Special Continuous Distributions

Dist.	$f(y)$	$E(Y)$	$V(Y)$	$m(t)$	Code in R
Uniform	$\frac{1}{\theta_2-\theta_1}$	$\frac{\theta_1+\theta_2}{2}$	$\frac{(\theta_2-\theta_1)^2}{12}$	$\frac{e^{t\theta_2}-e^{t\theta_1}}{t(\theta_2-\theta_1)}$	punif(y,theta1,theta2)
	$\theta_1 \le y \le \theta_2$				qunif(p,theta1,theta2)
Normal	$\frac{1}{\sigma\sqrt{2\pi}}e^{-\frac{(y-\mu)^2}{2\sigma^2}}$	μ	σ^2	$e^{t\mu+\frac{1}{2}t^2\sigma^2}$	pnorm(y,mu,sigma)
	$-\infty < y < \infty$				qnorm(p,mu,sigma)
Gamma	$\frac{y^{\alpha-1}e^{-y/\beta}}{\beta^\alpha\Gamma(\alpha)}$	$\alpha\beta$	$\alpha\beta^2$	$\frac{1}{(1-\beta t)^\alpha}$	pgamma(y,shape=alpha,scale=beta)
	$0 \le y < \infty$				qgamma(p,shape=alpha,scale=beta)
Exponential	$\frac{1}{\beta}e^{-y/\beta}$	β	β^2	$\frac{1}{(1-\beta t)}$	pexp(y,1/beta)
	$0 \le y < \infty$				qexp(p,1/beta)
Chi-Square	$\frac{y^{\nu/2-1}e^{-y/2}}{2^{\nu/2}\Gamma(\nu/2)}$	ν	2ν	$\frac{1}{(1-2t)^{\nu/2}}$	pchisq(y,nu)
	$0 \le y < \infty$				qchisq(p,nu)
Beta	$\frac{y^{\alpha-1}(1-y)^{\beta-1}}{B(\alpha,\beta)}$	$\frac{\alpha}{\alpha+\beta}$	$\frac{\alpha\beta}{(\alpha+\beta)^2(\alpha+\beta+1)}$	DNE	pbeta(y,alpha,beta)
	$0 \le y \le 1$				qbeta(p,alpha,beta)

$$\begin{aligned}
\Gamma(\alpha) &= (\alpha-1)\Gamma(\alpha-1) \\
\Gamma(1) &= 1 \\
\Gamma(\alpha) &= (\alpha-1)! \qquad \text{if } \alpha \text{ is a positive integer}
\end{aligned}$$

$$B(\alpha,\beta) = \frac{\Gamma(\alpha)\Gamma(\beta)}{\Gamma(\alpha+\beta)}$$