STAT 2000 Formula Sheet

1. $SE\left(\overline{x}_1 - \overline{x}_2\right) = \sqrt{\dfrac{s_1^2}{n_1} + \dfrac{s_2^2}{n_2}}$ with $df = \min\{n_1 - 1, n_2 - 1\}$

2. $SE\left(\overline{x}_1 - \overline{x}_2\right) = \sqrt{s_p^2\left(\dfrac{1}{n_1} + \dfrac{1}{n_2}\right)}$ with $df = n_1 + n_2 - 2$

   where $s_p^2 = \dfrac{(n_1 - 1)s_1^2 + (n_2 - 1)s_2^2}{n_1 + n_2 - 2}$

3. $SSG = \sum_{i=1}^{I} n_i \left(\overline{x}_i - \overline{x}\right)^2$

4. $P(X = k) = \dfrac{e^{-\lambda}\lambda^k}{k!}, \quad k = 0, 1, 2, \ldots$

5. $SE\left(\hat{p}_1 - \hat{p}_2\right) = \sqrt{\hat{p}_C(1 - \hat{p}_C)\left(\dfrac{1}{n_1} + \dfrac{1}{n_2}\right)}$ if $p_1 = p_2$ where $\hat{p}_C = \dfrac{x_1 + x_2}{n_1 + n_2}$

   $SE\left(\hat{p}_1 - \hat{p}_2\right) = \sqrt{\dfrac{\hat{p}_1(1 - \hat{p}_1)}{n_1} + \dfrac{\hat{p}_2(1 - \hat{p}_2)}{n_2}}$ if $p_1 \neq p_2$

6. $SE_{b_1} = \dfrac{s_e}{\sqrt{\sum\left(x_i - \overline{x}\right)^2}}$ where $s_e = \sqrt{MSE} = \sqrt{\dfrac{\sum(y_i - \hat{y})^2}{n - 2}}$

7. $t = \dfrac{r\sqrt{n - 2}}{\sqrt{1 - r^2}}$

8. $SE_{\hat{\mu}} = s_e\sqrt{\dfrac{1}{n} + \dfrac{\left(x^* - \overline{x}\right)^2}{\sum\left(x_i - \overline{x}\right)^2}}$

9. $SE_{\hat{y}} = s_e\sqrt{1 + \dfrac{1}{n} + \dfrac{\left(x^* - \overline{x}\right)^2}{\sum\left(x_i - \overline{x}\right)^2}}$