

# Steps for Hypothesis Testing

1. Define your parameters. Say explicitly what symbols like  $p$ ,  $\hat{p}$ ,  $n$ ,  $x$ ,  $\bar{x}$ , and  $\mu$  represent
2. State the claim being tested in symbols.
3. State the opposite of the claim in symbols.
4. Determine  $H_0$  and  $H_1$ .  $H_0$  is the statement from 2 and 3 which involves equality.  $H_1$  is the statement from 2 and 3 which does not involve equality.
5. Select a significance level  $\alpha$ . If  $\alpha$  is not given, use  $\alpha = 0.05$ .
6. Decide on the appropriate distribution (binomial,  $z$ ,  $t$ , etc.) and test statistic (observed successes,  $z$ -score,  $t$ -score, etc.). If using technology, you are deciding which test to use on your machine.
7. Find the  $P$ -value. This is the probability of getting a test statistic at least as extreme as your calculated test statistic. The  $P$ -value is a measure of consistency between your observations and the null hypothesis  $H_0$ .
8. Decide if you should reject  $H_0$ .
  - (a) If  $P < \alpha$ , then the observations are not consistent with  $H_0$ .  
REJECT  $H_0$  (Support  $H_1$ ).
  - (b) If  $P > \alpha$ , then the observations are consistent with  $H_0$ .  
DO NOT REJECT  $H_0$  (Do not support  $H_1$ ).
9. Restate your conclusion in non-technical terms that refer directly to the claim being tested.
  - If your claim is  $H_0$ , your conclusion will be one of these
    - There is enough sample evidence to reject the claim.
    - There is NOT enough sample evidence to reject the claim.
  - If your claim is  $H_1$ , then your conclusion will be one of these
    - There is enough sample evidence to support the claim.
    - There is NOT enough sample evidence to support the claim.