$\hat{\rho}$ = 32% ρ_0 = 35% α = 5% n = 450

Population	Voters in the United States
Focus Proportion	Adults Who Supported Romney

Step I Identify Procedure:

We want to test the evidence against the claim that the proportion of adults who supported Romney in the population of voters in the United States (ρ) is equal to 35% (ρ_0).

The null and alternative hypotheses are:

$$H_0: \rho = 35\%$$

$$H_A: \rho < 35\%$$

Step II Check Conditions:

* **Random Sample: A random sample was conducted to insure every member of the population was equally likely to be selected.**

* **Normal Sampling Distribution: The sampling distribution of all possible sample proportions has an approximately normal shape because:**

$$n * \rho > 10 \qquad n * (1 - \rho) > 10$$

$$450 * 35\% > 10 \qquad 450 * (1 - 35\%) > 10$$

* **Independence: The lack of replacement is not a problem in this case because the number of subjects in the population is more than 10 times the sample size.**

Step III Perform Procedure:

See "Graph B4" tab for graph of sampling distribution

Sampling Distribution: Proportion = 35% Standard Deviation = $\frac{\sqrt{\rho(1-\rho)}}{\sqrt{n}}$ **= (35%(1-35%)^0.5)/(450*^0.5) = 2.2%**

Shape: Approximately Normal

P-Value = $P(\hat{\rho} < 32\% \mid \rho = 35\%) =$ **8.6% compared to the Significance Level (α) of 5%**

Step IV Interpretation:

We fail to reject the null hypothesis at the 5% significance level (α). The P-value of 8.6% shows that an observed sample proportion as extreme as 32% ($\hat{\rho}$) would be expected to occur 8.6% of the time, and thus mere chance could explain the difference between the sample proportion and hypothesized population proportion. We cannot say that the proportion of adults who supported Romney in the population of voters in the United States is not equal to the reported proportion of 35% (ρ_0).