Math 530   -   Homework 5   -   Due Friday, Feb. 24, 2012

1. Write down the proof of Proposition 3.3.3 in the notes.

2. Let X_∞ be a random variable, and $\{X_n\}$ a stochastic process, defined on the same sample space. Define

$$Y_n = E(X_\infty | X_{n-1}, \ldots, X_1).$$

   Is Y_n a martingale? If so, prove it. If not, explain why.

3. At the end of Section 3.1, on page 56 of the notes, it says: "Try this for the "HH" problem above to see more clearly how this works." Work this out.

   That is use the strategy we developed for "OROMEOROMEO" to study the expected number of times the it takes before getting HH. Also compute the expected time until HT using the same strategy.