EngineeringRise

Arithmetic progressions

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

Result	Formula	Units or note
Common difference	d = T_(n+1) - T_n Valid when: sequence is an AP (constant difference)	dimensionless
nth term	T_n = a + (n - 1)d Valid when: AP with first term a, n a positive integer	dimensionless
Term difference	T_p - T_q = (p - q)d Valid when: terms of the same AP, p and q positive integers	dimensionless
Sum with d	S_n = n/2 x (2a + (n - 1)d) Valid when: AP with first term a, common difference d, n terms	dimensionless
Sum with last term	S_n = n/2 x (a + l) Valid when: AP with first term a, last term l, n terms	dimensionless
Term from sum	T_n = S_n - S_(n-1), T_1 = S_1 Valid when: any sequence; n >= 2 for the first form	dimensionless
Sum of an AP in n	S_n = A n^2 + B n gives d = 2A, a = A + B Valid when: sum S_n of an AP, n positive integer	dimensionless
Three terms / four terms	a - d, a, a + d / a - 3d, a - d, a + d, a + 3d Valid when: symmetric choice of AP terms; 3 or 4 terms, d common difference	dimensionless
Three numbers in AP	2y = x + z Valid when: x, y, z are consecutive terms of an AP	dimensionless
Ratio of m th terms	T_m / T'_m = S_(2m-1) / S'_(2m-1) Valid when: two APs; T and T' are their m th terms, S and S' their sums	dimensionless

Full lesson with worked examples:
https://www.engineeringrise.in/learn/learn/jee-main/mathematics/sequences-and-series/arithmetic-progressions

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