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 \( z_{a/2} \)
3. Calculate the margin of error, \( E = z_{a/2} \left( \frac{\sigma}{\sqrt{n}} \right) \)
4. Calculate \([\bar{x} - E, \bar{x} + E]\)

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 \( t_{a/2} \)
3. Calculate the margin of error, \( E = t_{a/2} \left( \frac{s}{\sqrt{n}} \right) \)
4. Calculate \([\bar{x} - E, \bar{x} + E]\)

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 \( Z_{a/2} \)
5. Calculate the Margin of Error, \( E = Z_{a/2} \sqrt{\frac{\hat{p}\hat{q}}{n}} \)
6. Finally, form \([\hat{p} - E, \hat{p} + E]\)
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 $z = \frac{\bar{x} - \mu_0}{\sigma}$ or $t = \frac{\bar{x} - \mu_0}{s}$ or $\rho = \frac{\hat{p} - \rho_0}{\sqrt{\frac{\rho_0(1 - \rho_0)}{n}}}$
5. Determine your rejection region (or find your p-value).
6. Find the initial conclusion
7. Word your final conclusion