Homework 6

625.433

1. (30 pts.) Exercise 6.7 in the text.

2. (30 pts.) Exercise 6.9 in the text.

3. (10 pts.) In the notes I wrote for the class in this Module, I calculated the Kernel of the Metropolis-Hastings algorithm. I claimed that it was

$$\rho(X_t, X_{t+1}) \cdot g(X_{t+1}|X_t) + \delta(X_{t+1} - X_t) \cdot (1 - r(X_t)).$$

   . Show the calculations that led to this.

4. (30 pts.) Baker (1965) suggested that the acceptance probability of the Metropolis-Hastings algorithm be

$$p = \frac{f_X(x_{i+1})}{f_X(x_{i+1}) + f_X(x_i)}.$$

   In the case where $g(x_{i+1}|x_i) = g(x_i|x_{i+1})$, does the acceptance probability guarantee detailed balance? Justify your answer in as much detail as possible.