

Math 2300, Spring 2018 – Discrete Structures
Material Covered Since Quiz 2
And Sample Problems

Please see review sheets for Quiz 1 and Quiz 2. The final exam is cumulative.

You may bring the PMI, PSMI, SOLHRRCC and SOLRRCC handouts. You may write on them in your own handwriting.

This is intended as a guide and not meant to exclude anything unless explicitly stated.

Solving Recurrences

Iterate and guess (check by induction)

Theorems (use to find formulas with numbered steps)

SOLHRRCC – distinct roots

SOLHRRCC – repeated roots

SOLRRCC (non-homogeneous)

Some sample problems:

For 1-3 use the theorem on the handout (SOLRRCC).

1. $a_k = 4a_{k-1} - 9$, $k \geq 1$, $a_0 = 1$

2. $a_k = 4a_{k-1} - 4a_{k-2} + k$, $k \geq 2$, $a_0 = 5$, $a_1 = 9$

3. $a_k = 2a_{k-1} + 3a_{k-2} + 5^k$, $k \geq 2$, $a_0 = -2$, $a_1 = 1$

4. Let $A = \{1,2,3\}$ and $B = \{x,y\}$.

a. List the elements of $A \times B$.

b. List the elements of the power set of A : $\mathcal{P}(A)$.

5. Let A , B , and C be sets. Prove that $(A \times B) \cup (A \times C) \subseteq A \times (B \cup C)$.

6. Let A , B , and C be sets. Use set identities to prove that $(A - B) - C = A - (B \cup C)$.

7. Assume that all sets are subsets of a universal set U and prove that for all sets A and B , if $A \subseteq B$, then $A \cap B^c = \emptyset$.