

Table 2: Some distributions and their p.g.f. in relation with the Gauss function

Distribution	P.g.f.
Binomial	$\frac{{}_2F_1(-n, \beta; \beta; \lambda z)}{{}_2F_1(-n, \beta; \beta; \lambda)}, \lambda = -\frac{p}{1-p}$
Poisson	$\lim_{p \rightarrow 0} \lim_{n \rightarrow \infty} \frac{{}_2F_1(-n, \beta; \beta; \lambda z)}{{}_2F_1(-n, \beta; \beta; \lambda)}, \lambda = np$
Negative Binomial	$\frac{{}_2F_1(k, \beta; \beta; (1-p)z)}{{}_2F_1(k, \beta; \beta; 1-p)}$
Crow-Bardwell	$\lim_{\beta \rightarrow \infty} \frac{{}_2F_1\left(1, b; \lambda; \frac{\theta z}{b}\right)}{{}_2F_1\left(1, b; \lambda; \frac{\theta}{b}\right)}$
Extended Crow-Bardwell	$\lim_{\beta \rightarrow \infty} \frac{{}_2F_1\left(\beta, b; \lambda; \frac{\theta z}{b}\right)}{{}_2F_1\left(\beta, b; \lambda; \frac{\theta}{b}\right)}$
Hypergeometric	$\frac{{}_2F_1(-n, -M; N - M - n + 1; z)}{{}_2F_1(-n, -M; N - M - n + 1; z)}$
Negative Hypergeometric	$\frac{{}_2F_1(-n, M; M - N - n + 1; z)}{{}_2F_1(-n, M; M - N - n + 1; z)}$
Waring	$\frac{{}_2F_1(1, k; k + \rho + 1; z)}{{}_2F_1(1, k; k + \rho + 1; 1)}$
Generalized Waring	$\frac{{}_2F_1(a, k; a + k + \rho; z)}{{}_2F_1(a, k; a + k + \rho; 1)}$
CBPD	$\frac{{}_2F_1(bi, -bi; \gamma; z)}{{}_2F_1(bi, -bi; \gamma; 1)}$
CTPD	$\frac{{}_2F_1(a + bi, a - bi; \gamma; z)}{{}_2F_1(a + bi, a - bi; \gamma; 1)}$