Data representation

2022-FM-52-3

3 At a summer camp an arithmetic test is taken by 250 children. The times taken, to the nearest minute, to complete the test were recorded. The results are summarised in the table.

Time taken, in minutes	1 – 30	31 – 45	46 – 65	66 – 75	76 – 100
Frequency	21	30	68	86	45

(a) Draw a histogram to represent this information. [4]

(b) State which class interval contains the median. [1]

(c) Given that an estimate of the mean time is 61.05 minutes, state what feature of the distribution accounts for the median and the mean being different. [1]

2023-FM-52-1

1 Each year the total number of hours, x, of sunshine in Kintoo is recorded during the month of June. The results for the last 60 years are summarised in the table.

x	$30 \leqslant x < 60$	$60 \leqslant x < 90$	$90 \leqslant x < 110$	$110 \leqslant x < 140$	$140 \leqslant x < 180$	$180 \leqslant x \leqslant 240$
Number of years	4	8	14	25	7	2

(a) Draw a cumulative frequency graph to illustrate the data. [3]

(b) Use your graph to estimate the 70th percentile of the data. [2]

(c) Calculate an estimate for the mean number of hours of sunshine in Kintoo during June over the last 60 years. [3]

2022-MJ-51-3

3 The times taken to travel to college by 2500 students are summarised in the table.

Time taken (t minutes)	$0 \leqslant t < 20$	$20 \leqslant t < 30$	$30 \leqslant t < 40$	$40 \leqslant t < 60$	$60 \leqslant t < 90$
Frequency	440	720	920	300	120

(a) Draw a histogram to represent this information. [4]

From the data, the estimate of the mean value of t is 31.44.

(b) Calculate an estimate of the standard deviation of the times taken to travel to college. [3]

(c) In which class interval does the upper quartile lie? [1]

It was later discovered that the times taken to travel to college by two students were incorrectly recorded. One student's time was recorded as 15 instead of 5 and the other's time was recorded as 65 instead of 75.

(d) Without doing any further calculations, state with a reason whether the estimate of the standard deviation in part **(b)** would be increased, decreased or stay the same. [1]

2023-MJ-51-1,5

1 A summary of 50 values of x gives

$$\Sigma(x-q) = 700, \qquad \Sigma(x-q)^2 = 14\,235,$$

where q is a constant.

(a) Find the standard deviation of these values of x. [2]

(b) Given that $\Sigma x = 2865$, find the value of q. [2]

5 The populations of 150 villages in the UK, to the nearest hundred, are summarised in the table.

Population	100 – 800	900 – 1200	1300 – 2000	2100 – 3200	3300 – 4800
Number of villages	8	12	50	48	32

(a) Draw a histogram to represent this information. [4]

(b) Write down the class interval which contains the median for this information. [1]

(c) Find the greatest possible value of the interquartile range for the populations of the 150 villages. [2]