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Problem from Standard Deviation

The Size of fishes, ~~Anna~~ Calarius batra-cus was recorded as 23, 22, 20, 24, 16, 17, 18, 19 and 21 cm Find out the Standard deviation(σ) by Indirect & Direct methods.

Ans: **INDIRECT METHOD** →

On the basis of above data mean is calculated

Here $\Sigma x = 180$ and Number of observation i.e. $N = 9$

$$\text{Mean} = \frac{180}{9} = 20$$

Now four column table is prepared.

Observation	Observation Mean $x - \bar{x}$	Deviation	Deviation
16	16-20	−4	16
17	17-20	−3	9
18	18-20	−2	4
19	19-20	−1	1
20	20-20	0	0
21	21-20	+1	1
22	22-20	+2	4
23	23-20	+3	9
24	24-20	+4	16
			$\Sigma x^2 = 60$

NOW $$\sigma = \sqrt{\frac{\Sigma x^2}{N-1}}$$

$$\sigma = \sqrt{\frac{60}{9-1}}$$

$$= \sqrt{\frac{60}{8}}$$

$$= \sqrt{7.5}$$

$$= 2.75 \text{ cm Ans}$$

DIRECT METHOD

For direct method use the formula

$$\sigma = \sqrt{\frac{\Sigma x'^2 - \frac{(\Sigma x')^2}{N}}{N}}$$

Put the data & Solved it.

Q2. Solved it:

Haemoglobin percent g/100ml of Rana tigerina was recorded as 14, 13, 12, 10, 11, 8, 7, 15, Calculate the Standard deviation by indirect method.

Note: Such type of question will ask in both theory & Practical Exam.