Algebra Section II Summary

The course material is divided in five sections. We have finished Section II (Section I was discussed previously) and we will start covering material from Section III before the midterm. Material we will *not* cover in the midterm will be given in *italics*.

> Complex numbers, algebraic and trigonometric form, binomial theorem, connection to plain geometry, (primitive) roots of unity. Polynomials in one variable, operations on polynomials, Horner scheme, testing for rational roots, fundamental theorem of algebra, irreducibility of polynomials, Schönemann–Eisenstein criterion. *Multivariate polynomials*, *full and elementary symmetrical polynomials*, Viete formulas, polynomial theorem *Cardano formula*.

> Systems of linear equations in two and three unknowns, row operations, Gauss and Gauss-Jordan elimination. $\mathbb{R}^n$ (n-dimensional real space) and its subspaces, linear combination, independence, generated subspace, base, dimension, coordinates

Complex numbers are discussed in Chapter 4.2, and polynomials in Chapter 17 of Judson. The clickable links to wikipedia given above are in general more detailed, and cover more material than what you will need. For systems of linear equations, and linear algebra in general, we will use Hefferon's Linear Algebra (downloadable from `http://kornai.com/Algebra19/hefferon_linalg.pdf`). The material that comes before the midterm is all in Chapter 1 (but not all of Chapter 1 will be covered). Sections marked *Topic:* will not be covered.