Financial Math Qualifier Topics, Part 1

Spring 2024

Representative Textbooks

- *Introduction to Financial Mathematics: Concepts and Computational Methods* by Arash Fahim.
- *Stochastic Calculus for Finance I* by Steven Shreve.
- *Options, Futures and Other Derivatives* by John Hull.

Topics for Part 1

Part 1A

1. Forward and futures contracts.
2. Hedging strategies using futures.
3. Determination of forward and future prices.

Part 1B

1. Mechanics of options markets.
2. Properties of options.
3. Trading strategies involving options.

Part 1C

1. Discrete probability. Discrete random variables.
2. Expectation and variance.
3. Independence.
4. Conditional probability and expectation.
5. Martingales.
6. Random walks.

Part 1D

1. One-step binomial model.
2. Multi-step binomial model.
3. Risk-neutral pricing.
4. European options.
5. American options.
6. Delta hedging.
7. Arrow-Debreu market model.
8. Discrete-time market model.
9. Portfolio.
10. Arbitrage.
11. Fundamental Theorem of Asset Pricing.