1. Let $R_{xx}(\tau) = \Lambda(\frac{\tau}{\sigma})$
   a. Find $S_x(f)$
   b. Find $B_{\text{eff}}$
   c. Find the $B_{3\text{dB}}$
   d. Find $B_{\text{first zero}}$ defined as the first frequency where $S_x(f) = 0$
   e. Compare the above definitions of bandwidth.

2. Chapter 6: Problem 6.1

3. Chapter 6: Problem 6.3

4. Chapter 6: Problem 6.4

5. Chapter 6: Problem 6.5

6. Chapter 6: Problem 6.11

7. Chapter 6: Problem 6.12 Verify your answer using
   http://www.ittc.ku.edu/~frost/EECS_861/Mathematica_files/ROC.cdf or
   http://demonstrations.wolfram.com/SignalDetectionTheory/

8. Let $s_0(k) = 0.5, 1.0, 0.5$ for $k = 0 \ldots 2$ & $s_0(k)=0$ elsewhere
   $s_1(k) = -0.5, -1.0, -0.5$ for $k = 0 \ldots 2$ & $s_1(k)=0$ elsewhere
   Assume
   $P(s_1) = 0.5$ & $P(s_0) = 0.5$
   $Y(k) = S(k) + N(k)$ for $k = 0 \ldots 2$ where
   $S(k)$ & $N(k)$ are statistically independent
   $N(k)$ is Gaussian white noise with a zero mean and unit variance, i.e., $\sigma_N = 1.$
   a. Find the MAP decision algorithm.
   b. Find the probability of error.
   c. Apply the MAP decision algorithm for the follow observations
      $y(k) = -0.4, 0.1, 0.1$ for $k = 0 \ldots 2$

9. Chapter 6: Problem 6.15

10. Chapter 6: Problem 6.17