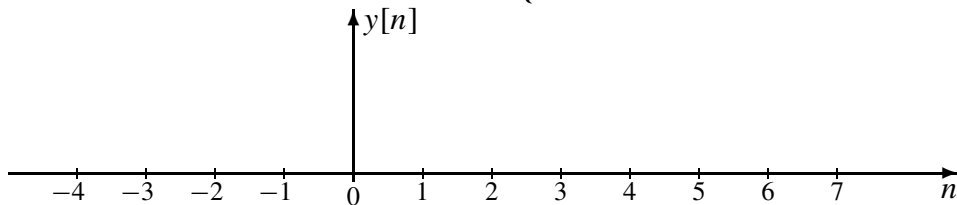**PROBLEM:**



(a) If the filter coefficients of an FIR filter are $\{b_k\} = \{0, 1, 0, -1\}$, 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

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

If the input signal is $x[n] = 5 + 3\cos(\pi n/4)$ for $-\infty < n < \infty$, determine a simple mathematical expression for the output signal $y[n]$.

$y[n] =$