EngineeringRise

Mean, median, mode and measures of dispersion

Formulas and units, JEE Main. Status: Reviewed on 2026-11-20.

Result	Formula	Units or note
Mean (grouped)	mean = (sum of f x)/N, N = sum of f; x = class mark Valid when: grouped data, x is the class mark, N is total frequency	same as data
Assumed mean method	mean = a + (sum of f d)/N, d = x - a Valid when: grouped or ungrouped data; a is any chosen assumed mean	same as data
Median (grouped)	l + ((N/2 - cf)/f) h Valid when: continuous classes; l lower limit of median class, cf before it	same as data
Mode (grouped)	l + ((f1 - f0)/(2 f1 - f0 - f2)) h Valid when: continuous classes; modal class has highest frequency, equal widths	same as data
Mean deviation about a	(sum of f |x - a|)/N Valid when: about any a; use median or mean as a; N is total frequency	same as data
Variance	(sum of f x^2)/N - (mean)^2 Valid when: variance divides by N (not N - 1); the mean is of the same data	data unit squared
Standard deviation	square root of variance Valid when: variance is non-negative; SD is the positive root	same as data
Linear change y = a x + b	mean_y = a mean_x + b; var_y = a^2 var_x Valid when: a and b constants; SD scales by |a|, a shift does not change it	n/a (as data)
First n natural numbers	mean (n + 1)/2; variance (n^2 - 1)/12 Valid when: data 1, 2, ..., n, each once; variance divides by n	pure numbers
Combined variance	(n1 (v1 + (m1 - m)^2) + n2 (v2 + (m2 - m)^2))/(n1 + n2) Valid when: two groups with sizes n1, n2, means m1, m2, variances v1, v2; m is combined mean	data unit squared
Coefficient of variation	(SD/mean) x 100 Valid when: mean not zero, usually positive data	percent

Full lesson with worked examples:
https://www.engineeringrise.in/learn/learn/jee-main/mathematics/statistics-and-probability/mean-median-mode-and-measures-of-dis

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