HYPOTHESIS TESTING

Step 1.A.: Identify the null and hypothesis.

The null is what is currently assumed to be true. The problem will say something about what the mean, proportion, or variance, etc., is currently or what it is believed to be currently. The hypothesis is what is being tested. The problem will say something about what someone wants to prove or disprove. It might also say specifically that someone wants to prove less than or greater than what is currently assumed.

Step 1.B.: Identify whether it is a two tailed, upper tailed, or lower tailed test.

This will be important information when making the decision and conclusion. To figure this out, consider what would make the null false. For example, if the null is $\mu \geq \$35$, the mean would have to be less than $35 for the null to be false. Therefore, the reject region will be in the lower tail. Another way to determine which test it is would be to consider what would make the alternate true. If the alternate is $\mu < \$35$, then for it to be true, the mean would be in the lower tail. A trick to figuring this out is to look at the way the sign is pointing in the alternate. If it's pointing to the right (>), then it is upper tailed. If it's pointing to the left (<), it is lower tailed. If the null and hypothesis are equal to and not equal to, respectively, then it is a two tailed test.

Step 2: Find the value of the test statistic.

The way to calculate the test statistic will vary based on the type of test. Be sure to understand what kind of test is necessary and use that formula to calculate the test statistic.

Step 3: Find the critical value or the p-value.

For most hypothesis tests, it will be easier to find the critical value rather than the p-value. Each test has a corresponding chart to use in order to find the critical value. The best way to find the p-value would be to use some kind of software, like Excel.

Step 4: Make the decision and conclusion.

The decision is either reject or don't reject/ cannot reject

> Upper Tailed Test: critical value* > test statistic** = do not reject; critical value< test statistic = reject
>
> Lower Tailed Test: critical value> test statistic = reject; critical value< test statistic = do not reject
>
> Two Tailed test: –critical value< test statistic< +critical value = do not reject;
> –critical value> test statistic > +critical value = reject

*Critical value corresponds to alpha
**Test statistic must be found to determine the p-value

The conclusion is specific to the problem. The conclusion should be written out to describe what reject or do not reject means. For example, if the null was that the mean price for a t-shirt is $35 and it is rejected, the decision and conclusion would be something along the lines of "reject the null; the mean price for a t-shirt is not $35."