

STAT 513 Test 2 Formula Sheet

$$S_{xy} = \sum x_i y_i - \frac{1}{n} \sum x_i \sum y_i$$

$$S_{xx} = \sum x_i^2 - \frac{1}{n} (\sum x_i)^2$$

$$\frac{S_{xy}}{S_{xx}} \quad \bar{y} - \hat{\beta}_1 \bar{x}$$

$$\frac{\sum x_i^2}{n S_{xx}} \sigma^2, \quad \frac{1}{S_{xx}} \sigma^2, \quad \frac{-\bar{x}}{S_{xx}} \sigma^2$$

$$S_{yy} = \sum y_i^2 - n \bar{y}^2 = \sum y_i^2 - \frac{1}{n} (\sum y_i)^2$$

$$SSE = S_{yy} - \hat{\beta}_1 S_{xy}$$

$$t = \frac{\hat{\theta} - \theta}{\sqrt{\frac{MSE}{S_{xx}} \left[a_0^2 \frac{\sum x_i^2}{n} + a_1^2 - 2a_0 a_1 \bar{x} \right]}}$$

where $\theta = a_0 \beta_0 + a_1 \beta_1$

$$\hat{\theta} \pm t_{\alpha/2, n-2} \sqrt{\frac{MSE}{S_{xx}} \left[a_0^2 \frac{\sum x_i^2}{n} + a_1^2 - 2a_0 a_1 \bar{x} \right]}$$