

Today: Frequency Response: s- vs z-plane

Lecture 6

ECE 147B
Digital Control

Reading: FPW 4.5, 7.5
or: FV 2.8, 41-4.6, 6.7

Topics:

- Time response (Finish from Lecture 5)
- Intuition for z-plane poles
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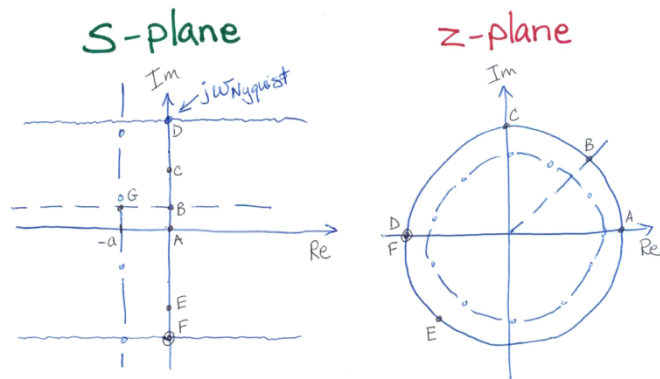
Next Class: Intro to state space (ss).
- FPW: 4.3.3
or: - FV: 7.1, 7.2

Exponential: $y(k) = r^k$

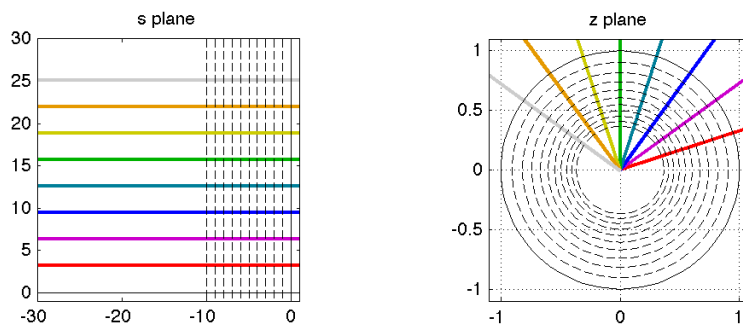
Sinusoid: $y(k) = r^k \left(\frac{e^{jk\theta} - e^{-jk\theta}}{2} \right)$

Sinusoid: $y(k) = r^k \left(\frac{e^{jk\theta} - e^{-jk\theta}}{2} \right) \Leftrightarrow Y(z) = \left(\frac{z^2 - r(\cos\theta)z}{z^2 - 2r(\cos\theta)z + r^2} \right)$

Pole Correspondence:



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Example: $G(z) = Y(z)/Z(z) = z/(z^2 - z + 0.5)$

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