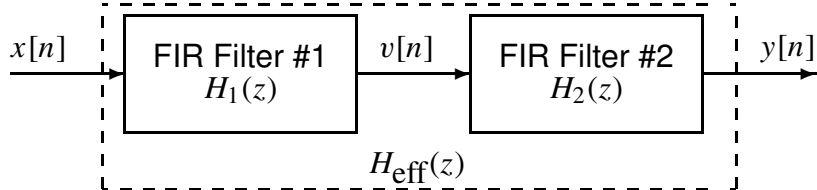


PROBLEM:

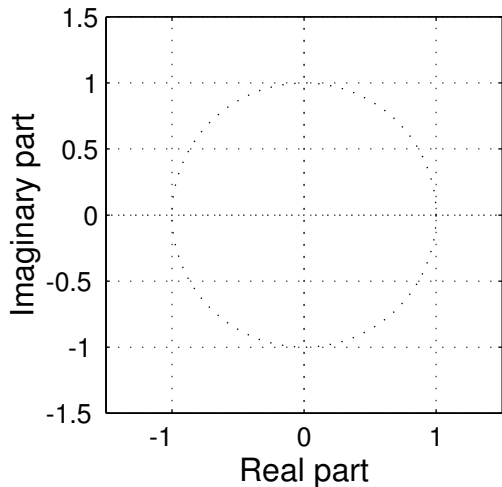
Consider the above LTI system where

$$v[n] = x[n] + 0.5x[n - 2] \quad \text{and} \quad H_2(e^{j\hat{\omega}}) = 1 - e^{-j\hat{\omega}} + e^{-j2\hat{\omega}}$$

- (a) Determine the system functions $H_1(z)$ and $H_2(z)$.

- (b) Determine the difference equation that relates the output $y[n]$ to the input $x[n]$.

- (c) Determine *all* of the zeros of the equivalent system $H_{\text{eff}}(z)$ and plot them in the z -plane.



- (d) Determine the input frequencies $\hat{\omega}$ that are nulled by this system (assume no aliasing).

EXPLAIN your answer.