

Steps to Tests of Significance (Hypothesis Testing)

1. Set up your hypotheses

The alternative hypothesis, H_A , is the claim.

The null hypothesis, H_0 , is the opposite of the alternative.

Together, the null and alternative hypotheses must cover all possible values of the parameter.

Note: The equal sign is always in the null hypothesis. You are sampling to see if your sample results are as far away from the null hypothesis that it is impractical to believe that the null is true. It is easy to provide evidence against an equality, but impossible to prove equality. Therefore, the equal sign belongs in the null hypothesis. For example, we can provide evidence that a person is guilty of a crime, but cannot prove that he or she is innocent.

2. **State all necessary assumptions or conditions.** Your work is not valid unless certain conditions are met. For example, if the experimental design is poor to begin with, your results are not credible.
3. **Set up your rejection region.** In other words, how many standard deviations away from the mean must your test statistic lay in order to believe that the null must not be true? This value is the critical value. If your test statistic lies in the rejection region, your results are significant (i.e. you have evidence against the null).
4. **Calculate the p-value.** Find the probability of obtaining results that are as extreme as or more extreme than your sample results if the null were in fact true.
5. **Make a decision:** Do you have evidence against the null or not?
6. **Write a conclusion in the context of the problem.** Either you have evidence to reject the null or you cannot reject the null hypothesis. What led you to this decision in the context of the problem? What does this mean in the context of the problem?