Question			Answer	Marks	Part marks and guidance	
1	(a)		8, 26 or 114	1		If more than one number all must be correct
	(b)		49	1		
	(c)		19	1		Do not accept 19 and 3
2			[5] 7 11 19	3	Conditions: (i) range of 14 (ii) median of 9 (iii) four different prime numbers ≥ 5 **B2** for numbers meeting two conditions or **B1** for numbers meeting one condition	Ignore the order of the numbers Examples:e.g. [5], 7, 11, 19 B3 (i), (ii), (iii) [5], 7, 13, 19 B2 (i), (iii) [5], 7, 11, 13 B2 (ii), (iii) [5], 5, 13, 19 B2 (i), (ii) [5], 9, 9, 19 B2 (i), (ii) [5], 9, 19 B2 (i), (ii) [5], 3, 13, 17 B2 (i), (ii) [5], 19 B1 (i) [5], 9, 9 B1 (ii) [5], 13 B1 (ii) [5], 7, 13, 17 B1 (iii) Accept negatives, decimals, fractions
3	(a)		33	1		Ignore extras 33, 40, 47 even if incorrect
	(b)		Add 7	1	May be seen on diagram with no contradiction on answer line	Needs quantity and direction See appendices

Question			Answer	Marks	Part marks and guidance	
4	(a)		B	1		Condone $\frac{1}{6}$
	(b)		A	1		Condone 0 or $\frac{0}{6}$
	(c)		E	1		Condone $\frac{4}{6}$ or $\frac{2}{3}$
5	(a)		$\frac{17}{100}$ oe must be a fraction	1		Must be an integer fraction
	(b)		4	1		
	(c)		[0].875	1		Allow rounded or truncated answer if 0.875 seen
6	(a)		20 final answer	2	**M1** for 87 – 7 implied by 80 or *their* (87 – 7) ÷ 4 or 20 x 4 = 80 + 7 = 87 oe	
	(b)		$y = 4x + 7$ final answer	2	**M1** for final answer $4x + 7$ or $y = 4x – 7$ or $y = kx + 7$ ($k \neq 0$) or $y = 4x + c$ where $c > 0$ final answer or $x = 4y + 7$ If **0** scored **SC1** for $x = \frac{y-7}{4}$ final answer	Accept throughout y on right e.g. $4x + 7 = y$ Accept throughout x x 4 or x 4 or x x k but not x^4 Accept $y = 4(x + c)$ where $c > 0$ $4x + 7y$ scores 0 $x = 4x + 7$ scores 0 Do not accept arrows e.g. 4 → xx → 7 → y

Question			Answer	Marks	Part marks and guidance	
7	(a)	(i)	243	1		
	(a)	(ii)	14	1		
	(b)		3 or $y = 3$ final answer	2	**M1** for 384 ÷ 6 may be implied by 64 or 4^3 or $384 = 6 \times 4^3$	
	(c)		$\frac{1}{3}$ oe fraction	1		
8			3.2[0]	2	**M1** for $\frac{1.44}{450} \times 1000$ oe	Breakdown/ build up methods must get to 1kg exactly
9			43 final answer	4	**B3** for 43.2 OR **M1** for 120 x 180 implied by 21600 **M1** for *their* 120 x 180 ÷ 10000 may be implied by 2.16 or 2 hectares and 1600 or 20 000 and 1600 **M1** for *their* 2.16 × 20 If **0** scored instead award **SC1** for answer 40	Allow alternate methods e.g. **M1** for 120 x 180 implied by 21600 **M1** $\frac{10000}{20}$ =500 **M1** for *their* $\frac{21600}{500}$ *Their* 2.16 must come from multiplication to find area

Question			Answer	Marks	Part marks and guidance	
10	(a)		He has added 4	1		Do not allow contradictions See appendices
	(b)		He has used 29 as the initial velocity	1	Accept *u* and *v* if clear *v* = 29 not *u* =29	See appendices
11	(a)		4	1		
	(b)		90	1		
	(c)		No, they need 566 to 567 [g] with correct working or No they need 46 to 47 [g] more with correct working OR No, they can only make 73[.4...] with correct working OR No, they need 7.08[3..] [g] but they only have 6.5 [g] oe with correct working	3	**M2** for *their* (80 ÷ 24) × 170 oe or **M1** for 80 ÷ 24 or 3.3… or implied by repeated addition reaching 72 or 170 ÷ 24 or 7.08[3..] or implied by repeated addition reaching 168 OR **M2** for *their* (520 ÷ 170) × 24 oe or **M1** for 520 ÷ 170 implied by repeated addition reaching 510 or repeated subtraction reaching 10 and 3 OR **M1** for 520 ÷ 80 or 6.5 **M1** for 170 ÷ 24 or 7.08[3..] or implied by repeated addition reaching 168	 Implied by 170 × 3 = 510 and 3 × 24 = 72 Implied by 170 × 3 = 510 Implied by repeated addition reaching 480 or repeated subtraction reaching 40 and 6

Question			Answer	Marks	Part marks and guidance	
	(d)		21.6[0]	**3**	**M2** for *their* (100 ÷ 6) × 1.35 or **M1** for 100 ÷ 6 may be implied by 16[.6…], 16.7, 17 or $16\frac{2}{3}$	Other answers without working score 0
12			148	**3**	**M2** for [2](4×5 + 4×6 + 5×6) or **M1** for (4×5) or (4×6) or (5×6) may be implied by 20, 24, 30	Implied by 74 Any attempt at volume scores 0
13	**(a)**		307.5	**2**	**M1** for 2460 ÷ 8	2460/480 must have × 60 to compare to original M1
	(b)		He can maintain the same average speed Same weather/track conditions No hills He doesn't get tired	**1**		See appendices
14			Open circle above –2 Arrow pointing right	**1** **1**		For 2 marks, arrow may be of any length but must start at –2, mark intent For the arrow accept a line starting at –2 and reaching 3

Question			Answer	Marks	Part marks and guidance	
15			0.25 × 72 oe may be implied by 18	1		Do not award 4 marks unless fully correct
			72 ÷ 6 oe may be implied by 12	1		Note $\frac{5}{12}$ with no working scores 0 as it may come from 1 – $\frac{7}{12}$
			72 – *their* (18 + 12) or 18 + 12 + 42 = 72	1		If start with $\frac{7}{12}$ = 42 must show 18 + 12 = 30
			$\frac{42}{72} = \frac{7}{12}$ or $\frac{7}{12} \times 72 = 42$ oe Accept 42 is $\frac{7}{12}$ of 72	1		Accept equivalent alternative methods e.g. 1 for $\frac{(18+12)}{72} = \frac{5}{12}$ and 1 for $1 - \frac{5}{12} = \frac{7}{12}$
			Alternative method		Alternative method	
			[25% =] $\frac{1}{4}$ oe	1	$\frac{1}{6}$ = 0.1666 to 0.167	Accept equivalent percentages to the same accuracy
			$\frac{1}{4} + \frac{1}{6}$	1	0.25 + 0.1666 to 0.167	
			1 – *their* $(\frac{1}{4} + \frac{1}{6})$ oe	1	1 – *their* (0.25 + 0.1666 to 0.17)	Penalise 0.17 on the second but not the third mark
			$\frac{7}{12}$ from use of common denominator	1	0.583[3] = $\frac{7}{12}$	

Question			Answer	Marks	Part marks and guidance	
16			$7x + 3$ final answer	**4**	**M2** for $21x + 9$ isw or **M1** for $5x + 4 + x + 2 + 9x - 5 + 6x + 8$ **M1** for *their* $(21x + 9) \div 3$	 Must be an algebraic expression in the form $ax + b$ $b \neq 0$
17			$3x^2 + 7xy + 2y^2$ final answer	**3**	**M2** for three correct terms from $3x^2 + 6xy + [1]xy + 2y^2$ or **M1** for two correct terms in the expansion above	More than 4 terms mark the worst 4 Accept values in a grid $7xy$ is 2 terms Do not accept for M2 or M1 $3x2y$, $3xx$, $2yy$, $1x1y$ unless processed further
18	**(a)**		Triangle **A** at (-5, 4) (-3, 4) (-4, 6)	**2**	**B1** for translation of $\begin{pmatrix} -6 \\ j \end{pmatrix}$ or $\begin{pmatrix} k \\ 3 \end{pmatrix}$ or for triangle at (7, -2) (9, -2) (8, 0)	See overlay. In all parts condone unlabelled if clear. Accept good freehand. Vertices within 2mm by eye Blue overlay 2 Red overlay B1 Vertical line shows where bottom left vertex should be for $\begin{pmatrix} -6 \\ j \end{pmatrix}$ Horizontal line shows where base line of triangle should be for $\begin{pmatrix} k \\ 3 \end{pmatrix}$
	(b)		Triangle **B** at (-3, 2) (-1,1) (-1, 3)	**2**	**B1** for 90° clockwise rotation or correct size and orientation incorrect position	Blue overlay 2 Red overlay shows B1 for clockwise rotation
	(c)		Triangle **C** at (1, -3) (3, -3) (2, -5)	**2**	**B1** for reflection in $x = -1$	Blue overlay 2 Red overlay B1

Question			Answer	Marks	Part marks and guidance	
19			7.57	2	**B1** for 7.56[8…] or $\frac{2\sqrt{358}}{5}$ or 7.570 If **0** scored **SC1** for *their* positive answer to more than 3 figures correctly rounded to 3 s.f.	Must see unrounded value
20			22.7[2…] or 22.73 or 23 or $\frac{250}{11}$	3	**M2** for $(1 - \frac{1.02}{1.32})$ [× 100] oe or $\frac{1.32-1.02}{1.32}$ [× 100] oe or $\frac{1.02-1.32}{1.32}$ [× 100] oe or **M1** for $\frac{1.02}{1.32}$ [× 100] oe e.g. $\frac{17}{22}$	condone −22.7[2…] or −22.73 or −23 for **3** marks **M2** implied by 0.227[2…] or 0.2273 or 0.23 or $\frac{5}{22}$ **M1** implied by 0.7727…, 0.77[3], 77.27, 77[.3] or 2270, 2272, 2273, 2300 Accept fully correct non-calculator methods

Question			Answer	Marks	Part marks and guidance	
21			1520 or 3 20 pm	**4**	**B3** for 3.20 or 1520 pm or **B2** for listing the next 3 correct times of both trams i.e. 10.20, 11.10, 12.[00] and 10.05, 10.40,11.15 or **B1** for listing the next 3 correct times of one tram i.e. 10.20, 11.10, 12.[00] or 10.05, 10.40,11.15 OR **B3** for 5 [h] 50 or **B2** for [LCM =] 350 or **B1** for listing the next 3 multiples of 50 or 35 i.e, 100, 150, 200 or 70, 105, 140 or 1[h] 40 2[h] 30 3[h]20 or 1[h]10 1[h]45 2[h]20 or **M1** for [50 =] 2 × 5 × 5 and [35 =] 5 × 7 allow in a factor tree or tables etc or [LCM =] 350*k* or 2 × 5× 5 × 7	Mark only 1 method Condone 0320, 3.20 am 1520am for 3 marks but do not accept 15 h 20 or 3 h 20 Condone 10.5 if followed by 1040 May be indicated by circling in a list must be identified Condone 1 in factor trees

Question			Answer	Marks	Part marks and guidance	
22	(a)		Straight line Passes through origin	1 1		See appendices
	(b)		Straight line intercepting positive *y*-axis Their line drawn parallel to given line	1 1		Gradient ≠ 0 Min length 4cm
23	(a)		960	2	**M1** for $\frac{720}{3}$ [× 4] may be implied by 240 nfww	
	(b)		16	3	accept any correct method **M2** for e.g. *their* (3 + 5) × 2 oe or $\frac{2}{3}${3 × (3 + 5)} oe or [*c*=] 3(3 + 5) – (3 + 5) or **M1** for e.g. $\frac{c}{3+5+c} = \frac{2}{3}$ oe or 3 × *c* = 2(3 + 5 + *c*) or $c = \frac{2}{3}(3 + 5 + c)$ oe or 3 + 5 = $\frac{1}{2}c$ or $\frac{1}{3}$ linked with 3 + 5	trials : **M1** for each correct trial to a max of **M2,** we need to see the value *c* tried and the appropriate fraction
24	(a)		0.6 oe 0.2, 0.8, 0.2, 0.8 oe	1 1		
	(b)		[0]. 32 oe	2	Correct or ft *their* 0.8 **M1** for 0.4 × *their* 0.8	*Their* 0.8 <1

Question			Answer	Marks	Part marks and guidance	
25			[*f* =] 7 [*n* =] 15	**4**	**B1** for [*f* =] 7 AND **B3** for [*n* =] 15 or **M2** for 50 × 5.5 – (1 × 12 + 3 × 2 + 5 × 9 + 6 × 16 + 8 × *their* 7) [÷ 4] or better or forming an equation and attempting to solve it correctly e.g. (1 x 12) + (3 x 2) + (5 x 9) + (6 x 16) + (8 x *their f*) +(*n* x 4) = 5.5 x 50 or better or **M1** for 50 × 5.5 or 275 or 1 × 12 + 3 × 2 + 5 × 9 + 6 × 16 + 8 × *their* 7 or 215	Note : if *f* is an error **FT** *their f* for the **M** marks **M2** implied by 60 or 275 – *their* 215 better = 12 + 6 + 45 + 96 + *their* 56 Common error is 1 + 3 + 5 + 6 + 8 = 23 5.5 × 6 = 33 and 33 – 23 =10 scores **M0**
26	**(a)**		Two accurate curves	**3**	**B2** for 7 or 8 points plotted accurately or **B1** for 5 or 6 points plotted accurately	Ignore the curve beyond points but the curve must not cross or touch the *y*-axis tolerance $\pm \frac{1}{2}$ small square from correct points radially no excessive feathering, no ruled lines, no excessive ‘tram lines’ overlay gives guidance only

Question			Answer	Marks	Part marks and guidance	
	(b)		A correct and accurate reading from *their* graph	**1FT DEP.**	**Dep.** on a graph in **(a)** with at least one positive solution and strict **FT** *their* curve.	If curve crosses *x*-axis between two grid lines accept either grid line value as correct answer If *their* curve has more than one positive solution accept any of *their* correct solutions Do not accept answers to more than 1d.p., $\sqrt{3}$ or answers clearly rounded from this. Condone whole numbers where appropriate e.g. 2 for 2.0 Do not accept 0 as positive.

27			5.36 to 5.4 and correct working	**6**	**B5** for the correct answer in the wrong format with correct working e.g. 0.0536 OR **M5** for $\frac{12^2-\pi\times6^2}{12^2\times4}$ [× 100] oe OR <u>Square</u> **M1** for 12^2 or 144 or 6^2 or 36 (must be consistent with $\frac{1}{4}\times\pi\times6^2$) and <u>Circle</u> **M2** for $\pi\times6^2$ or $\frac{1}{4}\times\pi\times6^2$ or **M1** for radius of 6 may be implied e.g. 2×π×6 (with π) and **M1** for (*their* 12^2 – *their* ($\pi\times6^2$)) [÷4] or *their* ($\pi\times6^2$) ÷ *their* 12^2 or *their* (6^2– *their* ($\frac{1}{4}\times\pi\times6^2$)) [÷*their* 12^2] or *their* ($\frac{1}{4}\times\pi\times6^2$) ÷ $\frac{their12^2}{4}$ If **0** or **M1** or **M2** scored, instead award **SC3** for answer 5.36 to 5.4 with no or insufficient working If **0** or **M1** scored, instead award **SC2** for 30.88 to 31 or 7.72 to 7.75 or 0.785 to 0.786 with no or insufficient working	"Correct working" requires evidence of at least **M1** AND **M2** AND **M1** . *their* 144 must come from attempt at area of a square **M2** implied by 113.04 to 113.12 or 28.26 to 28.28 6 [cm] could be on diagram **FT** *their* incorrect 6 identified as radius implied by 30.88 to 31 or 7.72 to 7.75 implied by 0.785 to 0.786 implied by 7.72 to 7.75 implied by 0.785 or 0.7852 to 0.7856 *their* area of the circle has to be an attempt at πr^2 not $2\pi r$ so that, if they do not, the most they can be awarded is **M1** for 144 and **M1** for radius = 6 cm