Worked answers | Statistics

A complete small investigation and report

6 questions | 12 marks

Equivalent correct methods earn the corresponding marks.

1. Check the total frequency in the loans table. [2 marks]

Fictional teaching data: books borrowed in one fortnight

Books borrowed	Frequency
4	1
5	2
6	3
7	2
8	2
9	1
13	1

$1+2+3+2+2+1+1=12$.

Answer: 12 students.

2. Use the loans table to calculate the total number of loans. [2 marks]

Fictional teaching data: books borrowed in one fortnight

Books borrowed	Frequency
4	1
5	2
6	3
7	2
8	2
9	1
13	1

$4\times1+5\times2+6\times3+7\times2+8\times2+9\times1+13\times1=84.$

Answer: 84 books.

3. Find the mean loans per student. [2 marks]

Fictional teaching data: books borrowed in one fortnight

Books borrowed	Frequency
4	1
5	2
6	3
7	2
8	2
9	1
13	1

$84\ \text{loans}\div12\ \text{students}=7.$

Answer: 7 books.

4. Why can the median be 6.5 books when counts are whole numbers? [2 marks]

Fictional teaching data: books borrowed in one fortnight

Books borrowed	Frequency
4	1
5	2
6	3
7	2
8	2
9	1
13	1

$(6+7)\div 2=6.5$.

A summary need not be an observed count.

Answer: For 12 observations, the median is the average of the sixth and seventh values, 6 and 7.

5. The record of 13 loans is confirmed correct. Should it be removed because it is higher than the others? Explain. [2 marks]

It is a genuine observation belonging to the question.

Keep it and describe its influence.

Answer: No.

6. Suggest an improvement if the question becomes “How much do students across the whole year borrow during a term?” [2 marks]

Match the collection period and group to the new question.

A fortnight and twelve selected students do not establish the broader pattern.

Answer: Use the whole term and a suitably selected larger group across the year, with the same loan definition.