1. \(x[n]\) is a white noise random process with variance \(\sigma_x^2\) \(\forall n\). As shown in the figure below, \(y[n] = h[n]^* x[n]\) where \(h[n]\) is a filter impulse response with a corresponding frequency response of \(H(e^{j\omega}) = \sin 2\omega\). Find an expression for the power spectral density of \(y[n]\) and plot it over \(0 \leq \omega \leq \pi\).

\[\Gamma_{yy}(e^{j\omega}) = P_{yy}(\omega) = \]

![Diagram](image-url)
1. $x[n]$ is a white noise random process with variance $\sigma_x^2 \forall n$. As shown in the figure below, $y[n] = h[n]^* x[n]$ where $h[n]$ is a filter impulse response with a corresponding frequency response of $H(e^{j\omega}) = \sin 2\omega$. Find an expression for the power spectral density of $y[n]$ and plot it over $0 \leq \omega \leq \pi$.

$$
\Gamma_{yy}(e^{j\omega}) = P_{yy}(\omega) = |H(e^{j\omega})|^2 P_{xx}(\omega) = (\sin^2 2\omega) \sigma_x^2
$$

![Diagram](image)