Department of Computer Science and Engineering
University of California at San Diego

CSE 21
Spring 97

Sample Quiz 7

1. Suppose the Tower of Hanoi has 5 poles instead of three. A disk can be transferred from one pole to any other pole, but at no time may a larger disk be placed on top of a smaller disk.

   Let S_n be the minimum number of moves to transfer the entire tower of *n* disks from the leftmost to the rightmost pole.

   Find $S_1, S_2, S_3, S_4, S_5, S_6, S_7, S_8$

2. Prove the following for the Fibonacci Sequence $F_0, F_1, F_2, ...$

   $F_{k+1}^2 + F_{k-1}^2 = 2F_{k+1}F_{k-1} + F_k^2\ , \quad k \geq 1$

3. Use iteration to guess an explicit formula for the following recursively defined sequence. Use the formulas from Epp (4.2) to simplify your answers whenever possible.

   $b_k = 3b_{k-1} + 4$, for $k \geq 1$
   $b_0 = 2$