Unit I Quiz.

Math 221 B/C

Write all your answers in complete sentences.

1. (1 point) In a complete sentence, state the Central Limit Theorem.

**As the sample size goes up, the distribution of sample means becomes approximately normal.**

1. (1 point) In a complete sentence, state the Law of Large Numbers.

**As the sample size goes up, the sample mean approaches the true mean.**

1. (1 point) How does the mean of the distribution of sample means compare to the mean of the population?

**They are equal**

1. (1 point) How does the standard deviation of the distribution of sample means compare to the standard deviation of the population?

**The standard deviation of the distribution of sample mean is less than the standard deviation of the population**

1. (1 point) How does the mean of a population compare to the median of the same population? (Consider a right-skewed population, left-skewed population and a bell-shaped population.

**Right-Skewed - Mean Larger**

**Bell Shaped – About the same**

**Left-Skewed – Median Larger**

1. (1 point) Say you want to obtain a sample from the residents of Rexburg. Describe how you could obtain each of the following types of sample from this population.
2. Cluster sample: **Divide the city into locations or blocks, then take a random sample of the blocks; then, sample everyone in the block**.
3. Stratified Sample: **Divide the City by Gender and take a random sample within each gender.**
4. Systematic Sample: **Stand in the corner of a busy intersection and sample 1 in 5 people with a random start**
5. Simple Random Sample: **Put all Rexburgers in a database and use a random number generator to do a random sample of students.**
6. (1 point) Write down the formula for obtaining a *z*-score from a normal population. Explain when you would use this z-score.

**We use this formula when we are looking for a probability for an individual.**

1. (1 point) Write down the formula for obtaining a *z*-score from a distribution of sample means. Explain when you would use this z-score.

**We use this formula when we are looking for a probability for a sample mean**

1. (1 point) Explain the difference between an observational study and an experiment.

**Observational study – we are getting results without influencing the outcome**

**Experiment – We are getting results when influencing the outcome**

1. (1 point) Write out the five steps of a statistical study (Daniel)

**Design the Study**

**Collect Data**

**Describe the Data**

**Make inference**

**Take Action**

**Daniel Can Discern More Truth**