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Differential systems and complex analysis for engineers

Foreword

Chapter 1. Systems of Differential Equations (SDEs)

- 1.1 Linear and Homogenous SDEs
- 1.2 Linear and Non-homogenous SDEs
- 1.3 Stability
- 1.4 Exercises

Chapter 2. Functions of a Complex Variable

- 2.1 The Field \mathbb{C}
- 2.2 The Topology on \mathbb{C}
- 2.3 Examples of Functions of a Complex Variable
- 2.4 Exercises

Chapter 3. Complex Differentiation

- 3.1 Analytic Functions
- 3.2 Harmonic Conjugates
- 3.3 Analytic Continuation
- 3.4 Determination of Analytic Functions
- 3.5 Exercises

Chapter 4. Complex Integration

- 4.1 The Complex Line Integral
- 4.2 Cauchy's Theorems
- 4.3 Taylor and Laurent Series
- 4.4 Classification of Singular Points
- 4.5 Exercises

Chapter 5. Residue Theory

- 5.1 The Residue Theorem
- 5.2 Computation of Residues at Poles
- 5.3 Jordan's Lemmas
- 5.4 Applications of the Residue Theorem
- 5.5 Exercises

Chapter 6. Software

6.1 Stability with MATLAB

6.2 MATLAB and MAPLE Commands for Complex Numbers and for Functions of a Complex Variable

Bibliography