

# STAT 513 Test 3 Formula Sheet

$$[\hat{\beta}_0 + \hat{\beta}_1 x^*] \pm t_{\alpha/2, n-2} \sqrt{\text{MSE} \left[ 1 + \frac{1}{n} + \frac{(x^* - \bar{x})^2}{S_{xx}} \right]}$$

$$\begin{matrix} (\underline{X}'\underline{X})^{-1} & \underline{X}'\underline{Y} \\ \underline{a}' & \hat{\underline{\beta}} - (\underline{a}'\underline{\beta})_0 \end{matrix} \quad t = \frac{\underline{a}'\hat{\underline{\beta}} - (\underline{a}'\underline{\beta})_0}{\sqrt{\text{MSE}[\underline{a}'(\underline{X}'\underline{X})^{-1}\underline{a}]}}$$

$$\underline{a}'\hat{\underline{\beta}} \pm t_{\alpha/2, n-k-1} \sqrt{\text{MSE}[\underline{a}'(\underline{X}'\underline{X})^{-1}\underline{a}]}$$

$$\hat{y}^* \pm t_{\alpha/2, n-k-1} \sqrt{\text{MSE} [1 + \underline{a}'(\underline{X}'\underline{X})^{-1}\underline{a}]}$$

$$F = \frac{(SSE_R - SSE_C) / (k-g)}{SSE_C / (n-k-1)}$$

Post-Test 3:

$$g^*(\theta | y_1, \dots, y_n) \propto L(\theta | y_1, \dots, y_n) g(\theta)$$

$$\frac{\sum (x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum (x_i - \bar{x})^2 \sum (y_i - \bar{y})^2}} = \frac{S_{xy}}{\sqrt{S_{xx} S_{yy}}} = \hat{\beta}_1 \sqrt{\frac{S_{xx}}{S_{yy}}}$$

$$\frac{r\sqrt{n-2}}{\sqrt{1-r^2}}$$

$$\frac{\frac{1}{2} \ln\left(\frac{1+r}{1-r}\right) - \frac{1}{2} \ln\left(\frac{1+p_0}{1-p_0}\right)}{1/\sqrt{n-3}}$$

$$\frac{1}{2} \ln\left(\frac{1+r}{1-r}\right) \pm z_{\alpha/2} \left(\frac{1}{\sqrt{n-3}}\right)$$

$$\left[ \frac{e^{2L} - 1}{e^{2L} + 1}, \frac{e^{2U} - 1}{e^{2U} + 1} \right]$$

$$1 - \frac{SSE}{S_{yy}}$$

$$\sum_{\text{cells}} \frac{(\text{Obs} - \text{Exp})^2}{\text{Exp}}$$