PROBLEM:

Let $h[n] = \delta[n] + 2\delta[n-1] + \delta[n-2]$ be the impulse response of an LTI system and let

$$x[n] = 2e^{j(\pi/2)n}, \qquad -\infty < n < \infty$$

be the input to that system.

(a) Determine the frequency response $\mathcal{H}(\hat{\omega})$ of $h[n]$.
Note: We have also used the notation $H(e^{j\hat{\omega}})$ for the frequency response; i.e. $\mathcal{H}(\hat{\omega}) = H(e^{j\hat{\omega}})$.

$\mathcal{H}(\hat{\omega}) =$

(b) If $y[n] = h[n] * x[n]$, the output is a complex exponential of the form $Ae^{j(\omega_o n + \phi)}$, where A is a real positive number. Determine A, ϕ and ω_o.

$A =$

$\phi =$

$\omega_o =$