

Be sure to get part b of this HW.



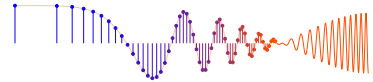
PROBLEM:

For each of the following systems (specified by either an $H(z)$ or a difference equation), determine all the poles and zeros and make a pole-zero plot.

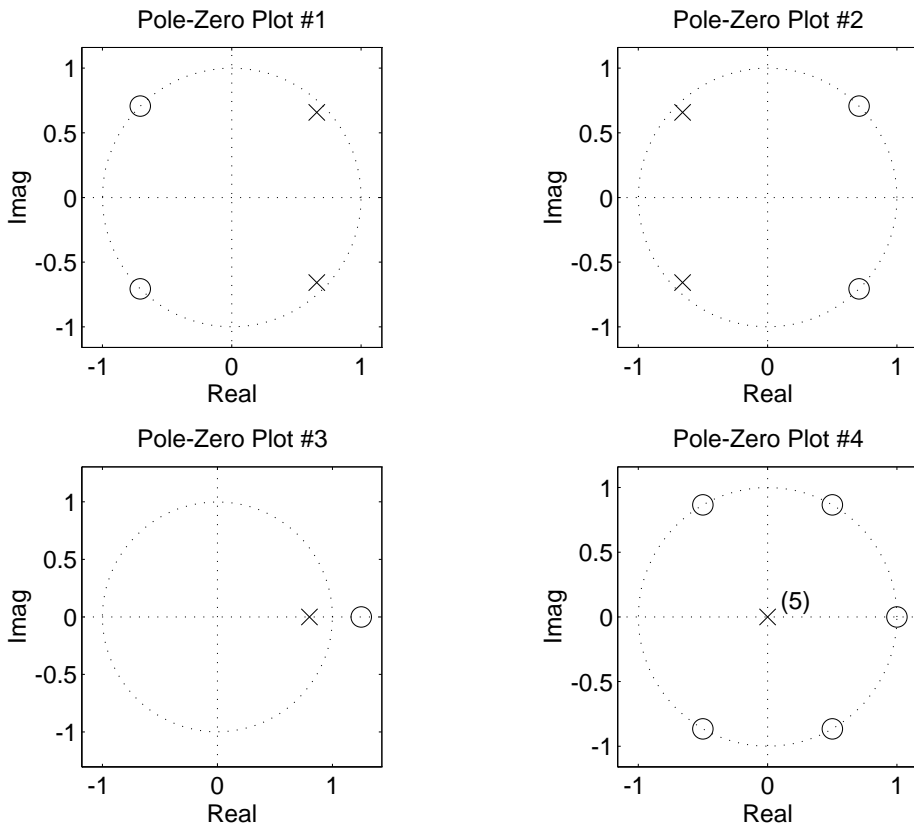
(a) \mathcal{S}_a : $y[n] = x[n] + x[n - 2] + x[n - 4]$

(b) \mathcal{S}_b : $H(z) = \frac{1 + 2z^{-1} + z^{-2}}{1 - 0.6z^{-1} + 0.81z^{-2}}$

(c) \mathcal{S}_c : $y[n] = 0.88y[n - 2] + 2x[n - 1] + 3x[n - 2]$



PROBLEM:



For each of the pole-zero plots (#1, #2, #3 and #4), determine which one of the following systems (specified by either an $H(z)$ or a difference equation) matches the pole-zero plot.

$S_1 : y[n] = -0.96y[n - 2] + x[n] + \sqrt{2}x[n - 1] + x[n - 2]$

$S_2 : y[n] = 0.8y[n - 1] + 0.8x[n] - x[n - 1]$

$S_3 : H(z) = \frac{1 - z^{-1}}{1 + 0.8z^{-1}}$

$S_4 : H(z) = \frac{1}{1 + 1.3152z^{-1} + 0.8649z^{-2}}$

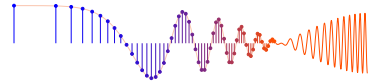
$S_5 : y[n] = -1.3152y[n - 1] - 0.8649y[n - 2] + x[n] - \sqrt{2}x[n - 1] + x[n - 2]$

$S_6 : H(z) = \frac{1 + \sqrt{2}z^{-1} + z^{-2}}{1 - 1.3152z^{-1} + 0.8649z^{-2}}$

$S_7 : y[n] = \sum_{k=0}^7 x[n - k]$

$S_8 : y[n] = x[n] + x[n - 1] + x[n - 2] + x[n - 3] + x[n - 4] + x[n - 5]$

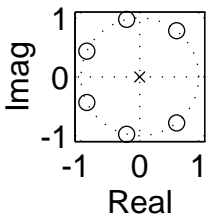
$S_9 : H(z) = 1 - z^{-1} + z^{-2} - z^{-3} + z^{-4} - z^{-5}$



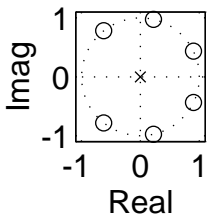
PROBLEM:

Match the frequency responses (#A–#E) with the correct pole-zero plots (#1 – #6). Poles are denoted with an **x** and zeros with an **o**.

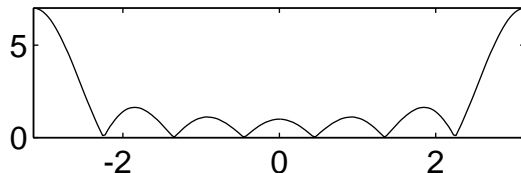
Pole-Zero Plot #1



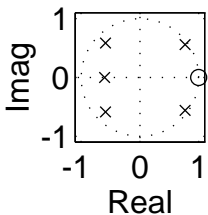
Pole-Zero Plot #2



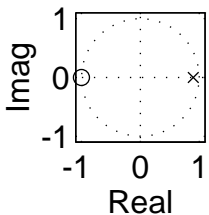
FREQ RESPONSE: A



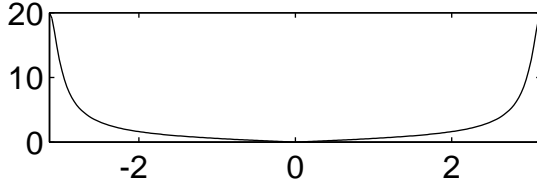
Pole-Zero Plot #3



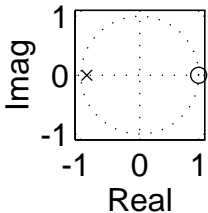
Pole-Zero Plot #4



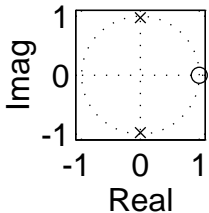
FREQ RESPONSE: B



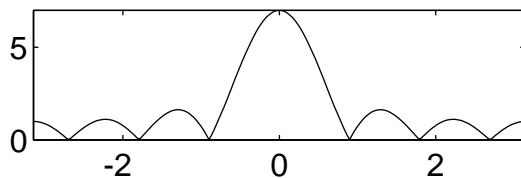
Pole-Zero Plot #5



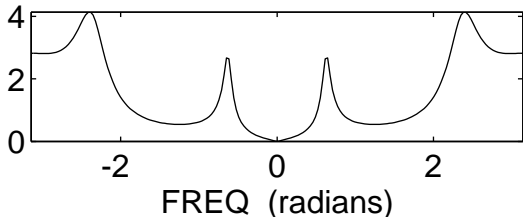
Pole-Zero Plot #6



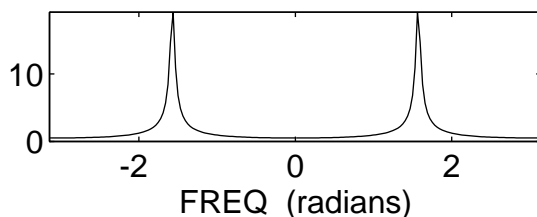
FREQ RESPONSE: C



FREQ RESPONSE: E



FREQ RESPONSE: D

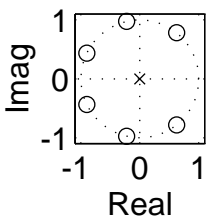




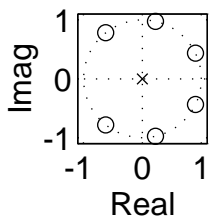
PROBLEM:

Match the impulses responses (#A–#E) with the correct pole-zero plots (#1 – #6). Poles are denoted with an **x** and zeros with an **o**.

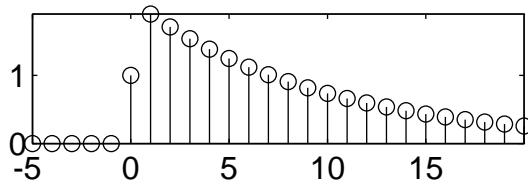
Pole-Zero Plot #1



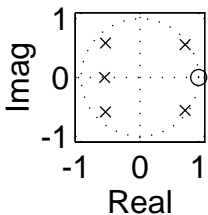
Pole-Zero Plot #2



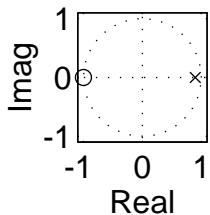
IMPULSE RESPONSE: A



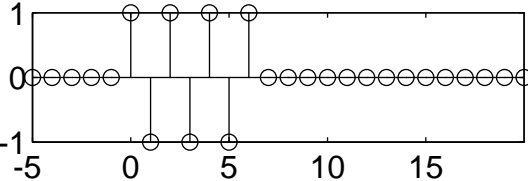
Pole-Zero Plot #3



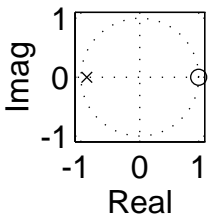
Pole-Zero Plot #4



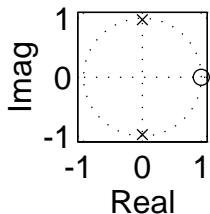
IMPULSE RESPONSE: B



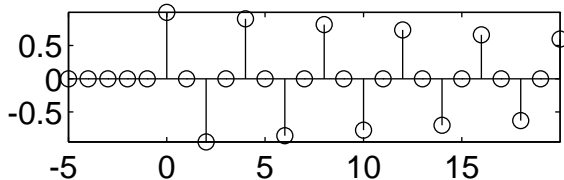
Pole-Zero Plot #5



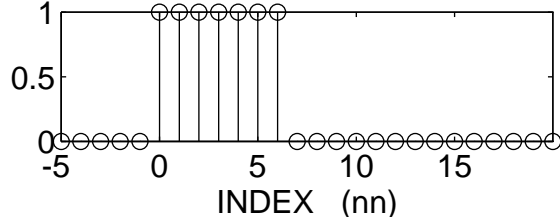
Pole-Zero Plot #6



IMPULSE RESPONSE: C



IMPULSE RESPONSE: E



IMPULSE RESPONSE: D

