Question			Answer	Marks	Part marks and guidance	
1			16.8[0]	3	**M2** for 14 × $\left(1+\frac{20}{100}\right)$ oe or **M1** for 14 × $\frac{20}{100}$ oe soi	M0 for 14 × (1 + 20%) without further working M1 implied by 2.8[0] or answer 11.2[0] M0 for 14 × 20% without further working
2			-1, 0, 1, 2, 3	3	**B2** for 5 correct values with one extra or for 4 correct with no extras or for $-1 \leq x < 4$ or **M1** for $^-4 + 3 \leq x$ or $x < 1 + 3$ oe	For M1, condone incorrect inequality sign or equals
3	(a)		<table><tr><td></td><td>2</td><td>5</td><td>8</td></tr><tr><td>2</td><td>4</td><td>7</td><td>10</td></tr><tr><td>5</td><td>7</td><td>10</td><td>13</td></tr><tr><td>8</td><td>10</td><td>13</td><td>16</td></tr></table>	1		
3	(b)		$\frac{2}{9}$ oe	2	FT *their* completed table **M1** for 4 and 16 identified FT *their* table and no others	Do not accept ratio or words isw conversion/cancelling M1 implied by $\frac{2}{15}$
4	(a)		$\frac{2}{5}$	1	Accept any equivalent fraction	isw attempts to simplify to a fraction

Question			Answer	Marks	Part marks and guidance	
4	(b)		55[%]	4	**M3** for $1 - \left(\frac{18}{100} \div \textit{their}\,\frac{2}{5}\right)$ oe or for $\frac{\textit{their}40-18}{\textit{their}\ 40}$ oe or **M2** for $\frac{18}{100} \div \textit{their}\ \frac{2}{5}$ oe or for *their* 40 – 18 oe or **M1** conversion of values to a common form e.g *their* 40% or $\frac{18}{100}$ or $\frac{82}{100}$ seen or *their* 0.4 **and** 0.18 or *their* 0.4 **and** 0.82 seen OR Alternative method using a value for the number of sweets eg if using 50 sweets … **M3** for fraction of Layla's share $\frac{20-9}{20}$ or **M2** for Layla eats 20 – 9 or **M1** for Layla receives 20 or is left with 9	M3 implied by 0.55 oe *their* 40 is *their* (a) converted to %, accept both 40 and 18 as decimals for M3 or M2 Accept FT conversion to 2 figs rot M2 implied by 0.45 oe, 45[%] or 22[%] M3 for any fraction leading to 0.55 M2 for 40%FT for *their* (a) of *their* sweets – 18% of *their* sweets M1 for 40%FT for *their* (a) of *their* sweets or 18% of *their* sweets

Question			Answer	Marks	Part marks and guidance	
5			12 with correct working	6	**B2** for $\frac{37}{40}$ oe or $\frac{3}{40}$ oe or **M1** for $\frac{1}{8}+\frac{4}{5}$ oe soi **M2**dep on M1 for [distance in m =] 900 ÷ $\left(1-their\ \frac{37}{40}\right)$ oe or **M1**dep on M1 for 900 = 1 – *their* $\frac{37}{40}$ **M1** for *their* distance ÷ 1000 soi with no further incorrect conversion If 0, 1 or 2 scored then instead award **SC3** for answer 12 If 0 or 1 scored then instead award **SC2** for answer 12000	''Correct working" requires evidence of at least M1M2 or convincing pictorial/alternate convincing approach 0.925 or 92.5% or 0.075 or 7.5% 0.125 + 0.8 or 12.5% + 80% eg 900 ÷ 3 = 300 and 300 × 40 = 12000 allow M1 for 900 ÷ 1000 with no further incorrect conversion seen Must see written distance to convert
6	(a)		Point correctly plotted	1		Accuracy ± ½ small square radially, use overlay as a guide
6	(b)		320	2	**B1** for answer **figs** 32 or for 4160 or 4480	Don't accept percentages

Question			Answer	Marks	Part marks and guidance	
6	(c)		Only part of vertical scale is shown oe	1		e.g. Because the population axis starts at 4000, 4.0 [thousand] Vertical axis does not start at 0 She may have just looked at the steepness of the graph **and** not the scale of the graph/numbers Accept it only goes up by 540 See AG Any incorrect statements/incorrect specific values scores zero
6	(d)		Increasing trend continues oe	1		e.g. The population growth will continue the same as in previous years People will not leave the village and the increase continues If a number is given with the increase then it should be at least 60 See AG Any incorrect specific values scores zero

Question			Answer	Marks	Part marks and guidance	
7			103 with correct working	5		"Correct working" requires evidence of at least M2 or M1M1
					B3 for $x = 42$ or **M2** for $4x = 180 - 35 + 23$ oe or $3x - 23 = 103$ or better	Accept equivalents for M2 e.g. $(180 - 35 + 23) \div 4$ if no algebra seen Accept e.g. $3x - 23$ and $x + 35 = 180$
					or **M1** for $3x - 23 + x + 35 = 180$ oe **A1** for $x = 42$	Using trial, allow correct substitution into $3x - 23 + x + 35$ to imply M1 if 180 also stated
					AND **M1** for $3 \times$ *their* $x - 23$ or *their* $x + 35$	
					If **0** or **1** scored, instead award **SC2** for answer 103 with no or insufficient working	SC marks may be seen on diagram
					If **0** scored, instead award **SC1** for [$x =$] 42	
8	**(a)**		Circle radius 3 cm	**2**		Allow freehand for 2 marks or for B1 if vertical and horizontal diameters are consistent
					B1 for circle any radius or for 3 indicated as the radius	6 indicated as diameter implies B1 B1 could be implied on a diagram
					or for correct circle with internal lines	but condone for 2 marks if correct circle and internal lines are diameter or radius

Question			Answer	Marks	Part marks and guidance	
8	(b)		Rectangle 6 cm (width) by 4 cm (height)	2	**B1** for any rectangle with no internal lines or for correct rectangle but good freehand	All lines must be ruled for 2 marks If <u>both</u> (a) and (b) are reversed but otherwise correct allow SC2 If one correct and reversal is clear allow SC1
9			$[\left(\frac{1}{10}\right)^2 =] \frac{1}{100}$ or 0.01 $[\sqrt{0.25} =]$ 0.5 or $\frac{1}{2}$ $[4^{-1}] = \frac{1}{4}$ or 0.25	M3	**M1** for each	For all method marks accept oe %'s If e.g. $[\left(\frac{1}{10}\right)^2 =] \frac{1}{100}$ = 0.1 then M0 Accept – 0.5 or ±0.5 oe for $\sqrt{0.25}$ or $\frac{5}{10}$
			No oe and $\left(\frac{1}{10}\right)^2$, 4^{-1}, $\sqrt{0.25}$ oe	A1		Accept equivalents Accept No oe and 4^{-1} and $\sqrt{0.25}$ need to swap places oe If – 0.5 oe for $\sqrt{0.25}$, then accept order is $\sqrt{0.25}$, $\left(\frac{1}{10}\right)^2$, 4^{-1} oe

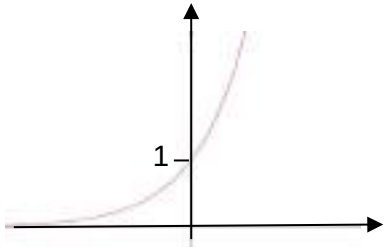
Question			Answer	Marks	Part marks and guidance	
10			[x =] 7.5 oe [y =] 12.5 oe with correct working	6	**M4** for 20 and $x + y$ or 20 and (3 + 5) oe or **M3** for 40 and 2($x + y$) or **M2** for 8 × 5 soi by 40 and $\frac{4}{2}(x+y)$ oe or **M1** for 8 × 5 soi by 40 or $\frac{4}{2}(x+y)$ oe AND **M1** for *their* 20 ÷ (3 + 5) <u>Alternative if trials used for the trapezium:</u> **M4** for [parallelogram =] 40 and $\frac{4}{2}(x+y)$ correctly evaluated with $x + y = 20$ or **M3** for 40 and $\frac{4}{2}(x+y)$ correctly evaluated with x : y in the ratio 3 : 5 but $x \neq 3$ $y \neq 5$ or **M2** for 8 × 5 soi by 40 and $\frac{4}{2}(x+y)$ correctly evaluated using any x and y or **M1** 8 × 5 soi by 40 or substitution into $\frac{4}{2}(x+y)$ with any x and y If **0**, **1** or **2** scored, instead award **SC3** for answer [x =] 7.5 and [y =] 12.5 with no or insufficient working If **0** or **1** scored, instead award **SC2** for answer [x =] 9 and [y =] 15	'Correct working' requires evidence of at least M3 For all method marks allow for $x + y$ e.g. $\frac{3}{5}y + y$, $a + b$ oe or other variables, Method may be seen in stages Implied by two answers in the ratio x : y = 3 : 5 e.g. 40 and $\frac{4}{2}(2+18) = 40$ e.g.40 and $\frac{4}{2}(6+10) = 32$ e.g. 8 × 5 and $\frac{4}{2}(3+5) = 16$ e.g. $\frac{4}{2}(4+5)$

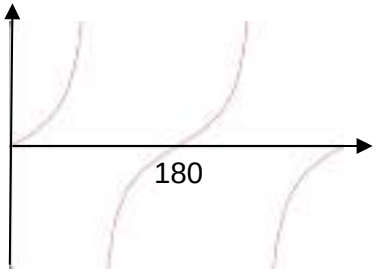
Question			Answer	Marks	Part marks and guidance	
11			$\frac{3}{11}$ cao	3	**B2** for $\frac{27}{99}$ oe fraction or **M1** for 27.27....	
12	(a)		The two events are dependent oe and $\frac{40}{60} \times \frac{39}{59}$ isw	2	**B1** for either	Accept e.g. The second probability is not $\frac{2}{3}$ oe The second probability is wrong oe The second probability is $\frac{39}{59}$ There is one less for the second pick oe It is out of 59 for the 2nd pick oe Any incorrect statement is B0

Question			Answer	Marks	Part marks and guidance	
12	(b)		$\frac{48}{95}$ oe with correct working	5		'Correct working' needs evidence of M2
					M4 for $2\left(\frac{8}{20}\times\frac{12}{19}\right)$ oe	
					or **M3** for $\frac{8}{20}\times\frac{12}{19}$ oe	
					or **M2** for $\frac{8}{20}$ and $\frac{12}{19}$ **or** $\frac{8}{19}$ and $\frac{12}{20}$ oe seen	
					or **M1** for $\frac{8}{20}$ or $\frac{12}{20}$ oe seen	
					If **0** or **M1** scored, instead award	
					SC2 for $\frac{8}{n}\times\frac{12}{n-1}$ oe or for $2\left(\frac{8}{20}\times\frac{12}{20}\right)$ oe	Must be proper fractions and $n \leq 60$
					or for answer $\frac{48}{95}$ oe with no or insufficient working	
					If **0** scored	
					SC1 for $\frac{8}{n}$ and $\frac{12}{n-1}$ or $\frac{8}{n-1}$ and $\frac{12}{n}$ seen	Must be proper fractions and $n \leq 60$
					or for answers $\frac{24}{95}$ oe or $\frac{12}{25}$ oe with no or insufficient working	

Question			Answer	Marks	Part marks and guidance	
13			Angle AED = angle BEC and [vertically] opposite Angle DAE = angle EBC and same segment Angle ADE = angle ECB and same segment	**M2**	For **M2** only two of the three statements and reasons are required **M1** for one pair of angles with a reason	Allow any unambiguous labelling for angles e.g. DAE or DAC or A, but not E For reason accept e.g. opp ∠'s For same segment, accept same arc but not same chord Accept 3rd angle in triangle oe for reason with final angle if other two given correctly with correct reasons
			[Triangle AED is similar to triangle BEC] [corresponding] angles are equal oe or AAA oe OR After two pairs of angles with reasons gives 3rd pair of equal angles with a reason	**A1**	With no errors or incorrect statements seen If 0 scored, **SC1** for at least two correct pairs of angles identified with no / incorrect reasons	Accept they have the 'same/equal angles' oe, AA **and** similar. Accept symbol ~ for similar Condone angles identified on diagram for **SC1**
14			[*a* =] 25 000 [*b* =] [0].94	**4**	**B1** for 25 000 AND **B3** for 0.94 oe or **B2** for $\frac{23500}{25000}$ or 94% oe or $\frac{25000-23500}{25000}$ or 0.06 oe or **M1** for 23500 = ab[1] or 23500 = 25000b[1]	

Question			Answer	Marks	Part marks and guidance	
15	(a)		$3\sqrt{5}$ final answer	2	**B1** for $\sqrt{45}$ or $\left[\sqrt{15}=\right]\sqrt{5}\sqrt{3}$	
15	(b)		$\frac{8\sqrt{15}}{3}$ or $\frac{8\sqrt{5}\sqrt{3}}{3}$ final answer	3	**B2** for $\frac{40\sqrt{15}}{15}$ or $\frac{40\sqrt{5}\sqrt{3}}{15}$ or **M1** for $\frac{40}{\sqrt{15}}\times\frac{\sqrt{15}}{\sqrt{15}}$ or better	
15	(c)		81	2	**M1** for $\sqrt[3]{27^4}$ soi or **B1** for $\sqrt[3]{27}$ = 3	
16	(a)		36 ÷ 20	1		Accept $\frac{36}{20}$
16	(b)		Tangent drawn to graph at t = 10 1[.0] to 1.5	B1 B2	 **Dep** on tangent or close attempt **M1dep** for rise/run with values substituted	Tangent - mark intention but no daylight
17			$14\sqrt{2}$ final answer	3	**M1** for ½ × 8 × 7 × sin 45 oe **B1** for sin 45 = $\frac{1}{\sqrt{2}}$ or better	
18	(a)		(x + 11)(x + 7) [= 0]	M2	**M1** for (x + a)(x + b) [= 0] where ab = 77 or a + b = 18 or for x(x + 11) + 7(x + 11) or x(x + 7) + 11(x + 7)	Condone omission of final bracket If partial factors and answers –11 and –7 award M2B1
			–11 and –7	B1	**FT** *their* factors if of the form (x + a)(x + b) with a, b integers	

Question			Answer	Marks	Part marks and guidance	
18	(b)	(i)	$(x + 9)^2 – 4$ final answer	3	**B1** for $(x + 9)^2$ **B2FT** for [+] 77 – (*their a*)^2 after $(x +$ *their a*$)^2$ correctly evaluated or **B1** for [+] 77 – (*their a*)^2 shown If 0 scored, **SC2** for final answer $(x + 9) – 4$	FT can be implied e.g. $(x + 10)^2 – 23$ gets B2FT
18	(b)	(ii)	(–9 , –4)	2	**FT** *their* 18(b)(i) if in form $(x + a)^2 + b$ **B1FT** for each value	
19	(a)		Correct sketch with *y* – intercept indicated at 1  	2	**B1** for correct increasing shape or any sketch with *y* – intercept at 1	For 2 marks, condone curve touching but not crossing *x*- axis

Question			Answer	Marks	Part marks and guidance	
19	(b)		Correct sketch through (0, 0), (180, 0) and (360, 0) indicated  	2	**B1** for three correct sections but joined and/or 180 not indicated	
20			$10^2 + 6^2 + 4^2$ oe or better 152 oe or better Does not fit and $13^2 = 169$ or $\sqrt{152}$ lies between 12 and 13 oe	**M2** **A1** **A1**	**M1** for $10^2 + 6^2$ or $6^2 + 4^2$ or $10^2 + 4^2$ all oe or better Dep on M2A1	M1 implied by 136, 52, or 116 eg $\sqrt{152}$ Accept No and $\sqrt{152}$ is less than 13 or No and $\sqrt{152}$ = 12. […]
21	(a)		[k =] 0	1		
21	(b)	(i)	$y = 3x - 1$ ruled 0.1 to 0.3 and 2.1 to 2.3	**M2** **A2**	**M1** for correct freehand or short line or for $y = 3x - k$ ruled or $y = ax - 1$ ruled but not $y = -1$ **A1** for each After **A0, SC1** for both values correct	For M2 must cross curve twice Accuracy ± 1mm at (0, -1) and (1, 2) Only award if M2 scored previously 0.15287… , 2.1804….

Question			Answer	Marks	Part marks and guidance	
	(b)	(ii)	$1 = (3x – 1)(x – 2)$	**M1**		Allow recovery from missing brackets for M1 or ‘ = 1’
			$3x^2 – x – 6x + 2$	**B2**	For correctly expansion of brackets B1 for 3 terms correct in expansion	For B2 accept $3x^2 – 7x + 2$ For B1 $–7x$ counts as two terms
			$3x^2 – 7x + 1 = 0$	**A1**	Dep on M1B2 with no errors or omissions	