

# Maths for Social Sciences

## 1 Introduction to Maths

- 1.1 Arithmetic
- 1.2 Algebra
- 1.3 Graphs and functions
- 1.4 Linear Equations
- 1.5 Quadratic Equations
- 1.6 Financial Maths
- 1.7 Introduction to calculus

## 2 Matrix Algebra

- 2.1 Elementary Geometry and Algebra using R
- 2.2 Vector Spaces
- 2.3 Matrix Basics
- 2.4 Norm, Rank, Trace, Determinant.
- 2.5 Matrix Inverse, Solution of Linear Systems
- 2.6 Eigenvalues and Eigenvectors
- 2.7 Matrices in Statistics and other applications

## 3 Simulation

- 3.1 Random numbers
- 3.2 Monte Carlo simulations
- 3.3 Monte Carlo integration
- 3.4 Simulating physical systems

## 4 Optimization

- 4.1 One-dimensional optimization
- 4.2 Linear programming
- 4.3 Quadratic programming