Be sure you *always have this page and* Normal and T-Distribution *as a reference for every estimation problem*

Important: If confidence level is not given use 95% as a default.

Estimating One Population **Mean** $\mu = \overline{x} \pm E$

$\overline{X}$ = **Point** estimate (Sample Mean)		E = Margin of error(error bound)
Decision making process based on **sample size**		
Margin of Error	If $n > 30$ $\quad E = z_{\alpha/2}\frac{\sigma}{\sqrt{n}} = z_{\alpha/2}\frac{s}{\sqrt{n}}$	(For $z_{\alpha/2}$, use Table page **1)**
	If $n \le 30$ $\quad E = t_{\alpha/2}\frac{s}{\sqrt{n}}$	(For $t_{\alpha/2}$, use Table page **2)**
Interval Estimate	$\mu = \overline{x} \pm E$	
TI-83/84	$stat \rightarrow tests \rightarrow$ *Option 7(Z-interval)*	$stat \rightarrow tests \rightarrow$ *Option 8(t-interval)*

Width (difference between upper and lower bounds**)** $= 2E = UB - LB \qquad E = (UB - LB)/2$

Point Estimate **(middle** of upper and lower bounds**)** $= \overline{x} = (UB + LB)/2$

Estimating One Population **Proportion** $P = \hat{p} \pm E$

Estimating Population **Proportion** $P = \hat{p} \pm E$	
$\hat{P} = \frac{x}{n}$ **(Called p-hat is sample proportion and point estimate for population proportion)**	**E = Margin of error** $\quad E = z_{\alpha/2}\sqrt{\frac{\hat{p}(1-\hat{p})}{n}}$

Width (difference between upper and lower bounds) $= 2E = UB - LB$ **so** $\quad E = (UB - LB)/2$

Point Estimate (middle **of upper and lower bounds**) $= \hat{p} = (UB + LB)/2$

TI-83 ***stat*** $\rightarrow$ ***test*** $\rightarrow$ ***Option A***

Estimating the ***difference*** between **Two** Populations ***Means*** or ***Proportions***

Mean $\mu_1 - \mu_2$	**Proportion** $P_1 - P_2$
$\mu_1 - \mu_2 = (\overline{x}_1 - \overline{x}_2) \pm E$	$P_1 - P_2 = (\hat{p}_1 - \hat{p}_2) \pm E$
Point **estimate** $= (\overline{x}_1 - \overline{x}_2)$	Point **estimate** $= (\hat{p}_1 - \hat{p}_2)$
$E = Z\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}$	$E = Z\sqrt{\frac{\hat{p}_1(1-\hat{p}_1)}{n_1} + \frac{\hat{p}_2(1-\hat{p}_2)}{n_2}}$
TI-83/84 ***stat*** $\rightarrow$ ***test*** $\rightarrow$ ***Option 9***	**TI-83/84** ***stat*** $\rightarrow$ ***test*** $\rightarrow$ ***B***