

# Midterm Topics

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The midterm is on Friday May 8th in class. You will not be allowed any notes, though calculators are allowed but will not be necessary. There will be four questions in forty minutes, on the topics listed below. The midterm will be very similar to the practice midterm posted online. It is likely that you will be asked to state and prove at least one theorem from Part I of the notes.

## Course notes Part I

- Sections 1.1 – 1.7. Omit material on trees in Section 1.7.
- Omit all of Section 1.8. (Averaging)
- Know how to state and use Principles 1 – 5.
- Know all statements and proofs of Theorems 1 – 6.
- Know the examples on bijections and combinatorial proofs.

## Course notes Part II

- Sections 2.1 – 2.3, 2.5 – 2.8.2, 2.9, 2.9.1. Omit Sections 2.4, 2.8.3, 2.10, 2.11, 2.12. (make sure you have latest notes).
- Know how to work with sums and formal power series.
  - See online notes on working with sums.
- Know how to state and use the Binomial Theorem
  - See online notes on binomial coefficients.
  - See online notes on working with sums.
- Know how to count compositions of various types.  
This is Section 2.8 but omit 2.8.3.
- Know how to count binary strings of various types.  
This is Section 2.9.

## Course notes Part III

- Sections 3.1 and 3.2.
- Know how to solve recurrence equations (Theorem 1).
- Know how to determine the asymptotic behaviour of the solution (Section 3.1).
- Know how to get recurrence equations from generating functions (Section 3.2).
  - See some examples for binary strings and compositions and exercises of Section 3.3.