Homework Set #2

Written Problems

Solve the following problems from P&M:

1. Problem 4.8: Parts (a) and (c)
2. Problem 4.9: Parts (b), and (g).
3. Problem 4.22
4. Problem 4.25
5. Problem 4.27: Parts (b) and (c).
6. Problem 4.45

Matlab Problems

1. Consider the system

\[ y(n) = 0.5y(n-1) - 0.09y(n-2) + x(n) + 2x(n-1) \]  \hspace{1cm} (1)

(a) Using MATLAB’s \texttt{roots} function, find the poles and zeros of this system. Be careful about the vectors you feed into the \texttt{roots} command. Is the system stable?

(b) Using the \texttt{freqz, abs, angle} commands, obtain and plot the magnitude and phase response of this system.

(c) Using the \texttt{filter} function, obtain and plot the response of this system to the input signal \( x(n) = u(n) \) for \( n = 0, 1, \ldots, 49 \). Does the steady state value of this output agree with the amplitude response? Explain.

2. McClellan, Chapter 1, Fourier Transform DTFT, Exercises 1.1 - b, c ; 1.3, 3.3, 5.1