Midterm Exam 2 Formula Sheet

MATH-E265

October 30, 2024

$X \sim Poisson(\lambda)$

PMF

$Pr[X = x] = \frac{e^{-\lambda}\lambda^k}{k!}$

Other formulas

$E[X] = \lambda$
$Var[X] = E[X^2] - (E[X])^2$

$X \sim Exponential(\theta)$

PDF

$f(x) = \frac{1}{\theta}e^{\frac{-x}{\theta}}$ Only where $\theta > 0 \quad x \geq 0$

CDF

$F(x) = Pr[X \leq x] = 1 - e^{\frac{-x}{\theta}}$

Survival Function

$S(x) = Pr[X > x] = e^{\frac{-x}{\theta}}$

Other Functions

$Pr[a \leq X \leq b] = \int_a^b f(x)dx = F(b) - F(a)$
$E[X] = \theta$
$Var[X] = 2\theta^2$

Miscellaneous

$Pr[X \geq c] = 1 - Pr[X = a] - Pr[X = b]$
$Pr[X \leq c] = Pr[X = a] + Pr[X = b]$
$F_X(x) = P(X \leq x)$