MATH 5200 6.0 Problem Solving 2002-03

Assignment 8 - *due March 6, 2003*

1. (a) Let a sequence $\{a_n\}$ be defined by $a_0 = 1,\ a_1 = -3,$

$$a_n + 2a_{n-1} + a_{n-2} = 0,\ n = 2, 3, \ldots.$$

Find an explicit formula for a_n.

(b) Let a sequence $\{a_n\}$ be defined by $a_0 = 1,\ a_1 = 0, a_3 = -5,$

$$a_n = 4a_{n-1} - 5a_{n-2} + 2a_{n-3},\ n = 3, 4, \ldots.$$

Find an explicit formula for a_n.

2. There are n seating positions arranged in a line. Find the number of ways of choosing a subset of these positions with no two chosen positions consecutive. How is the situation changed when the positions are arranged around a circle? It will be helpful to think about the Fibonacci numbers in answering these questions.