Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Math 153 Practice Exam #2 Part 2

1. Read the sentences below and then identify each **underlined (bold)** number by labeling it with the proper statistical symbol.

Joe wanted to figure out the average number of T.V’s per house in Maryland. He randomly selected **50** houses from the phone book and called each one to ask them how many T.V’s they had. The average number he calculated for the people that answered the phone was **3.2** and the standard deviation was **1.3**.

1. If 80 students were surveyed at a school and 56 of them said they like to watch the T.V show “The Big Bang Theory” what would be the value of p-hat, and then calculate the standard error of the sampling distribution using this information?
2. A company that produces light bulbs is concerned about the distribution of the life expectancy of the bulbs. The company takes a simple random sample of 81 bulbs and computes the sample mean to be 950 hours per bulb.
	1. Check the conditions to see if you can use a normal distribution?
	2. Construct a 95% confidence interval for the unknown mean life expectancy assuming that the population standard deviation is 30 hours.
	3. Interpret the 95% confidence interval found in (a).
3. In a simple random sample of 100 students taken at a large university, 25 are English majors.
4. **Construct and interpret** an approximate 90%-confidence interval for the percent of students at the university who are English majors. (Make sure to check conditons)
5. If you wanted to become more confident in your response without changing the width of the interval what would you have to do?
6. Using the formula for margin of error () if you wanted to have a margin of error less than 10% using a 95% confidence interval (Z-score of 1.96) and the standard deviation of the population was 20, what would be the smallest sample size that you could take?
7. The actual time it takes to cook a 25 pound turkey is a normal random variable with a mean of 5.4 hours and a standard deviation of 0.7 hours.
8. Given that an average of 5.1 hours was found for a sample of 50 turkeys, calculate and interpret a 90% confidence interval for the average cooking time of a 25 pound turkey.
9. Is the parameter that you are trying to estimate in (b) actually in the interval? What is the parameter?

**FORMULAS**

Sampling Distribution of Proportions

$$μ\_{\hat{p}}=p$$

$$σ\_{\hat{p}}=\sqrt{\frac{pq}{n}}$$

Sampling Distribution of Means

$$μ\_{\overbar{x}}=μ$$

$$σ\_{\overbar{x}}=\frac{σ}{\sqrt{n}}$$

