COS 341, November 8, 2000
Due: November 15, 2000

Homework Set 6

Reading Assignments Read Chapter 7.4 - 7.6. Start reading Chapter 9.

Written Assignments Do exercises 26, 33 and 34 in Section 7.8.

Special Problem 1 (counted as 1 exercise) Let $n > 1$ be any integer. The road map of a certain town forms a $2 \times n$ grid (two East-West streets of length $(n-1)$ each, and n North-South streets of length 1 each). All the roads are two-way. If you want to go from the south-west corner point Q to the north-east corner point W, how many different routes can you take without traversing the same segment twice? Give your answer as a closed-form expression of n.

Remarks Let $g(n)$ be this number. Then $g(2) = 2, g(3) = 4$.

Special Problem 2 (counted as 2 exercises)
(a) Solve the following recurrence relation: $a_0 = a_1 = 1$, and for $n \geq 2$,

$$a_n = \sqrt{a_{n-1}^2 + a_{n-2}^2}.$$

(b) Solve the following recurrence relation: $d_0 = d_1 = 1$, and for $n \geq 2$,

$$d_n = \frac{d_{n-1} d_{n-2}}{6d_{n-1} + d_{n-2}}.$$