Confidence Interval

Steps to Create a **Confidence Interval for the mean** (Large Sample)

1. List all given sample data from the problem including sample size and C-level
2. Find $z_{\alpha/2}$
3. Calculate the margin of error, $E = z_{\alpha/2} \left( \frac{\sigma}{\sqrt{n}} \right)$
4. Calculate $\left[ \bar{x} - E, \bar{x} + E \right]$ 

Steps to Create a **Confidence Interval for the mean** (Small Sample)

1. List all given sample data from the problem including sample size and C-level
2. Find $t_{\alpha/2}$
3. Calculate the margin of error, $E = t_{\alpha/2} \left( \frac{s}{\sqrt{n}} \right)$
4. Calculate $\left[ \bar{x} - E, \bar{x} + E \right]$ 

Steps to creating a **Confidence Interval for a population proportion**: 

1. Gather sample data: $x$ (or $\hat{p}$), $n$, and C-level
2. Calculate $\hat{p} = \frac{x}{n}$ & $(1 - \hat{p}) = \hat{q}$
3. Calculate the standard error, $\sigma_p = \sqrt{\frac{\hat{p}\hat{q}}{n}}$
4. Find $Z_{\alpha/2}$
5. Calculate the Margin of Error, $E = Z_{\alpha/2} \sqrt{\frac{\hat{p}\hat{q}}{n}}$
6. Finally, form $\left[ \hat{p} - E, \hat{p} + E \right]$
Steps to test a hypothesis:

1. Express the original claim symbolically
2. Identify the Null and Alternative hypothesis
3. Record the data from the problem
4. Calculate the test statistic using either $z = \frac{\bar{x} - \mu_0}{\sigma} \sqrt{n}$ or $t = \frac{\bar{x} - \mu_0}{s} \sqrt{n}$ or $z = \frac{\hat{p} - \rho_0}{\sqrt{n}} \sqrt{p_0 q_0}$
5. Determine your rejection region (or find your p-value).
6. Find the initial conclusion
7. Word your final conclusion