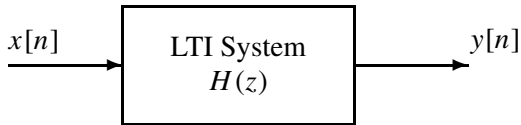


PROBLEM:

Consider the following linear time-invariant system:



The system function of the linear time-invariant filter is given by the formula

$$H(z) = (1 - z^{-1})(1 - e^{j\pi/2}z^{-1})(1 - e^{-j\pi/2}z^{-1})(1 - 0.9e^{j\pi/3}z^{-1})(1 - 0.9e^{-j\pi/3}z^{-1})$$

- Write the difference equation that gives the relation between the input $x[n]$ and the output $y[n]$.
- Plot the poles and zeros of $H(z)$ in the complex z -plane.
- If the input is of the form $x[n] = Ae^{j\phi}e^{j\hat{\omega}n}$, for what values of $-\pi \leq \hat{\omega} \leq \pi$ will $y[n] = 0$?