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. As store manager hypothesizes that the average number of pages a person copies on the store’s copy machine is less than 40. A sample of 50 customers’ orders is selected. At $α=0.01$, is there enough evidence to support the claim?

2 2 2 5 32 5 29 8 2 49 21 1 24

72 70 21 85 61 8 42 3 15 27 113 36 37

5 3 58 82 9 2 1 6 9 80 9 51 2

122 21 49 36 43 61 3 17 17 4 1

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 manufacturer states that the average lifetime of its television sets is more than 84 months. The standard deviation of the population is 10 months. One hundred sets are randomly selected and tested. The average lifetime of the sample is 85.1 months. Test the claim that the average lifetime of the sets is more than 84 months. 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.

1. A special cable has a breaking strength of 800 pounds. The standard deviation of the population is 12 pounds. A researcher selects a sample of 20 cables and finds that the average breaking strength is 793 pounds. At $α=0.01$, can one reject the claim that the breaking strength is 800 pounds?

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 hourly wage last year for members of the hospital clerical staff in a large city was $8.25. The standard deviation of the population was $0.54. This year a sample of 50 workers had an average hourly wage of $8.51. Test the claim, at $α=0.05$, that the average has not changed.

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. Ten years ago, the average acreage of farms in a certain geographical region was 65 acres. The standard deviation of the population was 7 acres. A recent study consisting of 22 farms showed that the average was 63.2 acres per farm. Test the claim, at $α=0.01$, that the average has not changed.

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.