Formula Sheet

Standardized Normal Data

$$z = \frac{\text{statistic} - \text{parameter}}{\text{standard deviation of the statistic}}$$

Least Squares Regression Line

$$y - \bar{y} = m(x - \bar{x}) \quad \text{or} \quad y = mx + (\bar{y} - m\bar{x}) \quad \text{where} \quad m = r\frac{s_y}{s_x}$$

Standard Deviations for Sample Means and Sample Proportions

$$\sigma_{\bar{x}} = \frac{\sigma}{\sqrt{n}} \qquad \sigma_{\hat{p}} = \sqrt{\frac{p(1-p)}{n}}$$

One Sample Inference for Means

$$\bar{x} \pm t^* \frac{s}{\sqrt{n}} \qquad t = \frac{\bar{x} - \mu}{s/\sqrt{n}} \qquad dF = n - 1$$

Two Sample Inference for Means

$$(\bar{x}_1 - \bar{x}_2) \pm t^* \sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}} \qquad t = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}} \qquad dF = \min(n_1, n_2) - 1$$

One Sample Inference for Proportions

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

Plus-4 method adds 2 successes and 2 failures to the sample.

$$z = \frac{\hat{p} - p_0}{\sqrt{\frac{p_0(1-p_0)}{n}}}$$

Two Sample Inference for Proportions

$$(\hat{p}_1 - \hat{p}_2) \pm z^* \sqrt{\frac{\hat{p}_1(1-\hat{p}_1)}{n_1} + \frac{\hat{p}_2(1-\hat{p}_2)}{n_2}}$$

Plus-4 method adds 1 success and 1 failure to each sample.

$$z = \frac{\hat{p}_1 - \hat{p}_2}{\sqrt{\hat{p}(1-\hat{p})\left(\frac{1}{n_1} + \frac{1}{n_2}\right)}}$$

Here $\hat{p}$ is the pooled proportion.