

Topics for Exam 1

1. Sampling and Statistics

- 1.1. Random samples
- 1.2. Statistics
- 1.3. Sampling distribution

2. Estimation

- 2.1. Unbiased estimators
- 2.2. Consistent estimators and the weak law of large numbers
- 2.3. Confidence intervals
- 2.4. Approximate confidence intervals and the central limit theorem

Relevant sections in the text: 5.1 and 2.2

Relevant chapters in the notes: 1 and 2

Relevant assignments: 1, 2, 3, 4 and 5.

Important Concepts

Random sample, statistic, sampling distribution, parameters, unbiased estimator, confidence interval, approximate confidence interval, consistent estimator, convergence in probability, the central limit theorem, convergence in distribution.

Important Skills

- 1. Know how to use moment generating functions to determine some common distributions
- 2. Know how to determine the sampling distribution of certain statistics
- 3. Know how to use independence, joint distributions, and cdfs, and the change of variables theorem in integration to determine distributions of multivariate random variables
- 4. Know how to compute confidence intervals and approximate confidence intervals