Number Systems and the Foundations of Analysis

Mathematical Adventures

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Preface

The aim of this book is to study the basic number system of mathematics using as a principal guide Mendelson (2008) and other supplementary materials.

The idea is to develop all the topics and solve the exercises proposed in Mendelson (2008) as it has done in Mathematical Adventures

1 Basic Facts and Notions of Logic and Set Theory

This chapter introduces the concepts and terminology of logic and set theory

1.1

2 The Natural Numbers

3 The Integers

4 Rational Numbers and Ordered Fields

5 The Real Number System

References

Mendelson, Elliott. 2008. *Number Systems and the Foundations of Analysis*. Mineola, N.Y: Dover Publications.

A Equality

B Finite Sums and the $\sum$ notation

C Polynomials

D Finite, Infinite and Denumerable Sets and Cardinal Numbers

E Axiomatic Set Theory and the Existence of the Peano System

F Construction of the Real Numbers via Dedeking Cuts

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