STAT-319 Formula Sheet for Second Exam Term 161

Chapter 3

$f(x) = p(1-p)^{x-1}$; $x = 1,2, \ldots \ldots$; $\mu = 1/p$; $\sigma^2 = (1-p)/p^2$

$f(x) = \frac{\binom{K}{x}\binom{N-K}{n-x}}{\binom{N}{n}}$; $x = \max\{0, n+K-N\}$ to $\min\{K, n\}$; $\mu = np$; $\sigma^2 = np(1-p)\frac{N-n}{N-1}$; $p = \frac{K}{N}$

$f(x) = \frac{e^{-\lambda t}(\lambda t)^x}{x!}$; $x = 0,1, \ldots \ldots$; $\mu = \lambda t$; $\sigma^2 = \lambda t$

Chapter 4

$F(b) = P(X \le b) = \int_{-\infty}^{b} f(x)\,dx$ and $P(a < X < b) = \int_a^b f(x)\,dx = F(b) - F(a)$

$\mu = E(X) = \int_{-\infty}^{\infty} x f(x)\,dx$; $E(X^2) = \int_{-\infty}^{\infty} x^2 f(x)\,dx$ and $\sigma^2 = E(X-\mu)^2 = E(X^2) - \mu^2$

$f(x) = \frac{1}{x_n - x_1}$; $x_1 \le x \le x_n$; $\mu = \frac{x_n + x_1}{2}$; $\sigma^2 = \frac{(x_n - x_1)^2}{12}$

$f(x) = \lambda e^{-\lambda x}$; $x > 0$; $\mu = \frac{1}{\lambda}$; $\sigma^2 = \frac{1}{\lambda^2}$

$X \sim N(\mu, \sigma^2)$; $Z = \frac{X-\mu}{\sigma} \sim N(0,1)$; $Z = \frac{\bar{X}-\mu}{\sigma/\sqrt{n}} \sim N(0,1)$

Chapter 6

$\bar{X} = \frac{\sum X}{n}$;

$S^2 = \frac{\sum (X - \bar{X})^2}{n-1} = \frac{\sum X^2 - \frac{1}{n}(\sum X)^2}{n-1}$

$R_\alpha = \frac{\alpha}{100}(n+1) = i.d$;

$P_\alpha = X_{(i)} + d(X_{(i+1)} - X_{(i)})$

$CV = s / \bar{X}$;

$CS = \frac{3(\bar{X} - \tilde{X})}{s}$

Chapter 7

$X \sim N(\mu, \sigma^2) \Rightarrow Z = \frac{X-\mu}{\sigma} \sim N(0,1)$; $\bar{X} \sim N(\mu, \sigma^2/n) \Rightarrow Z = \frac{\bar{X}-\mu}{\sigma/\sqrt{n}} \sim N(0,1)$

$\mu_{\bar{X}} = \mu$, $\sigma_{\bar{X}} = \frac{\sigma}{\sqrt{n}}$, $\mu_{\bar{X}_1 - \bar{X}_2} = \mu_1 - \mu_2$, $\sigma^2_{\bar{X}_1 - \bar{X}_2} = \frac{\sigma_1^2}{n_1} + \frac{\sigma_2^2}{n_2}$