Formula Sheet

$$\bar{x} = \frac{\sum x}{n} = \frac{\sum xf}{n}$$

$$SS(x) = \sum(x-\bar{x})^2 = \sum x^2 - n(\bar{x})^2 = \sum x^2 - \frac{(\sum x)^2}{n} = \sum x^2 f - \frac{(\sum xf)^2}{n}$$

$$s^2 = \frac{SS(x)}{n-1} \qquad s = \sqrt{s^2} \qquad z = \frac{x-\mu}{s}$$

$$p' = \frac{x}{n} \qquad \mu_{p'} = p \qquad \sigma_{p'} = \sqrt{\frac{p(1-p)}{n}} \qquad E = z(\alpha/2)\cdot\sqrt{\frac{p'(1-p')}{n}}$$

$$n = (z(\alpha/2))^2 \cdot \frac{p(1-p)}{E^2} \qquad z = \frac{p'-p_0}{\sqrt{\frac{p_0(1-p_0)}{n}}}$$

$$df = n-1 \qquad E = t(\alpha/2)\cdot\frac{s}{\sqrt{n}} \qquad t = \frac{\bar{x}-\mu}{s/\sqrt{n}}$$

$$\bar{d} = \frac{\sum d}{n} = \overline{x_1} - \overline{x_2} \qquad \mu_{\bar{d}} = \mu_d \qquad s_d = \sqrt{\frac{\sum d^2 - \frac{(\sum d)^2}{n}}{n-1}} \qquad E = t(\alpha/2)\cdot\frac{s_d}{\sqrt{n}} \qquad t = \frac{\bar{d}-\mu_d}{s_d/\sqrt{n}}$$

$$\mu_{\overline{x_1}-\overline{x_2}} \qquad s_{\overline{x_1}-\overline{x_2}} = \sqrt{\frac{{s_1}^2}{n_1} + \frac{{s_2}^2}{n_2}} \qquad E = t(\alpha/2)\cdot s_{\overline{x_1}-\overline{x_2}} \qquad t = \frac{(\overline{x_1}-\overline{x_2})-(\mu_1-\mu_2)}{s_{\overline{x_1}-\overline{x_2}}}$$

$$df = \frac{\left(\frac{{s_1}^2}{n_1} + \frac{{s_2}^2}{n_2}\right)^2}{\frac{{s_1}^4}{{n_1}^2(n_1-1)} + \frac{{s_2}^4}{{n_2}^2(n_2-1)}}$$

$$E = z(\alpha/2)\sqrt{\frac{{p_1}'(1-{p_1}')}{n_1} + \frac{{p_2}'(1-{p_2}')}{n_2}} \qquad {P_p}' = \frac{x_1+x_2}{n_1+n_2} \qquad z = \frac{{p_1}'-{p_2}'}{\sqrt{{P_p}'(1-{P_p}')\left(\frac{1}{n_1}+\frac{1}{n_2}\right)}}$$

$$\chi^2 = \sum\frac{(f_i-e_i)^2}{e_i} \qquad df = k-1$$

Ten equal partions z-score values: $-1.28,\ -0.84,\ -0.52\ -0.25,\ 0,\ 0.25,\ 0.52,\ 0.84,\ 1.28$

$$P(x) = {}_nC_x p^x q^{n-x} \qquad P(x) = \frac{\mu^x e^{-\mu}}{x!} \qquad P(x) = \frac{{}_MC_x \cdot {}_{(N-M)}C_{(n-x)}}{{}_NC_n}$$