Statistics 121 Formula Sheet

$$\bar{x} = \frac{1}{n}\sum x_i$$

$$s = \sqrt{\frac{\sum (x_i - \bar{x})^2}{n-1}}$$

Observation < *Q1 – (1.5 x IQR)*
Or
Observation > *Q3 + (1.5 x IQR)*

$$z = \frac{x-\mu}{\sigma}$$

$$x = \mu + z\sigma$$

Means

$$z = \frac{\bar{x} - \mu_0}{\sigma / \sqrt{n}}$$

$$\bar{x} \pm z^* \frac{\sigma}{\sqrt{n}}$$

$$n = \left(\frac{z^*\sigma}{m}\right)^2$$

$$t = \frac{\bar{x} - \mu_0}{s / \sqrt{n}}$$

with df = n –1

$$\bar{x} \pm t^* \frac{s}{\sqrt{n}}$$

with df = n –1

$$t = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}}$$

with df = smaller of (n_1 –1) and (n_2 –1)

$$\bar{x}_1 - \bar{x}_2 \pm t^* \sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}$$

with df = smaller of (n_1 –1) and (n_2 –1)

Proportions (for large samples – check conditions)

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

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

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

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

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

Slope

$$t = \frac{b}{SE_b}$$

with df = n –2

$$b \pm t^* SE_b$$

with df = n –2

Chi-square

$$X^2 = \sum \frac{(\text{observed count} - \text{expected count})^2}{\text{expected count}}$$

$$\text{expected count} = \frac{\text{row total} \times \text{column total}}{\text{table total}}$$

with df = (r –1)(c –1)