Formula Sheet

Note: $\theta = \frac{1}{\lambda}$

Note: $\mathrm{q} = 1 - \mathrm{p}$

Note: $\Gamma(\alpha) = \int_0^\infty x^{\alpha-1}e^{-x}dx$

	$\boldsymbol{\mu}$	$\boldsymbol{\sigma^2}$ = var(X)	pmf/pdf
Binomial	np	np(1 – p)	$\binom{n}{p}p^k q^{n-k}$
Poisson	λ	λ	$\frac{\lambda^{\mathrm{x}}}{\mathrm{x!}}e^{-\lambda}$
Negative Binomial	$\frac{r}{p}$	$\frac{rq}{p^2}$	$\binom{\mathrm{x}-1}{r-1}p^r q^{\mathrm{x}-r}$
Geometric	$\frac{1}{p}$	$\frac{1-p}{p^2}$	$pq^{\mathrm{x}-1}$
C.R.V	$\int_{-\infty}^{\infty}\mathrm{x}f(\mathrm{x})\mathrm{dx}$	$\int_{-\infty}^{\infty}(\mathrm{x}-\mu)^2 f(\mathrm{x})\mathrm{dx}$	-
Uniform	$\frac{b+a}{2}$	$\frac{(b-a)^2}{12}$	$\frac{1}{b-a}$
Exponential	$\frac{1}{\lambda}$	$\frac{1}{\lambda^2}$	$\lambda e^{-\lambda \mathrm{x}}$
Gamma	$\alpha\theta$	$\alpha\theta^2$	$\frac{1}{\Gamma(\alpha)\theta^\alpha}\mathrm{x}^{\alpha-1}e^{(-\mathrm{x}/\theta)}$
Chi-Squared: $\boldsymbol{\chi^2_\alpha(r)}$	r	2r	$\frac{1}{\Gamma\left(\frac{r}{2}\right)2^{(r/2)}}\mathrm{x}^{(r/2)-1}e^{(-\mathrm{x}/2)}$
Normal: X ~N(μ, $\boldsymbol{\sigma^2}$)	μ	σ^2	$\frac{1}{\sigma\sqrt{2\pi}}e^{-(\mathrm{x}-\mu)^2/2\sigma^2}, \mathrm{x} \in \mathrm{R}$