STAT401A **Exam 1 Formulas** **FALL 2003**

$\bar{Y} = \frac{Y_1+Y_2+\cdots+Y_n}{n} = \frac{1}{n}\sum_{i=1}^{n} Y_i \qquad s = \sqrt{\frac{1}{n-1}\sum_{i=1}^{n}(Y_i - \bar{Y})^2}$

$\mathrm{SD}(\bar{Y}) = \sigma/\sqrt{n} \qquad \mathrm{SE}(\bar{Y}) = s/\sqrt{n} \qquad t = \frac{\bar{Y}-\mu}{s/\sqrt{n}}$ d.f.$= n-1 \qquad \bar{Y} \pm t_{n-1}^{(1-\alpha/2)}\frac{s}{\sqrt{n}}$

$\mathrm{SD}(\bar{Y}_2 - \bar{Y}_1) = \sigma\sqrt{\frac{1}{n_1}+\frac{1}{n_2}} \qquad \mathrm{SE}(\bar{Y}_2 - \bar{Y}_1) = s_p\sqrt{\frac{1}{n_1}+\frac{1}{n_2}} \qquad s_p = \sqrt{\frac{(n_1-1)s_1^2+(n_2-1)s_2^2}{n_1+n_2-2}}$

$t = \frac{(\bar{Y}_2-\bar{Y}_1)-(\mu_2-\mu_1)}{s_p\sqrt{\frac{1}{n_1}+\frac{1}{n_2}}}$ d.f.$= n_1+n_2-2 \qquad (\bar{Y}_2 - \bar{Y}_1) \pm t_{n_1+n_2-2}^{(1-\alpha/2)} s_p\sqrt{\frac{1}{n_1}+\frac{1}{n_2}}$

T=sum of ranks in group 1 $\qquad Z = \frac{T-\mathrm{Mean}(T)}{\mathrm{SD}(T)} \qquad \mathrm{Mean}(T) = n_1(n_1+n_2+1)/2$

$\mathrm{SD}(T) = s_R\sqrt{\frac{n_1 n_2}{n_1+n_2}}$ $\qquad s_R$ is the standard deviation of all ranks.

K=number of positive differences $\qquad n$=number of nonzero differences $\qquad Z = \frac{K-n/2}{\sqrt{n/4}}$

S=sum of positive ranks $\qquad Z = \frac{S-\mathrm{Mean}(S)}{\mathrm{SD}(S)}$

n=number of nonzero differences $\qquad \mathrm{Mean}(S) = n(n+1)/4 \qquad \mathrm{SD}(S) = \sqrt{\sum_{i=1}^{n} R_i^2/4}$
