Some one-dimensional discrete distribution functions

Name	Domain	Point Probabilities	Restrictions on Parameters	Mean	Variance	Skewness γ_1	Excess γ_2	Characteristic function	Cumulants
26.1.19 Single point or degenerate	$x=c$ (c a constant)	$p=1$	$-\infty<c<+\infty$	c	0	----------	----------	$e^{i\lambda t}$	$\kappa_1=\lambda$, $\kappa_r=0$ for $r>1$
26.1.20 Binomial	$x_s=s$, for $s=0, 1, 2, \ldots, n$	$\binom{n}{s} p^s(1-p)^{n-s}$	$0<p<1$ ($q=1-p$)	np	npq	$\frac{q-p}{\sqrt{npq}}$	$\frac{1-6pq}{npq}$	$(q+pe^{it})^n$	$\kappa_1=np$ $\kappa_{r+1}=pq\frac{d\kappa_r}{dp}$ for $r\geq 1$
26.1.21 Hypergeometric	$x_s=s$, for $s=0, 1, \ldots \min(n, N_1)$	$\frac{\binom{N_1}{s}\binom{N_2}{n-s}}{\binom{N_1+N_2}{n}}$	N_1 and N_2 integers, and $n\leq N_1+N_2$ ($N=N_1+N_2$, $p=N_1/N$ and $q=1-p=N_2/N$)	np	$npq\left(\frac{N-n}{N-1}\right)$	$\frac{q-p}{\sqrt{npq}}\left(\frac{N-1}{N-n}\right)^{\frac{1}{2}}\left(\frac{N-2n}{N-2}\right)$	Complicated	$\frac{\binom{N_2}{n}}{\binom{N}{n}} F(-n, -N_1; N_2-n+1; e^{it})$	Complicated
26.1.22 Poisson	$x_s=s$, for $s=0, 1, 2, \ldots, \infty$	$\frac{e^{-m}m^s}{s!}$	$0<m<\infty$	m	m	$m^{-\frac{1}{2}}$	m^{-1}	$e^{m(e^{it}-1)}$	$\kappa_r=m$ for $r=1, 2, \ldots$
26.1.23 Negative binomial	$x_s=s$, for $s=0, 1, 2, \ldots, \infty$	$\binom{n+s-1}{s} p^n(1-p)^s$	$n\geq 0$ and $0<p<1$ ($p=1/Q$, and $1-p=P/Q$)	nP	nPQ	$\frac{Q+P}{\sqrt{nPQ}}$	$\frac{1+6PQ}{nPQ}$	$(Q-Pe^{it})^{-n}$	$\kappa_1=nP$ $\kappa_{r+1}=PQ\frac{d\kappa_r}{dQ}$ for $r\geq 1$
26.1.24 Geometric	$x_s=s$, for $s=0, 1, 2, \ldots, \infty$	$p(1-p)^s$	$0<p<1$	$\frac{1-p}{p}$	$\frac{1-p}{p^2}$	$\frac{2-p}{\sqrt{1-p}}$	$6+\frac{p^2}{1-p}$	$p[1-(1-p)e^{it}]^{-1}$	$\kappa_1=\frac{1-p}{p}$, $\kappa_{r+1}=-(1-p)\frac{d\kappa_r}{dp}$, $r\geq 1$