MTH 390 **Name:**_____
Quiz 4
Due: 2019-03-18 **Section: 21**

Instructions:

1. Read the directions carefully.
2. Write neatly in pencil and show all your work.
3. Use the appropriate notation.
4. Do not use decimals on any intermediate step.
5. If you have trouble during the quiz, feel free to ask me for help.

Score:_____

1. Solve the following difference equations.

   a. $u_n - 5u_{n-1} + 6u_{n-2} = 0$

   b. $u_n - 10u_{n-1} + 25u_{n-2} = 0$

   c. $u_n + 2u_{n-1} + 4u_{n-2} = 0$

2. Find the ACF for the following AR models. Hint: don't forget to find the coefficients.

   a. $X_t - 0.45X_{t-1} + 0.05X_{t-2} = W_t$, $W_t \sim N(0, \sigma^2)$

   b. $X_t - X_{t-1} + 0.25X_{t-2} = W_t$, $W_t \sim N(0, \sigma^2)$

3. Find the ACF for the ARMA model $X_t - 0.7X_{t-1} + 0.1X_{t-2} = W_t + W_{t-1}$, $W_t \sim N(0, \sigma^2)$.

4. Find the ACF for the ARMA model $X_t - 0.4X_{t-1} + 0.04X_{t-2} = W_t + W_{t-1}$, $W_t \sim N(0, \sigma^2)$.

5. Identify each ARMA model. Plot the ACF and PACF for each model. Provide the code and a description for each plot.

a. $X_t = W_t - 0.55W_{t-1} - 0.3W_{t-3}$, $W_t \sim WN(0, \sigma^2)$

b. $X_t = 1.5X_{t-1} - 0.56X_{t-2} + W_t$, $W_t \sim WN(0, \sigma^2)$

c. $X_t = 0.6X_{t-1} + W_t - 0.9W_{t-2}$, $W_t \sim WN(0, \sigma^2)$.