

Example 6-6: Consider the FIR filter defined by the impulse response

$$h[n] = -\delta[n] + 3\delta[n - 1] - \delta[n - 2]$$

The values of $h[n]$ are the filter coefficients $\{b_k\} = \{-1, 3, -1\}$, so the difference equation corresponding to this impulse response is

$$y[n] = -x[n] + 3x[n - 1] - x[n - 2]$$

Thus, the frequency response of this system is

$$H(e^{j\hat{\omega}}) = -1 + 3e^{-j\hat{\omega}} - e^{-j2\hat{\omega}}$$

