Mathematics for Economists

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Recap of Part II

Review - Constrained Optimization

Optimization problems with equality constraints:

- NDCQ
- first order necessary conditions
- second order sufficient conditions for local extrema

Optimization problems with inequality constraints

- NDCQ, first order necessary conditions
- necessary and sufficient conditions for concave problems

Review - Constrained Optimization

- Optimization problems with mixed constraints: NDCQ, first order necessary conditions
- Envelope theorems for unconstrained problems and constrained problems with equality or inequality constraints
  - interpretation of Lagrange multipliers

Review - Difference equations

- Firs order linear difference equations with constant coefficients: General solution and stability
- Eigenvalues, eigenvectors and generalized eigenvectors
- Systems of linear difference equations: General solution (real eigenvalues) and stability

Review - Differential equations

- First order ordinary differential equations: Linear equations with constant coefficients
- Linear second order differential equations with constant coefficients: General solution and stability
- Stability of autonomous first order equations, phase portraits
- First order linear systems of differential equations: General solution and stability
- Stability of autonomous first order systems

Book chapters

- Optimization: chapters 18-19
- Eigenvalues, difference and differential equations: chapters 23-25
- note: in exam there will be no questions on topics not covered in the lecture and exercise material