

MAIN TOPICS FOR EXAM 1

- (1) Probability
 - (a) Review material from Math 493: Random variables, expected value, variance, independence, Law of Large Numbers, Central Limit Theorem, distributions, etc. (These topics will not be targeted with specific questions.)
 - (b) Moment generating functions
 - (c) Gamma distributions
 - (d) F - and Student t -distributions
 - (e) how the t -distribution arises from normal samples
- (2) Statistics ideas
 - (a) statistics: “measurable” (i.e. integrable in continuous case) function on a sample
 - (b) unbiased estimators: definition and examples
 - (c) confidence intervals: idea and examples
- (3) Statistics tools
 - (a) sample mean
 - (b) sample variance
 - (c) maximum of a sample \rightarrow unbiased estimator
 - (d) order statistics: definition, pdfs, and estimation

Expect several True/False questions, followed by 2 other questions (possibly with multiple parts).

You may use your notes, the textbook (Hogg-McKean-Craig), the textbook from Math 493 (Grinstead-Snell), and Wikipedia, but not other textbooks or internet sources.

You may not discuss problems on the exam with anyone other than Russ.
Computational tools such as calculators or R are permitted.