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CHAPTER 1

The first part of the book is devoted to the study of the basic concepts of the theory of groups. We begin with the definition of a group and the study of its properties. We then discuss the concept of a subgroup and the quotient group. The second part of the book is devoted to the study of the structure of finite groups. We begin with the study of the Sylow theorems and the concept of a simple group. We then discuss the concept of a solvable group and the concept of a nilpotent group. The third part of the book is devoted to the study of the representation theory of groups. We begin with the study of the representation theory of finite groups and the concept of a character. We then discuss the concept of a module and the concept of a ring.

The fourth part of the book is devoted to the study of the theory of Lie algebras. We begin with the study of the definition of a Lie algebra and the study of its properties. We then discuss the concept of a representation of a Lie algebra and the concept of a Cartan subalgebra. The fifth part of the book is devoted to the study of the theory of associative algebras. We begin with the study of the definition of an associative algebra and the study of its properties. We then discuss the concept of a module over an associative algebra and the concept of a division algebra.

The sixth part of the book is devoted to the study of the theory of rings. We begin with the study of the definition of a ring and the study of its properties. We then discuss the concept of a module over a ring and the concept of a principal ideal domain. The seventh part of the book is devoted to the study of the theory of fields. We begin with the study of the definition of a field and the study of its properties. We then discuss the concept of a Galois extension and the concept of a Galois group. The eighth part of the book is devoted to the study of the theory of vector spaces. We begin with the study of the definition of a vector space and the study of its properties. We then discuss the concept of a linear transformation and the concept of a matrix.

The ninth part of the book is devoted to the study of the theory of linear algebra. We begin with the study of the definition of a linear system and the study of its properties. We then discuss the concept of a rank of a matrix and the concept of a determinant. The tenth part of the book is devoted to the study of the theory of quadratic forms. We begin with the study of the definition of a quadratic form and the study of its properties. We then discuss the concept of a discriminant and the concept of a signature.

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