

Formula Sheet – Test 1 – STAT 515

$$s^2 = \frac{\sum_{i=1}^n X_i^2 - \frac{(\sum_{i=1}^n X_i)^2}{n}}{n-1}$$

$$1 - \frac{1}{k^2}$$

$$z = \frac{x - \bar{x}}{s}$$

or

$$z = \frac{x - \mu}{\sigma}$$

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

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

$$P(A \cap B) = P(B)P(A|B) \text{ or } P(A \cap B) = P(A)P(B|A)$$

$$P(B|A) = \frac{P(A|B)P(B)}{P(A|B)P(B) + P(A|B^c)P(B^c)}$$

$$\mu = \sum xP(x), \sigma^2 = \left[\sum x^2P(x) \right] - \mu^2$$

For $X \sim \text{Binomial}(n,p)$:

$$P(x) = \frac{n!}{x!(n-x)!} p^x q^{n-x}, \mu = np, \sigma^2 = npq$$

For $X \sim \text{Poisson}(\lambda)$:

$$P(x) = \frac{\lambda^x e^{-\lambda}}{x!}$$