STAT-319 Formula Sheet for First Major Exam Term 161

Chapter 2:

$P(A \cup B) = P(A) + P(B) - P(A \cap B) = P(A \cap B') + P(A \cap B) + P(A' \cap B)$

$P(A \cup B) = 1 - P(A \cup B)' = 1 - P(A' \cap B')$ and $P(A \cap B)' = P(A' \cup B')$

$P(A \mid B) = \frac{P(A \cap B)}{P(B)}, P(B) \neq 0$ and $P(A \cap B) = P(A).P(B \mid A) = P(A \mid B).P(B)$

$P(B_i \mid A) = \frac{P(A \mid B_i).P(B_i)}{\sum_{i=1}^{k} P(A \mid B_i).P(B_i)}, P(A) \neq 0$

Chapter 3:

$\mu = E(X) = \sum xf(x);$ $E(X^2) = \sum x^2 f(x)$ and $\sigma^2 = E(X - \mu)^2 = E(X^2) - \mu^2$

$f(x) = \frac{1}{n};$ $x = x_1, x_2, \dots, x_n;$ $\mu = \frac{x_n + x_1}{2};$ $\sigma^2 = \frac{(x_n - x_1 + 1)^2 - 1}{12}$ (for consecutive integers from x_1 to x_n)

$f(x) = \binom{n}{x} p^x (1-p)^{n-x};$ $x = 0,1, \dots, n;$ $\mu = np;$ $\sigma^2 = np(1-p)$