

Exam #2 notes

Theme: randomness

Text: Chapters 3 and 4 (except 4.5)

Bring: calculator, 3" × 5" index card with formulas

Will get: Tables A,B

Below is one way you might organize the material for this exam. Note that this paints a big picture without all of the smaller details.

1. Understanding randomness with probability

- Probability: proportion of an outcome among infinitely many repetitions of a random process
- Basic rules
 - probability of event and probability of complement add to 1
 - add probabilities for OR of disjoint events
 - multiply probabilities for AND of independent events
- Random variable: quantitative variable with values determined by random process
 - mean, variance, and standard deviation (definitions and rules)
 - law of large numbers

2. Application: using randomness to control for unmeasured variables

- Random assignment in experiment
- Random selection in sampling

3. Application: randomness in selection of sample to get statistic as estimate of parameter for population

- statistic (such as sample mean or sample proportion) for a simple random sample is a random variable
- sampling distribution: values of a statistic for all possible samples of a given size
- sampling bias and sampling variability key to understanding statistic as estimate of parameter (in ways to be made precise in remainder of the course)