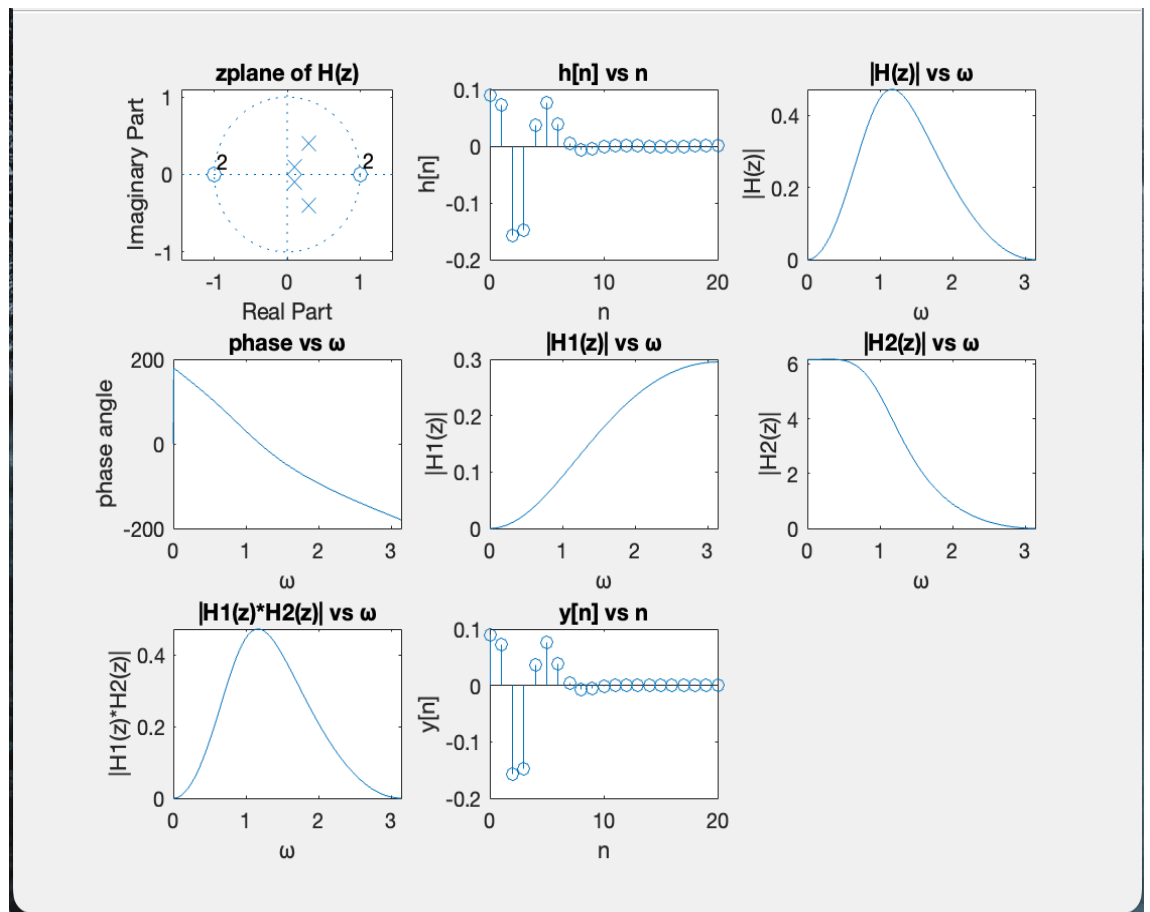


Signals and System MATLAB HW4

May 2024



(a)

poles : $(0.3 + j0.4), (0.3 - j0.4), (0.1 + j0.1), (0.1 - j0.1)$

$$\begin{aligned} \text{zeros} &: 1, -1 \\ \text{ROC} &: |z| > 0.5 \end{aligned}$$

(d)

$$\begin{aligned} H_1(z) &= \frac{0.09 - 0.18z^{-1} + 0.09z^{-2}}{1 - 0.2z^{-1} + 0.02z^{-2}} \\ H_2(z) &= \frac{1 + 2z^{-1} + z^{-2}}{1 - 0.6z^{-1} + 0.25z^{-2}} \end{aligned}$$

(e)

The result is the same as (c) because $H(z) = H_1(z)H_2(z)$ and thus $|H(z)| = |H_1(z)H_2(z)|$.

(f)

The result is the same as (b) because the input signal is $\delta[n]$ and thus $y[n] = h[n]$.