

STAT 1000 Formula Sheet

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

$$2. b_1 = r \frac{s_y}{s_x}$$

$$3. b_0 = \bar{y} - b_1 \bar{x}$$

$$4. P(X = k) = \binom{n}{k} p^k (1-p)^{n-k}$$

$$5. z = \frac{\hat{p} - p}{\sqrt{\frac{p(1-p)}{n}}}$$

$$6. s_p^2 = \frac{(n_1 - 1)s_1^2 + (n_2 - 1)s_2^2}{n_1 + n_2 - 2}$$

$$7. \bar{x}_1 - \bar{x}_2 \pm t^* \sqrt{s_p^2 \left(\frac{1}{n_1} + \frac{1}{n_2} \right)}$$

$$8. t = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{s_p^2 \left(\frac{1}{n_1} + \frac{1}{n_2} \right)}}$$

$$9. \hat{p} \pm z^* \sqrt{\frac{\hat{p}(1-\hat{p})}{n}}$$

$$10. n = \left(\frac{z^*}{m} \right)^2 p^*(1-p^*)$$