Assignment #7

Problems due in lecture on **Friday, November 19**:

§ page	NTHI	THI
§5.1 p. 207	9, 11, 13, 15	16, 19, 26
§5.2 p. 215	1(bcfg), 2(bcfg), 3(bcfg), 4(bcfg), 8, 9, 20	11(f), 12, 23(d)
§5.3 p. 227	2(b), 4(b)	4(d), 20, 21
from Handout T below	T-1, T-2, T-3, T-4, T-5, T-9	T-6, T-7, T-8, T-10 V-1, V-2

Problem V-1. Let F_n be the Fibonacci sequence, starting with $F_0 = 0$ and $F_1 = 1$.

(a) Prove by formal induction that $\begin{pmatrix} 1 & 1 \\ 1 & 0 \end{pmatrix}^n = \begin{pmatrix} F_{n+1} & F_n \\ F_n & F_{n-1} \end{pmatrix}$, for $n \geq 1$.

(b) Prove that for all $n \geq 1$, $F_n^2 - F_{n+1}F_{n-1} = (-1)^?$. (Use (a) rather than induction. Useful: Recall that determinants are compatible with matrix multiplication. What is the correct exponent?)

Problem V-2. (a) Do the "vanishing area" problem on the reverse side.

(b) What does it have to do with this course?

(c) The vanishing area problem can be made even closer to being correct by using larger numbers. Based on your intuition, suggest what numbers could be used.