

VII. Label this chart. Calculate the following sample statistics being sure to state the symbol and formula for each measure. Formulas are given on page 39. This problem is only for people not using statistics software.

Stated Class Limits	Frequency (f)	x	fx	x ²	fx ²
40 - 49	1	44.5	44.5	1,980.25	1,980.25
50 - 59	2	54.5	109.0	2,970.25	5,940.50
60 - 69	3	64.5	193.5	4,160.25	12,480.75
70 - 79	5	74.5	372.5	5,550.25	27,751.25
80 - 89	5	84.5	422.5	7,140.25	35,701.25
90 - 99	2	94.5	189.0	8,930.25	17,860.50
Totals	18	417.0	1,331.0	30,731.50	101,714.50

A. Standard deviation

$$S = \sqrt{\frac{\sum fx^2 - \frac{(\sum fx)^2}{n}}{n-1}} = \sqrt{\frac{101,714.50 - \frac{(1,331)^2}{18}}{18-1}} = \sqrt{\frac{101,714.50 - 98,420.06}{17}} = \sqrt{193.8} = 13.9$$

B. Variance

$$S^2 = (S)^2 = \sqrt{193.8}^2 = 193.8$$

C. Median

$$\frac{n}{2} = \frac{18}{2} = 9$$

$$\begin{aligned} L + \frac{\frac{n}{2} - CF_b}{f}(i) \\ = 69.5 + \frac{\frac{18}{2} - 6}{5}(10) \\ = 69.5 + \frac{3}{5}(10) \\ = 75.5 \end{aligned}$$

D. 85th percentile

$$\frac{xn}{100} = \frac{85(18)}{100} = 15.3$$

$$\begin{aligned} P_x = L + \frac{\frac{xn}{100} - CF_b}{f}(i) \\ P_{85} = 79.5 + \frac{\frac{85(18)}{100} - 11}{5}(10) \\ = 79.5 + \frac{4.3}{5}(10) \\ = 88.1 \end{aligned}$$