

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

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

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

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

$$T = \text{sum of ranks in group 1} \quad Z = \frac{T - \text{Mean}(T)}{\text{SD}(T)} \quad \text{Mean}(T) = n_1 \bar{R} \quad \bar{R} \text{ is the average of all ranks.}$$

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

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

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

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

$$\text{or } \text{SD}(S) = \sqrt{n(n+1)(2n+1)/24}$$
