TA’S NAME:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Problem Set #4**

1. I randomly sampled 200 sociologists and asked each of them whether they owned a copy of Durkheim’s *Suicide*. I observed that 87 of them do own that book. Construct and interpret a 90% confidence interval for the population proportion of sociologists who own a copy of *Suicide*. *Show your work.*

ANSWER: Here, equals 87/200 or 0.435. So, 🡺🡺0.435±0.058.

Thus, we can say with 90% certainty that the population proportion of sociologists who own a copy of *Suicide* is between 0.377 and 0.493.

1. I randomly sampled 289 enrolled college students and asked them each how much they spent on textbooks this semester. I observed a mean amount spent of $252 with a standard deviation of $110. Construct and interpret a 90% confidence interval for the population mean amount that college students spent on textbooks this semester. *Show your work.*

ANSWER: = $252\pm 1.66\frac{110}{\sqrt{289}}$= 252±10.74.

Thus, we can say with 90% certainty that the population mean amount that college students spent on textbooks this semester is between $241.26 and $262.74.

1. I randomly sampled 200 left-handed people and 200 right-handed people and asked each of them whether they had been in a car accident in the past 12 months. Among left-handed people, 10 had been in an accident in the past 12-months; among right-handed people, 20 had been in an accident in the past 12-months. Construct and interpret a 95% confidence interval for the difference in the population proportions of left- and right-handed people who have been in car accidents in the past 12 months. *Show your work*.

ANSWER: ; 







So, we are 95% certain that the difference in the population is within the range -0.101 to 0.001

1. You take a random sample from some population and form a 96% confidence interval for the population mean, μ. Which quantity is guaranteed to be in the confidence interval you construct?

a) 0

b) The population mean

c) The sample mean

d) .96

1. Decreasing the sample size, while holding the confidence level the same, will do what to the length of your confidence interval?

a) make it bigger

b) make it smaller

c) it will stay the same

d) cannot be determined from the given information

1. Decreasing the confidence level, while holding the sample size the same, will do what to the length of your confidence interval?

a) make it bigger

b) make it smaller

c) it will stay the same

d) cannot be determined from the given information

1. If you increase the sample size and confidence level at the same time, what will happen to the length of your confidence interval?

a) make it bigger

b) make it smaller

c) it will stay the same

d) cannot be determined from the given information

1. What should be the value of Z used in a 93% confidence interval?

a) 2.70

b) 1.40

c) 1.81

d) 1.89

1. A 95% confidence interval for the mean number of televisions per American household ranges from 1.15 to 4.20. For each of the following statements about the above confidence interval, choose true or false.
	1. The probability that μ is between 1.15 and 4.20 is .95. TRUE
	2. We are 95% confident that the true mean number of televisions per American household is between 1.15 and 4.20. TRUE
	3. 95% of all samples should have x-bars between 1.15 and 4.20. TRUE
	4. 95% of all American households have between 1.15 and 4.20 televisions. FALSE
	5. Of 100 intervals calculated the same way (95%), we expect 95 of them to capture the population mean. TRUE
	6. Of 100 intervals calculated the same way (95%), we expect 100 of them to capture the sample mean. FALSE