

Proof-Based Math Readings

Session: Measure Theory*

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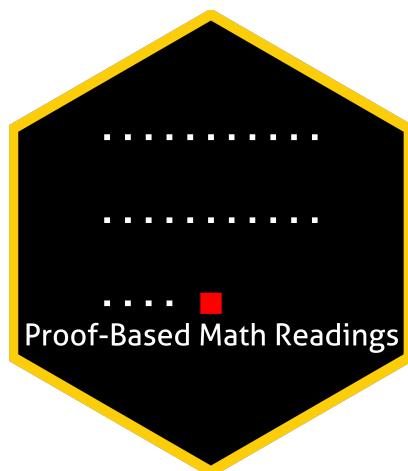
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0 Motivation

- *Proof-Based Math Readings* is a free, independent online reading group where we study the mathematics required for economics master's and PhD programs through an intuitive approach. Active since May 2023.
- This session of the reading group is on *Measure Theory*.

1 Prerequisites and Format

- Proof Techniques, Real Analysis, and Topology resources below.
- Please use the  [Application Form](#) to join our reading group; you will receive a response within a week.
- This session takes 12 weeks. We do not have face-to-face/online meetings due to the size of the group.
- Members read the main book and discuss the topics/exercises in the Proof-Based Math Readings Discord .

2 Resources

2.1 Main Book and Main Book's Playlist

Measure, Integration & Real Analysis - Sheldon Axler (2025, Errata-free version) is our main book for this session because it is well-written, well-structured, and open-access.

-  [Measure, Integration & Real Analysis - Sheldon Axler \(2025, Errata-free version\)](#)
-  [Measure, Integration & Real Analysis - Sheldon Axler \(202X, Playlist\)](#) → will be added after the 2nd edition.

2.2 Supplementary

2.2.1 Measure Theory

-  [Measure Theory - The Bright Side of Mathematics \(2025\)](#)
-  [Measure Theory - Indrava Roy \(2020\)](#)
-  [A horizontal integral?! Introduction to Lebesgue Integration - vcubingx \(2020\)](#)
-  [The Lebesgue Integral - BBC \(1975\)](#)

2.2.2 Proof Techniques

-  [Book of Proof - Richard Hammack \(3.4 Edition, 2025\)](#)
-  [Book of Proof - Richard Hammack \(3.4 Edition, 2025, Playlist by Jeremy Teitelbaum\)](#)
-  [Book of Proof - Richard Hammack \(3.4 Edition, 2025, Playlist by Michael Penn\)](#)

2.2.3 Real Analysis

-  [Measure, Integration & Real Analysis - Sheldon Axler \(2025, Supplement\)](#)
-  [Basic Analysis I: Introduction to Real Analysis - Jiri Lebl \(Version 6.2, 2025\)](#)
-  [Basic Analysis I: Introduction to Real Analysis - Jiri Lebl \(Version 6.2, 2025, Playlist by Casey Rodriguez\)](#)
-  [Introduction To Metric Spaces - Paige Bright \(2023\)](#)

3 Reading Schedule

- MIRA is the abbreviation of Measure, Integration & Real Analysis - Sheldon Axler (2025).

| | |
|---|------------------|
| MIRA, Chapter 1: Riemann Integration | Week 01 |
| 1A Review: Riemann Integral 1B Riemann Integral Is Not Good Enough | |
| MIRA, Chapter 2: Measures | Week 02-03-04-05 |
| 2A Outer Measure on \mathbb{R} 2B Measurable Spaces and Functions 2C Measures and Their Properties 2D Lebesgue Measure 2E Convergence of Measurable Functions | |
| MIRA, Chapter 3: Integration | Week 06-07-08 |
| 3A Integration with Respect to a Measure 3B Limits of Integrals & Integrals of Limits | |
| MIRA, Chapter 4: Differentiation | Week 09 |
| 4A Hardy–Littlewood Maximal Function 4B Derivatives of Integrals | |
| MIRA, Chapter 5: Product Measures | Week 10-11-12 |
| 5A Products of Measure Spaces 5B Iterated Integrals 5C Lebesgue Integration on \mathbb{R}^n | |

4 Further Readings (Optional)

Our Measure Theoretic Probability syllabus at github.com/zekiakyol/proof-based-math-readings