Stat 153 Homework Assignment 5 (due Wednesday, November 19)

1. Problem 2.26 in Shumway and Stoffer.

2. Problem 2.27 in Shumway and Stoffer.

3. Let $y_t = a + bt + x_t$, where x_t is a stationary time series with power spectral density $f_x(\eta)$. Let w_t be the time series obtained when first-differencing is applied to y_t. Write the power spectral density of w_t in terms of the power spectral density of x_t.

4. Suppose that $\mathbf{x}_t$ has covariance matrix P_t. Let $\mathbf{y}_t = G_t\mathbf{x}_t + \mathbf{w}_t$ where $\mathbf{w}_t \sim WN(0, \sigma_t)$ and assume that $\mathbf{w}_t$ is uncorrelated with $\mathbf{x}_t$. What is the covariance matrix of $\mathbf{y}_t$? Express your result in terms of P_t.

5. Problem 4.1 in Shumway and Stoffer.

6. Problem 4.2 in Shumway and Stoffer.