Chapter 7: Confidence Intervals

α = **alpha**	**n = sample size**
μ = Population Mean	$\bar{x}$ = Sample Mean
σ^2 = Population Variance	S^2 = Sample Variance
σ = Population Standard Deviation	S = Sample Standard Deviation
P = Population Proportion	$\hat{P}$ = Point Estimate of P = x/n

Note: **σ** is the square root of **σ^2** ; **S** is the square root of **S^2**

C.I. for Mean **σ Known**	**C.I. for Mean** **σ Unknown**	**C.I. for Proportion**	**C.I for** **σ^2 & σ**	
Z Table	**T Table**	**Z Table**	**Chi-Square Table**	
α Calculation: Ex, 95% C.I. **Solution:** $1 - 0.95 = 0.05$ $\therefore \alpha = 0.05$	α Calculation: Ex, 95% C.I. (n= 10) **Solution:** $1 - 0.95 = 0.05$ $\therefore \alpha = 0.05$	α Calculation: Ex, 95% C.I. **Solution:** $1 - 0.95 = 0.05$ $\therefore \alpha = 0.05$ --- $\hat{P} = \frac{x}{n}$	α Calculation: Ex, 95% C.I. (n= 10) **Solution:** $1 - 0.95 = 0.05$ $\therefore \alpha = 0.05$	
C.I: $\bar{x} \pm Z_{1-\frac{\alpha}{2}} \left(\frac{\sigma}{\sqrt{n}}\right)$	***C.I:*** $\bar{x} \pm t_{\frac{\alpha}{2},n-1} \left(\frac{S}{\sqrt{n}}\right)$	***C.I:*** $\bar{x} \pm Z_{1-\frac{\alpha}{2}} \left(\sqrt{\frac{\hat{P}(1-\hat{P})}{n}}\right)$	***C.I for σ^2 :*** **Lower:** $\frac{(n-1)S^2}{\chi^2_{\frac{\alpha}{2},n-1}}$ **Upper:** $\frac{(n-1)S^2}{\chi^2_{1-\frac{\alpha}{2},n-1}}$	***C.I for σ:*** **Lower:** $\sqrt{\frac{(n-1)S^2}{\chi^2_{\frac{\alpha}{2},n-1}}}$ **Upper:** $\sqrt{\frac{(n-1)S^2}{\chi^2_{1-\frac{\alpha}{2},n-1}}}$
If "n" is required: $n = \left(\frac{Z_{1-\frac{\alpha}{2}} * \sigma}{E}\right)^2$ **Note:** Round up answer		***If "n" is required:*** $n = \hat{P}(1-\hat{P})\left(\frac{Z_{1-\frac{\alpha}{2}}}{E}\right)^2$ **Note$_1$**: if $\hat{P}$ was unknown, assume it is **0.5** **Note$_2$:** Round up answer		