



Properties of Σ :

$$1) \sum_{i=1}^n c a_i = c \sum_{i=1}^n a_i$$

$$2) \sum_{i=1}^n (a_i + b_i) = \sum_{i=1}^n a_i + \sum_{i=1}^n b_i$$

$$3) \sum_{i=1}^n (a_i - b_i) = \sum_{i=1}^n a_i - \sum_{i=1}^n b_i$$

Some special formulas

$$\sum_{i=1}^n i = 1 + 2 + 3 + \dots + n = \frac{n(n+1)}{2}$$

$$\sum_{i=1}^n i^2 = 1^2 + 2^2 + 3^2 + \dots + n^2 = \frac{n(n+1)(2n+1)}{6}$$

$$\sum_{i=1}^n i^3 = 1^3 + 2^3 + 3^3 + \dots + n^3 = \left[\frac{n(n+1)}{2} \right]^2$$

$$\sum_{i=1}^n i^4 = 1^4 + 2^4 + 3^4 + \dots + n^4 = \frac{n(n+1)(6n^3 + 9n^2 + n - 1)}{30}$$