

Name _____
 Section _____
 Date _____

z-score (Standard Error of the Mean)

Read the chapter in your text that corresponds to z-score (Standard Error of the Mean) and define the following terms and symbols:

- Sampling Error _____

- Sampling Distribution _____

- Central Limit Theorem _____

- Standard error of M _____

- Law of large numbers _____

- Difference between Standard Deviation and Standard Error _____

- μ _____
- M _____
- σ _____
- S _____

SPSS Lab - z-score (SEM)

Mrs. Welty is a fourth grade teacher who is convinced that her small group of students (16) are exceptionally more intelligent than average. Using the Weschler Intelligence Scale for Children, WISC, she determines that the average IQ score for her class is 108. She compares this sample mean to the WISC population mean of 100 using the population standard deviation of 15.

- State H_0 : _____

➤ State H_1 : _____

The 16 student IQ scores are as follows:

104, 106, 100, 102, 99, 127, 118, 107, 104, 101, 122, 101, 100, 114, 130, 98

Begin the statistical analysis by entering these data into the SPSS Data Editor:

- Open the SPSS Data Editor and enter data into the columns. (Refer to "Data Input and the SPSS Screen" for the procedure for opening SPSS on the GCC network and entering data into the Data Editor.)
- Use two columns headed by the variables "Subject" and "IQ."
- Number each score under "subject" (1 through 16) and then enter the corresponding IQ score for each.
- Check your data before beginning the data analysis. There are 16 IQ scores corresponding to 16 students.
- Click on "Analyze" → "Descriptive Statistics" and then click on "Descriptives."
- Click on "IQ" and then the right arrow between the windows to indicate that we want the analysis done only on the variable "IQ." (Since "student" is a nominal variable it will not be analyzed.)

Answer the following questions to help statistically and practically answer the research question:

Descriptive Statistics for Mrs. Welty's students' IQ scores:

n	_____
Mean (M)	_____
Minimum	_____
Maximum	_____

Compute the z-score (standard of the mean) using the following formula:

$$Z_{ob} = \frac{M - \mu}{\sigma_M \text{ (Standard Error of the Mean)}}$$

Where $\sigma_M = \sigma / \sqrt{n}$

σ_M _____

Z_{ob} _____

Z_{crit} (2-tail, .05) _____

Decision about H_0 _____ Reject H_0 _____ Fail to Reject (Retain) H_0

Statistical Notation: _____

In actual words, based upon this z-score, what is your conclusion about the intelligence level of the students in Mrs. Welty's class?

Effect size: $\frac{M - \mu}{\sigma}$ _____

➤ Turn in this sheet as well as a copy of your Data Editor and Output Page.