

Q1 In an exp with 15 observations, the following results are available $\sum x^2 = 2830$, $\sum x = 170$.

One obs. that was 20 found to be wrong and replaced by correct value 30. The correct variance is?

$$\begin{aligned}\sum x_{\text{corrected}} &= 170 + 30 - 20 \\ &= 180\end{aligned}$$

$$\begin{aligned}\sum x^2_{\text{corrected}} &= 2830 - 400 + 900 \\ &= 3330\end{aligned}$$

$$\begin{aligned}\therefore \sigma^2_{\text{corrected}} &= \frac{3330}{15} - \left(\frac{180}{15}\right)^2 \\ &= 222 - 144 \\ &= 78.0\end{aligned}$$

Formulae

$$\sigma^2 = \frac{\sum x_i^2}{\sum b_i} - \left(\frac{\sum b_i x_i}{\sum b_i}\right)^2$$

[Difficulty \rightarrow Medium as per Jee Mains]
