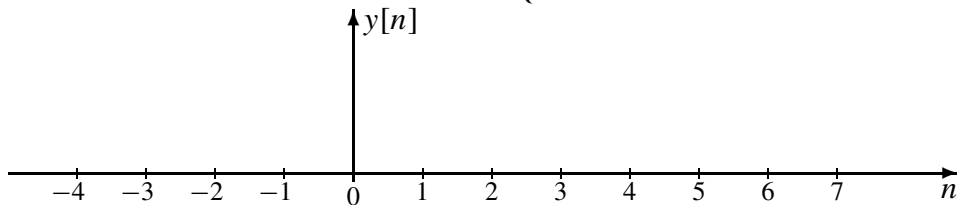


PROBLEM:

- (a) If the filter coefficients of an FIR filter are $\{b_k\} = \{0, 1, -1, 1\}$, make a plot of the output when the input is the unit step signal: $x[n] = u[n] = \begin{cases} 0 & \text{for } n < 0 \\ 1 & \text{for } n \geq 0 \end{cases}$


Label Carefully

Plot zero values also

- (b) Suppose that the frequency response of a different FIR filter is

$$\mathcal{H}(\hat{\omega}) = \cos\left(\frac{1}{2}\hat{\omega}\right)e^{-j\hat{\omega}}$$

If the input signal is $x[n] = 1 + 3 \cos(\pi n + \pi)$ for $-\infty < n < \infty$, determine a simple mathematical expression for the output signal $y[n]$.

$y[n] =$