

Answer on Question #73383 – Math – Statistics and Probability

1. The following data are the measures of the diameters of 36 rivet heads in millimetres.
170.69 171.96 173.23 170.18 172.21 170.18 168.15 171.45 169.16
169.16 168.66 171.70 170.94 172.72 170.69 171.70 171.70 169.67
169.16 168.15 170.69 171.70 170.18 172.21 171.70 169.42 170.18
170.69 171.20 172.97 172.47 170.21 169.16 171.70 171.70 170.69

Question

- (i) Complete the table below.

Solution

Diameters	Midpoint Frequency	Cumulative Frequency
$168.15 \leq x < 168.90$	3/36	3/36
$168.90 \leq x < 169.65$	5/36	8/36
$169.65 \leq x < 170.40$	6/36	14/36
$170.40 \leq x < 171.15$	6/36	20/36
$171.15 \leq x < 171.90$	9/36	29/36
$171.90 \leq x < 172.65$	4/36	33/36
$172.65 \leq x < 173.40$	3/36	1

Question

- (ii) Based on the answer in (i), find the mean, median and mode. Then identify the shape of the data and state your reason.

Solution

The median is the value separating the higher half of a data sample from the lower half. The mean is the sum of a collection of numbers divided by the number of numbers in the collection.

The mode of a set of data values is the value that appears most often.

$$\text{Mean} = 170.7869$$

$$\text{Median} = 170.69$$

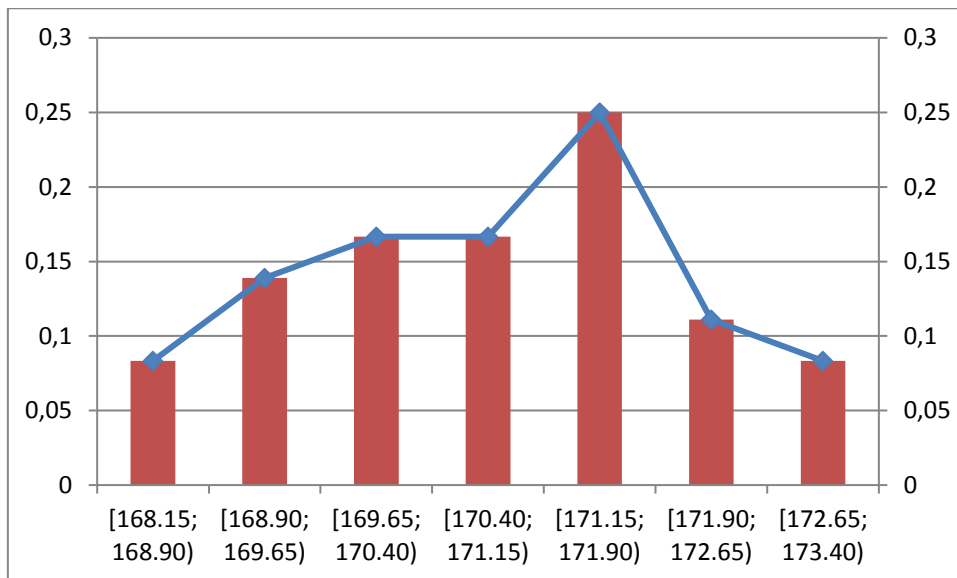
$$\text{Mode} = 171.7$$

The frequency distribution is somewhat asymmetric, because the mode is greater than the mean and the median

Question

- (iii) Based on the answer in (i), construct a histogram and a frequency polygon of the measurement of the diameter of rivet heads on a same graph paper and axes. Then identify the shape of the histogram.

Solution



Question

(iv) Is the shape of distribution determined in (ii) can be supported by the shape of the histogram? State your reason.

Solution

The appearance of the histogram confirms the preliminary conclusion that the frequency distribution is asymmetric (positive skewness): we have 7 intervals of values, the mod and the median are in the fourth interval, and the mod in the fifth.