

Summary of Part 1

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Midterm Exam

Topics covered: Lectures 1–11

- ▶ problem sets 1–4
- ▶ practice questions published this far

Material in the textbook

- ▶ Analysis and Calculus: Chapters 1–5, A1, A4, A5
- ▶ Linear algebra: Chapters 6–11, 23

Review - Analysis

Sets

Functions

- ▶ elementary functions
- ▶ rules of exponentiation and logarithm

Sequences and their limits

- ▶ geometric sequences and their sums

Continuous functions

Review - Univariate Calculus

Differentiable functions and derivatives

- ▶ forming a linear approximation
- ▶ log-differential
- ▶ elasticity

Rules of differentiation

- ▶ product rule
- ▶ chain rule

Higher order derivatives

Integration

Review - Linear Algebra

Solving a system of linear equations

- ▶ Gauss-Jordan elimination method
- ▶ Cramer's rule

Vectors

- ▶ inner product and norm
- ▶ linear independence
- ▶ bases of \mathbb{R}^n

Review - Matrices

- ▶ Matrix algebra
- ▶ Determinant of a matrix
- ▶ Inverse matrix
- ▶ Rank of a matrix
- ▶ Eigenvectors and eigenvalues