Important Continuous Random Variables

1016-351 Prob & Stat I
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Important continuous random variables

variable	pdf	mean	variance
Normal	Use table, $Z = \frac{X-\mu}{\sigma}$	μ	σ^2
Exponential	$f(x)=\lambda e^{-\lambda x}$, $x>0$	$\mu = \frac{1}{\lambda}$	$\sigma^2 = \frac{1}{\lambda^2}$
Gamma • If $\alpha>1$, then $\Gamma(\alpha) = (\alpha-1)\Gamma(\alpha-1)$ • For positive integers, $\Gamma(n) = (n-1)!$ • $\Gamma(\frac{1}{2}) = \sqrt{\pi}$	$f(x) = \frac{1}{\beta^\alpha \Gamma(\alpha)} x^{\alpha-1} e^{-x/\beta}$, $x>0$ where $\Gamma(\alpha) = \int_0^\infty x^{\alpha-1} e^{-x} dx$ and $F(x;\alpha) = \int_0^x y^{\alpha-1} e^{-y} dy$, $x>0$	$\mu = \alpha\beta$	$\sigma^2 = \alpha\beta^2$
Weibull	$f(x) = \frac{\alpha}{\beta^\alpha} x^{\alpha-1} e^{-(x/\beta)^\alpha}$, $x>0$	$\mu = \beta\,\Gamma\left(1+\frac{1}{\alpha}\right)$	$\sigma^2 = \beta^2\left\{\Gamma(1+\frac{2}{\alpha}) - \left[\Gamma(1+\frac{1}{\alpha})\right]^2\right\}$
Lognormal	$Y = \ln(X)$ were $X \sim N(\mu,\sigma^2)$	$\mu = e^{\mu+\sigma^2/2}$	$\sigma^2 = e^{2\mu+\sigma^2}(e^{\sigma^2}-1)$
Beta	f(x) =	μ =	σ^2 =
Chi-squared	f(x) =	μ =	σ^2 =