PROBLEM:

$$x[n] \longrightarrow \boxed{\begin{array}{c} \text{FIR FILTER} \\ \{b_k\} \end{array}} \longrightarrow y[n]$$
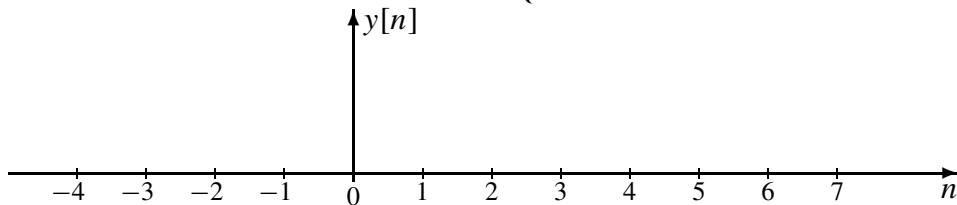
(a) If the filter coefficients of an FIR filter are $\{b_k\} = \{0, 1, -2, 1\}$, make a $\boxed{\text{plot}}$ of the output when the input is the unit step signal: $x[n] = u[n] = \begin{cases} 0 & \text{for } n < 0 \\ 1 & \text{for } n \geq 0 \end{cases}$

Label Carefully

Plot zero values also

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

$$\mathcal{H}(\hat{\omega}) = 2j \sin(\hat{\omega}) e^{-j2\hat{\omega}}$$

If the input signal is $\quad x[n] = 3 + 2\cos(\tfrac{1}{2}\pi n - \pi) \quad$ for $-\infty < n < \infty$,
determine a simple mathematical expression for the output signal $y[n]$.

$\boxed{y[n] = }$