isosceles</td><td>B3</td></tr>
<tr><td colspan="2"> 

and 180 – 47 – 86 = 47 (implies 3rd angle as 1st angle stated in diagram)
No triangle type stated</td><td>B2</td></tr>
<tr><td colspan="2"> 

and 180 – 47 – 86 = 47
No reference to any angles inside the triangle</td><td>B0</td></tr>
<tr><td colspan="2">47 + 86 = 133, 180 – 133 = 47, so isosceles triangle</td><td>B0</td></tr>
</table>

Q	Answer	Mark	Comments
7	**Alternative method 1**		
	8×5 or 40 or 3×16 or 48 or 88	M1	oe may be seen by the table
	$\frac{8 \times 5}{4}$ or 10 (days) or $\frac{3 \times 16}{4}$ or 12 (days) or $\frac{8 \times 5 + 3 \times 16}{4}$ or $\frac{88}{4}$	M1dep	oe eg $40 \div 4$ or $10 + 12$ may be embedded eg $\frac{40 + 48}{4}$
	22	A1	SC2 3 weeks and 1 day without 22 seen
	Alternative method 2		
	$8 \div 4$ or 2 or $3 \div 4$ or 0.75	M1	oe may be seen by the table
	$8 \div 4 \times 5$ or 10 (days) or $3 \div 4 \times 16$ or 12 (days)	M1dep	oe eg $10 + 12$
	22	A1	SC2 3 weeks and 1 day without 22 seen
	Additional Guidance		
	Up to M2 may be awarded for correct work with no answer or incorrect answer, even if this is seen amongst multiple attempts		
	Ignore conversion to weeks after 22 days seen		

Q	Answer	Mark	Comments
8	**Alternative method 1**		
	6 × 8 or 48 or 4.5 × 8 or 36 or 6 + 4.5 or 10.5	M1	oe may be seen on the pictogram implied by 84
	100 – (their 36 + their 48) or 100 – 84 or 100 – their 10.5 × 8 or 16	M1dep	oe one of their 36 and their 48 must be from a correct method may be seen on the pictogram
	2 circles drawn	A1	
	Alternative method 2		
	6 + 4.5 or 10.5	M1	may be seen on the pictogram
	100 ÷ 8 or 12.5	M1	
	2 circles drawn	A1	
	Additional Guidance		
	Circles do not need to be aligned		
	Mark intention for size and shape of symbols		
	Build up method may be seen eg 10 × 8 = 80 + 8 + 8 = 96 + 4 = 100		M2
	2 circles drawn with no working		M2A1

Q	Answer	Mark	Comments
9	HSO HSM HOM SOM	B2	with no errors may be given as words any order B1 for any one correct option stated
	Additional Guidance		
	Ignore repeated answers eg HSM and SHM		
	Repeated toppings is an error eg HHS		
	2 or 4 toppings is an error eg SM or HSOM		

Q	Answer	Mark	Comments
10(a)	37.5 or $37\frac{1}{2}$	B1	accept $\frac{75}{2}$
	Additional Guidance		
	37		B0
	37.5 followed by 37 or 38 on the answer line		B0
	38		B0
	37.50		B1

Q	Answer	Mark	Comments
10(b)	0.47	B2	B1 0.46 or 0.469 or 0.4688 or 0.46875 or 0.47 with one or more trailing 0s B1 their 3dp or more value correctly rounded to 2dp

Q	Answer	Mark	Comments
11	True May be true True	B3	B1 for each correct box
	Additional Guidance		
	More than one box ticked in a row is choice for that row		
	A tick and a cross (or two crosses) in a row, mark the tick		
	Any unambiguous indication eg Cross in all 3 correct boxes with all other boxes blank		B3

Q	Answer	Mark	Comments
12(a)	$(-4)^2 + 7 \times -4$ or $-4(-4 + 7)$ or 16 or -28	M1	oe eg $(-4)^2 + 7(-4)$
	-12	A1	SC1 -44
	Additional Guidance		
	SC is for $-4^2 + 7 \times -4 = -16 - 28 = -44$		
	Embedded 16 or -28 seen eg $16 + 7x$ without correct answer		M1A0
	Values may be implied eg1 $(-4)^2 + 7 \times 4 = 44$ 16 is implied eg2 only answer 44		M1A0 M0A0
	Further correct work eg $16 - 28 = -12$, Answer $3x$		M1A1
	Further incorrect work eg $16 - 28 = -12$, Answer $-12x$		M1A0
	$+ -28$ is the same as -28		M1
	Only $-4^2 + 7 \times -4$		M0A0
	$-4^2 + 7 \times -4 = -16 + 28 = 12$		M0A0
	$16x$ does not imply 16		M0A0

Q	Answer	Mark	Comments
12(b)	$y + 1$ or $1 + y$	B1	

Q	Answer	Mark	Comments
12(c)	$4a + 8$ or $8 + 4a$ or $5a$	M1	
	$5a + 8$ or $8 + 5a$	A1	
	Additional Guidance		
	Further incorrect work or simplification eg $5a + 8$, Answer $13a$		M1A0

Q	Answer	Mark	Comments
13	1 hour 58 minutes 32 seconds	B2	B1 2 of the 3 values correct or correct time not in the form requested
	Additional Guidance		
	1 hour 58 minutes 72 seconds		B1
	1 hour 59 minutes 32 seconds		B1
	(blank or 0) hour 118 minutes 32 seconds		B1
	(blank or 0) hour (blank or 0) minutes 7112 seconds		B1
	1 hour 118 minutes 7112 seconds		B0
	1 hour 98 minutes 72 seconds		B0

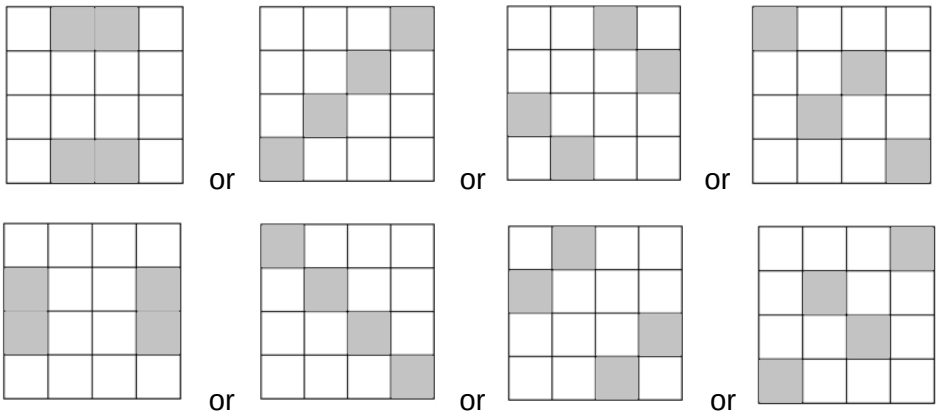
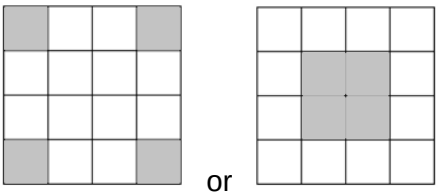
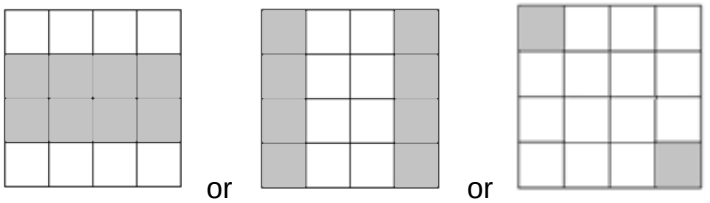
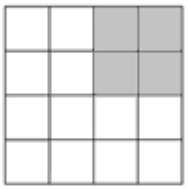
Q	Answer	Mark	Comments
14	**Alternative method 1**		
	360 – 90 – 78 – 48 or 144	M1	oe may be seen on the diagram
	120 × 360 ÷ 90 or 480	M1	oe eg 120 × 4
	$\frac{\text{their } 144}{360}$ × their 480	M1dep	oe dep on M2
	192	A1	
	Alternative method 2		
	360 – 90 – 78 – 48 or 144	M1	oe may be seen on the diagram
	120 ÷ 90 or $\frac{4}{3}$ or 90 ÷ 120 or $\frac{3}{4}$	M1	oe
	their 144 × $\frac{120}{90}$	M1dep	oe eg their 144 ÷ $\frac{90}{120}$ or 16 × 12 dep on M2
	192	A1	

Mark scheme and Additional Guidance continue on the next page

14 cont	**Alternative method 3**		
	360 – 90 – 78 – 48 or 144	M1	oe may be seen on the diagram
	their 144 ÷ 90 or $\frac{8}{5}$ or 90 ÷ their 144 or $\frac{5}{8}$	M1dep	oe
	$120 \times \frac{144}{90}$	M1dep	oe eg $120 \div \frac{90}{144}$
	192	A1	
	Additional Guidance		
	M1 may be awarded for correct work with no answer or incorrect answer, even if this is seen amongst multiple attempts		
	Allow × 1.3(3…) if seen for method for four thirds		

Q	Answer	Mark	Comments
15(a)	240 ÷ 10 or 120 ÷ 5 or 24 or 240 × 6 or 120 × 12 or 1440	M1	
	24 litres per minute or 1440 litres per hour	A1	oe eg 24 l/min or 0.4 litres per second
	Additional Guidance		
	M1 may be awarded for correct work with no answer or incorrect answer, even if this is seen amongst multiple attempts		
	Units may be abbreviated but must be the correct units for their correct rate eg allow 0.4 l/s or 0.4 lps for 0.4 litres per second		M1A1
	Do not ignore further incorrect attempts to change units eg 24 litres per minute and 0.4 litres/hour on the answer line		M1A0

Q	Answer	Mark	Comments
15(b)	Horizontal line from (10, 240) to (30, 240)	B1	$\pm\frac{1}{2}$ small square
	Straight line from their (30, 240) to (12 + their 30, 0)	B1ft	$\pm\frac{1}{2}$ small square for (12 + their 30, 0)
	Additional Guidance		
	Mark intention		
	No horizontal line and straight line from (10, 240) to (22, 0)		B0B1ft

Q	Answer	Mark	Comments
16	4 squares shaded so that the grid has exactly two lines of symmetry	B2	B1 4 squares shaded so that the grid has four lines of symmetry or even number of squares shaded so that the grid has exactly two lines of symmetry
	Additional Guidance		
	 or or or or or or or		B2
	 or		B1
	 or or		B1
			B0
	Mark intention		
	Part squares shaded		B0

Q	Answer	Mark	Comments
17	**Alternative method 1**		
	7 × 4000 ÷ 100 or 280	M2	oe M1 7 × 4000 or 28000 or 7 ÷ 100 or 0.07 or 4000 ÷ 100 or 40
	280 and No	A1	oe eg 20 less and No
	Alternative method 2		
	300 × 100 ÷ 4000 or 7.5	M2	oe M1 300 × 100 or 30000 or 300 ÷ 4000 or 0.075 or 100 ÷ 4000 or 0.025
	7.5 and No	A1	
	Alternative method 3		
	300 × 100 ÷ 7 or 4285(.7...) or 4286	M2	oe M1 300 × 100 or 30000 or 300 ÷ 7 or [42.8, 42.9] or 100 ÷ 7 or [14.2, 14.3]
	[4200, 4300] and No with M2 seen	A1	

Mark scheme and Additional Guidance continue on the next page

17 cont	**Alternative method 4**		
	7 × 4000 or 28000	M1	oe
	300 × 100 or 30000	M1	oe
	28000 and 30000 and No	A1	
	Alternative method 5		
	300 ÷ 4000 or 0.075	M1	oe
	7 ÷ 100 or 0.07	M1	oe
	0.075 and 0.07 and No	A1	
	Additional Guidance		
	M1 may be awarded for correct work with no answer or incorrect answer, even if this is seen amongst multiple attempts		
	No may be indicated by selecting the box or a statement in the working lines		
	No cannot be implied only by an inequality		
	A correct value is sufficient to show working eg 280 and No (except in alt 3)		M2A1
	20 less in alt 1 implies M2		

Q	Answer	Mark	Comments
18	X is directly proportional to $\frac{1}{Y}$	B1	

Q	Answer	Mark	Comments
19	**Alternative method 1**		
	$1.7^2 - 1.5^2 = 0.64$ and $\sqrt{0.64} = 0.8$ **or** $2.89 - 2.25 = 0.64$ and $\sqrt{0.64} = 0.8$	B2	accept $0.8^2 = 0.64$ for $\sqrt{0.64} = 0.8$ accept $\sqrt{1.7^2 - 1.5^2} = 0.8$ for B2 accept $1.7^2 - 1.5^2 = 0.8^2$ for B2 B1 1.7^2 and 1.5^2 oe
	Alternative method 2		
	$1.7^2 - 0.8^2 = 2.25$ and $\sqrt{2.25} = 1.5$ **or** $2.89 - 0.64 = 2.25$ and $\sqrt{2.25} = 1.5$	B2	accept $1.5^2 = 2.25$ for $\sqrt{2.25} = 1.5$ accept $\sqrt{1.7^2 - 0.8^2} = 1.5$ for B2 accept $1.7^2 - 0.8^2 = 1.5^2$ for B2 B1 1.7^2 and 0.8^2 oe
	Alternative method 3		
	$0.8^2 + 1.5^2 = 2.89$ and $\sqrt{2.89} = 1.7$ **or** $0.64 + 2.25 = 2.89$ and $\sqrt{2.89} = 1.7$	B2	accept $1.7^2 = 2.89$ for $\sqrt{2.89} = 1.7$ accept $\sqrt{0.8^2 + 1.5^2} = 1.7$ for B2 accept $0.8^2 + 1.5^2 = 1.7^2$ for B2 B1 0.8^2 and 1.5^2 oe
	Additional Guidance		
	B1 may be awarded for correct work with no answer or incorrect answer, even if this is seen amongst multiple attempts		
	$1.7^2 - 1.5^2 = 0.64$ $x^2 = 0.64$ $x = 0.8$		B2
	Max B1 if any incorrect statement seen eg $1.7^2 - 1.5^2 = \sqrt{0.64} = 0.8$		B1
	Accept 1.7×1.7 for 1.7^2 etc		
	Condone eg $1.5\,\text{cm}^2$ and $1.7\,\text{cm}^2$ for 1.5^2 and 1.7^2 for B1 but must be recovered for B2		
	$0.64 \div 0.8 = 0.8$ is equivalent to $\sqrt{0.64} = 0.8$		

Q	Answer	Mark	Comments
20(a)	125 × 0.32 or 40 or 80 × 0.35 or 28	M1	oe
	12	A1	
	Additional Guidance		
	M1 may be awarded for correct work with no answer or incorrect answer, even if this is seen amongst multiple attempts		
	80 × 0.5 = 40		M0

Q	Answer	Mark	Comments
20(b)	No and valid reason involving the number of trials	B1	eg reasons she didn't do the most she did fewer spins Beth did more they should use all 205 spins
	Additional Guidance		
	Ignore irrelevant or incorrect statements alongside a correct statement as long as not contradictory		
	eg1 No and Beth did most but she could have done more		B1
	eg2 No and Beth has more number of spins so there is a higher probability of landing on heads		B1
	eg3 No and Beth did most spins but Lynn did more		B0
	Allow 'she' to refer to Lynn unless clearly referring to Beth eg No and Because she tried 125 times however Lynn tried only 80 times		B1
	No and She did not do as many spins so her answer is less accurate than Beth's		B1
	No and Beth spun the wheel more times. Therefore her probability would be lower		B1
	No and Beth spun more times so her final outcome will be higher		B1
	No and Beth did 125 spins and Lynn did 80 spins		B0
	No and Beth did 125 spins so she has more chance of being accurate		B0

Q	Answer	Mark	Comments
21	digits 537 ÷ digits 895 or answer with only digit 6	M1	eg 537 ÷ 895 or 537 ÷ 895 000 or 537 ÷ 0.895 or 0.006 or 6000
	0.6 or $\frac{3}{5}$	A1	oe value eg $\frac{537}{895}$
	Additional Guidance		
	Ignore simplification or conversion attempt after correct answer seen		
	Condone eg 537 ÷ $895\,000^3$ for M1 but must be recovered for A1		

Q	Answer	Mark	Comments
22	**Alternative method 1 – using sin 40**		
	sin chosen or used	M1	
	21 × sin 40	M1dep	accept 21 × [0.64, 0.643]
	[13.49, 13.5]	A1	
	Alternative method 2 – using cos 50		
	cos (90 – 40)	M1	
	21 × cos (90 – 40)	M1dep	oe accept 21 × [0.64, 0.643]
	[13.49, 13.5]	A1	
	Alternative method 3 – finds base then uses Pythagoras		
	$21^2 – (21 \sin (90 – 40))^2$	M1	oe complete method except square root
	$\sqrt{21^2 – (21 \sin(90 – 40))^2}$ or $\sqrt{[182.2, 182.22]}$	M1dep	oe
	[13.49, 13.5]	A1	
	Additional Guidance		
	Check diagram for working		
	Allow correct use of sine rule to indicate sin		
	Ignore rounding or truncating after the correct answer is seen eg answer 14 after 13.5 seen		M1M1A1
	sin 40 × 21		M2
	sin may be indicated by eg circling S in SOH CAH TOA		
	Do not accept answers from full sized or scale drawing		
	sin 50 used (unless using Alt 3)		M0

Q	Answer	Mark	Comments
23	8.5 m $\leqslant$ length $<$ 9.5 m	B2	oe B1 8.5 or 9.5 in correct position SC1 9.5 m $\leqslant$ length $<$ 8.5 m
	Additional Guidance		
	Accept 9.4$\dot{9}$ for 9.5		
	Accept eg 8.50 for 8.5		

Q	Answer	Mark	Comments
24	1 + 0.2 or 1.2 or 100(%) + 20(%) or 120(%)	M1	oe eg $x + 0.2x$ implied by eg 20% = 64 000 or 10% = 32 000
	384 000 ÷ 1.2 or 384 000 ÷ 120 (× 100) or 3200 (× 100)	M1dep	oe eg 64 000 × 5 or 32 000 × 10
	320 000	A1	
	Additional Guidance		
	M1 may be awarded for correct work with no answer or incorrect answer, even if this is seen amongst multiple attempts		
	460 800 is M0 unless 1.2 oe seen		
	Correct answer followed by further work		M2A0

Q	Answer	Mark	Comments
25	x^3y or yx^3	B1	
	$5xy^3$ or $5y^3x$	B1	
	$5x^2y^2$ or $5y^2x^2$	B1	
	Additional Guidance		
	Mark the answer lines unless blank		
	Do not allow transcription errors		

Q	Answer	Mark	Comments
26	$4x + 1 = 2x + 17$	M1	oe equation in terms of x any letter
	$4x - 2x = 17 - 1$ or $1 - 17 = 2x - 4x$ or $(x =)\ 8$	M1dep	oe collection of terms
	Correctly substitutes their 8 into a correct expression for the length or width of the rectangle	M1	their $8 > 0$ and their $8 \neq 1$
	Correct method for both the length and the width of the rectangle using their 8	M1dep	their $8 > 0$ and their $8 \neq 1$ dep on 3rd M
	3267	A1	SC1 $12x + 3$ or $6x + 51$
	Additional Guidance		
	The first M1 or SC1 may be awarded for correct work with no answer or incorrect answer, even if this is seen amongst multiple attempts		
	Trial and improvement to find $(x =)\ 8$ is M2		
	Using an incorrect value of x for 3rd and 4th marks eg when $x = 10$ $4 \times 10 + 1 = 41$ and $41 \times 3 = 123$ or $12 \times 10 + 3 = 123$ and $123 \div 3 = 41$ or $2 \times 10 + 17 = 37$ and $6 \times 10 + 51 = 111$		M0M0M1M1dep M0M0M1M1dep M0M0M1M1dep