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Measures of Central Tendency Formulas

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List of 11 Measures of Central Tendency Formulas

Measures of Central Tendency

Mean

1) Combined Mean of Multiple Data

$$fx \quad \mu_{\text{Combined}} = \frac{(N_X \cdot \mu_X) + (N_Y \cdot \mu_Y)}{N_X + N_Y}$$

[Open Calculator !\[\]\(de95854c7ee024cfadc48187bbb781b2_img.jpg\)](#)

$$ex \quad 44 = \frac{(40 \cdot 36) + (80 \cdot 48)}{40 + 80}$$

2) Mean of Data

$$fx \quad \text{Mean} = \frac{\sum x}{N_{\text{Values}}}$$

[Open Calculator !\[\]\(6a9b39b98eb945faa14c645ec99e4eaa_img.jpg\)](#)

$$ex \quad 75 = \frac{750}{10}$$

3) Mean of Data given Coefficient of Variation

$$fx \quad \text{Mean} = \frac{\sigma}{CV}$$

[Open Calculator !\[\]\(f1c5da15572e3e09d343161be98f508d_img.jpg\)](#)

$$ex \quad 83.33333 = \frac{25}{0.3}$$



4) Mean of Data given Coefficient of Variation Percentage

$$fx \text{ Mean} = \left(\frac{\sigma}{CV\%} \right) \cdot 100$$

[Open Calculator !\[\]\(cbe80b694ebd74fcfe136a095b608235_img.jpg\)](#)

$$ex \ 75.75758 = \left(\frac{25}{33} \right) \cdot 100$$

5) Mean of Data given Median and Mode

$$fx \text{ Mean} = \frac{(3 \cdot \text{Median}) - \text{Mode}}{2}$$

[Open Calculator !\[\]\(3e2231b1ad3ca8da8658228c00dd08e0_img.jpg\)](#)

$$ex \ 75 = \frac{(3 \cdot 70) - 60}{2}$$


6) Mean of Data given Standard Deviation

$$fx \text{ Mean} = \sqrt{\left(\frac{\sum x^2}{N_{\text{Values}}} \right) - (\sigma^2)}$$

[Open Calculator !\[\]\(0d5ec72f61334709c3fc9450209b754f_img.jpg\)](#)

$$ex \ 75 = \sqrt{\left(\frac{62500}{10} \right) - ((25)^2)}$$



7) Mean of Data given Variance Open Calculator 

$$\text{fx Mean} = \sqrt{\left(\frac{\sum x^2}{N_{\text{Values}}}\right) - \sigma^2}$$

$$\text{ex } 75 = \sqrt{\left(\frac{62500}{10}\right) - 625}$$

Median 8) Median of Data given Mean and Mode Open Calculator 

$$\text{fx Median} = \frac{(2 \cdot \text{Mean}) + \text{Mode}}{3}$$

$$\text{ex } 70 = \frac{(2 \cdot 75) + 60}{3}$$

9) Median of First N Natural Numbers Open Calculator 

$$\text{fx Median} = \frac{N + 1}{2}$$

$$\text{ex } 70 = \frac{139 + 1}{2}$$



Mode

10) Mode of Data given Mean and Median

$$\text{fx } \text{Mode} = (3 \cdot \text{Median}) - (2 \cdot \text{Mean})$$

[Open Calculator !\[\]\(74d4806277d7e73349d8e8c0897931e9_img.jpg\)](#)

$$\text{ex } 60 = (3 \cdot 70) - (2 \cdot 75)$$

11) Mode of Grouped Data

fx
[Open Calculator !\[\]\(8bba887393ca45b761e5cb49e755e762_img.jpg\)](#)

$$\text{Mode} = l_{\text{Lower}} + \left(\frac{f_1 - f_0}{(2 \cdot f_1) - f_2 - f_0} \right) \cdot W_{\text{Class}}$$

$$\text{ex } 60 = 30 + \left(\frac{14 - 11}{(2 \cdot 14) - 15 - 11} \right) \cdot 20$$



Variables Used

- **CV** Coefficient of Variation
- **CV%** Coefficient of Variation Percentage
- **f_0** Frequency of Class Preceding the Modal Class
- **f_1** Frequency of Modal Class
- **f_2** Frequency of Class Succeeding the Modal Class
- **l_{Lower}** Lower Limit of Modal Class
- **Mean** Mean of Data
- **Median** Median of Data
- **Mode** Mode of Data
- **N** Value of N
- **N_{Values}** Number of Individual Values
- **N_X** Sample Size of Random Variable X
- **N_Y** Sample Size of Random Variable Y
- **w_{Class}** Class Width of Data
- **μ_{Combined}** Combined Mean of Multiple Data
- **μ_X** Mean of Random Variable X
- **μ_Y** Mean of Random Variable Y
- **σ** Standard Deviation of Data
- **σ^2** Variance of Data
- **ΣX** Sum of Individual Values
- **ΣX^2** Sum of Squares of Individual Values



Constants, Functions, Measurements used

- **Function:** `sqrt`, `sqrt(Number)`
Square root function



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