

Discrete Structures for CS Exam #2 Study Guide

Review homework 5-7. Try similar odd-numbered problems at the end of each section; their solutions are at the end of the book. When in doubt of a problem or solution, ask.

Expect questions of the following type:

- Given a statement involving sets in propositional logic, express it in English (and vica verca)
- Given one or more sets, find
 - union
 - intersection
 - complementation
 - difference
 - cardinality
 - cartesian product
 - power set
- Draw a Venn Diagram for some sets
 - use it to show relationship between sets (if one is a subset of another or they are equal)
- Know important sets (Z , N , R)
- Know what it means for an integer to be positive, non-negative, negative, or non-positive - they are all different.
- Given a sequence, use forward or backward substitution to conjecture a closed formula which describes the n th term of that sequence
- Given a recurrence formula or closed formula, find the first n terms of the sequence it describes
- Given one or more functions
 - find the result of that function at some value (for example, find $f(5)$)
 - provide the domain and range
 - determine if it is surjective/injective/bijective
 - if it exists, find its inverse
 - find the composition of the functions
 - find the n th term for a recursively defined function
- Find the value of a function which uses ceiling, floor, or factorial
- Find the summation over some sequence
- Define a function/set recursively
- Proof techniques
 - Mathematical induction
 - Structural induction (understand example on slides and from the homework)
 - Prove two sets are equal using
 - membership table
 - containment proof (left is a subset of the right and right is a subset of left)
 - set builder notation and propositional logic