1

d

α
β
$\mathcal{R}$
$(a\mathcal{R}b)$
$\alpha\mathcal{R}$
β
x

$(x > 0) - (x < 0)$

x
-1
x

$$(1+z)^n = \sum_{k=0}^{n} \binom{n}{k} z^k \,, \tag{1.1}$$

$$(1+z)^n = \sum_{k} \binom{n}{k} z^k \,; \tag{1.2}$$

k

$$(1+z)^n = \sum_{k} \binom{n}{k} z^k = \sum_{k} \binom{n}{k+1} z^{k+1} = \sum_{k} \binom{n}{\lfloor n/2 \rfloor - k} z^{\lfloor n/2 \rfloor - k} \,; \tag{1.3}$$

$$(1+z)^n = \sum_{k=0}^{n} \binom{n}{k} z^k = \sum_{k=-1}^{n-1} \binom{n}{k+1} z^{k+1} = \sum_{k=-\lceil n/2 \rceil}^{\lfloor n/2 \rfloor} \binom{n}{\lfloor n/2 \rfloor - k} z^{\lfloor n/2 \rfloor - k} \,. \tag{1.4}$$

n

$$\sum_{k=2}^{n-1} k(k-1)(n-k) \sum_{k=0}^{n} k(k-1)(n-k) \,; \tag{1.5}$$

$n =$

$$\sum_{k\in A} f(k)+\sum_{k\in B} f(k) = \sum_{k\in A\cup B} f(k)+\sum_{k\in A\cap B} f(k)$$

(1.9)

$\sum$

$$\sum_{k\in A} f(k) + \sum_{k\in B} f(k) = \sum_{k} f(k)\,[k\in A] + \sum_{k} f(k)\,[k\in B] = \sum_{k} f(k)\,([k\in A]+[k\in B])$$

$$[k\in A]+[k\in B] = [k\in A\cup B]+[k\in A\cap B]\,.$$

(1.10)

$$\sum_{j=1}^{n}\sum_{k=1}^{j} f(j,k) = \sum_{k=1}^{n}\sum_{j=k}^{n} f(j,k)\,;$$

(1.11)

$$\sum_{j,k} f(j,k)\,[1\le j\le n]\,[1\le k\le j] = \sum_{j,k} f(j,k)\,[1\le k\le j\le n] = \sum_{j,k} f(j,k)\,[1\le k\le n]\,[k\le j\le n]\,,$$

$$[k\ even] = \sum_{m}[k=2m] and [k\ odd] = \sum_{m}[k=2m+1]\,;$$

(1.12)

$$\sum_{k} f(k) = \sum_{k} f(k)\,([k\ even]+[k\ odd]) = \sum_{k,m} f(k)\,[k=2m] + \sum_{k,m} f(k)\,[k=2m+1] = \sum_{m} f(2m) + \sum_{m} f(2m+1)\,.(1.13)$$

lg

$$\sum_{k\ge 1}\binom{n}{\lfloor \lg k\rfloor} = \sum_{k\ge 1}\sum_{m}\binom{n}{m}\left[m=\lfloor \lg k\rfloor\right] = \sum_{k,m}\binom{n}{m}[m\le \lg k< m+1]\,[k\ge 1] = \sum_{m,k}\binom{n}{m}[2^m\le k<2^{m+1}]\,[k\ge 1] = \sum$$

$$\prod_{P(k)} f(k) = \prod_{k} f(k)^{[P(k)]}\,.$$

(1.15)

n

$$\prod_{p} p^{\,[p\ prime]\,[p\ divides\ n]}\,.$$

$$\delta_{ik} = \begin{cases} 1\,, i=k \\ 0\,, i\neq k\end{cases}$$

(1.16)

δ_j^k

$[j =$

$k]$

δ_{jk}

$[j =$

$k]$

δ_{jk}

$[j =$

$k+$

ö

$\overset{n}{F}_m$, $\overset{n}{A}_m$, and $\overset{n}{C}_m$

$\left[{n \atop n-m}\right]$
n
$\left\{{n+m \atop n}\right\}$
$=$
$\left[{-n \atop -n-m}\right]$

$\overset{-n}{F}_m$

§

$n!$
$\binom{n}{k}$
$\sum$

$\mathfrak{S}^k_{a,b}$
$\sum_{k=a}^b$
$(a,r)^n$
$a^{n|r}$
§§

$$(a,d)^n = \overset{w}{\underset{0}{\mathfrak{S}}} \overset{n}{F}_w \, a^{n-w} \, d^w and a^n = \overset{r}{\underset{0}{\mathfrak{S}}} (-1)^r \overset{-n+r}{F}_r \, (a,d)^{n-r} \, d^r$$

$$v \overset{n}{F}_v = \overset{w}{\underset{0,v-1}{\mathfrak{S}}} \binom{n-w}{v+1-w} \overset{n}{F}_w \, ,$$

§n

$\left[{n \atop k}\right]$
$1 \leq$
$n \leq$
7
$\left[{n \atop k}\right]$
$\left\{{n \atop k}\right\}$

C^k_n
$\left[{n \atop n-k}\right]$
n
$\mathfrak{C}^k_n$
$\left\{{n+k-1 \atop n-1}\right\}$
$-n$
$1-$
n
C^k_n
$\mathfrak{C}^k_n$
n
k
$C^k_n =$
$\mathfrak{C}^k_{1-n}$
$f_k(n) =$
$g_k(1-$
$n)$