Time Frame: 50 minutes

Subject Matter: Z Test TELL ME

Objective: TSWBAT test means for large samples, using the z test.

Standards: DA – 4.10

 Materials: PowerPoint Presentation, Calculator, and Worksheets

SHOW ME

Presentation of Information

In pairs, the students will be asked to solve the following problems.

1. The average US wedding includes 125 guests. A random sample of 35 weddings during the past year in a particular county had a mean of 110 guests and a standard deviation of 30. Is there sufficient evidence at the $α=0.01$ level of significance that the average number of guests differs from the national average?

Solution:

STEP 1: State the hypothesis and identify the claim.

STEP 2: Find the critical value.

STEP 3: Compute the test value.

STEP 4: Make the decision.

STEP 5: Summarize the result.

1. The average salary of public school teachers for a specific year was reported to be $39,385. A random sample of 50 public school teachers in a particular state had a mean of $41,680 and a standard deviation of $5,957. Is there sufficient evidence at the $α=0.05$ level to conclude that the mean salary differs from $39,385?

Solution:

STEP 1: State the hypothesis and identify the claim.

STEP 2: Find the critical value.

STEP 3: Compute the test value.

STEP 4: Make the decision.

STEP 5: Summarize the result.

1. To see if young men ages 8 through 17 years spend more or less than the national average of $24.44 per shopping trip to a local mall, the manager surveyed 33 young men and found the average amount spent per visit was $22.97. The standard deviation of the sample was $3.70. At $α=0.02$, can it be concluded that the average amount spent at a local mall is not equal to the national average of $24.44?

Solution:

STEP 1: State the hypothesis and identify the claim.

STEP 2: Find the critical value.

STEP 3: Compute the test value.

STEP 4: Make the decision.

STEP 5: Summarize the result.

1. A college professor claims that the average cost of a paperback textbook is greater than $27.50. A sample of 50 books has an average cost of $29.30. The standard deviation of the sample is $3.00. Should the null hypothesis be rejected at $α=0.05$?

Solution:

STEP 1: State the hypothesis and identify the claim.

STEP 2: Find the critical value.

STEP 3: Compute the test value.

STEP 4: Make the decision.

STEP 5: Summarize the result.

1. A study found that the average stopping distance of a school bus traveling 50 miles per hour was 264 feet (Sanpshot, USA TODAY, March 12, 1992). A group of automotive engineers decided to conduct a study of its school buses and found that for 20 buses, the average stopping distance of the company’s buses traveling 50 miles per hour was 262.3 feet. The standard deviation of the population was 3 feet. Test the claim that the average stopping distance of the company’s buses is actually less than 264 feet. Should the null hypothesis be rejected at $α=0.01$?

Solution:

STEP 1: State the hypothesis and identify the claim.

STEP 2: Find the critical value.

STEP 3: Compute the test value.

STEP 4: Make the decision.

STEP 5: Summarize the result.