Sample Mean

$$\overline{x} = \frac{\sum_{i=1}^{n} x}{n}$$

Where: n=sample size
x=observed characteristic

Sample Variance

$$s^2 = \frac{\sum_{i=1}^{n} (x - \overline{x})^2}{(n-1)}$$

Where: n=sample size
x=observed characteristic
$\overline{x}$ =mean

Sample Standard Deviation

$$s = \sqrt{\frac{\sum_{i=1}^{n} (x - \overline{x})^2}{(n-1)}}$$

Standard Error of the Mean

$$se(\overline{\mathrm{y}}) = \frac{s}{\sqrt{n}}$$

Standard Error of the Mean for Proportions

$$se(\mathrm{p}) = \sqrt{\frac{(1-f)}{n-1} p(1-p)}$$

Where: (1-f)=finite population correction where f is the sampling fraction
p = proportion of population expected to choose one of the two response categories (.50 is the most conservative estimate)

Confidence Limits

$$C(se(\overline{\mathrm{y}}))$$

$$C(se(\mathrm{p}))$$

Where: C = Z statistic associated with the confidence level; 1.96 corresponds to the .95%, 2.33 corresponds to the 98% level, and 2.58 corresponds to the .99% confidence level

Formula for Estimating Completed Sample Sizes Needed

$$Ns = \frac{(Np)(p)(1-p)}{(Np-1)(B/C) + (p)(1-p)}$$

Where: Ns = completed sample size needed for desired level of precision
Np = size of population
p = proportion of population expected to choose one of the two response categories (.50 is the most conservative estimate)
B = acceptable amount of sampling error; (e.g., .03 = $\pm$ of the true population value)
C = Z statistic associated with the confidence level; 1.96 corresponds to the .95%, 2.33 corresponds to the 98% level, and 2.58 corresponds to the .99% confidence level