1. Which of the following are true statements about the difference between an experimental and observational study?

   Researchers have control over the treatment in an observational study

   There is no difference between an experimental study and an observational study.

   An experimental study is conducted in a lab.

   Researchers have control over the treatment in an experimental study.

2. A difference across sample means (for example, through visual assessment) implies a difference across population means.

   True

   False

3. Rresearchers are conducting an experiment with one treatment of five levels. However, they also believe that an additional continuous variable will impact the response. Given this information, which method is most appropriate?

   Analysis of variance (ANOVA)

   Analysis of covariance (ANCOVA)

   Analysis of variance (ANOVA) with a separate regression model to control for the additional continuous variable.

   A regression model with the treatment as a discrete predictor/explanatory variable.

4. What role does randomization play in statistical inference?

   - Randomization helps mitigate the risk of applying the treatment to experimental units in some systematic way that would affect the causal conclusions of an experiment.
   - Randomization is detrimental in making statistical inferences.
   - Randomization helps make an experiment harder to replicate.
   - Randomization helps researchers assign experimental units to levels of the response.