$1, 1, 1, 1, \ldots, 1, \ldots$	$\dfrac{1}{1-z} = \sum_{N\ge 0} z^N$
$0, 1, 2, 3, 4, \ldots, N, \ldots$	$\dfrac{z}{(1-z)^2} = \sum_{N\ge 1} N z^N$
$0, 0, 1, 3, 6, 10, \ldots, \binom{N}{2}, \ldots$	$\dfrac{z^2}{(1-z)^3} = \sum_{N\ge 2} \binom{N}{2} z^N$
$0, \ldots, 0, 1, M+1, \ldots, \binom{N}{M}, \ldots$	$\dfrac{z^M}{(1-z)^{M+1}} = \sum_{N\ge M} \binom{N}{M} z^N$
$1, M, \binom{M}{2} \ldots, \binom{M}{N}, \ldots, M, 1$	$(1+z)^M = \sum_{N\ge 0} \binom{M}{N} z^N$
$1, M+1, \binom{M+2}{2}, \binom{M+3}{3}, \ldots$	$\dfrac{1}{(1-z)^{M+1}} = \sum_{N\ge 0} \binom{N+M}{N} z^N$
$1, 0, 1, 0, \ldots, 1, 0, \ldots$	$\dfrac{1}{1-z^2} = \sum_{N\ge 0} z^{2N}$
$1, c, c^2, c^3, \ldots, c^N, \ldots$	$\dfrac{1}{1-cz} = \sum_{N\ge 0} c^N z^N$
$1, 1, \frac{1}{2!}, \frac{1}{3!}, \frac{1}{4!}, \ldots, \frac{1}{N!}, \ldots$	$e^z = \sum_{N\ge 0} \dfrac{z^N}{N!}$
$0, 1, \frac{1}{2}, \frac{1}{3}, \frac{1}{4}, \ldots, \frac{1}{N}, \ldots$	$\ln\dfrac{1}{1-z} = \sum_{N\ge 1} \dfrac{z^N}{N}$
$0, 1, 1+\frac{1}{2}, 1+\frac{1}{2}+\frac{1}{3}, \ldots, H_N, \ldots$	$\dfrac{1}{1-z}\ln\dfrac{1}{1-z} = \sum_{N\ge 1} H_N z^N$
$0, 0, 1, 3\left(\frac{1}{2}+\frac{1}{3}\right), 4\left(\frac{1}{2}+\frac{1}{3}+\frac{1}{4}\right), \ldots$	$\dfrac{z}{(1-z)^2}\ln\dfrac{1}{1-z} = \sum_{N\ge 0} N(H_N-1) z^N$

Table 3.1 Elementary ordinary generating functions

$A(z) = \sum_{n\geq 0} a_n z^n$	$a_0,\ a_1,\ a_2,\ \ldots,\ a_n,\ \ldots$
$B(z) = \sum_{n\geq 0} b_n z^n$	$b_0,\ b_1,\ b_2,\ \ldots,\ b_n,\ \ldots$
right shift	
$zA(z) = \sum_{n\geq 1} a_{n-1} z^n$	$0,\ a_0,\ a_1,\ a_2,\ \ldots,\ a_{n-1},\ \ldots$
left shift	
$\frac{A(z) - a_0}{z} = \sum_{n\geq 0} a_{n+1} z^n$	$a_1,\ a_2,\ a_3,\ \ldots,\ a_{n+1},\ \ldots$
index multiply (differentiation)	
$A'(z) = \sum_{n\geq 0} (n+1) a_{n+1} z^n$	$a_1,\ 2a_2,\ \ldots,\ (n+1)a_{n+1},\ \ldots$
index divide (integration)	
$\int_0^z A(t)dt = \sum_{n\geq 1} \frac{a_{n-1}}{n} z^n$	$0,\ a_0,\ \frac{a_1}{2},\ \frac{a_2}{3} \ldots,\ \frac{a_{n-1}}{n},\ \ldots$
scaling	
$A(\lambda z) = \sum_{n\geq 0} \lambda^n a_n z^n$	$a_0,\ \lambda a_1,\ \lambda^2 a_2,\ \ldots,\ \lambda^n a_n,\ \ldots$
addition	
$A(z) + B(z) = \sum_{n\geq 0} (a_n + b_n) z^n$	$a_0 + b_0,\ \ldots,\ a_n + b_n,\ \ldots$
difference	
$(1-z)A(z) = a_0 + \sum_{n\geq 1} (a_n - a_{n-1}) z^n$	$a_0,\ a_1 - a_0,\ \ldots,\ a_n - a_{n-1},\ \ldots$
convolution	
$A(z)B(z) = \sum_{n\geq 0} \Big(\sum_{0\leq k\leq n} a_k b_{n-k} \Big) z^n$	$a_0 b_0,\ a_1 b_0 + a_0 b_1,\ \ldots,\ \sum_{0\leq k\leq n} a_k b_{n-k},$
partial sum	
$\frac{A(z)}{1-z} = \sum_{n\geq 0} \Big(\sum_{0\leq k\leq n} a_k \Big) z^n$	$a_1,\ a_1 + a_2,\ \ldots,\ \sum_{0\leq k\leq n} a_k,\ \ldots$

Table 3.2 Operations on ordinary generating functions