Poisson random variable

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Synonym	Poisson distribution

The Poisson discrete probability function with parameter $\lambda > 0$ is given by

$$f_X(x) = \frac{e^{-\lambda}\lambda^x}{x!}, \qquad x \in \mathbb{N}.$$

A random variable X with such a density has expectation, variance, moment generating function and characteristic function given by $E[X] = \lambda$, $Var[X] = \lambda$, $M_X(t) = e^{\lambda(e^t-1)}$, and $\phi_X(t) = e^{\lambda(e^{it}-1)}$, respectively.