

Midterm 1 Topics List

Midterm 1 will cover material from the first 3 Homework Assignments and from chapters 1 to 10 (Sets and Numbers up until Intro to Graphs). Graph Transformations will not be on the midterm.

NOTE: Any and all homework questions are fair game to show up on the midterm, you should understand not just how to solve them, but also the techniques you used so that you could solve a similar problem (like a homework problem with different numbers).

Chapter Breakdowns:

Sets and Numbers: Definition of a set, subset, and the 4 special sets (natural numbers, integers, rational numbers and real numbers).

Rules for Numbers: Know how to use the 4 rules for addition and the 4 rules for multiplication (if not necessarily which rule is which). Know the definition of the Distributive Law and how to use it. Understand intervals, how they are sets, and how intervals can be subsets of other intervals.

Solving Simple Equations: Nothing will directly show up from this chapter, but you should be comfortable solving simple equations in the context of other problems that may show up.

Functions: Be comfortable with the definition of a function, the difference of the domain and target of a function and what the domain means in context of the input (i.e. $f(x): \mathbb{N} \rightarrow \mathbb{R} \Rightarrow x$ is a natural number). Know how to identify constant and identity functions, and how to identify when something is not a function.

Sequences: Know the definition of an arithmetic sequence, and how to predict numbers in an arithmetic sequence. Also know the definition of a geometric sequence as well as how to predict numbers in a geometric sequence.

Sums and Series: Know how to sum the first k terms of an arithmetic sequence as well as how to sum an infinite geometric sequence. Note: $-1 < r < 1$ must be true to use the geometric sequence formula.

Counting 1: Know how to count the number of ways to create a set from independent objects (making a sandwich type problems) and how to order objects in a set (arranging letters into words type problems).

Counting 2: Know the definition of n choose k , how to evaluate it, and when to use it. Be familiar with both definitions of Pascal's Triangle and how to use entries of Pascal's when solving the Binomial Theorem.

More on Functions: Understand Function Composition, Domain, Range, and Implied Domain.

Intro to Graphs: Be comfortable with drawing graphs on the Cartesian plane, as well as the shapes of graphs of constant functions, identity functions and the other graphs shown in class and the book. Know what the vertical line test is and how to use it, what intercepts are, and the concept of little circles vs giant dots and how they pertain to the domain and range of graphs