

- 15 (a)** A random sample of eight cars was selected from the Large Data Set.
The masses of these cars, in kilograms, were as follows.
- 950 989 1247 1415 1506 1680 1833 2040
- It is given that, for the population of cars in the Large Data Set:
- lower quartile = 1167
- median = 1393
- upper quartile = 1570
- 15 (a) (i)** It was decided to remove any of the masses which fall outside the following interval.

$$\text{median} - 1.5 \times \text{interquartile range} \leq \text{mass} \leq \text{median} + 1.5 \times \text{interquartile range}$$
 Show that only one of the eight masses in the sample should be removed. **[3 marks]**
- 15 (a) (ii)** Write down the statistical name for the mass that should be removed in part (a)(i). **[1 mark]**
- 15 (b)** The table shows the probability distribution of the number of previous owners, N , for a sample of cars taken from the Large Data Set.
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|------------|------|------|------|------|------|------|-----------|
| n | 0 | 1 | 2 | 3 | 4 | 5 | 6 or more |
| $P(N = n)$ | 0.14 | 0.37 | 0.9k | 0.25 | 0.4k | 1.7k | 0 |
- Find the value of $P(1 \leq N < 5)$ **[4 marks]**
- 15 (c)** An expert team is investigating whether there have been any changes in CO₂ emissions from all cars taken from the Large Data Set.
- The team decided to collect a quota sample of 200 cars to reflect the different years and the different makes of cars in the Large Data Set.
- 15 (c) (i)** Using your knowledge of the Large Data Set, explain how the team can collect this sample. **[2 marks]**
- 15 (c) (ii)** Describe **one disadvantage** of quota sampling. **[1 mark]**