M111 Worksheet on Hypothesis Testing for the Mean

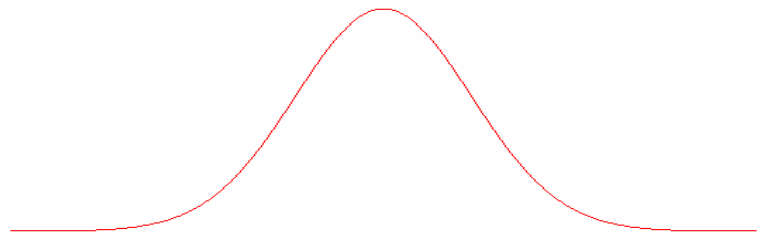
Name_____

Exercise A: It is claimed that the mean salary of college-educated women in Indiana is greater than the national average for all college-educated women, which is known to be $45,000. A random sample of 100 college-educated women in Indiana is taken. Their average salary is determined to be $46,500, with a standard deviation of $5200. With a significance level of $\alpha = 0.05$, test this claim.

1. For the claim being tested, state the null hypothesis H_0 and alternative hypothesis H_a.

2. Specify the level of significance, α.

3. Determine the type of test, critical value z_0 and rejection regions. Label and shade below:



4. Find the standardized z score for your sample mean. and its corresponding P-value (percentile value).

5. Determine whether to reject or fail to reject the null hypothesis.

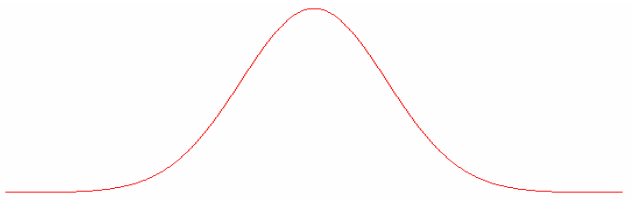
6. Interpret your decision in context of original claim.

Exercise B: Th U.S. Department of Agriculture reports that the mean cost of raising a child for birth to age 2 in a rural area is $8390. We believe this statistic to be incorrect so we conduct a test of 900 children age 2 and find that the mean cost of this sample is $8275, with a standard deviation of $1540. With a significance level of $\alpha = 0.05$, what can we conclude?

1. For the claim being tested, state the null hypothesis H_0 and alternative hypothesis H_a.

2. Specify the level of significance, α.

3. Determine the type of test, critical value z_0 and rejection regions. Label and shade below:



4. Find the standardized z score for your sample mean. and its corresponding percentile value.

5. Determine whether to reject or fail to reject the null hypothesis.

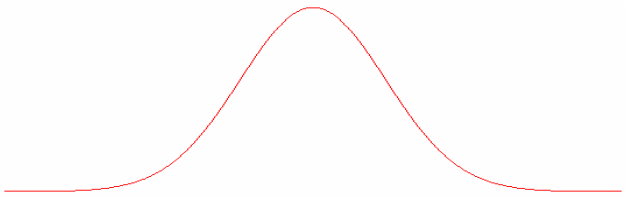
6. Interpret your decision in context of original claim.

Exercise C. In an advertisement, Domino's pizza claims that its mean delivery time is less than 30 minutes. A random selection of 36 delivery times has a sample mean of 28.5 minutes and a standard deviation of 3.5 minutes. Is there enough evidence to support the claim at the .01 level of significance?

1. For the claim being tested, state the null hypothesis H_0 and alternative hypothesis H_α.

2. Specify the level of significance, α.

3. Determine the type of test, critical value z_0 and rejection regions. Label and shade below:



4. Find the standardized z score for your sample mean. and its corresponding P-value (percentile value).

5. Determine whether to reject or fail to reject the null hypothesis.

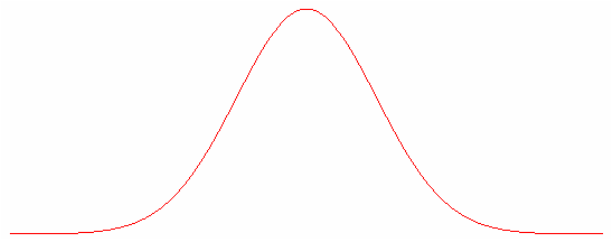
6. Interpret your decision in context of original claim.

Exercise D: A light bulb manufacturer guarantees that the mean life of a halogen bulbs at least 750 hours. You feel that the claim is false. If a random sample of 36 light bulbs is taken and determined to have a mean life of 745 hours with a standard deviation of 60 hours. With a significance level of $\alpha = 0.05$, can you reject the manufacturer's claim?

1. For the claim being tested, state the null hypothesis H_0 and alternative hypothesis H_α.

2. Specify the level of significance, α.

3. Determine the type of test, critical value z_0 and rejection regions. Label and shade below:



4. Find the standardized z score for your sample mean.

5. Determine whether to reject or fail to reject the null hypothesis.

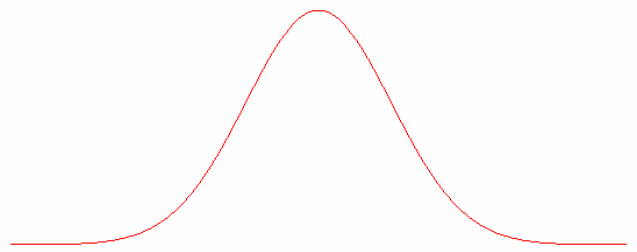
6. Interpret decision in context of original claim.

Exercise E: It is estimated that the mean consumption of tea by Americans is greater than 7 gallons per year. In a sample of 100 people, it is found that the mean consumption of tea is 7.8 gallons per year with a standard deviation of 2.67 gallons. With a significance level of $\alpha = 0.07$, can you support the claim?

1. For the claim being tested, state the null hypothesis H_0 and alternative hypothesis H_α.

2. Specify the level of significance, α.

3. Determine the type of test, critical value z_0 and rejection regions. Label and shade below:



4. Find the standardized z score for your sample mean.

5. Determine whether to reject or fail to reject the null hypothesis.

6. Interpret decision in context of original claim.