

Reading assignment: Read carefully Sections 5.1, 7.1, and Example 7.4 from Section 7.2.

Written assignments:

1. p. 102, #18
2. How many ways are there to put seven white and two black billiard balls in nine pockets? Some of the pockets may remain empty and the pockets are considered distinguishable.
Hint: Find the answers for the black and white balls separately.
3. Twelve chairs are arranged in a row. How many ways are there to choose five of them, so that no two chosen chairs are adjacent.
Hint: Imagine that the chosen chairs are removed and we see only the unchosen ones. How many ways are there to add five chairs to them?
4. Determine the number of rearrangements of the string AAABBBCCC that do not contain three consecutive letters of the same type.
5. p. 139, #26
6. Determine the number of solutions of the equation $x_1 + x_2 + \cdots + x_{10} = 100$ in positive integers not exceeding 30.
Directions: First, find how many solutions this equation has if all x_i are positive integers and one of them, say x_1 , is constrained to be > 30 . To do this, consider numbers $x_1 - 30, x_2, x_3, \dots, x_{10}$. Second, for a subset S of $\{1, 2, \dots, 10\}$ find how many solutions the equation has if all x_i are positive integers and in addition $x_j > 30$ for all $j \in S$. Third, apply the Inclusion-Exclusion Principle. Notice what happens if $|S| \geq 4$.