

Name:

Result:

1.

(6 points)

Health inspectors investigate the dental hygiene of school children. One point of interest was the number of dental fillings. They've collected data from one school by asking every 20th student on the list of all the students.

(a) Identify the sampling method used. [1]

The results are shown in the table below:

Number of fillings	0	1	2	3	4	5
Frequency	4	3	8	q	4	1

(b) Determine if the data is **discrete** or **continuous**. [1]

The mean number of fillings in this group is 2.2.

(c) Calculate the value of q . [2]

(d) For the sampled group, find: [2]

(i) the median number of fillings,

(ii) percentage of students who have at least one filling.

(a) Systematic sampling.

(b) Discrete.

(c)

$$\frac{3 + 16 + 3q + 16 + 5}{4 + 3 + 8 + q + 4 + 1} = 2.2$$

so we get that $\frac{40 + 3q}{20 + q} = 2.2$, so $40 + 3q = 44 + 2.2q$ and this gives $0.8q = 4$, so finally $q = 5$.

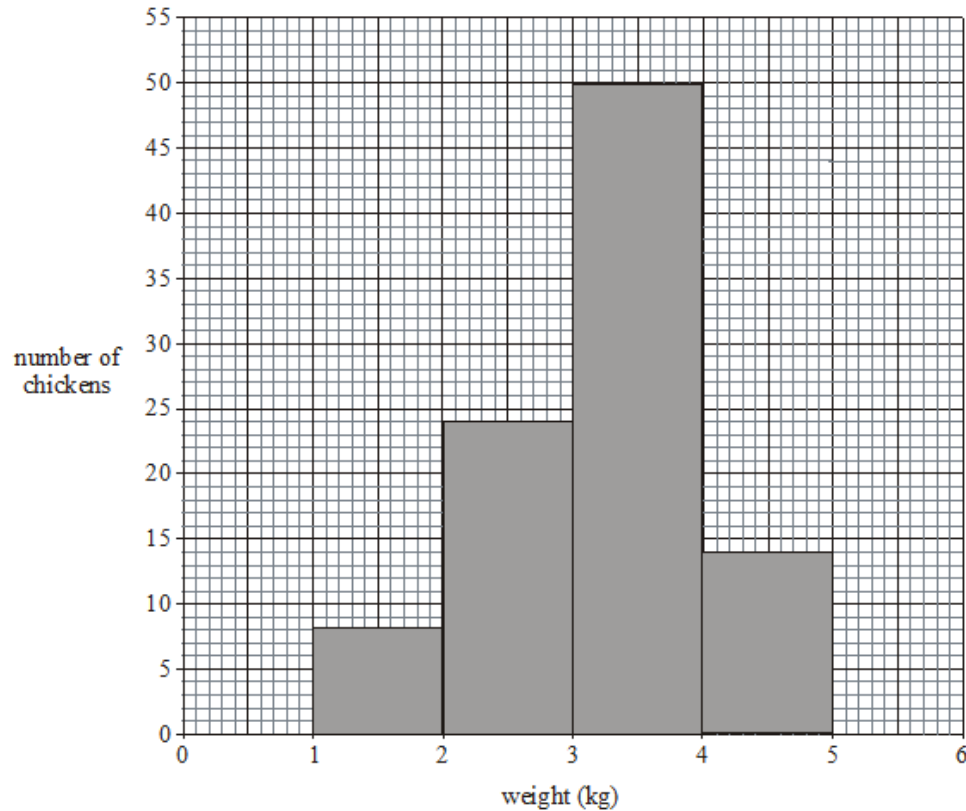
(d) (i) 25 students have been surveyed, so the median is the 13th value, which is 2.

(ii) 21 students have at least one filling, which is $\frac{21}{25} \cdot 100\% = 84\%$.

2.

(4 points)

The following histogram shows the weights of a number of frozen chickens in a supermarket. The weights are grouped such that $1 \leq \text{weight} < 2$, $2 \leq \text{weight} < 3$ and so on.



(a) Write down [2]

(i) the total number of chickens,

(ii) the modal weight group.

(b) Estimate the mean weight of frozen chickens in the supermarket. [2]

(a) (i) total number of chickens = $8 + 24 + 50 + 14 = 96$.

(ii) modal weight group $3 \leq \text{weight} < 4$.

(b) We use the mid-value for each interval, so 1.5, 2.5, 3.5 and 4.5 and then we can use the GDC or:

$$\text{mean} = \frac{8 \cdot 1.5 + 24 \cdot 2.5 + 50 \cdot 3.5 + 14 \cdot 4.5}{96} \approx 3.23$$