

Hypothesis Testing Methods

Traditional and P-Value

[H 405]

Traditional Method:

Step 1 Identify the **Null Hypothesis H_0** and the **Alternative Hypothesis H_a**

Step 2 Identify α (Level of Significance)

Step 3 Find the critical value(s)

Step 4 Find the test statistic

- For a Proportion: Hand calculation

$$z = \frac{\hat{p} - p}{\sqrt{\frac{pq}{n}}}$$

TI 83/84 – Use **1PropZTest** (See Handout H-404)

- For a population mean (with α known):

$$z = \frac{\bar{x} - \mu_x}{\frac{\sigma}{\sqrt{n}}}$$

TI 83/84 - Use **Z-Test** (See Handout H 404)

- For a population mean (with α **Not** known):

$$t = \frac{\bar{x} - \mu_x}{\frac{s}{\sqrt{n}}}$$

TI 83/84 - Use **T-Test** (See Handout H-404)

Step 5 Draw a graph and label the test statistic and critical value(s)

Step 6 Make a decision to reject or fail to reject the null hypothesis

- **Reject H_0** - The test statistic falls within the critical region.
- **Fail to Reject H_0** - Test statistic does not fall within the critical region.

P-Value Method:

P-value is the area determined as follows:

- Left Tail Test: *p-value* is the area to the left of the test statistic.
- Right Tail Test: *p-value* is the area to the right of the test statistic.
- Two Tailed Test: *p-value* is twice the area bounded by the test statistic

Make a decision to reject or fail to reject the null hypothesis:

- **Reject H_0** if $p\text{-value} \leq \alpha$
- **Fail to reject H_0** if $p\text{-value} > \alpha$