Question			Answer	Marks	Part marks and guidance	
1	(a)	(i)	44	1		±2°
		(ii)	Acute	1		Condone incorrect spelling
	(b)		Parallel	1		Condone incorrect spelling
2	(a)	(i)	>	1		
		(ii)	=	1		
	(b)		184 300	1		
	(c)		[0].625	1		
3	(a)		42	1		
	(b)		81	1		
	(c)		11, 23 and 41	2	**B1** for 2 or 3 correct with no more than 1 incorrect	
4			$\frac{28}{40}$ oe	3	**B2** for 0.7 or 70% OR **B1** for 8 or 4 or 30/100 oe and **M1** for 40 – *their* (8 + 4) soi by 28	Answer must be a fraction ignore cancelling of fraction after $\frac{28}{40}$ but not conversion to decimal or percentage Allow 8/40 or 4/40 or 12 nfww
5	(a)	(i)	(4, 3)	1		

Question			Answer	Marks	Part marks and guidance	
		(ii)	(−2, −1)	1		
	(b)		Point plotted at (3,− 2)	1		Condone use of a letter (R) if clearly in correct position
	(c)		line $y = 3$ drawn	1	minimum length 1 square	
6			9.2	3	**M1** for 0.17 × 54 oe **A1** for 9.18 If 0 scored **SC1** for *their* answer rounded to 1dp, if two dp or more seen.	Allow fully correct non calculator method for 1 mark allow 1 error in addition
7	(a)		$12t – 10u$ or $2(6t – 5u)$ cao	2	**B1** for $12t$ or $– 10u$ in final answer	12t + - 10u scores **B1**
	(b)		$5(v + 4w)$	1		Condone omission of final bracket
	(c)		−3 and −7	3	**M2** for (x + 3) and (x + 7) **M1** for (x + a) and (x + b) where ab = 21 or $a + b = 10$ **B1** ft their quadratic factors If 0 scored **SC1** for answer ±7 and ±3	ft their quadratic factors condone omission of final bracket
8	(a)		240	1		

Question			Answer	Marks	Part marks and guidance	
	(b)		10	**1**		
	(c)		No, with correct supporting values and justification	**4**	**B3** for 1.374 to 1.38 [kg] or 1374 to 1380[g] or 74 to 80[g] or 0.074 to 0.08 [kg] or 14[..people] OR **B1** for 1.3 × 1000 soi by 1300 or *their* 1375 ÷ 1000 and **M1** for 15 ÷ 6 soi by 2.5 or 550 ÷ 6 soi by 91.6[6] or 91.7 and **M1** for 550 × 2.5 =1375 or 1300 ÷ *their* 91.6[6] or *their* 91.6[6] × 15	Accept equivalent method
9	**(a)**		30	**1**		
	(b)	**(i)**	15 24 13 39	**1** **1** **1**		
		(ii)	fully labelled pie chart with at least 3 sectors correctly drawn	**2**	**B1** for 1 correct sector correctly labelled or pie chart with at least 3 sectors correctly drawn with incorrect or no labels	Wayne 144 Harry 15 Obi 72 Antony 39 Allow ±2°

Question			Answer	Marks	Part marks and guidance	
10			No he has scored 85[.2%] or no he needs at least 52.46 (52.5/53) to pass oe	2	**M1** for 52 ÷ 61 or 52 ÷ 0.61 soi by 0.85[2…] or 85[.2%] .. or 0.86 × 61 soi by 52.46 or 52.5 or 53	
11			Identifying there are not enough coaches or too many people with correct justification	2	**M1** for 320 ÷ 53 soi by 6.03[..] or 53 × 6 soi by 318 or 2 or 320 ÷ 6 soi by 53.3	No, he needs 7 coaches alone scores 0 See appendix
12			8	2	**M1** for 2 × 16 [÷4] or 16 ÷ 2 (speed)	32 alone scores 0
13	(a)		3 cao	1		
	(b)		1.5	3	**M1** for 6 × 25000 soi by 150 000 or **B1** for figs 15 or 1cm :0.25km and **M1** for *their* 150000 ÷ 100 000 or for *their* 0.25 x 6	
	(c)		$\frac{6}{13}$	1		
14	(a)		5.43×10^5	1		
	(b)		[0]. 063	1		
	(c)		No, it isn't in standard form, e.g it should be $2.4[4] \times 10^8$	1		See appendix

Question			Answer	Marks	Part marks and guidance	
15			19	5	**B4** for 12 nfww OR **M1** for x +7 or x - 7 **M1** for x +7 +x +7 +x + x + x + x = 86 **M1** for 6x + 14 = 86 ft **B1** for 12 ft OR **M1** for 86 - 7- 7 **A1** for 72 **M1**for *their* 72 ÷ 6 **A1** for 12 OR **M1** for a = c +7 oe **M1** for 2a + 4c = 86 oe **M1** for correct method to eliminate one variable allow one arithmetic error **A1** for 12	Allow use of other letters accept equivalent methods e.g **M1** for y+7 or y – 7 **M1** for y + y + y – 7+ y– 7+ y– 7 + y– 7 =86 **M1** for 6y – 28 =[86] **M1** for 6y = 114

Question			Answer	Marks	Part marks and guidance	
16			Complete correct arc centred at B identified with full construction shown including either perpendicular bisector of AB (including arcs and intersecting the arc centred at B) or arc(s) of 5cm radius centred at A and intersecting the arc from B at 2 points	5	**B4** 5cm arc centred at B with full construction shown including either perpendicular bisector of AB (including arcs and intersecting the arc centred at B) or arc(s) of 5cm (±0.2 cm) radius centred at A and intersecting the arc from B at 2 points OR **B2** for complete arc 5cm (±0.2 cm) centred at B or **B1** for arc**s** 5cm (±0.2 cm) radius centred at B or continuous arc 5cm (±0.2 cm) radius centred at B, but not covering the whole of the required region, minimum span 30° AND **B1** for arc[s] centred at A radius 5cm (±0.2 cm) or a perpendicular bisector of AB OR **B1** for minimum of 3 points in the correct position without arc from B	**B4** is fully correct without the correct locus identified Complete arc for the region required

Question			Answer	Marks	Part marks and guidance	
17			277 830	3	**M2** for 240000×1.05^3 or **M1** for 240000×1.05^2 soi by or 264600 If 0 scored **SC1** for 291721[.5] or 291722	
18	(a)		$2 \times 5 \times 7^2$ oe	2	**B1 for** only 2, 5 and 7 identified **or** **M1** for any correct factor pair of 490	Condone inclusion of 1 for **B1** Not 1 and 490
	(b)		12 20 [pm]	4	**SC3** for 1220 am OR **B2** for LCM as 200 and **M1** for 9:00 plus *their* LCM OR **M1** for 25 = 5x5 and 40 = 2 x 2 x 2 x 5 and **M1** for 9:00 plus *their* LCM OR **B1** for listing [0]925, [0]950, 1015 and **B1** for listing [0]940, 1020, 1100	

Question			Answer	Marks	Part marks and guidance	
19	(a)		0.7 0.8 , 0.2, 0.8, 0.2	1 1		
	(b)		0.76 with a complete correct method	2	**M1** for one correct product from *their* probabilities	e.g 1 – 0.24 = 0.76 or 0.06 + 0.56 + 0.14 = 0.76 Marks may be awarded for work on the diagram
20			34.5	3	**M2** for 38.64 ÷ 1.12 oe or **B1** for 1.12 or 112	

Question			Answer	Marks	Part marks and guidance	
21			214	5	**B4** for 214.2 or 214.24 to 214.26 OR **B1** for 60 marked or used as width of rectangle or distance from B to the corner AND **M2** for $\frac{1}{4}$ × π × 120 soi by 30π, 94.2 or 94.24 to 94.26 or **M1** for π × 120 soi by 376.8 to 377.1 or $\frac{1}{2}$ π × 120 soi by 188.4 to 188.6 AND **M1** for 2 × *their* 60 + *their* 30π AND **B1** for their final answer written to more than 3 figs correctly rounded to 3 s.f. to a max. of **4** marks	Accept 120 + 30 π for **B4** Allow e.g. r = 60 for **B1**

Question			Answer	Marks	Part marks and guidance	
22	(a)		135	2	**B1** for angle 45	e.g 45 marked at ACB or ABC or 180 – 45 or 90 + 45
	(b)		209 to 209.1	4	**M2** for $\tan^{-1}$ (45÷25) or $\tan^{-1}$ (25÷45) soi by 61, 60.94 to 60.95 or 29[.1] , 29.05... or **M1** for tan [=] 45÷25 or tan [=] 25÷45 AND **M1** for 270 – *their angle*ABD or 180 + *their angleADB*	Accept longer methods but they must get to the equivalent point to gain credit e.g. if they find the hypotenuse, they score **M0** until they start to use sin or cos. Can be implied by *their* answer
23	(a)		4 points accurately plotted	2	**B1** for 2 or 3 points accurately plotted	Condone missing or incorrect lines

Question			Answer	Marks	Part marks and guidance	
	(b)		Here are 4 different categories , • Compares the number of people in the whole of 2015 to the whole of 2016 (e.g. there were more people shopping in 2016) • Compares same seasons in 2015 with seasons in 2016 (e.g there were more in Jul–Sept 2016 than in 2015) • Compares seasons within the same year (e.g in 2016 there were more customers in the summer months) • Compares increases / decreases in the number of customers, referring to gradients (e.g the biggest change was between Jul–Sept and Oct-Dec) Do not allow comparisons that only refer to the shape of the graph (e.g, it goes up and down again or it peaks in Jul–Sept) 1 mark for each acceptable comment - for 2 marks they must come from different categories	**2**	**B1** for 1 correct comment	If they make 3 comments mark the best 2. It is possible to cover 2 categories in one comment for 2 marks

Question			Answer	Marks	Part marks and guidance	
24	(a)		24 31	5	**M1** for 3X + 2Y = 134 oe **M1** for 2X + 5Y = 203 oe **M1** for multiplying both equations by scalars to equate coefficients of one variable (allow one arithmetic error) **M1** for correct method to eliminate one variable (allow one arithmetic error) if **M4** not scored award **B3** for one correct answer	allow any correct method e.g. substitution **M1** for rearranging one equation to make X or Y the subject, $X = \frac{134-2Y}{3}$ **M1** for substitution of *their* expression in the other equation
	(b)		Any correct comment relating to distance	1		See appendix

APPENDIX

Exemplar responses for Q11

Response	Mark
No – 6 coaches only hold 318 people which is 2 short	2
Gary needs an extra coach for the other 2 people	2
320 ÷ 6 = 53.3333.. no you can't split a person up into 3 parts, you will need 7 coaches	2
320/53 = 6.03 No because it's a decimal you need to round up not down	2
53x6=318 Gary is not correct as 6 coaches will mean 2 people will not be aloud on the coaches	2
Gary is incorrect 6 coaches only hold 318 people so he needs 7	2
6 coaches hold 318 so there will be 2 people left	2 bod
320/53 = 6.03…. No he is wrong he will need more	2
Gary is correct 320/53 = 6.0	1
320/6=53.3 Not enough room one person will be left behind *(in fact two people are left behind!)*	1