Mark scheme

Question			Answer/Indicative content	Marks	Guidance	
1			Candidate clearly shows that: 23 + 490 = 513	4	**M2** for [£]0.07 × 7000 or 7[p] × 7000 and [£]0.23 × 100 or 23[p] × 100 or **M1** for [£]0.07 × 7000 or [£]0.23 × 100 or 7[p] × 7000 or 23[p] × 100 **B1** for £23 or [£]490 or for 2300[p] or 49 000[p]	"Shows that" requires evidence of at least **M2**, **B1** For **M2**, **M1** & **B1** if units (£ or p) are given they must be correct
			Total	**4**		
2			$\frac{27}{81}$	3	**B2** for a fraction with numerator a cube number >1 **and** denominator a square number as final answer or for $\frac{27}{81}$ seen in workings but not their final answer OR **B1** for a fraction with numerator a cube number >1 **or** denominator a square number as final answer **B1** for answer $\frac{1k}{3k}$ OR	Condone $\frac{27}{81} = \frac{1}{3}$ on answer line for **3** marks e.g. answers $\frac{27}{36}, \frac{64}{25}$ scores **B2** For **B1** allow e.g. $\frac{x}{64}$ or $\frac{}{64}$ e.g. answer $\frac{12}{36}$ scores **B1B1** Where k is an integer >1

				B1 for [1,] 8,27,64, [125] **B1** for [1,] 4,9,16,25,36,49,64,81,[100]	No other numbers are allowed in these lists
		Total	**3**		
3		170	2	**FT** 35 [+] *their* 70 [+] 65 correctly evaluated **B1** for 35 [+] 70 [+] 65 or **B1FT**: 35 [+] *their* 70 [+] 65	**FT** for 2 marks *Their* 70 from 3(a) Values could be given on diagram in 3b
		Total	**2**		
4		Correctly completes frequency tree with Football 35 Hockey 25 Athletics 23 Athletics 9	4	**B1** for each correct entry OR **M1** for option 1 sums to 60 or option 2 sums to 60 and **M1FT** *their* football – 12 and *their* hockey – 16	Do not allow empty boxes to imply 0 **FT** dep on no negative answers
		Total	**4**		
5	a	35	1		
	b	11 or 22	1		Accept 11 and 22 with no extras
		Total	**2**		
6	a	3	1		Condone +3
	b	204	1		
		Total	**2**		

7			1 3 7 21	2	**B1** for 2 correct and no incorrect factors or 3 correct and 1 incorrect or 1 × 21 and 3 × 7	
			Total	**2**		
8			407	1		
			Total	**1**		
9			21	1		
			Total	**1**		
10			196	2	**B1** for answer figs 196 or **M1** for $(1.4 \times 10)^2$ oe or $\sqrt{196} = \frac{14}{10} = 1.4$	May be flow diagram
			Total	**2**		
11			× −	1		
			Total	**1**		
12		i	Any even number	1		
		ii	84	1		Accept any common multiple
			Total	**2**		
13			8.77	3	**B2** for 8.773…or 8.774 or **B1** for 2771.288 or 76.98… If **0** scored, instead award **SC1** for *their* answer	

					to more than 3 figures correctly rounded to 3 sf	
		Total	**3**		
14	a	Three of 20[.00], 30[.00], 30 and 5 seen 30 × 20 5 × 30 750 or 600 and 150	B1 M1 M1 A2	for *their* 30 × *their* 20 for *their* 5 × *their* 30 **A2 dep** on **B1M1M1** or **A1 dep** on **B1M1** for 600 or 150	**B1** seen as rounding *their* 30 can be 30 $\frac{1}{4}$, 30.25 or 31 *their* 20 can be 20.23 or 21 *their* 5 can be 5 $\frac{1}{3}$, 5.3, 5.33[3...]or 6 *their* 30 can be 30.18 or 31
	b	The calculation is an underestimate	1		All values were rounded down **oe** Mark best response as long as not contradictory or incorrect For additional information refer to 'Qn16b, 2024 June, Alternative J560/02, Mark Scheme Appendix' within downloadable resource materials.
		Total	**6**		
15	a	19 8 21 60 10	3		

				FT *their* 19 – 11 for *their* 8	
				B2 for 3 correct or **B1** for 2 correct	
b		Rafting and [R=] 41 or 8 + 12 + 10 + 11 [S=] 23 or 3 + 5 + 5 + their 10 [T=] 36 or *their* 8 + 4 + 20 + 4	3	**FT** *their* (a) even if **NR**	Accept *their* most popular with **strict FT** from *their* three correct totals for these sports Sums must be correctly evaluated May be on diagram
				M2 for two from [R=] 41 or 8 + 12 + 10 + 11 [S=] 23 or 3 + 5 + 5 + their 10 [T=] 36 or *their* 8 + 4 + 20 + 4 or	Accept labelled or in correct order Check 13 + *their* 10 Check 28 + *their* 8
				M1 for one from [R=] 41 or 8 + 12 + 10 + 11 [S=] 23 or 3 + 5 + 5 + their 10 [T=] 36 or *their* 8 + 4 + 20 + 4 If 0 or 1 scored, instead award **SC2** for Rafting = 41 which is 18 more than S and 5 more than T	If (a) is **NR**, **FT** all marks. The values will be: [R=] 8 + 12 + 10 + 11 or 41 [S=] 3 + 5 + 5 or 13 [T=] 4 + 20 + 4 or 28 and the answer R[afting] and the sums or totals seen
c		$\frac{46}{100}$ **oe**	2	**FT** *their* 21	Ignore attempts to change form Accept fraction, decimal (e.g. 0.57) and percentage (e.g. 57%) but not ratio nor in words

					B1 for *their* 21 + 25 correctly evaluated or 46 seen If (a) is **NR**, award **SC1** for answer $\frac{25}{100}$ **oe or** answer $\frac{1}{25}$	For **B1**, condone $\frac{1}{46}$ as 46 seen
	d		[That] these [100] children are representative of all children [who attend the adventure park] **oe**	1		See Appendix Representative sample
			Total	**9**		
16			200	2	**B1** for answer 100 or answer 200*n* with *n* integer > 1	400, 600, ...
			Total	**2**		
17			1331	2	**M1** for 11 × 11 × 11 **oe**	1.331×10^3 scores M1
			Total	**2**		
18	a		5	2	**M1** for 10 × 5.5 **oe**	**M1** implied by 55 Repeated addition, we must see their method, allow one arithmetic error e.g. 5.5, 11 then 11×5 [=55]
	b		6	3	**B2** for 6.25 or	*their* (a) must be > 0.8

				M2 for *their* (a) × 1000 ÷ 800 or *their* (a) ÷ [0].8 or **M1** for *their* (a) × 1000 or 800 ÷ 1000 or *their* (a) ÷ figs 8	**M2** implied by repeated addition or subtraction to one less than *their* (a) or *their* (a) × 1000. If *their* (a) < 2.4 then all multiples must be seen For additional information refer to 'Qn15b, 2024 June, Alternative J560/02, Mark Scheme Appendix' within downloadable resource materials.
	c		200	2	**B2FT** for *their* (a) × 1000 – *their* (b) × 800 evaluated correctly or **M1** *their* (a) × 1000 – *their* (b) × 800	*their* (a) must be > 0.8 *their* (a) × 1000 ≥ *their* (b) × 800 *their* (b) must be an integer Implied by repeated subtraction or addition. Working may be seen in part (b) for **M1**
		Total		**7**		
19	a		−7	1		
	b		36	1		
	c		−14	1		
		Total		**3**		
20			461	2		

					M1 for 52 × 9 implied by 468	Condone flow diagrams $\frac{x+7}{9}=52$ is not enough
		Total		**2**		
21	a	Any odd number		1		In all parts if more than one answer all must be correct
	b	A multiple of 9		1		Accept 9
	c	125		1		Do not accept e.g 5^3 but condone 5^3 = 125
	d	5, 7, 11, 13, ... or any other prime number		1		
		Total		**4**		
22	a	36		1	**Examiner's Comments** Most candidates scored the mark here. Incorrect answers were generally either multiples of 9 that were outside of the given range (e.g. 27 or 45) or numbers in the correct range that were not multiples of 9 (e.g. 33 or 39).	
	b	20 or 25		1	**Examiner's Comments** Many candidates scored the mark here. A small number of candidates gave both of the valid answers (i.e. 20 and 25), which	Accept 20 and 25 with no extras

					was given the mark, however others who gave extra values that were not correct were not given credit. A small number wrote their answer as a multiplication including an extra value, e.g. '5 × 20' and in this example 5 is not between 11 and 30, therefore credit could not be given. Common incorrect answers were 15 or a factor of 100 that was outside of the given range (e.g. 10 or 50).	
			Total	**2**		
23			Correctly completes frequency tree with Football 45 Hockey 35 Athletics 33 Athletics 21	4	**B1** for each correct entry OR **M1** for option 1 sums to 80 or option 2 sums to 80 and **M1FT** *their football* – 12 and *their hockey* – 14	Do not allow empty boxes to imply 0. FT dep on no negative answers

Examiner's Comments

Many candidates scored marks on this question, however only a small proportion scored full marks.

A common error was to have 50 students choosing football and 30 choosing hockey. This however often resulted in 38 and 16 choosing Athletics in Option 2, which resulted in 2 marks being awarded.

Candidates who were successful showed their working in the space provided below Question 9 (b), while those less successful tended to show no working.

Key point: Finding two numbers given their sum and difference.

A number of candidates struggled to find two numbers whose sum was 80 and that

					had a difference of 10. The most successful gave one of the following methods.	
					Method 1	
					Hockey = x and Football = x + 10	
					$x + x + 10 = 80$	
					$2x + 10 = 80$	
					$2x = 70$	
					$x = 35$	
					Candidates then found football as 45.	
					Method 2	
					The sum is 80 and the difference is 10.	
					$\frac{80}{2} = 40$	
					$\frac{10}{2} = 5$	
					$40 + 5 = 45$	
					$40 - 5 = 35$	
					Irrespective of the method used, those who were most successful checked that their numbers for football and hockey had a sum of 80 **and** a difference of 10.	
		Total	**4**			
24		Candidate clearly shows that: 27 + 560 = 587		4	**M2** for [£]0.08 × 7000 or 8[p] × 7000 and [£]0.27 × 100 or 27[p] × 100 or **M1** for	"Shows that" requires evidence of at least **M2, B1** For M2, M1 & B1 if units (£ or p) are given they must be correct

						[£]0.08 × 7000 or [£]0.27 × 100 or 8[p] × 7000 or 27[p] × 100 **B1** for £27 or [£]560 or for 2700[p] or 56 000[p]	

Examiner's Comments

Many candidates answered this question correctly. As a 'Show that' question, it is important that candidates use the given information and arrive at an answer of £587. Lower performing candidates often started with £587 and tried to work back to the given information.

Candidates needed to show their calculations and have the correct units and conversions between pence and pounds. Lower performing candidates mixed up the units and/or made arithmetic errors, for example 0.8 × 7000 = 560 was common, as was answers of 560p and 27p being equated to £587.

		Total		4		

| 25 | | | $\frac{8}{64}$ **cao** | 3 | **B2** for a fraction with numerator a cube number >1 **and** denominator a square number as final answer

or

for $\frac{8}{64}$ seen in workings but not their final answer

OR | Condone $\frac{8}{64} = \frac{1}{8}$ on answer line for 3 marks

e.g. answers $\frac{27}{36}, \frac{64}{25}$ scores B2 |

					B1 for a fraction with numerator a cube number >1 **or** denominator a square number as final answer	For B1 allow e.g. $\frac{x}{64}$ or $\frac{\square}{64}$ e.g. answer $\frac{2}{16}$ scores B1B1
					B1 for answer $\frac{1k}{8k}$	Where k is an integer >1
					OR	
					B1 for [1,] 8,27,64, [125] **B1** for [1,] 4,9,16,25,36,49,64,81,[100]	No other numbers are allowed in these lists

Examiner's Comments

Around half the candidates were able to score a mark on this question. This question assessed understanding of cube numbers, square numbers and equivalent fractions.

Candidates showed a good understanding of square numbers and many were able to give a denominator that was a square number. Candidates were less successful however with cube numbers and 2, 3 or 10 were often given.

Candidates who were less successful often did not show their working clearly. Often multiple fractions were seen in the working, sometimes without any of them being clearly given as a final answer.

		Total		**3**	
26	a	2		1	Condone +2 **Examiner's Comments** Many candidates answered this question correctly.

					Common incorrect answers were ⁻2 and ⁻12.
	b	156		1	**Examiner's Comments** Most candidates answered this question correctly. Candidates used a wide variety of methods and the most successful were the traditional column multiplication or a grid. Those that didn't reach the correct answer often wrote long lists that contained arithmetic errors or showed no working at all.
	c	206		1	**Examiner's Comments** Many candidates were successful at this question, however there was more success with the multiplication in Question 2 (b) rather than the division here. The most common error was to omit the 0 in 206 and give a final answer of 26. The most common method was the 'bus stop' method of short division; those who did not complete this correctly generally either omitted remainder numbers or made arithmetic errors.
		Total		**3**	
27		160		2	**FT** t*heir* 35 [+] 70 [+] 55 correctly evaluated FT for 2 marks **B1** for 35 [+] 70 [+] 55 "their 35" from 3(a) or **B1FT**: t*heir* 35 [+] 70 [+] 55 Values could be given on diagram in 3b **Examiner's Comments** Most candidates gave the correct answer of 160. A follow through (FT) mark was given for candidates who had an incorrect value for Question 3 (a). Candidates who showed

						working by giving the three values they were using generally picked up at least 1 mark, however a small number of candidates showed no values and were given 0 marks.
			Total		**2**	
28	a		1　3　5　15		2	**B1** for 2 correct and no incorrect factors or 4 correct and 1 incorrect or 1 × 15 and 3 × 5 **Examiner's Comments** This was answered quite well. The common errors were omitting one factor (often 1 or 15) or including another number. Some candidates listed multiples of 15.
	b		15		1	**Examiner's Comments** Candidates thought this more complex than it was and few scored the mark. Common wrong answers were 5, 60 and multiples of 15. (?)　　　**Misconception** Many candidates did not appreciate that 15 was a factor of 15 and 60.
			Total		**3**	
29			169		2	**B1** for answer figs 169 or **M1** for $(1.3 \times 10)^2$ oe or $\sqrt{169} = 13 \div 10 = 1.3$ 　　　May be flow diagram **Examiner's Comments**

				1	Many good answers were seen, with more successful candidates going straight to 169. Most of those who struggled resorted to trial and improvement, usually unsuccessfully. A few worked through to 169, but then gave the answer 13. 170 was a common wrong answer. A common wrong method was to square root 13.
			Total	**2**	
30	a		x +	1	**Examiner's Comments** Almost all candidates scored this mark.
	b		3.16	3	**B2** for 3.158...or 3.159 or **B1** for 249.41 or 9.9764 If **0** scored, instead award **SC1** for *their* answer to more than 3 figures correctly rounded to 3 sf **Examiner's Comments** Few scored full marks here, though many scored B2 for 3.159 or 3.158. Many gave their answer to three decimal places rather than three significant figures.
			Total	**4**	
31	i		Any odd number	1	**Examiner's Comments** Most candidates gave the correct answer.
	ii		51	1	

						Accept any common multiple
						Examiner's Comments Most candidates gave a correct answer, with 51 and 102 being the most common. Some confused factors and multiples. The most common incorrect answer was 1.
			Total	**2**		
32			$(14 - 6) \div 2 = 4$ $5 \times (2 + 3 \times 2) = 40$	2	**B1** for each	Ignore extra brackets that do not invalidate the answer(s) e.g. $((14 - 6) \div 2) = 4$
			Total	**2**		
33	a		Three thousand[s]	1		Not 3 thousand[s]
	b		5 000 000	1		Not 5 million
			Total	**2**		
34	a		Cube numbers only clearly indicated	1		Accept any clear indication. e.g. ringed, ticked, others deleted
	b	i	33 – 25	1		Mark dotted answer line if different to tiles
		ii	35	1		Mark dotted answer line if different to tiles
			Total	**3**		
35			35	2		

					M1 for (499 − 79) ÷ 12 **oe**	For **M1** accept 420 for 499 − 79 or 12*x* + 79 = 499
		Total		**2**		
36		[0]5.03		2	**M1** for 15.09 ÷ 3 **oe**	
		Total		**2**		
37		3800		1		Condone additional superfluous zeros e.g. 3800.0
		Total		**1**		
38		40		3	**M2** for *their* 65 + *their* **(a)** − *their* 70 or **M1** for *their* 65 + *their* **(a)** If **0** scored, instead award **SC1** for 65, 45 and 70	**M1** implied by 110 **SC** could be seen on the graph or in parts **(a)** and/or **(b)**
		Total		**3**		
39				3	**B1** for ⁻40 **B1** for ⁻4 **B1FT** for *their* ⁻4 × ⁻3 evaluated	Do not accept 12 from incorrect factor pair
		Total		**3**		
40	a	1 7 49		2	**B1** for 7 **B1** for 1 and 49	Allow **B1** for one correct factor pair Treat incorrect extra(s) as choice

	b		64 or 81	1		If more than one both must be correct Not 8^2 or 9^2

		Total	**3**		

41		5 with correct working	5	**M1** for 480 × 0.7 or 480 × 70 **M1** for 766 – 110 or 766 – *their* (480 × 0.7) **M1** for 766 – (110 + *their* (480 × 0.7)) **M1** for (766 – (110 + *their* (480 × 0.7))) ÷ 80 Trials **M4** for 480 × 0.7 + 4 × 80 + 110 = 766 **oe** or **M3** for two trials of the form 480 × 0.7 + *n* × 80 + 110 **oe** seen and correctly evaluated where *n* ≥ 1, *n* ≠ 4 or **M2** for one trial of the form 480 × 0.7 + *n* × 80 + 110 seen and correctly evaluated where *n* ≥ 1, *n* ≠ 4 or **M1** for 480 × 0.7 [+…] If **0**, **1** or **2** scored, instead award **SC3** for answer 5 with no working or insufficient working If **0** or **1** scored, instead award **SC2** for answer 4 with	"Correct working" requires evidence of at least **M3** or **M1 M1 M1** *Their* 480 × 0.7 may be 480 × 70 with an attempt to convert to pounds ÷ 80 may be repeated subtraction or addition e.g. for Trials and + 80's **M4** for 480 × 0.7 + 3 × 80 + 110 = 686 and 686 + 80 = 766 **M3** for 480 × 0.7 + 3 × 80 + 110 = 686 **M2** for 480 × 0.7 + 2 × 80 + 110 = 606 or 480 × 0.7 + 80 + 110 = 526 **M1** for 480 × 0.7 [+ …] For trials and trials + 80's, accept correct rearrangements that have a target of 656, 430 or 320 rather than 766

					no working or insufficient working If **0** scored, **SC1** for 320 with no working or insufficient working	
			Total	**5**		
42			34 **nfww**	4	**M1** for 26 + 40 + 54 implied by 120 as total **M1** for [0].65 × *their* 120 may be implied by 78 **M1** for *their* 78 − (16 + 28)	Must see a calculation if not 78 "65% of" is not a calculation
			Total	**4**		
43			200	2	**B1** for answer 100 or answer 200*n* with *n* integer > 1 **Examiner's Comments** Very few correct answers were seen. Most methods were inappropriate, involving finding fractions or percentages of values. Common incorrect answers were 64, 36, 62.5, 1.5 and 37.5, among others. Very few candidates understood that the number of papers needed to be a value where both 64% and 62.5% of it would result in an integer.	400, 600, ...
			Total	**2**		
44			1728	2	**M1** for 12 × 12 × 12 oe **Examiner's Comments**	1.728×10^3 scores M1

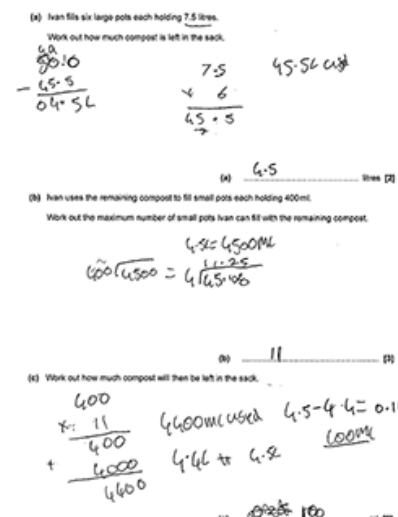|					
					Candidates often scored 2 marks here. Very few showed working; those that did generally wrote 12 × 12 × 12 or, rarely, 12^3. Less successful responses didn't show recognition of the cube root; 36 (from 12 × 3) and 144 were common errors.
		Total		**2**	
45	a	22 8 23 55 7		3	**FT** *their* 22 – 14 for *their* 8 **B2** for 3 correct or **B1** for 2 correct **Examiner's Comments** Many candidates gained 3 marks for a correctly completed tree. A few made numerical slips when calculating some of the entries. A small number of candidates placed values in the wrong place, such as placing '55' where the value should have been '22'. Some interchanged '22' and '23' in their respective positions. A tiny minority did not attempt the question.

	b	Tennis
		
		and
		
		[R=] 37 or 11 + 12 + 5 + 9
		[S=] 20 or 3 + 5 + 5 + *their* 7
		[T=] 43 or *their* 8 + 6 + 25 + 4
				3	**FT** *their* (a) even if NR
					
					M2 for two from
					    [R=] 37 or 11 + 12 + 5 + 9
					    [S=] 20 or 3 + 5 + 5 + *their* 7
					    [T=] 43 or *their* 8 + 6 + 25 + 4
					
					or
					M1 for one from
					    [R=] 37 or 11 +
						Accept *their* most popular with **strict FT** from *their* three correct totals for these sports
						Sums must be correctly evaluated
						May be on diagram
						Accept labelled or in correct order
						Check 13 + *their* 7
						Check 35 + *their* 8

					12 + 5 + 9 　　　[S=] 20 or 3 + 5 + 5 + *their* 7 　　　[T=] 43 or *their* 8 + 6 + 25 + 4 If 0 or 1 scored, instead award **SC2** for Tennis = 43 which is 6 more than R and 23 more than S	If (a) is NR, FT all marks. The values will be: [R=] 11 + 12 + 5 + 9 or 37 [S=] 3 + 5 + 5 or 13 [T=] 6 + 25 + 4 or　　　35 and the answer R[afting] and the sums or totals seen

Examiner's Comments

Many correct answers were seen. 'Show how you decide' indicated that working or values were needed to score and most candidates followed this request. Some however placed their totals not in the answer space, but anywhere around the tree or even beside the initial table.

Examiners followed through from the candidate's tree and so many scored full marks here despite making errors in part (a).

A few candidates only showed the highest total, not considering that to show which was the most popular activity it would be necessary to show all three totals.

c	$\frac{57}{100}$ oe		2		**FT** *their* 22 or 11 + 3 + *their* 8 **B1** for *their* 22 + 35 correctly evaluated or 57 seen If (a) is **NR**, award **SC1** for answer $\frac{35}{100}$ oe	Ignore attempts to change form Accept fraction, decimal (e.g. 0.57) and percentage (e.g. 57%) but not ratio nor in words For **B1**, condone $\frac{1}{57}$ as 57 seen

					or answer $\frac{1}{35}$ **Examiner's Comments** Many correct answers were seen. Follow through could be awarded where candidates had an incorrect tree. Some candidates just responded with '57', which scored 1 mark. Candidates generally gave their answer as a fraction, but quite a few decimals were seen and a couple of percentages. A few candidates gave their answer as a ratio or in words (e.g. 'Fairly likely') and these scored 0 marks.
	d		[That] these [100] children are representative of all children [who attend the adventure park] oe	1	Representative sample <table><tr><th>Assumption</th><th>Mark</th><th>Reason</th></tr><tr><td>All children choose in the same way as these children</td><td>1</td><td>Has the idea of a representative sample</td></tr><tr><td>Every group of 100 will chose the same options every time</td><td>1</td><td>BOD does not say "in the same proportion" but implies representative sample</td></tr><tr><td>45% of children that weren't in the 100 would choose football</td><td>1</td><td>Indicates representative sample</td></tr><tr><td>That every child that turns up for the adventure park will choose the same options as the 100</td><td>1</td><td>BOD. Does not say "in the same way as the 100" but indicates representative sample</td></tr><tr><td>The same proportions apply to all other children coming to the park</td><td>1</td><td>Representative sample</td></tr></table>

Because 45 is 45% of every 100 children that come to the park	1	Representative sample
45%/0.45 of ALL children will choose football	0	Repeats question

Examiner's Comments

Most candidates did not get a mark. Many answers restated the comment in some way or gave suggestions such as that Alex assumed each person was 1%, or that they all turned up, or that football was very popular, or that they didn't want to play golf.

Many seemed to not understand what an assumption was. There was very little understanding that Alex had assumed the sample represented the preferences of all people at the adventure park.

Assessment for learning

Candidates need to practise giving concise reasons and presenting these for peer consideration.

		Total	**9**	

| 46 | a | 5 | 2 | **M1** for 6 × 7.5 **oe** · **M1** implied by 45 Repeated addition, we must see their method, allow one arithmetic error. e.g. 7.5, 15 then 15×3 [=45] |

Examiner's Comments

The majority of candidates responded and achieved at least M1. Most attempted 6 × 7.5, with many correctly reaching 45 and then subtracting this from 50.

Where errors were made, it was often a mistake in their long multiplication or

					through repeated addition (most that attempted repeated addition added up 7.5 six times, but some tried 6 seven and a half times). Some candidates didn't subtract their calculation result from 50, for example giving 45 as their answer.
	b	12		3	**B2** for 12.5 or **M2** for *their (a)* × 1000 ÷ 400 or *their (a)* ÷ [0].4 or **M1** for *their (a)* × 1000 or 400 ÷ 1000 or *their (a)* ÷ figs 4 *their (a)* must be > 0.4 **M2** implied by repeated addition or subtraction to one less than *their (a)* or *their (a)* × 1000 see appendix If *their (a)* < 1.2 then all multiples must be seen **Examiner's Comments** Those who achieved the correct answer for part (a) were regularly able to score at least M2 here in part (b). The context of this question seemed to help candidates access the question. Many different approaches were used by candidates, including short division, repeated subtraction and repeated addition. There was good evidence of candidates making their division easier for themselves. For example, after $\frac{5000}{400}$ was seen, a number of candidates attempted $\frac{50}{4}$. Many candidates picked up the M2 for a correct method without a correct answer, but the B2 was rarely given as almost all that reached '12.5' then went on to the correct answer and full marks. Those who struggled were often able to score M1 for a correct conversion, generally for converting their (a) into millilitres although some converted 400ml into litres. As in Question 11, some candidates however struggled to convert correctly

between relevant units; the most common error here was using 1L = 100ml.

◯ **Assessment for learning**

While repeated addition and/or subtraction is rarely the most efficient approach, to support its marking we have drawn up specific marking guidance that can be used where needed. It appears in the J560/02 mark scheme appendix this year and allows for a consistent approach to be made by both markers as well as those marking student mocks. It may also be beneficial to familiarise candidates with the required working they must show in order to be given method marks where needed.

				B2FT for *their* (*a*) × 1000 – *their* (*b*) × 400 evaluated correctly or **M1** *their* (*a*) × 1000 – *their* (*b*) × 400	*their* (*a*) must be > 0.4 *their* (*a*) × 1000 ≥ *their* (*b*) × 400 *their* (*b*) must be an integer. Implied by repeated subtraction or addition. Working may be seen in part (*b*) for **M1**
	c	200	2		

Examiner's Comments

Candidates successful in parts (a) and (b) almost always achieved the correct answer here, often by using their working out from part (b).

'Follow Through' from both (a) and (b) was credited and some candidates with errors in part (a) and/or part (b) correctly complete the calculation '*their* (a) × 1000 – *their* (b) × 400' to pick up the 2 marks.

A significant number of candidates did not respond, however these were almost always those who didn't respond to part (b)

			or didn't complete it fully.			
			Exemplar 2			
			This candidate's response to (a) is incorrect, but they write 7.5 × 6 and it leads to the value on the answer line, so M1 is given. In (b), M2 is given for '*their* (a) × 1000 ÷ 400'. They simplify this calculation to the equivalent 45 ÷ 4. In part (c) we look for Follow Through ('FT') from their parts (a) and (b). They correctly carry out '*their* (a) × 1000 – *their* (b) × 400' (their subtraction calculation is in litres, but it is correct) and so B2FT is given.			
		Total	**7**			
47	a		Three of 20[.00], 30[.00], 40 and 4 seen 40 × 20 4 × 30 920 or 800 and 120	B1 M1 M1 A2	for *their* 40 x *their* 20 for *their* 4 x *their* 30 **A2** dep on **B1M1M1**	**B1** seen as rounding *their* 40 can be $40\frac{1}{3}$, $40.\overline{3}$, 40.33[3...] or 41 *their* 20 can be 20.15 or 21 *their* 4 can be $4\frac{1}{4}$, 4.25 or 5 *their* 30 can be 30.23 or 3

or
A1 dep on **B1M1**
for 800 or 120

Examiner's Comments

Many did not follow the instruction to round given in this question and subsequently struggled. Those who did successfully round the values generally arrived at a correct response.

Long multiplication was often used for 40 × 20, but repeated addition was sometimes used for 4 × 30.

Responses that did not round (or did not round correctly) were frequently given M1M1 for showing working to multiply the wage by the hours worked for both the weekdays and the weekend. Some that hadn't rounded attempted to partition the values to simplify their working. For example, dividing £20.15 by 3 to get the pay per $\frac{1}{3}$ of an hour, then adding it to *their* £20.15 × 40, or similarly for the Saturday pay.

A few omitted their working altogether and just wrote 800 and 120. The questions asks candidates to '…show that Amaya may be correct' and just writing values is insufficient to show this.

There were a number of common issues seen in candidates working.

1. Candidate working out was often poorly presented and in some cases this resulted in values being used incorrectly or omitted.

2. Converting units of time continues to be a challenge for many. Many correctly converted $\frac{1}{3}$ hour to 20 minutes or $\frac{1}{4}$ hour to 15 minutes, but then incorrectly used 40.20 and 4.15 in calculations.

3. Some tried to divided $40\frac{1}{3}$ by 5, in an attempt to find the hours worked each day from Monday to Friday. This was often rounded to 8 hours worked per day, then

multiplied by the wage (either £20 or £20.15) and this then finally multiplied by 5 to give pay across the weekdays.

Exemplar 3

40h 20min week ~£806 porgus

4 h 15 min Sat   926

20×40=800
40+0.15=6

30×4=120

At a glance it might look like this candidate has rounded all the values, but in fact they have not rounded the £20.15 wage. Instead, they have partitioned it and multiply both partitions by 40.

Three rounded figures is sufficient for the B1 however, so it is given.

M1 is given for '40 × *their* 20', as even though they have not rounded 20.15, they carry out a valid multiplication (20.15 is noted in the mark scheme's guidance column as acceptable here).

The second M1 is also given for '30 × 4'.

A1 is then given for 120. The A2 is not given as even though '800' is seen in the response, it is part of their partitioned calculation and the final result for the weekday earnings is £806.

This candidate is given 4 marks in total.

	b	The calculation is an underestimate		1		All values were rounded down oe Mark best response as long as not contradictory or incorrect

We want the candidate to say WHY they are certain of the figure being at least £900.

If <u>TOTAL</u> is used then this MUST be £920. IF <u>rounded figures are used</u> then **all** four must be rounded down correctly (20,30,40,4)

Response Mark

1 It is an Underestimate **1**
2 All Values were rounded down **1**
3 This is correct because at minimum she will make 920 ('*at minimum' implies rounding and is correct*) **1**
4 The values are rounded down meaning she earnt more than this **1**
5 (40 x 20) + (4 x 30) already equal over £900 **1**
6 The underestimation is over £900 **1**
7 If you round the earnings you get over £900 (*this is true for rounding both up and down*) **1BOD**
8 Because in my working not adding the minutes, it's still over £900 as it's £928.80 (*incorrect*) **0**
9 Because I estimated it meaning she'd probably got more (*probably does not mean certain*) **0**
10 As it has gone over £900 (*not describing rounding or underestimate*) **0**
11 This is correct because she will make 920 (*the candidate is not telling us WHY they are certain*) **0**
12 Because £20.15x40=£806 and £30.23 x4=120.92 + them = 926.92 not including the minimum (*All rounded values not used*) **0**
13 If you added everything without a fraction it adds up to almost £900 (*incorrect*) **0**
14 Because it works out that all of her work will add to over 900 (*no reference to underestimate*) **0**
15 Because it's over 900 (*not enough, need to say WHY it is certainly over £900*) **0**
16 The estimation is over £900 (*not enough, need to say WHY estimation is certainly over £900*) **0**
17 Because I rounded down (*not enough- needs to be e.g. rounded <u>all</u> numbers down*) **0**

<u>Examiner's Comments</u>

					Many candidates did not attempt this question. The majority struggled to access the contextual nature in relation to what they had been asked to do in part (a). Even those with full marks in (a) struggled to understand why Amaya can be 'certain'. Most relied on their response to part (a), often just repeating working here. A number of candidates stated Amaya would earn a certain amount during the week, so adding her earnings from the weekend would take the weekly earnings over £900. Some referenced rounding down the hours worked, but not the hourly rate, while others referenced rounding down the hourly rate, but not the hours worked.
			Total	**6**	
48	a		⁻11	1	**Examiner's Comments** Many candidates gave the correct response here. Common incorrect responses were 11, ⁻3 and 3. Very few used a number line. ◯ **Assessment for learning** For candidates that struggle with negative numbers, encourage them to use a number line starting with the original number and then 'travelling' in the correct direction.
	b		⁻7	1	**Examiner's Comments** This was answered correctly by most candidates. The common incorrect response was 7.
	c		16	1	**Examiner's Comments**

						Response to this question varied, but were often incorrect. Responses of ⁻16, ⁻8 and 8 were very common. Candidates continue to demonstrate a lack of knowledge with powers in this context. Very few candidates showed they understood that the question was asking ⁻4 × ⁻4.
		Total		**3**		
49		2, 3, 5 or 7		1		**Examiner's Comments** Many correct answers were seen.
		Total		**1**		
50		654		2		**M1** for 81 × 8 implied by 648	Condone flow diagrams $\frac{x-6}{8}$ = 81 is not enough
						Examiner's Comments Many correct responses were seen for this question. The most common incorrect response was 696, from adding 6 to 81 and then multiplying by 8.
		Total		**2**		
51	a	Any even number		1		In all parts if more than one answer all must be correct **Examiner's Comments** Most responses were correct.
	b	A multiple of 7		1		Accept 7

						Examiner's Comments
						Most responses were correct.
	c		27, 64, 125 or 216		1	Do not accept e.g 6^3 but condone $6^3 =$ 216 **Examiner's Comments** Many correct answers were seen; however several wrote a square number (e.g. 100). ⟳ **Assessment for learning** Candidates are required to understand the difference between square numbers and cube numbers.
		Total			**3**	
52		49			2	**B1** for answer 7 Accept 7^2 for 2 marks
		Total			**2**	
53		A and 4[.00] less than 4.59 oe or A and [0].59 saved oe or A and 4[.00] and 4.59 seen in final statement OR A and 1.33[3..] less than 1.53 oe or A and 0.20 oe saved or A and 1.33[3..] and 1.53 seen in final statement			3	**Method 1** **M1** for 1.6 × 2.5 oe or 4[.00] oe **M1** for *their* 1.53 × 3 or (3 × 1.7) × 0.9 oe or 4.59 oe **Method 2** **M2** for 1.6 × 2.5 ÷ 3 oe or 1.33[3..] or **M1** for 1.6 × 2.5 oe or 4[.00]	Ignore other figures/statements that don't invalidate answer All values may be seen in (a) oe may be 1.6 + 1.6 + 1.6 ÷ 2 Allow "A because it's cheaper" oe if 4[.00] and 4.59 only seen as final costs in working space for (b) Allow "A because it's cheaper" oe if 1.33[3..] and 1.53

						only seen as final costs in working space for (b)
		Total		3		

54		17 and 102		3	**B2** for answer 17 or 102 in correct place
					
					or
					M1 for one correct trial of 2 × 3 × prime
					
					or a correct factor tree for a number from 100 to 110
					
					or an integer from 100 to 110 ÷ (2 × 3)
						Accept 6 for (2 × 3) throughout e.g. 6 × 17 = 102 for 2 × 3 × 17 = 102
						
						e.g. 2 × 3 × 7 = 42
						  2 × 3 × 11 = 66
						  2 × 3 × 13 = 78
						May be 2 × 3 × 17 = 102 if answer not 17 and 102 Includes 100 and 110
						
						Includes 100 and 110

		Total		3		
55	a	3 × (3 – 3)		1		Condone extra brackets that do not invalidate answer e.g (3 × (3 – 3))
	b	24 – 6(5 – 1) = 0		1		If more than one symbol in a space, mark the worst
		Total		2		
56		800 with correct working		6	**M1** for 3 × 1.30 + 2	"Correct working" requires evidence of at least two M marks and one A mark Allow working in

					× 0.85 **oe** or 3.9[0] + 1.7[0] **A1** for 5.6[0] AND **M1** for (8 – *their* 5.6[0]) **oe** **A1** for 2.4[0] AND **M1** for *their* 2.4[0] ÷ 1.2[0] [× 400] **A1FT** for *their* 2.4[0] ÷ 1.2[0] rounded down × 400 If **0** or **1** scored, instead award **SC2** for answer 800 with no or insufficient working If **0** scored, instead award **SC1** for 2.4[0] with no or insufficient working	pence provided consistent units used 5.6[0] implies M1A1 Could be implied by *their* 5.6[0] + *their* 2.4[0] + *their* 'change' [= 8.0[0]] Implied by list 1.2[0], 2.4[0], [3.6[0], …] up to one less than *their* 2.4[0] or Embedded 2 × 1.2[0] = 2.4[0] <u>Alternative Method</u>: For first M1A1 M1A1 M1 for 8 - 3 × 1.30 or 8 - 2 × 0.85 A1 for 4.1[0] or 6.3[0] AND M1 for 8 - 3 × 1.30 - 2 × 0.85 or *their* 4.1[0] - 2 × 0.85 or *their* 6.3[0] - 3 × 1.30 A1 for 2.4[0]
		Total		**6**		
57			2 × 3 × 3 × 3 Or 2 × 3³	2	**B1** 2, 3, 3, 3 as answer **Or** **M1** for attempt at factor tree or ladder with 2 correct stages shown	B1 could be seen as a correct complete tree/ladder
		Total		**2**		

58	a		$^{-}2$	1		
	b		8	1		
	c		$\frac{5}{6}$ oe fraction	1		
			Total	**3**		
59	a	i	13, 15 or 17	1		If more than one all must be correct
		ii	36 or 49	1		If more than one all must be correct
		iii	3	1		
	b		13	1		
			Total	**4**		
60	a		$\sqrt{36}$ = 6 or 6^2 = 36 3	M1 A1	If **0** scored, **SC1** for answer 3 with no or confused or insufficient working	Ignore other correct roots e.g. $\sqrt{25}$ = 5 unless these used to reach answer. Must just be 3
	b		It would not change **oe**	1		The square root symbol only gives the positive root, so no change **oe**
			Total	**3**		
61			6	1		
			Total	**1**		
62	a		5 × 5 or 5^2	1		

						As last line on working lines
	b		64		1	
			Total		**2**	
63	a		24		2	**M1** for 150÷ 6.25 **oe**	May be 24 repeated subtraction or addition in a list Accept 6.25 × 24 for **M1**
	b		1320		3	**B2** for figs 132 OR **M2** for 11 000 × (81 – 69) **oe** or **M1** for 11 000 × 81 or 11 000 × 69 or 81 – 69	May be in working or on answer line May be implied by figs 891 – figs 759 **oe** may be e.g. 11 000 × (0.81 – 0.69) or 11 000 × 0.12 Subtraction should be seen but may be implied by layout Condone subtraction written the wrong way around May be implied by figs 891... or figs 759 ... or 12
			Total		**5**	
64	a		21		1	
	b		7 + (6 – 2) × 5 = 27		1		Condone additional bracket(s) as long as mathematically correct.
			Total		**2**	
65			14:10 or 2:10pm		4	

					B3 for 2.10 or 1410pm or **B2** for listing the next 3 correct times of both trams i.e. 11.30, 12.10, 12.50 and 11.15, 11.40, 12.05 or **B1** for listing the next 3 correct times of one tram i.e. 11.30, 12.10, 12.50 or 11.15, 11.40, 12.05 OR **B3** for 3[h]20 or **B2** for [LCM =] 200 or **B1** for listing the next 3 multiples of 40 or 25 i.e., 80, 120, 160 or 50, 75, 100 or 1[h]20, 2[h], 2[h]40 or 50, 1[h]15, 1[h]40 or **M1** for [40 =] 2 × 2 × 2 × 5 and [25 =] 5 × 5 allow in a factor tree or tables etc or [LCM =] 200*k* or 2 × 2 × 2 × 5 × 5	Mark only 1 method Condone 0210, 2.10am, 1410am for 3 marks but do not accept 14h10 or 2h10 Condone 12.05 May be indicated by circling in a list must be identified Condone 1 in factor trees
			Total	**4**		
66			18.6[0]	3	**M2** for *their* (100 ÷ 8) × 1.55 or **M1** for 100 ÷ 8 may be implied by 12, 12.5 or 13	Other answers without working score 0
			Total	**3**		

67	a		17, 27, 75	1		If more than one number all must be correct
	b		27	1		
	c		17	1		Do not accept 17 and 3
			Total	**3**		
68			225	4	**B3** for answer 450 or 675 or 900 or **M3** for 3 × 3 × 5 × 5 or 5 × 5 × 9 oe OR **M1** for [25 =] 5 and 5 **M1** for [45 =] 3 and 3 and 5 OR **M1** for 25, 50, 75, 100, (... 200, 225) **M1** for 45, 90, 135, 180, (... 225)	Accept final answer 2.25 m for 4 marks. Ideally "cm" would be crossed out but BOD if not May be in factor tree Allow 9 and 5 Must have first 4 correct in each list
			Total	**4**		
69	a		One of 1, 2, 3, 4, 6, 12	1		Accept more than one correct but no errors May be a product e.g. 4 × 3 but not 2^2 × 3 or an incorrect product e.g. 2 × 3
	b		25	1		Mark the answer line Accept 5^2 = 25

						as answer but not 5^2
	c		4 and 9	2	Mark final answer **M1** for a pair seen that either multiply to give 36 or add to give 13	For **M1**, accept non-integers and negatives Accept answers 9 × 4 and 9 + 4
			Total	**4**		
70	a		7	1		
	b		49	1		Accept both but no extras
			Total	**2**		
71			52	3	**M2** for 39 ÷ 3 × 4 oe or 39 + 13 or **M1** for 39 ÷ 3 oe may be soi by 13 OR breakdown method **B2** for 39 associated with $\frac{3}{4}$ and 13 associated with $\frac{1}{4}$ or **B1** for 39 associated with $\frac{3}{4}$ or 13 associated with $\frac{1}{4}$	Do not accept e.g. $39 \times \frac{3}{4}$ May be shown e.g. on a bar model 39 associated with $\frac{3}{4}$ and 9.75 associated with $\frac{1}{4}$ scores 0
			Total	**3**		
72			37.5 or $37\frac{1}{2}$ or $\frac{75}{2}$	2	**B1** for 1406.25 or $1406\frac{1}{4}$ or $\frac{5625}{4}$	

			Total		2	
73			34		4	**M3** for (2 × 24 + 4 × 19) – 90 oe or **M2** for 2 × 24 + 4 × 19 may be implied by 48 + 76 or 124 or **M1** for 2 × 24 or 4 × 19 may be implied by 48 or 76
			Total		4	
74			$\frac{1}{4}$		2	**M1** for 12 and 18 chosen	Accept $\frac{2}{8}$ For M1 12 and 18 may be circled or underlined – intention that only these 2 numbers selected must be clear
			Total		2	
75			195		4	**B1** for 50 [adults] and **M2** for 30 × 1.5 + (*their* 50) × 3 soi or **M1** for 30 × 1.5 or (*their* 50) × 3	For M2 and M1 *their* 50 must be an integer The addition may be implied by *their* answer May be implied by 45 May be implied by *their* 150
			Total		4	
76	a		Correct, labelled pie chart with correct working		6		"correct working" requires at least **M1M1 and ruled line** If there are labelled angles, mark the method that leads to the angles

					If angles are not shown mark worst method
				M2 for 360 − (140 + 80 + 30) oe or **M1** for 140 + 80 + 30 AND **M1** for $\frac{3}{5}$ × *their* 110 oe **A1** for 66 or **M1** for $\frac{2}{5}$ × *their* 110 oe **A1** for 44 AND **B1** for ruled line at 66° **B1** for *their* larger sector labelled 'bus' and smaller sector labelled 'car'	May be implied by 110 May be implied by 250 Mark to the candidate's advantage *Their* 110 < 360 66 implies M1A1 44 implies M1A1 Tolerance ± 2° only if correct working seen.
	b		Walk	1	
			Total	**7**	
77	a	i	⁻1	1	
		ii	⁻8	1	
		iii	$\frac{4}{5}$	1	
		iv	$3\frac{3}{4}$	1	Accept 3.75 Accept an equivalent fraction but do not accept $\frac{7.5}{2}$
	b		7	2	**B1** for answer 2 or 5 or 7 with one or	e.g. B1 for 2 × 5 × 7

						both other prime numbers.	
			Total	6			
78	a		[No,] 1 is not a prime [factor] **oe**	1			Accept it should be 2 × 5^2, but do not **isw** if with an incorrect statement.
	b		72	3	**B1** for [$\sqrt{64}$ =] 8 **B1** for [3^2 **oe** =] 9		For **3** marks condone ±72 or $^-$72 For **B1** condone ±8 or -8
			Total	4			
79	a		$^-$2	1			
	b		12	1			
			Total	2			
80	a		13	1			
	b		(4 × 7 + 8) ÷ 4 = 9	1			
			Total	2			
81			52 with correct working	5	**M3** for 500 – 6 × 55 – 14 **oe** Or **M2** for 500 – 6 × 55 **oe** or for 6 × 55 + 14 **oe** Or **M1** for 6 × 55 or for 500 – 14 or 5[.00] –[0].14 **M1** for *their* 156 ÷ 3 If **0** scored **SC2** for answer 52		'Correct working' requires evidence of at least **M2** [156] [170] [344] [330] [486] or [4.86]

					Or **SC1** for 156 with no working	
		Total		**5**		
82		18		2	**B1** for 324 or 18^2 Or **M1** for $\sqrt{315+9}$	Accept ⁻18
		Total		**2**		
83	a	Any even number		1		If more than one, all must be correct
	b	Any cube number		1		If more than one, all must be correct Do not accept k^3
	c	53 or 59		1		If more than one, both must be correct
	d	Any multiple of 7		1		If more than one, all must be correct
		Total		**4**		
84	a	5 with correct working		3	**M1** for $280 - n$ where $45 \leq n \leq 55$ **soi** by 225 to 235 **M1** for (*their* number of characters) ÷ 45 <u>Alternative method</u> **M2** for two from [5 letters] 280 ÷ 6 [6 letters] 280 ÷ 7 [7 letters] 280 ÷ 8 Or **M1** for one from [5 letters] 280 ÷ 6 [6 letters] 280 ÷ 7 [7 letters] 280 ÷ 8	Correct working requires at least **M1** *n* represents an estimate of the number of spaces and/or punctuation, digits, symbols etc.

					Alternative method (trials) **M2** for two from 4 × 45 + [45 to 55] 5 × 45 + [45 to 55] 6 × 45 + [45 to 55] Or **M1** for one from 4 × 45 + [45 to 55] 5 × 45 + [45 to 55] 6 × 45 + [45 to 55] OR **M1** for 280 ÷ 45 **A1** for final answer of 6 If **0** scored and no/insufficient working, **SC1** for answer 5	Allow 45 × 6 = 270 for **M1** Answer '5 to 6' or 6 with no working scores **0**
	b		84 [seconds] $\frac{45}{60}$ × *their* 84 **oe** or $\frac{48}{their\,84}$ × 60 **oe** OR 1.4 **oe** 45 × *their* 1.4 **oe** or 48 ÷ *their* 1.4 AND 63 or 34.[2…] and long/longer word length **oe**	B1 M1 B1 M1 A1		**oe** may be $1\frac{24}{60}$ **oe** *their* 1.4 is not 1.24 Ignore non-contradictory statements but, 'She may type slower' is incorrect and, if included, scores **A0**
			Total	**6**		
85			10 with correct working	5	**B1** for 4000 [cm] or [0].7[0] [m] **M1** for $\frac{figs\,4}{figs\,7}$ **soi** 57.1(…) or $57\frac{10}{70}$ **oe**	If both seen and one incorrect award **B0** Correct working requires all part marks **soi** At least 4 repeated

					M1 for *their* 57.1… truncated **soi** 57 M1 for figs 4 – *their* 57 × figs 7 If **0** scored with no/insufficient working **SC2** for answer 10 Or **SC1** for answer 0.1	additions or repeated subtractions May have indication of continuing 57 implies **M2 B1** 4000 – 3990 implies **M3 B1** May be (*their* 57.1(…) – 57) × 70
		Total		**5**		
86		4		1		
		Total		**1**		
87		22.75 with correct working		6	**B5** for figs 2275 as final answer with at least the **M2** mark OR **M1** for [10p =] 0.15 × 200 **oe soi** 30 **M1** for [20p =] 0.375 × 200 **oe soi** 75 **M1** for (200 – *their* 30 – *their* 75) **oe soi** by 95 and **M2** for (*their* 30 × 10) and (*their* 75 × 20) and (*their* 95 × 5) **oe** Or **M1** for one from (*their* 30 × 10) or (*their* 75 × 20) or (*their* 95 × 5) **oe** If **0** or **1** scored and no/insufficient working seen, **SC2** for figs 2275 as final answer	Ignore money notation Ignore money notation May work in £ Implied by 300, 1500, 475 or £3, £15, £4.75 If **M1** only and **SC2** available award **SC2** only
		Total		**6**		
88		15 ÷ (7 – 2) = 3 (5 × 2 + 3) × 2 = 26		2		

						B1 for each	Ignore extra brackets that do not invalidate the answer(s) e.g $(15 \div (7 - 2)) = 3$
						Examiner's Comments	
						The first calculation was correct more often than the second.	
						Many candidates seemed to think that brackets could only encompass two values.	
			Total	**2**			
89	a		seven hundred[s]	1			Not 7 hundred[s]
						Examiner's Comments	
						This question was well answered.	
						Some candidates used the digit 7 in their response, or wrote 'hundreds', to score zero marks.	
	b		8 000 000	1			Not 8 million
						Examiner's Comments	
						This part was also well answered.	
						A common error was to use too many or too few zeros.	
			Total	**2**			
90			Prime numbers only clearly indicated	1			Accept any clear indication. e.g. Ringed, ticked, others deleted
						Examiner's Comments	

						The vast majority selected the correct term. A common error was 'odd numbers', but all terms were chosen.
		Total		**1**		
91		40		2	**M1** for (599 – 119) ÷ 12 oe	For M1 accept 480 for 599 – 119 or $12x + 119 = 599$ A common MR is 199 for 119. **M1** still available for (599 – 199) ÷ 12
						Examiner's Comments This practical question was well received by many. A large number of correct responses with clear working were seen. A number of candidates misread 119 as 199. Some wrote 599 – 119, but actually calculated 599 – 199. An error sometimes seen was (599 + 119) ÷ 12.
		Total		**2**		
92	i	35 - 32		1		Mark dotted answer line if different to tiles **Examiner's Comments** Many candidates answered correctly. Some rewrote or changed their response on the dotted line. Some candidates wrote calculations using more than the single operator given.
	ii	32		1		Mark dotted answer line if different to tiles

					Examiner's Comments This was also well answered. Some candidates wrote multiples of 8 that did not contain the given digits. Some misinterpreted the demand, for example writing 35 – 3.
			Total	**2**	
93			50	3	**M2** for 70 + *their (a)* – *their* 55 or **M1** for 70 + *their (a)* M1 Implied by 105 If 0 scored **SC1** for 70, 35 and 55 SC could be seen on the graph or in parts (a) and/or (b) **Examiner's Comments** Most candidates identified the 3 values needed and these generally came to the correct answer. There were however a few who calculated 70 + 35 and did nothing further. Only a few were unable to access this part and these often had the correct numbers 70, 35 and 55 shown somewhere in the three parts of the question, for which they were given a mark. **Writing on diagrams** When reading from diagrams, encourage candidates to write their reading on the diagram and then rewrite it where appropriate in the questions. This will allow them to self-assess their readings from the diagram later and also when checking through questions.
			Total	**3**	
94			4500	1	

					Condone additional superfluous zeros e.g. 4500.0 **Examiner's Comments** Most candidates were able to answer this question correctly. Those that didn't, had often made errors in place value, e.g. 450 or 45 000.
		Total		**1**	

95				3	**B1** for -36 **B1** for -6 **B1 FT** for *their* -6 x -5 evaluated ╎ Do not accept 30 from incorrect factor pair **Examiner's Comments** Most candidates were able to access marks here, with many being given full marks. Those who scored highly often used written methods for the multiplication/division instead of answering the question mentally. Errors with multiplying or dividing directed numbers were frequently seen, often incorrectly calculating ⁻54 ÷ 9 to be 6 (although these did often go on to pick up follow through marks, for example using the 6 they had obtained to correctly calculate 6 × ⁻5 to be ⁻30). A few candidates did not seem familiar with the concept of multiplication grids, resulting in incorrect and seemingly random attempts. Exemplar 1

Multiplication grid:

×	⁻5	9
⁻4	20	⁻36
⁻6	30	⁻54

					This candidate has correctly entered ⁻36 into the top right box and is given B1. The candidate incorrectly identifies the other factor of ⁻54 as 6, resulting in B0. However, the candidate correctly uses this to obtain ⁻30 as the result of *their* ⁻6 × ⁻5, resulting in a further B1. The candidate was given 2 marks in total.
		Total		**3**	
96			[0]3.02	2	**M1** for 12.08 ÷ 4 oe **Examiner's Comments** Many candidates realised that the calculation could be inversed and used a 'bus stop' method. Those that did this were often successful and given 2 marks, however a mark was given for just writing a correct division. The most common error seen was an answer of 3.2, occasionally even after a correct answer had been found in a division calculation.
		Total		**2**	
97	a		1 5 25	2	**B1** for 5 — Allow B1 for one correct factor pair and **B1** for 1 and 25 — Treat incorrect extra(s) as choice **Examiner's Comments** Many candidates gave the correct three answers. Some candidates listed '5' twice, which resulted in them then missing another factor (usually 1). Some candidates gave multiples of 25.
	b		49 or 64	1	

					If more than one both must be correct Not 7^2 or 8^2 **Examiner's Comments** Most candidates correctly identified one or both of the square numbers.
			Total	**3**	
98			6 with correct working	5	**M1** for 560 × 0.6 or 560 × 60 **M1** for 916 – 130 or 916 – *their* (560 × 0.6) **M1** for 916 – (130 + *their* (560 × 0.6)) **M1** for (916 – (130 + *their* (560 × 0.6))) ÷ 90	"Correct working" requires evidence of at least **M3** or **M1 M1 M1 M1** *Their* 560 × 0.6 may be 560 × 60 with an attempt to convert to pounds ÷90 may be repeated subtraction or addition
					<u>Trials</u> **M4** for 560 × 0.6 + 5 × 90 + 130 = 916 oe or **M3** for two trials of the form 560 × 0.6 + *n* × 90 + 130 oe seen and correctly evaluated where *n* ≥ 1, *n* ≠ 5	egs for <u>Trial and +90s</u> **M4** for 560 × 0.6 + 3 × 90 + 130 = 736 and 736 + 90 + 90 = 916 **M3** for 560 × 0.6 + 3 × 90 + 130 = 736 and 736 + 90 = 826
					or **M2** for one trial of the form 560 × 0.6 + *n* × 90 + 130 seen and correctly evaluated where *n* ≥ 1, *n* ≠ 5	**M2** for 560 × 0.6 + 3 × 90 + 130 = 736

					or **M1** for 560 × 0.6 [+…]	**M1** for 560 × 0.6 [+ …]

For trials and trials + 90s, accept correct rearrangements that have a target of 786, 580 or 450 rather than 916

If **0**, **1** or **2** scored, instead award **SC3** for answer 6 with no working or insufficient working

If **0** or **1** scored, instead award **SC2** for answer 5 with no working or insufficient working

If **0** scored, **SC1** for 450 with no working or insufficient working

Examiner's Comments

Assessment for learning

On a calculator paper, candidates should be encouraged to use their calculators for division,rather repeated division.

A significant number of candidates showed complete and well-presented correct methods, scoring all 5 marks. Some showed correct working, but omitted to add 1 at the end for the first day and gave an answer of 5, scoring 4 marks (as shown in the exemplar below). Others were successful using trials. Several candidates were given the first mark.

					Exemplar 1
		Total	**5**		
99			46 nfww	4	**M1** for 30 + 38 + 52 implied by 120 as total
					M1 for [0].85 × *their* 120 may be implied by 102
					Must see a calculation if not 102. "85% of" is not a calculation
					M1 for *their* 102 – (24 + 32)
					Examiner's Comments
					This question was answered reasonably well, with most candidates who reached the correct answer of 46 showing clear and well-organised methods. Candidates should be encouraged to use their calculator to work out percentages. Many candidates used non-calculator methods to calculate 85% of 120 that were often incomplete or contained errors. Several candidates found 46 from an incorrect method.
		Total	**4**		
100	a		$\sqrt{16} = 4$ or $4^2 = 16$ 2	M1 A1	Ignore other correct roots e.g. $\sqrt{9} = 3$ unless these used to reach answer.
				If 0 scored, **SC1** for answer 2 with	Must just be 2

						no or confused or insufficient working	

Examiner's Comments

Only the strongest candidates scored marks on this question.

For those that didn't make the connection that *b* was a square number, substitution of values for b from 8 to 17 should have been an achievable way forward, however few did this successfully.

A number of candidates got as far as $\sqrt{16} = 4$, but then concluded that 8 was the value of a. 4 was also a very common wrong answer.

Around 40% of candidates made no attempt to answer the question.

	b		It would not change oe	1	The square root symbol only gives the positive root, so no change oe

Examiner's Comments

Almost all answered this question incorrectly.

		Total	**3**	

101	a		20	2	**M1** for 125 ÷ 6.25 oe	May be 20 repeated subtraction or addition in a list Accept 6.25 × 20 for M1

Examiner's Comments

Many candidates did well on this question. The common error was 6.25 × 125.

						Very few candidates attempted non-calculator methods.
	b	1080		3	**B2** for figs 108 OR **M2** for 12 000 × (77 − 68) oe or **M1** for 12 000 × 77 or 12 000 × 68 or 77 − 68	May be in working or on answer line May be implied by figs 924 – figs 816 oe may be e.g. 12 000 × (0.77 – 0.68) or 12 000 × 0.09 Subtraction should be seen but may be implied by layout Condone subtraction written the wrong way around May be implied by figs 924... or figs 816 ... or 9

Examiner's Comments

Candidates generally answered this question well, although a number of errors were made. A common mistake was to use incorrect multiples of 10 to arrive at answers such as £10.80 or £108 000, which were awarded 2 marks.

Some candidates incorrectly divided 12 000 by 77 (and/or 68), misunderstanding the question. A very small number of candidates rounded 77 and 68, using 80 and 70 instead, which scored no marks.

		Total		**5**	
102		3		1	

Examiner's Comments
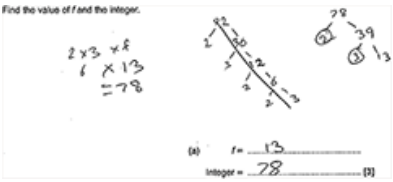
	b				This question was well answered. The common errors were to give the lowest common multiple (i.e. 18) or another multiple of 6 and 9 (such as 54).
			Total	**1**	
103	a		… 5 × 5 or 5^2	1	As last line on working lines **Examiner's Comments** Less able candidates did not do well on this question. A minority did not attempt the question. The common errors were 25, 2 × 2 × .... × 2 (sometimes listing 2 ten times), or 2 × 10, which suggests that candidates were unsure about prime factors.
	b		125	1	**Examiner's Comments** Candidates did better with this question and 125 was seen from around half of candidates. Common errors were 5, 25, $\sqrt{125}$ and 625.
			Total	**2**	
104	a		12	1	**Examiner's Comments** Many candidates were successfully able to apply BIDMAS to this calculation and arrive at 12 correctly. The most common incorrect answer given was 2, through calculating from left to right. Some candidates answered ⁻12, most often when logical working was not shown.
	b		2 + (7 − 3) × 8 = 34	1	Condone additional

						bracket(s) as long as mathematically correct.
						Examiner's Comments Many candidates were able to position the brackets correctly around the '7 − 3' (though often seen after an initial wrong attempt and then corrected). Working was often seen in the space provided below the question. The most common error seen was '2 + 7 − (3 × 8)', with the candidate showing how BIDMAS should be performed on the calculation given.
		Total		**2**		
105		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	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

					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 =] 350k or 2 × 5× 5 × 7	May be indicated by circling in a list must be identified Condone 1 in factor trees
					Examiner's Comments Although there were many correct answers, most candidates only listed the subsequent departure times of the trams (which was awarded B2 if they listed at least 3 times for each). Many did not go to the next step of identifying the common time. Most correct answers were from listing times, rather than finding the LCM and adding it on to 9:30 am. Some found the correct LCM of 350 minutes, but then interpreted this as 3 hours 50 minutes rather than 5 hours 50 minutes.	
		Total		**4**		
106			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

					Examiner's Comments Many candidates gave the correct answer. Several candidates ignored the context by using 16.6 or 17 complete packets of cookies rather than 16 complete packets, but often still scored 2 marks.
		Total		**3**	
107	a	8, 26 or 114		1	If more than one number all must be correct **Examiner's Comments** This was the most successful part of this question, with 8 being selected in the majority of responses. A few candidates gave all three correct values.
	b	49		1	 **Examiner's Comments** Many gave the correct answer, the common incorrect responses were 8 and 11 with a small number choosing square numbers that were not in the list.
	c	19		1	Do not accept 19 and 3 **Examiner's Comments** Many candidates gave the correct answer. However there was the usual confusion between factors and multiples with many giving 114 as their answer. A small number of candidates answered with a factor of 57 that was not in the list, such as 3, 1 or 57.
		Total		**3**	

108	a	13 and 78	3	**B2** for answer 13 or 78 in correct place	Accept 6 for (2 × 3) throughout e.g. 6 × 13 = 78 for 2 × 3 × 13 = 78
				or	

				M1 for one correct trial of 2 × 3 × prime	e.g. 2 × 3 × 5 = 30
					
					   2 × 3 × 7 = 42
					
					   2 × 3 × 11 = 66
					
					May be 2 × 3 × 13 = 78 if answer not 13 and 78

				or a correct factor tree for a number from 70 to 80	Includes 70 and 80
				or an integer from 70 to 80 ÷ (2 × 3)	Includes 70 and 80

Examiner's Comments

Most candidates attempted this question but only a small number gained 3 marks. Tree diagrams, products of primes and lists of factors were seen but there were few well organised solutions. Not many candidates started with 2 × 3 = 6 and then looked for a prime number such that 6 × prime number = value between 70 and 80. Trial and improvement was the favoured method, but this only occasionally produced the correct result.

⟳   **Assessment for learning**

Candidates should practise constructing

					efficient methods, using the evidence in the question, to answer this type of 'problem solving' question. Exemplar 2 This response shows clear working involving 2 × 3 = 6 and 6 × prime number (13) to produce a fully correct answer.
	b		49	2	**B1** for answer 7 │ Accept 7^2 for 2 marks **Examiner's Comments** Some candidates gained 2 marks here. Quite a number gained a mark for an answer of 7. Other incorrect answers included 7^3 and a common multiple of 98 and 147.
			Total	**5**	
109	a		(5 − 5) × 5	1	Condone extra brackets that do not invalidate answer e.g ((5 − 5) × 5) **Examiner's Comments** Responses to this question were often correct. A common error was (5 × 5) and some gave (5 − 5 ×).
	b		20 − 5(1 + 3) = 0	1	If more than one symbol in a space, mark the worst

						Examiner's Comments This question was not very well answered. The common incorrect answer was 20 ÷ 5(1 + 3) but signs appeared in many different combinations. Not many candidates showed working but a few did show lists of calculations with the symbols in different positions.
			Total		**2**	
110			A and 3.75 less than 4.32 oe or A and [0].57 saved oe or A and 3.75 and 4.32 seen in final statement OR A and 1.25 less than 1.44 oe or A and 0.19 oe saved or A and 1.25 and 1.44 seen in final statement		3	**Method 1** **M1** for 1.5 × 2.5 oe or 3.75 oe **M1** for *their* 1.44 × 3 or (3 × 1.6) × 0.9 oe or 4.32 oe **Method 2** **M2** for 1.5 × 2.5 ÷ 3 oe or 1.25 or **M1** for 1.5 × 2.5 oe or 3.75 **Examiner's Comments**	Ignore other figures/statements that don't invalidate answer All values may be seen in (a) oe may be 1.5 + 1.5 + 1.5 ÷ 2 Allow "A because it's cheaper" oe if 3.75 and 4.32 only seen as final costs in working space for (b) Allow "A because it's cheaper" oe if 1.25 and 1.44 only seen as final costs in working space for (b)

						Similar imprecise responses were seen in this part of the question. The best organised candidates correctly found the cost of three packets of biscuits from each supermarket. For this they earned M1M1. Candidates who said that 10% of £1.60 was the packet price in (a) (often, but not always, 0.16) were allowed M1 for correctly working out the price of three of these prices. Less well organised candidates did a lot of working in the answer space for (a) and very little in (b) then made general statements such as A; it is cheaper. Where the prices that were being compared could not be determined, only a maximum of M2 could be given. Most candidates did not write a conclusive statement at the end of their working that compared the price of three packets from each supermarket. The answer lines are given to prompt candidates to write a sensible comparison in this type of question.
		Total		**3**		
111		400 with correct working		6	**M1** for 2 × 1.15 + 3 × 0.70 **oe** or 2.3[0] + 2.1[0] **A1** for 4.4[0] AND **M1** for (7 – *their* 4.4[0]) **oe**	"Correct working" requires evidence of at least two M marks and one A mark Allow working in pence provided consistent units used 4.4[0] implies M1A1 Could be Implied by

						their 4.4[0] + *their* 2.6[0] + *their* 'change'
				A1 for 2.6[0]		[=7.0[0]]
				AND		
				M1 for *their* 2.6[0] ÷ 1.3[0] [× 200] **A1FT** for *their* 2.6[0] ÷ 1.3[0] rounded down × 200		Implied by list 1.3[0], 2.6[0], [3.9[0], ...] up to one less than *their* 2.6[0] or Embedded 2 × 1.3[0] = 2.6[0]
						Alternative Method: For first M1A1 M1A1
						M1 for 7 – 2 × 1.15 or 7 – 3 × 0.70
						A1 for 4.7[0] or 4.9[0]
						AND
						M1 for 7 – 2 × 1.15 – 3 × 0.70
				If **0** or **1** scored, instead award		or *their* 4.7[0] – 3 × 0.70
				SC2 for answer 400 with no or insufficient working		or *their* 4.9[0] – 2 × 1.15 A1 for 2.6[0]
				If **0** scored, instead award **SC1** for 2.6[0] with no or insufficient working		
				Examiner's Comments		
				Many candidates set out their working clearly, showing every step required to get to the correct answer, and many scored the full 6 marks. Some candidates did not		

provide a complete solution. As the question states 'You must show your working' it is essential to communicate each calculation required for each step, however simple they seem.

Errors seen included calculating the cost of 2 pineapples as £2.20 or working out 2 kg of banana. Some made errors subtracting £4.40 from £7 with the results £3.60 and £3.40 often seen. Many candidates avoided using division so £1.30 + £1.30 = £2.60 was commonly seen. Candidates who made an error in getting to their value of £2.60 were often able to gain follow through marks for finding their correct number of packets of strawberries and hence their correct weight. Some did not consider that strawberries were sold in 200g packs and incorrectly attempted to find an exact weight.

'**You must show your working**.'

A limited response in these questions can often be the difference between 2 or 3 marks and 6 marks. In Question 10, if 400g was seen with insufficient working the candidate scored 2 special case marks.

These types of questions are in every examination series, so candidates should be made aware that all workings must be shown.

Exemplar 1

In this response, the candidate has attempted to add pineapples and bananas, but they have only included one pineapple, so score M0A0. They proceed to subtract their total from £7 which scores M1. They

					then list multiples of £1.30 to find how many strawberries they could buy. This scores M1. The final answer of 500 is incorrect so this response scores a total of 2 marks. If the original answer of 400 had been given then a follow through A1 would have been scored.
		Total		**6**	
112			$2 × 2 × 3 × 3$ Or $2^2 × 3^2$	2	**B1** 2, 2, 3, 3 as answer **Or** **M1** for attempt at factor tree or ladder with 2 correct stages shown B1 could be seen as a correct complete tree/ladder **Examiner's Comments** Most successful candidates attempted a factor tree, and many were able to gain at least 1 mark. Fewladder methods were seen. Some completed the factor tree successfully but then stated the answer incorrectly as 2, 3 or listed all the factors with or without indices, e.g., 2, 2, 3, 3, or 2^2, 3^2. Some included an addition operator, $2^2 + 3^2$. It was common to see an error from a 6 × 6 factor tree of 3 × 3 and 3 × 3 instead of 2 × 3 and 2 × 3. Non scoring factor trees had errors in the first branch of 2 and 12 or 2 and 16. A common error was to list factor pairs for 36.
		Total		**2**	
113	a		−4	1	**Examiner's Comments** Answers seen were mainly correct. The most common incorrect responses were 4, 18 and −18.
	b		5	1	

					Examiner's Comments Many correct answers were seen, with the most common error being 20.
	c		$\frac{9}{10}$ oe fraction	1	| **Examiner's Comments** This part was less well answered, with a variety of fractions seen. A denominator of 15 was common.
		Total		**3**	
114	a	i	12, 14 or 16	1	If more than one all must be correct **Examiner's Comments** This was the most successfully answered part of the question and possibly of the paper. Almost all candidates could write down an even number between 11 and 17.
		ii	16 or 25	1	If more than one all must be correct **Examiner's Comments** 16 and 25 were seen in fairly equal numbers. There were no particularly common wrong answers. A small number of candidates gave answers of 4^2 or 5^2 without evaluation.
		iii	4	1	**Examiner's Comments** The term 'cube root' was not well understood. Giving the square root of 64 was much more common. 64^3 was

					evaluated and given as the answer by some candidates.
	b		17	1	**Examiner's Comments** The hint that '3 is a factor of 51' may have led to the high success rate in this question. A small number of candidates produced a factor tree comprising of 51, 3 and 17 but did not give an answer.
			Total	**4**	
115			54	3	**M2** for 36 ÷ 2 × 3 oe or 36 + 18 or **M1** for 36 ÷ 2 oe may be soi by 18 OR breakdown method **B2** for 36 associated with $\frac{2}{3}$ and 18 associated with $\frac{1}{3}$ or **B1** for 36 associated with $\frac{2}{3}$ or 18 associated with $\frac{1}{3}$ Allow 0.66… to imply 2/3 Do not accept e.g. 36 × $\frac{2}{3}$ May be shown e.g. on a bar model 36 associated with $\frac{2}{3}$ **and** 12 associated with $\frac{1}{3}$ scores 0 **Examiner's Comments** This question proved to be one of the least accessible on the paper. Few established that yellow made up two thirds of the tiles and equated 18 to 1/3. The most common response was a value of 12 (from 36 ÷ 3) followed by 36 + 12 = 48.
			Total	**3**	
116			62.5 or 62 $\frac{1}{2}$ or $\frac{125}{2}$	2	**B1** for 3906.25 or 3906 $\frac{1}{4}$ or $\frac{15625}{4}$

					Examiner's Comments A straightforward calculator question, with many candidates scoring 2 marks. As calculators automatically apply the correct order of operations the B1 mark (for 3906.25) was seldom awarded.	
		Total		**2**		
117		36		4	**M3** for (2 × 22 + 4 × 18) − 80 oe or **M2** for 2 × 22 + 4 × 18 may be implied by 44 + 72 or 116 or **M1** for 2 × 22 or 4 × 18 may be implied by 44 or 72 **Examiner's Comments** Most candidates set out their work clearly and gave the correct answer, scoring full marks. Those who were unable to reach the correct answer almost always scored 2 or 1 mark(s) for a partially correct method.	
		Total		**4**		
118		3		2	**M1** for (150 − 90) ÷ 20	Condone 150 − 90 ÷ 20 for **M1**
					Examiner's Comments Many candidates gave the correct answer. A small number did not use the function machine in reverse.	
		Total		**2**		
119	a	8		1	**Examiner's Comments** The majority of candidates had 8 as the cube number and scored the mark.	
	b	23 or 83		1		

121	a					Accept both but no extras **Examiner's Comments** Many correctly stated either 23 or 83. Some misread the question and tried to make a calculation using the digits which resulted in a prime number, e.g. 3 + 8 = 11.
		Total		**2**		
120		315		4	**B3** for answer 630 or 945 or 1260 or **M3** for 3 × 3 × 5 × 7 or 5 × 7 × 9 OR **M1** for [35 =] 5 and 7 **M1** for [45 =] 3 and 3 and 5 OR **M1** for 35, 70, 105, 140, (... 280, 315) **M1** for 45, 90, 135, 180, (... 270, 315)	Accept final answer 3.15 m for 4 marks. Ideally "cm" would be crossed out but BOD if not May be in factor tree Allow 9 and 5 Must have first 4 correct in each list **Examiner's Comments** This question was omitted by a significant number of candidates and, where an attempt was made, it was usually 35 × 45 with 35 + 45 regularly appearing. Very few attempted to find the LCM. The most successful method used was to list multiples of 35 and 45 to find the common value.
		Total		**4**		
121	a	One of, 1, 2, 3, 6, 9, 18		1		Accept more than one correct but no errors May be a product

						e.g. 2 × 9 but not 2 × 3^2 or an incorrect product e.g. 2 × 6 **Examiner's Comments** This was well answered, although some candidates wrote more than one factor. Occasionally a candidate gave an incorrect factor, together with one or more correct factors, and scored 0 marks. Some confused factor with multiple and gave 36 as an answer.
	b		16		1	Mark the answer line Accept 4^2 = 16 as answer but not 4^2 **Examiner's Comments** This was well answered, although 4^2 and 4 were common errors. Other non-square numbers also appeared and so did 25, possibly indicating that the question had not been read carefully.
	c		5 and 8		2	Mark final answer **M1** for a pair seen that either multiply to give 40 or add to give 13 For **M1**, accept non-integers and negatives Accept answers 8 × 5 and 8 + 5 **Examiner's Comments** Many good answers were seen and most candidates scored at least 1 mark. Answers meeting one condition such as 10 and 4 or 9 and 4 scored 1 mark
			Total		**4**	
122	a		Correct, labelled pie chart with correct working		6	**M2** for 360 − (160 + 60 + 20) oe or **M1** for 160 + 60 + 20 "correct working" requires at least **M1M1 and ruled line**

AND

M1 for $\frac{2}{5} \times$ *their* 120 oe
A1 for 48
or
M1 for $\frac{3}{5} \times$ *their* 120 oe
A1 for 72

AND

B1 for ruled line at 48°

B1 for *their* smaller sector labelled "bike" and larger sector labelled "car"

| |
If there are labelled angles, mark the method that leads to the angles
If angles are not shown mark worst method

May be implied by 120
May be implied by 240

Mark to the candidate's advantage
Their 120 < 360
48 implies M1A1

72 implies M1A1

Tolerance ± 2° only if correct working seen.

Examiner's Comments

This question was well attempted and often resulted in full marks. A small minority didn't label their sectors or labelled incorrectly. Occasionally the only mark lost was for drawing the line on the pie chart in the wrong place after 48° or 72° seen. Most used a ruler, but some freehand lines, losing this mark, were seen. Those not scoring full marks often gained M2 for finding the remaining 120°. The most common error after this was to divide 120 by 2 and 3, leading to 60° and 40°. Others only did 120 ÷ 2 = 60 then assumed the other angle was also 60°. These candidates didn't consider the unequal aspect of the ratio while some that did gave the two sectors as 70° and 50°. Arithmetic errors when calculating 240° and 120° were made by some, however many went on to gain a further method mark for the next step of finding ⅖ and ⅗ of their 120°. Others used the ratio to 'count up' to find angles that summed to 120, e.g. 2 : 3, 4 : 6, 40 : 60, etc. rather than dividing by 5. Working out appeared less well set out in this question with some methods scattered all over the page.

	b	Bus	1		**Examiner's Comments** Generally answered correctly, 160 was seen most commonly in place of a correct response. Train, the median rather than the mode, was sometimes seen and there were a few who did not attempt this part.
		Total	**7**		
123		225	4	**B1** for 20 [adults] and **M2** for 50 × 2.5 + (*their* 20) × 5 soi or **M1** for 50 × 2.5 or (*their* 20) × 5	For M2 and M1 *their* 20 must be an integer The addition may be implied by *their* answer May be implied by 125 May be implied by *their* 100 **Examiner's Comments** Most candidates attempted this question and many were able to score some method marks, even if their final answer was incorrect. Those who did not get the correct final answer and showed insufficient working often lost method marks. Many missed the cue to scale up the ratio and didn't realise they needed to work out how many adult tickets they needed before trying to calculate the cost. So, responses scored M2 for 2.50 × 50 + 5.00 × *n*, or just M1 for 2.50 × 50. A common approach was to use the ratio given and work out the cost of 5 children and 2 adults. Some who dealt with the ratio aspect successfully, struggled to multiply 2.50 by 50. Some attempted to split this into 2.50 × 5 then × 10 but without a calculator found this difficult. **Check the reasonableness of answers by use of estimation** Candidates would benefit from reinforcement of their understanding of place value in relation to such calculations. Some gave solutions with clearly incorrect

				magnitude. Candidates should therefore be encouraged to check their answers by estimation. Their final answer comes from adding £37.50 and £50.00. This scores M2 for 50 × 2.5 + (their 20) × 5. Although arithmetic errors have been made, their communication supports correct steps of working. They have clearly labelled the number of adult tickets so we can see where 5 × 10 comes from and they have stated 2.50 × 50 even though they incorrectly calculate this as £37.50. Finally, they show the addition of their child ticket total and their adult ticket total. A total of 2 scored.
		Total	**4**	
124	i	⁻1	1	
	ii	⁻6	1	**Examiner's Comments** The majority of candidates were able to answer part (a) (i) correctly, with the most common errors being an answer of 1 or 9. Some candidates drew a number line to help them complete the calculation. Part (a) (ii) was also correct for most. Where the mark was lost the negative sign in the question was ignored resulting in an answer of 6, or rarely ⁻1 where the calculation was treated as an addition.
	iii	$\frac{3}{7}$	1	
	iv	$\frac{3}{4}$	1	Accept [0].75 Accept an equivalent fraction but do not accept $\frac{1.5}{2}$

| | | | | | **Examiner's Comments**

The majority of candidates gained the mark in part (a) (iii). The most common misconception seen was candidates adding the numerators and denominators to get an answer of $\frac{3}{14}$. The correct equivalent fractions of $\frac{6}{14}$ and $\frac{21}{49}$ were

occasionally seen. Part (iv) of (a) candidates found most difficult. One method was to separate the mixed number and halve 1 then halve the ½, this generally led to the correct answer of ¾. Occasionally it led to incorrect answers such as $\frac{0.5}{4}$. A common incorrect answer of

1 implied that candidates mistook the word "of" for "off" so subtracted ½ from 1½. Those that recognised they needed to divide $\frac{3}{2}$ by 2 often left their answer in the incorrect form $\frac{1.5}{2}$. Few changed the question to $\frac{1}{2} \times \frac{3}{2}$ |
|---|---|---|---|---|---|
| | | **Total** | **4** | | |
| 125 | | $\frac{3}{8}$ | | 2 | **M1** for 12, 15, 18 chosen |

For M1 12, 15, 18 may be circled or underlined – intention that only these 3 numbers selected must be clear

Examiner's Comments

Part (a) was successfully answered by many candidates. Wrong representations of probability were evident with frequent errors of 1 : 8, 1 to 8, 1 in 8, 1 out of 8. Incorrect fractions included $\frac{1}{7}, \frac{1}{18}$ from

assuming all numbers from 1 to 18 were used and $\frac{2}{8}$ as a result of including both

11 and 12 for "less than 12". Some gave word answers such as "unlikely". Where candidates did not achieve full marks in part (b), M1 was often awarded either by writing

			out 12, 15, 18 in the part (b) answer space or clearly indicating that these were selected on the spinner, or in the list of numbers stated in the question. Those that answered with an incorrect representation of probability, or in words for part (a), generally gave answers in the same incorrect format in part (b).			
		Total	**2**			
126		5	2	**B1** for answer 2 or 3 or 5 with one or both other prime numbers.	e.g. B1 for 2 × 3 × 5	

Examiner's Comments

Many candidates seemed confident with factors and it was rare to see multiples. Prime numbers were also identified by a good proportion of candidates. The most common methods seen used either a factor tree or lists of the factors of 30. Although not all candidates chose 5 as the highest common factor, many gained 1 mark for selecting 2, 3 or all three of the prime factors. Common errors from listing factors of 30 were to choose 15 or 10 as the answer. A small minority misunderstood factor, and wrote the largest prime number under 30 although this error was sometimes compounded by the choice of 27. Some others wrote a factor pair as their answer such as 5 and 6 or 3 and 10.

		Total	**2**			
127	a	4 with correct working	3	**M1** for 210 − n where 40 ≤ n ≤ 50 soi by 160 to 170 **M1** for (their number of characters) ÷ 40 Alternative **M2** for two from [4 letters] 210 ÷ 5 [5 letters] 210 ÷ 6 [6 letters] 210 ÷ 7 or	Correct working requires at least M1 n represents an estimate of the number of spaces and/or punctuation, digits, symbols etc] Allow 40 × 5 = 200 for M1 Answer "4 to 5" or 5	

| | | | | M1 for one from
[4 letters] 210 ÷ 5
[5 letters] 210 ÷ 6
[6 letters] 210 ÷ 7

Alternative (trials):
M2 for two from
3 × 40 + [40 to 50]
4 × 40 + [40 to 50]
5 × 40 + [40 to 50]

or
M1 for one from
3 × 40 + [40 to 50]
or 4 × 40 + [40 to 50]
or 5 × 40 + [40 to 50]

OR
M1 for 210 ÷ 40
A1 for final answer of 5

If 0 scored and no/insufficient working SC1 for answer 4

Examiner's Comments

Candidates were more successful with part **(a)** than part **(b)**, but generally the question was not well answered.

⟳ **AfL**

Practise solving and discussing problem solving question, considering strategies and conclusions.

A number of candidates scored 2 marks in this part for dividing 210 by 40 and truncating the result to five letters, although some did not truncate and only scored 1 mark. Some tried forms of trial and improvement, but were rarely successful. Some multiplied 210 by 40. | with no working score 0 |
| | b | 72 [seconds]

$\frac{40}{60} \times their\ 72$ oe or $\frac{52}{their\ 72} \times 60$ oe | B1M1B1M1A1 | | |

			OR 1.2 oe 40 × *their* 1.2 oe or 52 ÷ *their* 1.2 **AND** 48 or 43.[3…] and short/shorter word length oe			oe may be $1\frac{12}{60}$ oe *their* 1.2 is not 1.12 Ignore non-contradictory statements but, "He may type faster" is incorrect and, if included, scores A0 **Examiner's Comments** In some conversions of time units were seen to score a mark. Some correct and creative solutions were seen, but these were very few in number. Some candidates just tried to write an explanation with no calculations to back it up.
			Total	**6**		
128			40 with correct working	5	**B1** for 2800 [cm] or [0].6[0] [m] **M1** for $\frac{\text{figs }28}{\text{figs }6}$ soi 46.6 to 46.7 or $46\frac{40}{60}$ oe **M1** for *their* 46.6… truncated soi 46 **M1** for figs 28 – *their* 46 × figs 6 If 0 scored with no/insufficient working **SC2** for answer 40 or **SC1** for answer 0.4 **Examiner's Comments** This problem solving question was attempted by most candidates and many scored some marks. Many however did not score the first B1 for converting from metres to centimetres or vice	If both seen and one incorrect award B0 Correct working requires all part marks soi At least 4 repeated additions or repeated subtraction May have indication of continuing 46 implies M2 B1 2800 – 2760 implies M3 B1 May be (*their* 46.6... – 46) × 60

					error was to think that there are 10 cm in 1 m and so 280 cm was a common error.
					(?) **Misconception**
					Some candidates though that there were 10 or 1000 cm in 1 metre.
					Most candidates scored a mark for dividing 28 m by 60 cm, in some form. It was regrettable to see many candidates attempt this division by repeated subtraction, even for candidates with 2800 cm or even 28000 cm; such inefficient methods lead to errors and wasted time. Some candidates found 46.66… in some form and truncated this to the nearest integer for a further mark.
		Total	**5**		
129		43	1		**Examiner's Comments** This was correctly answered by many, but 15 was a common incorrect response to this part, where the candidate did not close the bracket before typing '+ 29' in their calculator.
		Total	**1**		
130		49.50 with correct working	6	**B5** for figs 495 as final answer with at least the M2 mark OR **M1** for [10p =] 0.2 × 150 oe soi 30 **M1** for [20p =] 0.3 × 150 oe soi 45 and **M1** for (150 – *their* 30 – *their* 45) oe soi by 75 and **M2** for (*their* 30 × 10) and (*their* 45 × 20) and (*their* 75 × 50) oe or **M1** for one from (*their* 30 × 10) or (*their* 45 × 20) or	Ignore money notation Ignore money notation May be 150 ÷ 2 May work in £ Implied by 300, 900, 3750 or £3, £9, £37.5[0] If M1 only and SC2 available award SC2 only

					(*their* 75 × 50) oe	
					If 0 or 1 scored and no/insufficient working seen **SC2** for figs 495 as final answer	
					Examiner's Comments	
					This problem solving question was the first to demand a strategy. Many candidates did achieve the correct answer, but a sizeable minority did not.	
					◯ **AfL**	
					Many candidates did not annotate stages in the solution and organised their working poorly. Candidates should practice presenting solutions.	
					The best candidates showed working with annotation to indicate the coin denomination, the number of coins and the value, together with the total. Some candidates worked with percentages rather than numbers of coins and could not get a value. Many changed the fraction to a percentage before finding the number of 10p coins. Some found the number of 10p coins, subtracted the result from 150 and then found 30% of the result. A few candidates gave decimal numbers of coins, clearly not taking into account the context. Some candidates attached '£' to their numbers of coins.	
		Total		**6**		
131	a	18 07 [pm] or 6 07 pm		4	**B3** for 18 07 am or 6 07 [am] OR **B2** for listing the next three correct times of both fountains, i.e. 15 43, 16 07, 16 31 and 16 01, 16 43, 17 25 OR	Condone use of 12 hour clock e.g. [0]3 43 and 3 43 am for **B1** and **B2** *their* time must be over 60

				B1 for listing the next three correct times of one fountain, i.e. 15 43, 16 07, 16 31 or 16 01, 16 43, 17 25. <u>Alternative method</u> **B3** for 2[h] 48[m] OR **B2** for [LCM=] 168 OR **B1** for listing the next three multiples of 24 and 42, i.e. 48, 72, 96 and 84, 126, 168 OR **M1** for [24 =] 2 × 2 × 2 × 3 or [42 =] 2 × 3 × 7 allow in a factor tree or table or [LCM=] 168k (k ≠ 1) and **M1** for correctly converting *their* time(mins) to hours and mins **Examiner's Comments** It was rare to see candidates find the LCM in this part, but several gave the correct answer from listing times. Many who attempted this question and did not reach 1807 scored 1 or 2 marks for listing times.	
	b		[size] 15 [number] 11	4	**B3** for 15 and 11 OR **B2** for [HCF or group size =] 15 or **M2** for [60] = 2× 2 × 3 × 5 and [105] = 3 × 5 × 7 or for listing complete	accept any correct method [60] 1,2,3,4,5,6,10,12,15,20,30,60 [105] 1,3,5,7,15,21,35,105

						factors of both numbers allow in a factor tree or table OR **M1** for one of 2 × 2 × 3 × 5 or 3 × 5 × 7 allow in a factor tree or table or for common factors 3 or 5 AND **B1** for [size] 3 [number] 55 or [size] 5 [number] 33
			Total		**8**	
132	a		Any odd number		1	If more than one, all must be correct
	b		Any square number		1	If more than one, all must be correct Do not accept k^2 **Examiner's Comments** Many students gave 2 as a square number.
	c		31 or 37		1	If more than one, both must be correct **Examiner's Comments** Some students gave a prime number that was not between 31 and 40.
	d		Any multiple of 8		1	

						If more than one, all must be correct
			Total	4		
133			17	2	**B1** for 289 or 17^2 or **M1** for $\sqrt{295-6}$	Accept -17
			Total	2		
134	a		[No,] answer is not in index form **oe**	1	**Examiner's Comments** In this part most stated that Reece was correct because the numbers multiplied to 20. It was common to see a factor tree, but most ignored the part that stated the answer had to be in index form.	Accept it should be $2^2 \times 5$ but do not isw if with an incorrect statement
	b		72	3	**B1** for $[\sqrt{81} =] 9$ **B1** for $[2^3$ **oe** $=] 8$ **Examiner's Comments** A wide range of responses were given, including some candidates stating 3 even though many of these went on to correctly identify 2^3 as 8 in this part. This last part was far more successful. Candidates seemed solidly prepared on squares, cubes and roots. Where candidates didn't achieve full marks a very large proportion gained at least 1 mark for either $\sqrt{81} = 9$ or, more commonly, 23 = 8. A common error was 81 × 8 = 648, which did gain 1 mark. Some candidates made a computational error when attempting 9 × 2 × 2 × 2, if they hadn't calculated 2^3 as 8 separately.	For 3 marks condone ±72 or −72 For B1 condone ±9 or −9
			Total	4		
135	a		3	1		

						Examiner's Comments This part was usually correct, with the common incorrect answer being ⁻17.
	b		⁻8		1	| **Examiner's Comments** This part also very well answered, with only occasionally the wrong sign or ⁻6 seen.
		Total			**2**	
136	a		12		1	| **Examiner's Comments** This was generally answered correctly. The most common error in this part was 10, from candidates just working from left to right disregarding BIDMAS.
	b		$(5 \times 7 + 1) \div 9 = 4$		1	| **Examiner's Comments** Successful candidates in this part often made a number of attempts before settling on the correct solution. The majority only considered a pair of numbers to bracket rather than the triple that was required for the question.
		Total			**2**	
137			72 with correct working		5	**M3** for $500 - 4 \times 60 - 44$ **oe** or **M2** for $500 - 4 \times 60$ **oe** or for $4 \times 60 + 44$ **oe** or **M1** for 4×60 or for $500 - 44$ or $5[.00] - [0].44$ **M1** for *their* $216 \div 3$ | "Correct working" requires evidence of at least **M2** [216] [260] [284] [240] [456] or [4.56]

					If 0 scored **SC2** for answer 72 or **SC1** for 216 with no working

Examiner's Comments

Given that this was a large-mark problem-solving question, there was a lot of accurate work seen with many candidates scoring 4 or 5 marks. The basis of this question involved the four operations (predominantly subtraction and division), though it was evident that many candidates were lacking confidence in using standard written strategies to perform these calculations, particularly in division. Instead, candidates often opted for trial and improvement methods, coupled with repeated addition. They were still able to score reasonably well as the method marks allowed for arithmetic errors, so as long as they clearly showed what they were trying to do they didn't lose method marks. However, many struggled to correctly subtract and divide relatively simple numbers.

◯   **AfL**

Candidates need to be reminded of the importance of looking at the given units and ensuring their final answer is appropriate. In this question several candidates lost a mark for giving 0.72 as a final answer.

		Total		**5**	