STAT319 First Major Exam Formula Sheet

$$P(A \cup B) = P(A) + P(B) - P(AB).$$

$$P(A \mid B) = \frac{P(AB)}{P(B)}, \quad P(B) \neq 0;$$

$$P(E_i \mid B) = \frac{P(B \mid E_i) P(E_i)}{P(B \mid E_1) P(E_1) + \cdots + P(B \mid E_k) P(E_k)} \quad i = 1, \cdots, k$$

$$\mu \equiv E(X) = \sum_x x f(x).$$

$$E(X^2) = \sum x^2 f(x), \quad \sigma^2 \equiv E(X - \mu)^2 = E(X^2) - \mu^2.$$

$$f(x) = \binom{n}{x} p^x q^{n-x}; \quad x = 0, 1, \ldots, n; \quad 0 < p < 1; \quad q = 1 - p; \quad \mu = np, \quad \sigma^2 = npq.$$

$$f(x) = q^x p, \quad x = 0, 1, 2, \cdots; \quad q = 1 - p; \quad \mu = 1/p, \quad \sigma^2 = q/p^2.$$

$$f(x) = \binom{K}{x} \binom{N-K}{n-x} \div \binom{N}{n}, \quad \max\{0, n - (N-K)\} \le y \le \min\{n, K\}; \quad \mu = np,$$

$$\sigma^2 = (1 - c) \, npq, \quad (N - 1) \, c = n - 1, \quad p = (K/N), \quad q = 1 - p.$$

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