

## Some Helpful Identities

$$\left(\sum x_k\right)^2 = \sum x_k^2 + \sum_{i \neq j} x_i x_j$$

$$\sum_{k=0}^{\infty} x^k = \frac{1}{1-x}, \quad x < 1$$

$$(a+b)^n = \sum_{k=0}^n \frac{n!}{k!(n-k)!} a^k b^{n-k}$$