MH2500 Probability and Introduction to Statistics

Handout 12 - Review

Objectives

Recall: Goals for this course

- A first course in Probability with some introduction to statistics.
- Appreciate the subject.
- Preparation for future Statistics courses.

Overview / Exam

- Sample space, Probability measure, multiplication principle, Bayes' rule, etc. (Sections 1.1–1.5)
- Single random variable, binomial, geometric, negative binomial, Poisson, exponential, gamma, normal, functions of a random variable. (Sections 2.1–2.3)
- Joint discrete distributions, joint continuous random variables, independent random variables, conditional distributions, sums and quotients, ordered statistics.
  (Sections 3.1–3.7, excluding general case in 3.6)
- Expected value, expectation of functions of random variables, variance and standard deviation, Chebyshev's inequality, covariance and correlation, conditional expectation, moment generating function, (Sections 4.1–4.5 excludes 4.2.1, 4.4.2, 4.6)
- The law of large numbers, convergence in distribution, central limit theorem. (Sections 5.1–5.3.)

Discounts

The exam covers Chapters 1–5 = Handouts 1–9 = Tutorials 1–12.
You will not be tested on

- Sections/subsections in Chapters 1–5 that were not covered in lecture.
- Beta distribution
- Problems requiring integrations using polar coordinates.
- the Acceptance-Rejection method.
- Convergence issues in expected values, variances, covariances, and moment generating functions.