Proof-Based Math Readings
Session: Graph Theory*

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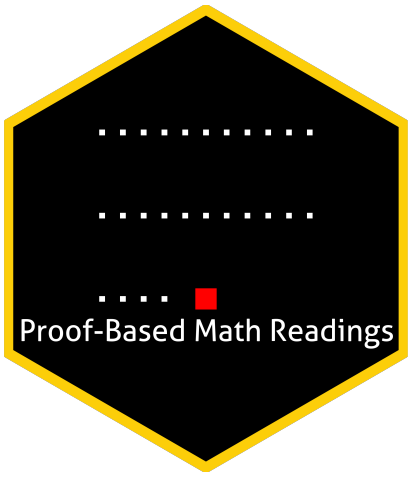

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0 Motivation

- *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 *Graph Theory*.

1 Prerequisites and Format

- Proof Techniques 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

A First Course in Graph Theory - Gary Chartrand, Ping Zhang (2012) is our main book because it is well-written and well-structured.

Mikhail Lavrov's playlist is our playlist because the narrative is great.

- A First Course in Graph Theory - Gary Chartrand, Ping Zhang (2012)
- A First Course in Graph Theory - Gary Chartrand, Ping Zhang (2012, Playlist by Mikhail Lavrov)
- A First Course in Graph Theory - Gary Chartrand, Ping Zhang (2012, Playlist by Wrath of Math)
- A First Course in Graph Theory - Gary Chartrand, Ping Zhang (2012, Notes by Evan Chen)

2.2 Supplementary

2.2.1 Graph Theory

- Introduction to Graph Theory: A Computer Science Perspective - Reducible (2020)
- Graph Theory - Don Sheehy (2020)
- D3 Graph Theory (Interactive)
- Graph Online (Interactive)

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)

3 Reading Schedule

FCGT is the abrevviation of **A First Course in Graph Theory - Gary Chartrand, Ping Zhang (2012)**.

FCGT **Week 01**

Appendix 1: Sets and Logic
Appendix 2: Equivalence Relations and Functions
Appendix 3: Methods of Proof

FCGT **Week 02**

Chapter 1: Introduction

FCGT **Week 03-04**

Chapter 2: Degrees
Chapter 3: Isomorphic Graphs

FCGT **Week 05-06**

Chapter 4: Trees
Chapter 5: Connectivity

FCGT **Week 07-08**

Chapter 6: Traversability
Chapter 7: Digraphs

FCGT **Week 09-10**

Chapter 8: Matchings and Factorization
Chapter 9: Planarity

FCGT **Week 11-12**

Chapter 10: Coloring Graphs

4 Further Readings (Optional)

Graphs and Digraphs - G. Chartrand, H. Jordon, V. Vatter, P. Zhang (7th Edition, 2024)