Outline

- The Laplace Transform
- The Region of Convergence (ROC) for Laplace Transforms
- The Inverse Laplace Transform
- Geometric Evaluation of the Fourier Transform
- Properties of the Laplace Transform
- Some Laplace Transform Pairs
- Analysis & Characterization of LTI Systems Using the Laplace Transform
- System Function Algebra and Block Diagram Representations
- The Unilateral Laplace Transform

Problem 9.10: Geometric evaluation and Low- High- Band-Pass

9.10. Using geometric evaluation of the magnitude of the Fourier transform from the corresponding pole-zero plot, determine, for each of the following Laplace transforms, whether the magnitude of the corresponding Fourier transform is approximately lowpass, highpass, or bandpass:

(a) $H_1(s) = \dfrac{1}{(s+1)(s+3)}, \quad \mathcal{R}e\{s\} > -1$

(b) $H_2(s) = \dfrac{s}{s^2+s+1}, \quad \mathcal{R}e\{s\} > -\frac{1}{2}$

(c) $H_3(s) = \dfrac{s^2}{s^2+2s+1}, \quad \mathcal{R}e\{s\} > -1$

Problem 9.25: Geometric evaluation and FT

9.25. By considering the geometric determination of the Fourier transform, as developed in Section 9.4, sketch, for each of the pole-zero plots in Figure P9.25, the magnitude of the associated Fourier transform.