You must demonstrate (or assume, if necessary) that the following conditions are met before performing a hypothesis test or constructing a confidence interval:

### Means ($z$ or $t$)

<table>
<thead>
<tr>
<th>One sample</th>
<th>Two samples</th>
</tr>
</thead>
</table>
| 1. sample is random  
2. standard deviation of the population is known  
3. population is normally distributed OR sample is large | 1. The samples are independent  
2. Check BOTH samples for conditions 1-3 for one sample-$z$ shown above. |
| **Therefore, I will use $z$ procedures for population means.** | **Therefore, I will use $t$ procedures for population means with $n-1$ degrees of freedom.** |

| Matched pairs—two lists |  |
| 1. Samples are matched  
2. The list of differences is... | 1. The samples are independent  
2. Check BOTH samples for conditions 1-3 for one sample-$t$ shown above. |
| 1. large ($>40$), OR  
2. medium (15-40) and plot of differences shows little skewness and no extreme outliers, OR  
3. small ($<15$) and plot of differences shows no skewness and no outliers |  |
| **Therefore I will use $t$ procedures for the difference of two population means.** | **Therefore I will use $t$ procedures for the difference of two population means using $n-1$ degrees of freedom.**  
([n=smaller sample size] OR use the degrees of freedom calculated by the calculator.) |

### Proportions ($z$)

<table>
<thead>
<tr>
<th>One Sample</th>
<th>Two samples</th>
</tr>
</thead>
</table>
| 1. The sample is random  
2. Number of successes ($np$) and the number of failures ($nq$) is at least 10 (show the actual numbers!)  
3. The probability of success is constant OR $n < 10\%$ population (show the actual numbers!) | 1. Both samples are random  
2. Number of successes ($np$) and the number of failures ($nq$) is at least 10 for BOTH samples (show the actual numbers!)  
3. The probability of success is constant for each sample OR $n < 10\%$ population (show the actual numbers!) |
| **Therefore I will use $z$ procedures for a population proportion.** | **Therefore I will use $z$ procedures for the difference of two population proportions.** |

### Distributions (chi-square)

| 1. Working with counts  
2. ONE of the following  
• All expected counts are at least 5 OR  
• All expected counts are $>1$ AND no more than 20\% of expected counts are less than 5 | 1. The residual plot does not show a curved or fanned pattern  
2. A histogram/stemplot/line plot of the residuals shows little skewness and no extreme outliers. |
| **Therefore I will use chi-square procedures** [for Goodness Of Fit (1 sample, 1 variable), Independence (1 sample, 2 variables) OR Homogeneity (2 samples, 2 variables)] | **Therefore I will use $t$ procedures for the slope of the regression line with $n-2$ degrees of freedom ($n$= number of $(x,y)$ pairs) |

Work to show: hypotheses, verification of assumptions, name of procedure, picture, $z/t/\text{chi}$ calculation with substituted values and result, $p$-value, decision, and conclusion in context.