

Equation Sheet for Final

Distributions

$$P(X = x) = \frac{e^{-\lambda} \lambda^x}{x!} \qquad P(X = x) = \binom{x-1}{r-1} q^{x-r} p^r \qquad f_X(x) = \frac{1}{\sqrt{2\pi} \sigma} e^{-(x-\mu)^2 / 2\sigma^2}$$

Expectations and Variances

Family	$\mathbb{E}(X)$	$\text{Var}(X)$
Geometric	$\frac{1}{p}$	$\frac{q}{p^2}$
Hypergeometric	$n \frac{M}{N}$	$n \frac{M}{N} \left(1 - \frac{M}{N}\right) \left(\frac{N-n}{N-1}\right)$
Discrete Uniform	$\frac{N+1}{2}$	$\frac{N^2-1}{12}$
Continuous Uniform	$\frac{a+b}{2}$	$\frac{(b-a)^2}{12}$