

Significance test example

For this example, the population of interest consists of the 1362 females who reported height (in inches) on the Math 160 student surveys from 2002 through 2008. The parameter of interest is the mean height μ for the full population. Our hypothesis comes from the question “Is the mean height for this population the same as the mean height of 64.1 inches for all females ages 18 to 22 in the United States?” In terms of null and alternative hypothesis, this is

$$H_0 : \mu = 64.1 \text{ inches}$$

$$H_a : \mu \neq 64.1 \text{ inches}$$

In order to carry out a significance test using the tools we have at hand, we need to know the population standard deviation. (Note that this situation of knowing the population standard deviation without knowing the population mean rarely occurs in practice.) The standard deviation for the height distribution of the full population (1362 females in the Math 160 survey) is $\sigma = 2.992$ inches.

You will carry out a significance test using one of the samples given on the flip side.

1. Determine the size of your sample.

$$n =$$

2. Show how to compute the mean of your sample.

$$\bar{x} =$$

3. Compute the standard deviation of the sampling distribution.

$$\sigma_{\bar{x}} =$$

4. Compute the standardized score for your sample mean.

$$z =$$

5. Determine the P -value for your sample mean (using Table A if needed).

$$P =$$

6. Determine whether or not you reject the null hypothesis at the $\alpha = 0.05$ significance level.

