PROBLEM:
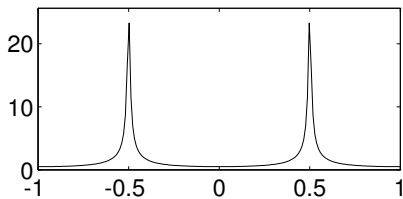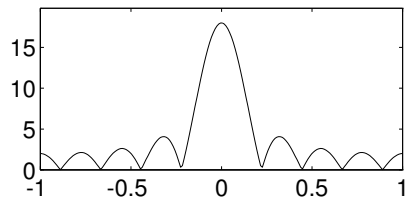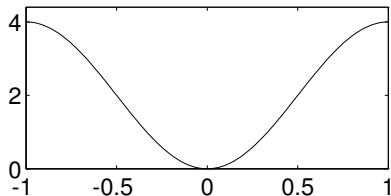

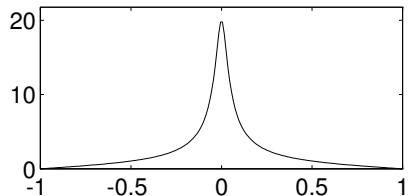FREQ RESPONSE: A   FREQ RESPONSE: B
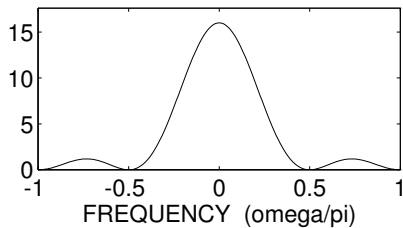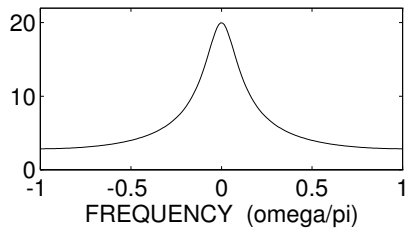FREQ RESPONSE: C   FREQ RESPONSE: D
FREQ RESPONSE: E   FREQ RESPONSE: F
FREQUENCY (omega/pi)

For each of the frequency response plots (A, B, C, D, E, F), determine which one of the following systems (specified by either an $H(z)$ or a difference equation) matches the frequency response. NOTE: frequency axis is normalized; it is $\hat{\omega}/\pi$.

$\mathcal{S}_0:$ $y[n] = -0.96y[n-2] + x[n]$

$\mathcal{S}_1:$ $y[n] = 0.75y[n-1] + 5x[n-1]$

$\mathcal{S}_2:$ $y[n] = 0.75y[n-1] + 0.75x[n] - x[n-1]$

$\mathcal{S}_3:$ $H(z) = \dfrac{1 + z^{-1}}{1 - 0.9z^{-1}}$

$\mathcal{S}_4:$ $H(z) = (1 - z^{-1})^2$

$\mathcal{S}_5:$ $H(z) = 3(1 + z^{-1} + z^{-2} + z^{-3} + z^{-4} + z^{-5})$

$\mathcal{S}_6:$ $y[n] = 2x[n] - 2x[n-1]$

$\mathcal{S}_7:$ $y[n] = 2\displaystyle\sum_{k=0}^{8} x[n-k]$

$\mathcal{S}_8:$ $y[n] = x[n] + 2x[n-1] + 3x[n-2] + 4x[n-3] + 3x[n-4] + 2x[n-5] + x[n-6]$

$\mathcal{S}_9:$ $H(z) = \dfrac{1 + \sqrt{2}z^{-1} + z^{-2}}{1 - 1.3152z^{-1} + 0.8649z^{-2}}$