STAT 535 Test 1 Formulas

For events A and B:

$$P(B|A) = \frac{P(A \cap B)}{P(A)} = \frac{P(B)L(B|A)}{P(A)}$$

where $L(B|A) = P(A|B)$ and $L(B^c|A) = P(A|B^c)$, and

$$P(A) = P(B)L(B|A) + P(B^c)L(B^c|A)$$

For random variable (or vector) y and parameter θ:

$$f(\theta|y) = \frac{f(\theta)L(\theta|y)}{f(y)} \propto f(\theta)L(\theta|y).$$

$$f(y|\pi) = \binom{n}{y} \pi^y (1-\pi)^{n-y} \quad \text{for } y \in \{0, 1, 2, \ldots, n\}$$

$$f(\pi) = \frac{\Gamma(\alpha+\beta)}{\Gamma(\alpha)\Gamma(\beta)} \pi^{\alpha-1}(1-\pi)^{\beta-1} \quad \text{for } \pi \in [0,1]$$

$$f(y|\lambda) = \frac{\lambda^y e^{-\lambda}}{y!} \quad \text{for } y \in \{0, 1, 2, \ldots\}$$

$$f(\lambda) = \frac{r^s}{\Gamma(s)} \lambda^{s-1} e^{-r\lambda} \quad \text{for } \lambda > 0.$$

$$f(y) = \frac{1}{\sqrt{2\pi\sigma^2}} \exp\left[-\frac{(y-\mu)^2}{2\sigma^2}\right] \quad \text{for } y \in (-\infty, \infty)$$

$$f(\mu) = \frac{1}{\sqrt{2\pi\tau^2}} \exp\left[-\frac{(\mu-\theta)^2}{2\tau^2}\right] \quad \text{for } \mu \in (-\infty, \infty).$$