1. A Gaussian random process $X(t)$ has a PSD of $S_x(f) = \frac{1}{1 + (\pi f)^2}$

Find
   a. $R_{XX}(\tau)$
   b. $E[X(t)]$
   c. $\text{Var}[X(t)]$
   d. $E[X(t)|X(t-1)=1]$
   e. $\text{Var}[X(t)|X(t-1)=1]$
   f. $P(X(t)>1|X(t-1)=1)$

2. Chapter 4: Problem 4.5

3. Chapter 4: Problem 4.9 a,b
   c. In 4.9 a) Plot $S_{YY}(f)$ for $b_1=-0.5$ and $b_1=0.5$
   d. In 4.9 b) Plot $S_{YY}(f)$ for $a_1=-0.5$ and $a_1=0.5$
      Check your results using http://www.ittc.ku.edu/~frost/EECS_861/Mathematica_files/ARMA_study-V3.cdf
      e. Find $E[Y(k)]$ and $\text{Var}[Y(k)]$ for the 4 cases in parts c) and d) above.

4. Chapter 4: Problem 4.12

5. Chapter 4: Problem 4.14

6. Chapter 4: Problem 4.18

7. Chapter 4: Problem 4.20

8. Chapter 5: Problem 5.54

9. Chapter 5: Problem 5.57

10. Chapter 5: Problem 5.58