

Statistics – MATH 281 A/B/C

Topics for 2025 Qualifying Exam

281A:

Concentration Inequalities
Laws of Large Numbers
O_p, o_p (proofs)
Models and Parameters
Bayesian Perspective
Decision Theory: risk functions
Bias-Variance Decomposition
Statistical Optimality: Bayes and Minimax
Mean Square Prediction Error
Best Linear Predictor
Sufficiency (factorization, minimal sufficiency, etc)
Exponential Families
Minimum Contrast Estimates (M-estimators)
Maximum Likelihood

281B

Consistency of MLE (Proofs)
Consistency of M-estimators (Proofs)
Asymptotic normality of MLE and M-estimators
Efficiency
Delta Method for Moments
Delta Method for Law Approximations
Delta Method: Multivariate Case

281C

All the topics in Chapter 3 of Testing Statistical Hypotheses (3rd edition) by Lehmann and Romano.