1(a)	Label (horizontal) x axis (eg number of users) and/or (vertical) y axis (eg year) or label axis Correctly place the year before the number of users (eg year 2004-2007) Use key to indicate (eg for the 'm' or indicate what 'm' is or use ' '000 000s) or make it clear what 'm' stands for Bar should be drawn in proportion or accept similar explanation or add a scale on the axis Improve title/make it clear what the numbers represent eg what part of the year	E2	E1 for each valid improvement Ignore any additional but incorrect suggestions SC1 (two errors identified but no suggestions for improvement made) oe for all

1(a)	**Additional Guidance**
	E0 for suggesting other form of graphs eg line graph, vertical bar chart etc

1(b)	**Alt 1**		
	900 + 40 or 940	M1	
	(40 ÷ 940) × 350	M1	Award M1 for using stratified sampling
	14 or 15	A1	
	Says that the data doesn't support the claim or They should have selected 14 or 15 users not 25 or The number of Instagram users selected in the survey is too large	E1	Dep on second M1
1(b)			

Alt 2

900 + 40 or 940	M1	
$\frac{25}{350}$ or $\frac{40}{940}$ or 0.07(14…) or 0.04(26…) or 7.(14…) % or 4.(26…)%	M1	Award M1 for using proportionality
'not equal' or 'not similar' or 'disproportionate' eg: $\frac{25}{350} \neq \frac{40}{940}$ or 0.0714 ≠ 0.0426 or 7.14% ≠ 4.26%	A1	Award A1 for comparing both fractions/decimals/% and concluding that they are not equal/disproportionate ft their '940' ≠ can be implied
Says that the data doesn't support the claim (must have compared two figures before concluding)	E1	Dep on second M1

Alt 3

350 – 25 or 325 or 900 + 40 or 940	M1	
Using ratios $\frac{325}{25}$ or $\frac{900}{40}$ or 13 or 22.5 or $\frac{325}{350}$ or $\frac{900}{940}$ or 0.92(85…) or 0.95(74…)	M1	

	‘not equal’ or ‘not similar’ or ‘disproportionate’ $\frac{325}{25} \neq \frac{900}{40}$ or $13 \neq 22.5$ or $\frac{325}{350} \neq \frac{900}{940}$ or $0.92(85\ldots) \neq 0.95(74\ldots)$	A1	Award A1 for comparing both fractions/decimals/ratios and concluding that they are not equal/disproportionate ft their ‘940’ ≠ can be implied
	Says that the data doesn’t support the claim (must have compared two figures before concluding)	E1	Dep on second M1

1(d)	**Additional Guidance**
	For A1, must compare two fractions with same denominator or two decimals or percentages
	Pairs of fractions can be inverted
	Candidates may attempt to work out the actual numbers and compare. Eg $\frac{25}{350}$ x 940 or 67.(…) or $\frac{25}{325}$ x 900 or 69.(…) scores M1M1A1 Note: 350 must be paired with 940 or 325 must be paired with 900 to score A1 Incorrect pairing can score M1M1A0E1

Question	Solution	Marks	Comments
2(a)(i)	$\overline{d} = 8.33$	**B1**	
(ii)	$\text{sd} = 0.345$ (population) OR 0.356 (sample)	**B2**	$\sqrt{\left(\frac{1182.556.....}{17} - 8.33...^2\right)}$ M1 =0345……A1
(b)	140.2 or 0.1402 seen	**B1**	
	$\frac{8.90}{140.2} \times 100$	**M1**	
	$= 6.348$	**A1**	accept 6.35
(c)	men jump further than women on average	**E1**	
	men have smaller std. dev – hence are more consistent	**E1**	
(d)(i)	$Q_1 = 6.545$, $Q_3 = 7.095$	**B1**	Either Q_1 or Q_3 correct
	$Q_3 - Q_1 =$ 0.55	**M1** **A1**	Subtract their Q_1 and Q_3
(ii)	Advantage: Not swayed by extreme	**E1**	

	values Disadvantage: Half the data plays no part in measuring IQR (does not use all of the data)	**E1**	
	Total	**13**	

Question	Solution	Marks	Comments
3(a)	Continuous	**B1**	Any indication
3(b)	Discrete	**B1**	Any indication
3(c)	Qualitative	**B1**	Any indication
	Total	**3**	

Question 4

	Starting value (£)	Interest (£)	Final value (£)
First 3 months	2500.00	14.50	2514.50
Second 3 months	2514.50	14.58	2529.08
Third 3 months	2529.08	14.67	2543.75
Fourth 3 months	2543.75	14.75	2558.50

	Solution	Marks	Comments
(a)	Third 3 months £ $2529.08 \times \frac{0.58}{100}$	**M1**	Accept 14.67
	Final value is £ 2543.75	**A1**	
	Fourth 3 months £ $2543.75 \times \frac{0.58}{100}$	**M1**	Accept 14.75
	Final value is £ 2558.50	**A1**	SC3 for £ 2558.49 or .51
(b)	=B4*1.0058 OR =B4+C4	**B1**	Could use 0.58% or 0.58/100
(c)	$A = 2500(1 + 0.0058)^4$	**B1**	Any acceptable formula.
(d)	AER is $\frac{58.50}{2500} \times 100$	**M1**	
	= 2.34 %	**A1**	
	Total	**8**	

5(a)	Makes an assumption about number of hours the store is open per week For example Mon–Sat 6am to 10pm and Sunday 10am to 4pm gives 100 hours	B1	Realistic estimate would be 80 -120 but 24 hour supermarkets would have larger total
	Makes an assumption about the average amount spent per customer eg £60	B1	Allow £50 - £100
	23500 ÷ their number of hours the shop opens per week eg 23500 ÷ 100 = 235	M1	Calculate the average number of customers per hour
	their customers per hour × their average spend per customer eg 235 × 60	M1	
	Accurate answer for their values eg 14000	A1	Must be rounded at least to the nearest pound Can be rounded further

5(b)	Gives a valid evaluation eg if the shop was open for more hours the estimate would be too high eg if my assumption about the average spend was higher then my final estimate would be too low	B1	oe

Question 6

$2000 = \frac{A}{1.15} + \frac{A}{1.15^2}$	M1
$2000 \approx 1.626A$	M1 A1
£$A \approx$ £1230	A1

7	**Alternative method 1**		
	Makes an assumption for average number of people in 3 or 4 bedroom homes eg 3 or 4 bedroom family homes average 4 people per home or Makes an assumption for average number of people in 1 or 2 bedroom homes eg 1 or 2 bedroom homes average 2 people per home	B1	
	Uses [134,191] (cubic metres) for the family homes	B1	
	Uses [54,134] (cubic metres) for the 1 or 2 bedroom homes	B1	
	240 × their usage for 3 or 4 bed homes eg 240 × 164 or 39 360 or approx. 39 000	M1	Allow any rounded or unrounded answer eg 240 × 164 is approx. 40 000 or 39 500
	80 × their usage for 1 or 2 bed homes eg 80 × 101 or 8080 or approx.8000	M1	Allow any rounded or unrounded answer
	30 × 54 or 1620 or approx. 1600	M1	water usage for retirement flats must use 54 for annual use or per day [145, 150] litres or [0.14, 0.15] cubic metres Allow rounding to 1 or 2 sf
	their 40 000 + their 1600 + their 9000	M1	sum of their 3 rounded or unrounded answers
	Correct answer for their values	A1	All method marks must be scored
	their answer ÷ 365 (×1000) or their answer ÷ 52 ÷ 7 (×1000)	M1	Condone ÷ 12 ÷ 31
	Correct division of their total per year to give value per day and conversion to litres	A1	Must convert to litres Penalise decimal answers

7	**Alternative method 2-working on daily values**

	Makes an assumption for average number of people in 3 or 4 bedroom homes eg 3 or 4 bedroom family homes average 4 people per home or Makes an assumption for average number of people in 1 or 2 bedroom homes eg 1 or 2 bedroom homes average 2 people per home	B1	
	Any water usage ÷ 365 (×1000)	B1	Implied by figures within the ranges of the values used for each size of home
	For the 3-4 bed homes, uses [360, 530] litres or [0.36, 0.53] cubic metres	B1	
	For the 1 or 2 bedroom homes, uses [145, 360] litres or [0.145, 0.36]	B1	
	240 × their usage for 3 or 4 bed homes eg 240 × 450 or 108 000 or approx. 110 000	M1	Allow any rounded or unrounded answer Allow rounding to 1 or 2 sf
	80 × their usage for 1 or 2 bed homes eg 80 × 367 or 29 360 or approx. 29 000	M1	Allow any rounded or unrounded answer eg 80 × 0.367 = 29.36 or 29.4 or 29 or 30 Allow rounding to 1 or 2 sf
	30 × 148 or 4440 or approx. 4500 or 30 × 0.148 or 4.44 or approx. 4.5	M1	Water usage for retirement flats per day [145,150] litres or [0.14,0.15] cubic metres Allow rounding to 1 or 2 sf
	their 110 000 + their 29000 + their 4500	M1	Sum of their 3 rounded or unrounded answers
	Correct answer for their values (in litres or cubic metres)	A1	All method marks must be scored
	Answer given with correct evaluations of division by 365 (changing to per day) seen earlier	A1	Penalise decimal answers

	Additional Guidance
	All values can be rounded at any point.

	Example for final mark 138000 given as their answer (first A mark)is incorrect A0 In their working they divided their water usages correctly by 365 Their answer is in litres and no decimals so final A1 is awarded (Note the M1 for dividing water usage by 365 is for one seen-whereas the A1ft is for dividing all water usages accurately)