

AMS 310 (01) — Review for Final

1. Axioms and properties of probability
2. Venn diagrams and the algebra of events
3. Counting principle, permutation, combination
4. Conditional probability and independence of events
5. Bayes' theorem
6. Bernoulli and Binomial random variables, and their means and variances
7. Poisson variable and process, and its mean and variance
8. Normal density and distribution, standard normal
9. Joint density, joint cumulative distribution, marginal density, conditional density for continuous random variables
10. Criterion for independence using density or distribution functions
11. Properties of expectation and variance
12. Definition of a random sample. What is i.i.d.?
13. Central limit theorem
14. What are sample mean and sample variance? What are mean and variance, standard deviation for sample mean?
15. Distributions for sample means for large or small sample size when population variance known or unknown (list a table)
16. Point estimation for mean: biased or unbiased estimator
17. Interval estimation for mean: confidence interval and its derivation
18. What are null and alternative hypothesis?
19. Definitions of type I and type II errors for tests of hypothesis

20. Testing criteria concerning one mean
21. Test criterion using p-value
22. Derivation and computation for Type II error or operating characteristic curve
23. Testing for two means
24. Paired test
25. Estimate for Bernoulli probability, derivation of confidence interval
26. Test for Bernoulli probability for both small and large sample