Example 10-8: The system function of the IIR system

$$y[n] = 0.5y[n-1] + 3x[n-2]$$

can be written down from the filter coefficients as

$$H(z) = \frac{3z^{-2}}{1 - 0.5z^{-1}} = \frac{3}{z(z - 0.5)}$$

The system has poles at z = 0 and z = 0.5, and taking the limit $\lim_{z \to \infty} H(z)$, we get $H(z) \to 3/z^2 \to 0$.

Thus, it also has two zeros at $z = \infty$.



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