

PROBLEM:

Use linearity and time-invariance to solve the following problem: For a particular LTI system, when the input is a delayed *unit impulse* signal: $x_1[n] = \delta[n - 3]$, the corresponding output is

$$y_1[n] = \delta[n] - 2\delta[n - 2] = \begin{cases} 0 & n < 0 \\ 1 & n = 0 \\ 0 & n = 1 \\ -2 & n = 2 \\ 0 & n \geq 3 \end{cases}$$

Determine the output when the input to the LTI system is $x_2[n] = \delta[n] - 2\delta[n - 4] - \delta[n - 8]$. Give your answer as a plot of $y_2[n]$ versus n , or a list of values for $-\infty < n < \infty$.