Calculus I

SyG

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Chapter 1

Introduction

Definition 1.1. Mathematics (according to Oxford Eng. Dictionary)

The abstract science which investigates deductively the conclusions implicit in the elementary conception of spacial and numerical relations. This science can be divided in 6 main topics:

1. **Foundations:** logic, set theory, proof theorems, etc.

2. **Algebra:** numbers, arithmetical operations, order theorems.

3. **Analysis:** differentiation, integration, measure, etc.

4. **Geometry and topology:** proporties of space, shape, position ?? of figures.

5. **Combinatories:** graph theory, partition theory, etc.

6. **Applied Mathematics:** computational sciences, probability, the range of applications of Mathematics is wide, such as:

   (a) **Banking and Finance:** Black and Schole ??

   (b) **Aeronautical engineering:** Fluid mechanics, shape design.

   (c) **Chemistry:** Models for proteing folding, thermodynamics.

   (d) **Informatic:** Cryptography, computational algebra, parallel programming, etc.

Summary of the program: 1st Semester

- Real numbers
- Sequence and series of numbers
- Continuity and limit
- Differentiation
- Integration

Chapter 2

Real numbers and some basic concepts

2.1   Set of points

We recall here some basical concepts: