|  | **Sampling Distribution of Sample Proportions** | **Sampling Distribution of Sample Means** |
| --- | --- | --- |
| When the Population Proportion or Standard Deviation is Unknown | Replace with the sample proportion, . | Replace with the sample standard deviation, . |
|  |  |
| **Inference** | Use the standard Normal distribution for drawing inferences about the population regardless of whether you use or to estimate the standard error. | Use the **standard Normal distribution** for drawing inferences about the population when the population standard deviation is **known**. Use the **Student’s t distribution** for drawing inferences about the population when the population standard deviation is **unknown**. \* |
| **Assumptions and Conditions for Inference** | * The sampled values must be **independent**of each other. * The sampling process must be **random**. * The sample size, ***n***, must be no larger than 10% of the population. * For proportions, the number of “successes,” ***np***, and the number of “failures,” ***n(1-p)***, are expected to be at least 5. * For means, the sample size must be greater than or equal to 30, i.e., n ≥ 30 | |
| **Critical Value** |  |  |
| **Margin of Error (ME)** | The margin of error is the number of standard errors that are subtracted from or added to the point estimate. | |
|  |  |
| **Sample Size for Desired ME** |  |  |
| **Typical Confidence Intervals and their Critical Values** | 90% CI = 1.645  95% CI = 1.96  98% CI = 2.33  99% CI = 2.58 | The t values depend on the degrees of freedom, n-1, and must be found with technology or the t Table. |

\*All problem scenarios relating to the sampling distribution of sample **means** will have an unknown population standard deviation, and therefore, will require the Student’s t distribution.