

PROBLEM:

Suppose that a LTI system has a frequency response function equal to

$$\mathcal{H}(\hat{\omega}) = 2 + 3e^{-j\hat{\omega}} + 3e^{-j3\hat{\omega}} + 2e^{-j4\hat{\omega}}$$

- Determine the difference equation that relates the output $y[n]$ of the system to the input $x[n]$.
- Determine and plot the *impulse response*.
- Determine the output when the input is a pulse:

$$p[n] = \begin{cases} 1 & \text{for } 0 \leq n \leq 3 \\ 0 & n < 0 \end{cases}$$

Use *convolution* for a quick solution.