Continuous Distributions

Beta $0 < \alpha$ $0 < \beta$	$f(x) = \dfrac{\Gamma(\alpha+\beta)}{\Gamma(\alpha)\Gamma(\beta)} x^{\alpha-1}(1-x)^{\beta-1}, \qquad 0 < x < 1$ $\mu = \dfrac{\alpha}{\alpha+\beta}, \qquad \sigma^2 = \dfrac{\alpha\beta}{(\alpha+\beta+1)(\alpha+\beta)^2}$
Chi-square $\chi^2(r)$ $r = 1, 2, \ldots$	$f(x) = \dfrac{1}{\Gamma(r/2)2^{r/2}} x^{r/2-1} e^{-x/2}, \qquad 0 \le x < \infty$ $M(t) = \dfrac{1}{(1-2t)^{r/2}}, \qquad t < \dfrac{1}{2}$ $\mu = r, \qquad \sigma^2 = 2r$
Exponential $0 < \theta$	$f(x) = \dfrac{1}{\theta} e^{-x/\theta}, \qquad 0 \le x < \infty$ $M(t) = \dfrac{1}{1-\theta t}, \qquad t < \dfrac{1}{\theta}$ $\mu = \theta, \qquad \sigma^2 = \theta^2$
Gamma $0 < \alpha$ $0 < \theta$	$f(x) = \dfrac{1}{\Gamma(\alpha)\theta^\alpha} x^{\alpha-1} e^{-x/\theta}, \qquad 0 \le x < \infty$ $M(t) = \dfrac{1}{(1-\theta t)^\alpha}, \qquad t < \dfrac{1}{\theta}$ $\mu = \alpha\theta, \qquad \sigma^2 = \alpha\theta^2$
Normal $N(\mu, \sigma^2)$ $-\infty < \mu < \infty$ $0 < \sigma$	$f(x) = \dfrac{1}{\sigma\sqrt{2\pi}} e^{-(x-\mu)^2/2\sigma^2}, \qquad -\infty < x < \infty$ $M(t) = e^{\mu t + \sigma^2 t^2/2}$ $E(X) = \mu, \qquad \mathrm{Var}(X) = \sigma^2$
Uniform $U(a, b)$ $-\infty < a < b < \infty$	$f(x) = \dfrac{1}{b-a}, \qquad a \le x \le b$ $M(t) = \dfrac{e^{tb} - e^{ta}}{t(b-a)}, \qquad t \ne 0; \qquad M(0) = 1$ $\mu = \dfrac{a+b}{2}, \qquad \sigma^2 = \dfrac{(b-a)^2}{12}$