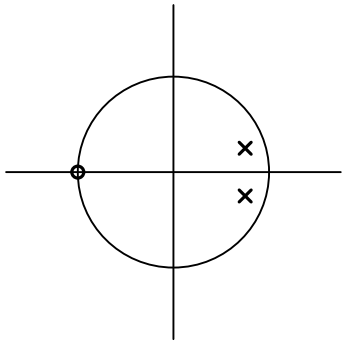
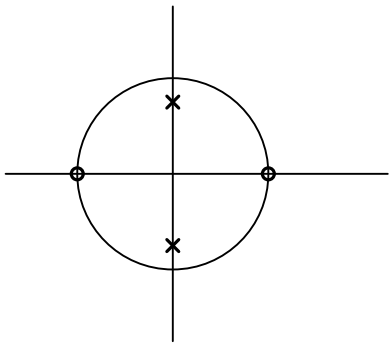
1. For each of the following causal filters, choose one of the following 4 descriptions:
   1. Unstable
   2. Lowpass
   3. Bandpass
   4. Highpass

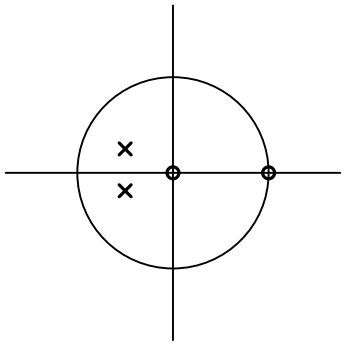
a.



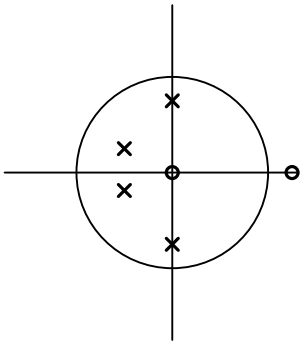
b.



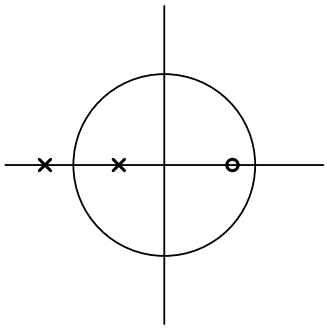
c.



d.



e.



2. A FIR LTI system is described by

$$y[n] = a_1\, x[n+k] + a_2 x[n+k-1] + a_3 x[n+k-2] + a_2 x[n+k-3] + a_1 x[n+k-4].$$

a. Find $H(e^{jw})$
b. For what values of k will $H(e^{j\omega})$ be purely real?

3. Given causal $H(z) = \frac{6+2z^{-1}}{4+kz^{-2}}$

Find the range of the k for which the system is stable.