

Appendix E

Selected Formulae for STAT 1000

$$1. s = \sqrt{\frac{1}{n-1} \sum (x_i - \bar{x})^2}$$

$$2. r = \frac{1}{n-1} \sum \left(\frac{x_i - \bar{x}}{s_x} \right) \left(\frac{y_i - \bar{y}}{s_y} \right)$$

$$3. b = r \frac{s_y}{s_x} \quad a = \bar{y} - b\bar{x}$$

4. The sampling distribution of \bar{x} has a mean of μ and a standard deviation of $\frac{\sigma}{\sqrt{n}}$.

5. If X has a binomial distribution with parameters n and p , then

$$P(X = k) = \binom{n}{k} p^k (1-p)^{n-k}, \quad k = 0, 1, \dots, n$$

$$6. \bar{x} \pm z^* \frac{\sigma}{\sqrt{n}} \quad n = \left(\frac{z^* \sigma}{m} \right)^2 \quad z = \frac{\bar{x} - \mu_o}{\sigma / \sqrt{n}}$$

$$7. \bar{x} \pm t^* \frac{s}{\sqrt{n}} \quad t = \frac{\bar{x} - \mu_o}{s / \sqrt{n}}$$

8. The sampling distribution of \hat{p} has a mean of p and a standard deviation of $\sqrt{\frac{p(1-p)}{n}}$.

$$9. \hat{p} \pm z^* \sqrt{\frac{\hat{p}(1-\hat{p})}{n}} \quad n = \left(\frac{z^*}{m} \right)^2 p^*(1-p^*) \quad z = \frac{\hat{p} - p_o}{\sqrt{\frac{p_o(1-p_o)}{n}}}$$