1. POPULATION
   a. Identify the parameter of interest:
   \( \mu \): Mean Numerical (Measurement) \quad \pi \): proportion Categorical (success-failure)

   b. Describe the variable in context with the problem:
   \( \mu \) = mean of the amount of drying time of a particular paint. \quad \pi = \) proportion of people in the community who prefer smoking

2. STATISTICAL METHOD
   a. Determine the confidence level \((1 - \alpha)\) and the level of significance \(\alpha\).

   \textbf{NOTE:} If not specified, set the confidence to 0.95 (95%) and the level of significance to 0.05.

   b. Identify the required formula for the confidence interval:
   
   When \( \sigma \) known:
   \[
   \bar{x} \pm \left( z_{\text{critical value}} \frac{\sigma}{\sqrt{n}} \right)
   \]
   
   When \( \sigma \) unknown:
   \[
   \bar{x} \pm \left( t_{\text{critical value}} \frac{s}{\sqrt{n}} \right)
   \]

3. SAMPLE
   a. Calculate or identify the descriptive statistics:
   
   Descriptive statistics needed:
   - the sample mean
   - standard deviation
   - sample size

   Descriptive statistics needed:
   - the sample proportion
   - sample size

   b. Check the conditions for normality:
   population is normal \quad OR \quad \( np \geq 10 \) AND \( n(l - p) \geq 10 \)
4. STATISTICAL RESULTS
   a. Find the required $z$ or $t$ critical value:

   **$z$ critical value:**
   1. Find $\frac{\alpha}{2}$
   2. Take this value and locate it in the standard normal probability table and identify the $z$ critical value.

   **NOTE:** Commonly used $z$ critical value

<table>
<thead>
<tr>
<th>Confidence Level</th>
<th>$\alpha$</th>
<th>$\frac{\alpha}{2}$</th>
<th>$z$ critical value</th>
</tr>
</thead>
<tbody>
<tr>
<td>90%</td>
<td>.10</td>
<td>.05</td>
<td>1.645</td>
</tr>
<tr>
<td>95%</td>
<td>.05</td>
<td>.025</td>
<td>1.960</td>
</tr>
<tr>
<td>99%</td>
<td>.01</td>
<td>.005</td>
<td>2.576</td>
</tr>
</tbody>
</table>

   **$t$ critical value:**
   1. Determine the degrees of freedom: $df = (n - 1)$
   2. Use the appropriate confidence level and the $df$ and locate the $t$ critical value in the $t$ critical value table.

   For example,

<table>
<thead>
<tr>
<th>Confidence Level</th>
<th>$df$</th>
<th>$t$ critical value</th>
</tr>
</thead>
<tbody>
<tr>
<td>90%</td>
<td>15</td>
<td>1.75</td>
</tr>
<tr>
<td>98%</td>
<td>7</td>
<td>3.00</td>
</tr>
<tr>
<td>95%</td>
<td>23</td>
<td>2.07</td>
</tr>
</tbody>
</table>

   b. Compute the confidence interval based on formula in step 2.

   **NOTE:** Calculator shortcuts for the confidence interval:

   When $\sigma$ known:
   - Z-Interval
   - 1-PropZInt

   When $\sigma$ unknown:
   - T-Interval

5. CONCLUSION

   Interpret the confidence interval in the context of the problem:

   Ex) There is 95% probability that the mean drying time is between...  
   Ex) There is 95% probability that the proportion of people who prefer smoking is between...