$$\sum_{i=1}^{n} a_1 r^{i-1} = \sum_{j=0}^{n-1} a r^j = \frac{a_1(1-r^n)}{(1-r)}$$

$$\sum_{j=0}^{n} \binom{n}{j} a^j b^{n-j} = (a+b)^n$$

$$\sum_{j=0}^{\infty} \frac{x^j}{j!} = e^x$$

$$\sum_{j=0}^{\infty} \binom{-n}{j} \; -x^{\;j} = \sum_{j=0}^{\infty} \binom{n+j-1}{j} \; x^{\;j} = (1-x)^{-n}$$

$$\sum_{n=k}^{m} \frac{1}{n(n+1)} = \frac{1}{k} - \frac{1}{m+1}$$

$$\sum_{n=1}^{\infty} \frac{1}{n(n+1)} = 1$$

$$n(A_k) = \binom{n}{k} K^k (M-K)^{n-k}, ordered, w/rep$$

$$n(A_k) = \binom{n}{k} (K)_k (M-K)_{n-k}, ordered, w/orep$$

$$n(A_k) = \binom{K}{k} \binom{M-K}{n-k}, unordered, w/orep$$

$$\binom{n+r-1}{n} if, n, Xballs \to r, /urns$$

$$r^n if, n, /balls \to r, /urns$$

$$\binom{n-1}{r-1} x_i \in \mathbb{Z}^+$$

$$\binom{n+r-1}{n} x_i \in \mathbb{Z}^+ \cup \{0\}$$