

PROBLEM:

Given a feed-forward filter defined via the weighted average:

$$y[n] = x[n] + \sqrt{2}x[n-1] + x[n-2]$$

- Find the z -transform operator description for this system.
- Calculate the roots of the z -transform polynomial. Express your answer in polar form.
- Explain in words the significance of the root locations when processing an input signal of the form $x[n] = e^{j\omega n}$