Formula Sheet – Test 1 – STAT 515 – Summer 2007

$$s^2 = \frac{\sum (X_i - \bar{X})^2}{n-1} \text{ or } s^2 = \frac{\sum X_i^2 - (\sum X_i)^2 / n}{n-1}$$

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

$$z = \frac{x - \bar{x}}{s} \text{ or } z = \frac{x - \mu}{\sigma}$$

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

$$P(A \mid B) = \frac{P(A \cap B)}{P(B)} \quad \text{or} \quad P(B \mid A) = \frac{P(A \cap B)}{P(A)}$$

$$P(A \cap B) = P(B)\,P(A \mid B) \quad \text{or} \quad P(A \cap B) = P(A)\,P(B \mid A)$$

For a discrete r.v. X:

$$\mu = \sum xP(x) \quad \text{and} \quad \sigma^2 = \left[\sum x^2 P(x)\right] - \mu^2$$

For X ~ Binomial(n, p):

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

For X ~ Uniform(c, d):

$$P(a < X < b) = \frac{b-a}{d-c} \quad \text{and} \quad \mu = \frac{c+d}{2} \quad \text{and} \quad \sigma^2 = \frac{d-c}{\sqrt{12}}$$

$$Z = \frac{X - \mu}{\sigma} \quad \text{and} \quad X = Z\sigma + \mu$$