Question			Answer	Marks	Part marks and guidance	
1	a		One from 1, 2, 4, 10 or 20	1		If more than one, all must be correct
	b		Any multiple of 20	1		If more than one, all must be correct Answer 5 × 4 = 20 scores 0
2	a		25	1		
	b	i	12	1		
		ii	8	1		
3			Incorrect oe and [2 – 3 × 2 =] ⁻4 and [3 – 5 =] ⁻2	2	**B1** for [2 – 3 × 2 =] ⁻4 or 3 – 5 = ⁻2 or -2 associated with 3 – 5	Both answers are -2 scores B1 Incorrect because the answers are different scores 0
4	a		110	1		
	b	i	1	1		
	b	ii	Median [because] All but one score is close to 3 oe	1		Allow, it is not distorted by (the high value or 111) oe Accept 3 for Median Must mention or imply clustering or distortion See Appendix
5	a		Cylinder	1		Condone poor spelling
	b		[square-based] pyramid or octahedron	1		Condone poor spelling

Question			Answer	Marks	Part marks and guidance	
6	a		35	2	**M1** for 50 × 0.7 oe	Answer 35% implies **M1** For **M1** accept correct non-calculator methods that show operations See Appendix
	b		$\frac{7}{10}$ or equivalent fraction	2	**B1** for $\frac{3}{10}$ oe or answer 0.7 or 70%	**B1** may be implied by e.g.0.3 or $\frac{21}{70}$ etc but not × 3 ÷ 10
	c		Correct fraction	2	**M1** for common denominator of form 7*n* where *n* is integer > 1 or for 0.428[5...] and 0.571[4...] or 42.8[5...]% and 57.1[4...]% or $\left(\frac{3}{7}+\frac{4}{7}\right)\div 2$	For 2 marks, Ignore attempts to cancel once correct answer seen **but not** to change to decimal or percentage. May be 0.429 May be 42.9% Possible correct answers are $\frac{1}{2}$ or $\frac{7}{14}$ or $\frac{10}{21}$ or $\frac{11}{21}$ etc

Question			Answer	Marks	Part marks and guidance	
7			(-2, 4)	3	**B1** for [a length =] 6 soi **M1** for square or partial square anchored on (4, -2) and fitting entirely on the grid or two or three plots only that define a square anchored on (4, -2) or attempt $\begin{pmatrix} 4 \\ -2 \end{pmatrix} \pm \begin{pmatrix} 6 \\ 6 \end{pmatrix}$ If 0 scored, **SC1** for answer (-3, 5) or (-1, 3) or (0, 2) or (1, 1) or (2, 0) or (3, -1) or (5, -3)	e.g. line from A to (-2, -2) or (4, 4) At least two connected sides A suitable square side 6 anchored on (4, -2) scores **B1M1** Square need not be drawn some working to be seen for "attempt" e.g. 4 – 6 and −2 + 6

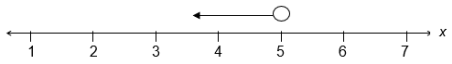
Question			Answer	Marks	Part marks and guidance	
8	a		18 515	4	**M3** for $7 \times 2300 \times 1.15$ oe or **M2** for 2300×1.15 oe soi 2645 or $7 \times 2300 \times 0.15$ soi 2415 or **M1** for 2300×0.15 oe soi 345 or 7×2300 soi 16 100	oe may be $\div 100$ and $\times 115$. If non calculator method then must see operations to award M unless implied by correct value. See Appendix
	b		7	3	**M2** for $63 \div 9$ OR **M1** $\frac{1}{10} : \frac{9}{10} = x : 63$ oe soi or **B1** for $\frac{9}{10}$ or 0.9 or 9 or 7 seen	Alternative: **M2** for $63 \div [0].9 - 63$ oe or **M1** for $63 \div [0].9$ oe For M1 Accept $1 : 9 = x : 10$
9			Incorrect oe supported by full correct evidence and $\frac{1}{3}$ or Incorrect oe supported by full correct evidence and $\frac{2}{3}$ not equal $\frac{2}{6}$ oe	3	**M2** for GB, GG, GR, RB, RG, RR oe only and $\frac{2}{6}$ or **M1** for 5 or 6 correct pairs shown [and one wrong or repeat] or [There are] six pairs [with] two matching [so P =] $\frac{1}{3}$" oe	oe correct, annotated tree diagram isw attempt to **cancel** once $\frac{2}{6}$ seen For **M1** ignore any fractions and mark only lists

Question			Answer	Marks	Part marks and guidance	
10			[Bank] A and 4 with correct working	5		Correct working requires at least M2
					M1 for 280 ÷ 250 soi 1.12 or 0.12	Accept 12% [of 250] seen.
					M1 for 400 × *their* 1.12 oe soi 448	oe 0.12 × 400 = 48, 400 + 48
					M1 for 452 – *their* 448	
					A1 dep for *their* A	**A1** for [Bank] A is dep **M3** *their* A is correct bank from identified 452 – *their* 448
					OR	ALTERNATIVE FORM OF METHOD
						Reduction to **common** amount ≠ 1 Marks only for e.g. 50 common
					M1 for 280 ÷ 250 soi 1.12	**M1** for 250 ÷ 5 and 280 ÷ 5 (**50**/56)
					M1 for 452 ÷ 400 soi 1.13	**M1** for 400 ÷ 8 and 452 ÷ 8 (**50**/56.5)
					M1 for (*their* 1.13 – *their* 1.12) × 400	**M1** for (*their* 56.5 – *their* 56) × 8
					A1dep for *their* A	**A1** for [Bank] A is dep **M3** *their* A is correct bank from identified (*their* 1.13 – *their* 1.12) × 400
					If 0 or **M1** scored, **SC2** for A and 4	
					or	
					If 0 scored, **SC1** for *their* A **and** wrong difference with subtraction seen	If there is evidence for **M1** only and **SC2** is available, award only **SC2**
						A value for A – a value for B seen or A value for B – a value for A seen

Question			Answer	Marks	Part marks and guidance	
11			$c = 2$ final answer $d = -3$ final answer	**5**	**B3** for $c = 2$ and **B2** for $d = -3$ OR **M4** for $5 + 2d = -1$ oe or **M3** for $10 + c = 12$ or $5 + cd = -1$ or $10x + cx = 12x$ or **M2** for $10x + 5 + cx + cd$ [$= 12x - 1$] oe or **M1** for $10x + 5$ or $cx + cd$	Must not come from wrong working Accept e.g. $d2$ or $2 \times d$ etc for $2d$ e.g. $10x + cx + cd = 12x - 6$
12	**a**	**i**	6	**1**		
		ii	-5	**1**		
	b		-1	**2**	**B1** for $1 = 2^0$ or **M1** for $2^y = \frac{1}{2}$ or $2^{1+y} = 2^0$ or $1 + y = 0$ or $2 \times 2^{-1} = 1$	**B1** Implied by $2 \times 2^y = 2^0$

Question			Answer	Marks	Part marks and guidance	
13	a		Straight line from (0, 0) with positive gradient	2	**B1** for straight line with positive gradient or a series of crosses in a straight line that would pass through (0, 0)	Intercept within 1 mm of (0, 0) ("centre of line" inside circle of overlay) For 1 or 2 marks, intended straight Ignore scale on axes At least three crosses
	b	i	36	3	**M2** for 432 ÷ 120 × 10 oe or **M1** for 432 ÷ 120 soi 3.6 or 120 ÷ 10 soi 12	e.g. 432 ÷ 12 120+120+120+60 = 420 oe
		ii	1640	3	**B1** for [2 kg =] 2000 seen **M1** for $100 \times \frac{their\ 36}{10}$ or 10 × *their* 36	**B1** may be awarded for the conversion even if not used in method May be 10 × *their* 36 correctly evaluated or 360 seen

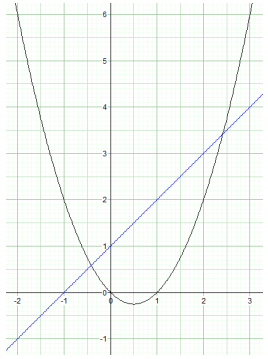
Question			Answer	Marks	Part marks and guidance	
14	a		Points plotted at (210, 130) and (100, 80)	2	**B1** for 100 soi or for one point plotted correctly	Half square tolerance May be implied by point plotted at duration 100
	b		Point at (220, 64) circled	1		
	c	i	Ruled line of best fit drawn	1		Use overlay anchored on top right point Line must reach to edges of overlay
	c	ii	*Their* line used to give duration for £90 ± 5 minutes	1 FT	Strict **FT** from their intended straight line of best fit	NB read (*n*, 90) not (90, *n*)
	d		[7 hours is] is beyond the given data oe	1		Accept eg the trend may not continue
15			16.5	4	**B3** for 5.5 [cm] nfww or **M2** for $3x + x + 3x + x = 44$ or better or $44 \div 8$ oe or **M1** for $3x$ [as length] and x [as width] or $4x$ [as length + width] or $8x$ [as perimeter] OR Using trial length and width with length = 3 × width **M1** for a perimeter found **M1** for a second perimeter closer to 44 If 0 scored **SC1** for answer 33	May be other letters or in words for 2 or 1 mark $3x$ and x may be on diagram

Question			Answer	Marks	Part marks and guidance	
16			$x < 5$ AND  	4	**B2** for $x < 5$ or **M1** for $3x < 19 - 4$ or better AND **B2FT** for $x < 5$, or *their* inequality, correctly shown or **B1** for $x < 5$, or *their* inequality, correctly shown with a hollow circle and wrong arrow **or** filled circle and correct arrow	Solution to inequality: Allow **M1** for this expression with other inequality symbols or equals sign or [x =] 5 as solution (can be implied by mark/circle on the diagram) or trials leading to selection of 5 or final correct trial using 5 Displaying the solution: Display must show an inequality that fits on the number line for FT Mark to candidate's advantage either $x < 5$ or *their* inequality Accept an arrow of any length or a line reaching 1 If no solution to inequality seen: Hollow circle at 5 arrow to left **M1B2** Filled circle at 5 arrow to left **M1B1** Hollow circle at 5 arrow to right **M1B1** Filled circle at 5 arrow to right **M1B0** Mark at 5 no line or arrow **M1B0** Circle and/or arrow at other than 5 **M0B0**

Question			Answer	Marks	Part marks and guidance	
17			2.25 nfww	**5**	**B2** for 36 or **M1** for $\frac{9\times 8}{2}$ AND **M2** for $\frac{1}{2}\times (12 + 20) \times h$ = *their* area of triangle oe or **M1** for $\frac{1}{2}\times (12 + 20) \times h$ oe	$8 \times 9 = 72$ then $72 \div (20 + 12) =$ 2.25 is wrong working May be in stages Allow (*their* area of triangle) ÷ 16 or better e.g. 36 ÷ 16 or72 ÷ 32 for **M2** **M**2 and **M1** may have area in stages e.g. $12h + \frac{8h}{2}$ (rectangle + one or two triangles) May be two trials approaching *their* area of triangle or one correct trial with 2.25 May be 16*h* or one trial with value for *h* substituted to attempt *their* area of triangle
18			5.39[6...] or 5.4[0]	**3**	**M2** for $8 \times \tan 34$ or any complete correct method or **M1** for $\tan 34 = \frac{x}{8}$	e.g. $\frac{8}{\tan(90-34)}$ e.g. $\tan(90-34) = \frac{8}{x}$ See appendix

Question			Answer	Marks	Part marks and guidance	
19	(a)		30 final answer	2	**B1** for 150 or 30 seen or **M1** for 360 ÷ 12 oe	e.g. $180 - \frac{180 \times 10}{12}$
	(b)		150 or **FT**(180 – **(a)**)	1		Only allow **FT** if 0 < *their* **(a)** < 180

Question			Answer	Marks	Part marks and guidance	
20			385 with correct working	**6**		"Correct working" requires evidence of at least M2 AND B1 i.e. correct and consistent units used
					M2 for [mass of one panel =] 2.4 × 1.2 × 0.018 × 750 or 240 × 120 × 1.8 × 0.750 or **M1** for figs 24 × figs 12 × figs 18 × figs 750 or 2.4 × 1.2 × 0.018 or 240 × 120 × 1.8 AND **B1** for 15 000 [kg] or 15 000 000 g seen or *their* mass correctly converted to tonnes **M1** for $\frac{figs\ 15}{their\ mass}$ **A1** for 385.[…] to 387 If 0 or B1 scored instead award **SC2** for answer 385 with no or insufficient working or **SC1** for answer 385.[…] to 387 with no working	soi by 38.8 to 38.9 [kg] soi by 38 800 to 38 900 [g] soi by 0.0518 to 0.0519 [m^3] soi by 51 800 to 51 900 [cm^3] Assume *their* mass unit from **M2**, but do not assume from **M1** only Accept any figure **but not** 2.4, 1.2, 1.8 and 750 for *their* mass For **M1** accept one or more trial(s) of *their* mass × an integer in attempt to = *their* figs 15

Question			Answer	Marks	Part marks and guidance	
21	(a)		$\begin{pmatrix} 4 \\ -2 \end{pmatrix}$	2	**B1** for 1 component correct If **0** scored, **SC1** for $\begin{pmatrix} -4 \\ 2 \end{pmatrix}$ or $\begin{pmatrix} 4 \\ -2 \end{pmatrix}$ or (4. –2)	Penalise first appearance of vinculum or poor form in vector but condone second use
	(b)		$\begin{pmatrix} 1 \\ \frac{9}{4} \end{pmatrix}$ oe	2	**B1** for 1 component correct or $\begin{pmatrix} 4 \\ 9 \end{pmatrix}$ seen	
22	a		2 0	2	**B1** for each	
	b		Correct curve 	3	**B2FT** for all points correctly plotted or **B1FT** for 4 or 5 points correctly plotted	FT their values from the table in (a) for points but accept only the correct curve. Accuracy ± half small square Correct curve must have at least one square of daylight below *x*-axis at minimum point and not intended straight
	c		-[0].4 and 2.4	2	Correct answer or **FT** *their* graph for both **B1** for each	-0.45 to -0.35 and 2.35 to 2.45 FT from *their* line with half square accuracy (may be straight)

Question			Answer	Marks	Part marks and guidance	
23	a		0.12 oe isw	2	**M1** for 0.6×0.2	Ignore attempts to change form once correct answer seen. Accept 12% or $\frac{12}{100}$ or equivalent fraction
	b		0.6 oe isw	3	**M2** for $0.4 \times 0.3 + 0.6 \times 0.8$ or **M1** for 0.4×0.3 or 0.6×0.8	Accept 60% or equivalent fraction Ignore attempts to change form once correct answer seen. 0.12 could come from (a) so calculation must be seen for **M2** May be implied by 0.48

APPENDIX

Exemplar responses for Q4b(ii)

Response		Mark
Mode. It is the most common number of pets	Defines mode	**0**
Median It's the middle number	Defines median	**0**
Mean It would include all the numbers	Doesn't recognise distortion	**0**
3 We don't include 111 in the calculation. It's an anomaly	Doesn't mention distortion	**0**
Median It is a realistic figure	Doesn't say why it is realistic	**0**
Median [It's the more realistic average as] most pupils are closest to 3 than the rest	Implies clustering	**1**
3 Most of the numbers are near this	Accept 3 for Median (and imply Mode from 1)	**1**