1. If $x[n] = 4(\frac{1}{4})^n\, u[n]$ and $h[n] = 8\delta[n] + 2\delta[n\text{-}1]$, find y[n] valid for n $\geq$ 1 using the steady-state method.

2. Compute the solutions to Problem 1 using z transforms.

3. Using the method given in the class notes, design an M=2 FIR LP filter that passes low frequencies up to $\omega_p = \frac{\pi}{4}$ rads/sample, but stops frequencies higher than $\omega_s = \frac{3\pi}{4}$ rads/sample. Write the z transform of your filter.

4. Prove the efficiency of the above filter using Matlab to plot its gain function in dB for ω=0 to π rads/sample.