Final Exam Questions — Math 121

Some of these questions will be on the final exam.

1. What is the difference between a statistic and a parameter?

2. The concept of p-value is one of the central ideas of statistical inference. P-values can be calculated from many different probability distributions (e.g., normal, t, and χ^2). Why are low p-values considered statistically significant?

3. Why is random sampling important?

4. Why are large samples better than small samples?

5. Explain the difference between sample bias and random error.

6. How does the sampling distribution for $\bar{x}$ change as the sample size N gets larger? Explain two key differences.

7. What is the difference between a randomized controlled experiment and an observational study? Why would anyone go to the extra trouble of doing a randomized controlled experiment?

8. When we find a 95% confidence interval for a parameter, what are we 95% sure is true?

9. What is the Law of Large Numbers, and what does it have to do with gambling in a Las Vegas casino?

10. Explain the difference between explanatory, response, and lurking variables.