

MATHEMATICS 2

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Linear Algebra

- *Matrices*. Matrix algebra, Determinant, Trace, Rank, Inverse Matrix, Eigenvalues and eigenvectors.
- *Linear Spaces*. The algebra of vectors, Euclidean Spaces, Inner product, Linear independence.
- *Systems of Linear equations*. Cramer's Theorem, Cramer's rule, Rouché Capelli theorem.

Calculus

- *Integral Calculus*. Definite and indefinite integrals, Integral properties, The fundamental theorem of calculus, Integration by parts and integration by substitution, Improper integrals.

Optimization

- *Calculus of several variables*. Domain, Partial derivatives, gradient, hessian matrix. Stationary points. Countour curves.
- *Unconstrained optimization*. First and second order conditions.
- *Constrained optimization with Equality constraints*. First and second order conditions.

A short list of suggested book

- C. P. Simon, L. Blume, Mathematics for Economists, W. W. Norton and Company, New York, 1st ed. 1994.
- M. Carter, Foundations of Mathematical Economics, The MIT Press, Cambridge, Massachusetts, 2001.
- W. Rudin, Principles of Mathematical Analysis, Mc Graw Hill, 3rd ed. 1964