

PROBLEM:

Given a feedback filter defined via the recursion:

$$y[n] = -y[n - 5] + x[n] \quad (\text{DIFFERENCE EQUATION}) \quad (1)$$

- (a) Determine the system function $H(z)$.
- (b) How many poles does the system have? Compute and plot the pole locations.
- (c) When the input to the system is the two-point pulse signal:

$$x[n] = \begin{cases} +1 & \text{when } n = 0, 1 \\ 0 & \text{when } n \neq 0, 1 \end{cases}$$

determine the output signal $y[n]$, so that you can make a plot of its general form. Assume that the output signal is zero for $n < 0$.

- (d) The output signal is periodic for $n > 0$. Determine the period.