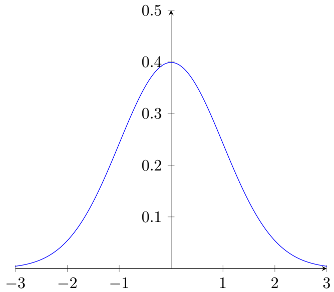
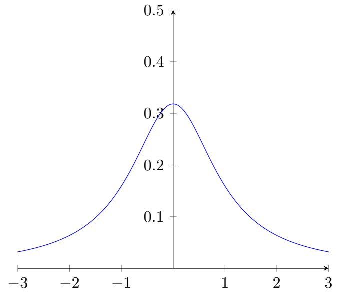
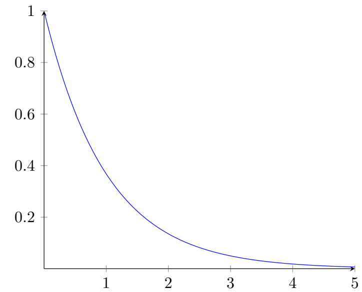
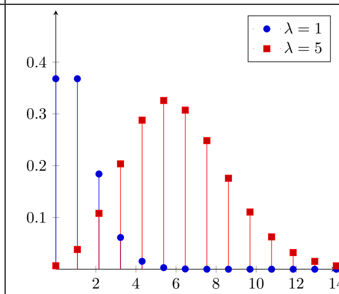
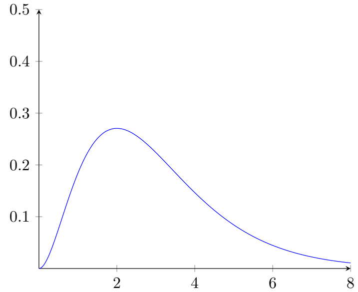
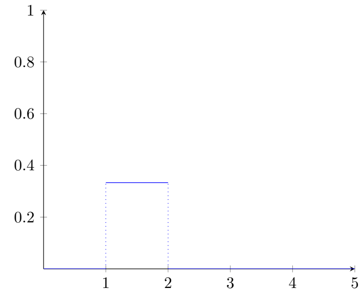
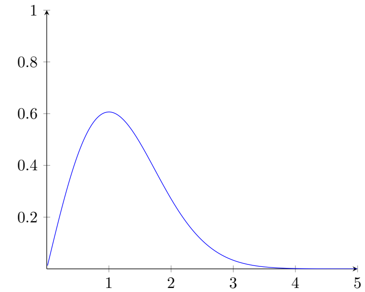
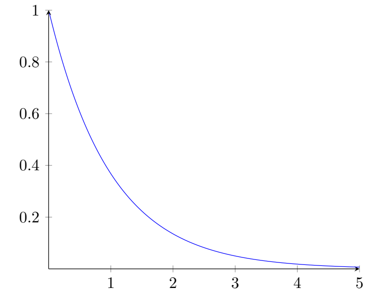
Overview over distributions

	normal distribution	Students t distribution	exponential distribution	Poisson distribution
plot				
parameters	mean μ variance σ^2	degrees of freedom ν	rate $\lambda > 0$	rate $\lambda > 0$
PDF	$f(x) = \frac{1}{\sqrt{2\pi\sigma^2}} \exp\left(-\frac{(x-\mu)^2}{2\sigma^2}\right)$	$f(x) = \frac{\Gamma\left(\frac{\nu+1}{2}\right)}{\sqrt{\nu\pi}\Gamma\left(\frac{\nu}{2}\right)} \left(1 + \frac{x^2}{\nu}\right)^{-\frac{\nu+1}{2}}$	$f(x) = \lambda \exp(-\lambda x)$	$f(n) = \frac{\lambda^n \exp(-\lambda)}{n!}$
CDF	$F(x) = \frac{1}{2}\left[1 + \operatorname{erf}\left(\frac{x-\mu}{\sigma\sqrt{2}}\right)\right]$ (1) $\operatorname{erf}(x) = \frac{2}{\sqrt{\pi}} \int_0^x \exp(-t^2)\,\mathrm{d}t$	$F(x) = \frac{1}{2} + x\Gamma\left(\frac{\nu+1}{2}\right) \cdot \frac{{}_2F_1\left(\frac{1}{2}, \frac{\nu+1}{2}, \frac{3}{2}, \frac{-x^2}{\nu}\right)}{\sqrt{\nu\pi}\Gamma\left(\frac{\nu}{2}\right)}$	$F(x) = 1 - \exp(-\lambda x)$	$F(n) = \exp(-\lambda) \sum_{i=0}^{\lfloor n \rfloor} \frac{\lambda^i}{i!}$
mean	μ	$\begin{cases} 0 & \nu > 1 \\ \text{undefinded} & \text{otherwise} \end{cases}$	$\frac{1}{\lambda}$	λ
variance	σ^2	$\begin{cases} \frac{\nu}{\nu-2} & \nu > 2 \\ \infty & 1 < \nu \leq 2 \\ \text{undefinded} & \text{otherwise} \end{cases}$	$\frac{1}{\lambda^2}$	λ

	Gamma distribution	**uniform distribution**	**Rayleigh distribution**	**Weibull distribution**
plot				
parameters	shape $\alpha > 0$ rate $\beta > 0$	$-\infty < a < b < \infty$	scale $\sigma > 0$	scale $\lambda \geq 0$ shape $k \geq 0$
PDF	$f(x) = \frac{\beta^\alpha}{\Gamma(\alpha)} x^{\alpha-1} \exp(-\beta x)$	$f(x) = \begin{cases} \frac{1}{b-a} & x \in [a,b] \\ 0 & \text{otherwise} \end{cases}$	$f(x) = \frac{x}{\sigma^2} \exp\left(\frac{-x^2}{2\sigma^2}\right)$	$f(x) = \frac{k}{\lambda} \left(\frac{x}{\lambda}\right)^{k-1} \exp\left(-\left[\frac{x}{\lambda}\right]^k\right)$
CDF	$F(x) = \frac{1}{\Gamma(\alpha)} \gamma(\alpha, \beta x)$ $\gamma(s,x) = \int_0^x t^{s-1} \exp(-t)\,\mathrm{d}t$	$F(x) = \begin{cases} 0 & x < a \\ \frac{x-a}{b-a} & x \in [a,b) \\ 1 & x > b \end{cases}$	$f(x) = 1 - \exp\left(\frac{-x^2}{2\sigma^2}\right)$	$F(x) = 1 - \exp\left(-\left[\frac{x}{\lambda}\right]^k\right)$
mean	$\frac{\alpha}{\beta}$	$\frac{1}{2}(a+b)$	$\sigma\sqrt{\frac{\pi}{2}}$	$\lambda\Gamma\left(1 + \frac{1}{k}\right)$
variance	$\frac{\alpha}{\beta^2}$	$\frac{1}{12}(b-a)^2$	$\frac{4-\pi}{2}\sigma^2$	$\lambda^2 \left[\Gamma\left(1+\frac{2}{k}\right) - \left(\Gamma\left(1+\frac{1}{k}\right)\right)^2\right]$