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. A survey claims that the average cost of a hotel room in Atlanta is $69.21. To test the claim, a researcher selects a sample of 30 hotel rooms and finds that the average cost is $68.43. The standard deviation of the population is $3.72. At $α=0.05$, is there enough evidence to reject the claim?

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. It has been reported that the average credit card debt for college seniors is $3,262. The student senate at a large university feels that seniors have a debt much less than this, so it conducts a study of 50 randomly selected seniors and finds the average debt is $2,995 with a sample standard deviation of $1,100. With $α=0.05$, is the student senate correct?

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 researcher estimates that the average revenue of the largest business in the United States is greater than $24 billion. A sample of 50 companies is selected, and the revenue (in billions of dollars) is shown. At $α=0.05$, is there enough evidence to support the researcher’s claim?

178 122 91 44 35 41 38 36 15 25

61 56 46 20 32 31 30 19 19 19

30 28 28 20 27 24 16 15 15 19

29 16 16 19 15 25 25 18 14 15

24 23 17 17 22 22 21 20 17 20

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. Full time Ph. D. students receive an average salary of $12,837 according to the U.S. Department of Education. The dean of graduate studies at a large university feels that Ph.D. students in his state earn more than this. He surveys 44 randomly selected students and finds their average salary is $14,445 with standard deviation of $1,500. With $α=0.05$, is the dean correct?

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 report in USA TODAY stated that the average age of commercial jets in the United States is 14 years. An executive of a large airline company selects a sample of 36 planes and finds the average age of the planes is 11.8 years. The standard deviation of the sample is 2.7 years. At $α=0.01$, can it be concluded that the average age of the planes in his company is less than 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

After 20 minutes, the class will go over the problems.