

PROBLEM:

The following polynomial is the system function for an FIR filter:

$$\mathcal{H}(z) = 1 + \frac{1}{2}z^{-1} + \frac{1}{2}z^{-2} + z^{-3}$$

- Factor the polynomial and plot its roots in the complex plane.
- Break $\mathcal{H}(z)$ into the cascade of two “smaller” systems: a first-order FIR and a second-order FIR.
- Draw a signal flow graph for each of the “small” FIR systems, using block diagrams consisting of adders, multipliers and unit-delays.