- The z-Transform

- The Region of Convergence for z-Transforms

- The Inverse z-Transform

- Geometric Evaluation of the Fourier Transform

- Properties of the z-Transform

- Some Common z-Transform Pairs

- Analysis & Characterization of LTI Systems
    Using the z-Transforms

- System Function Algebra and
    Block Diagram Representations

- The Unilateral z-Transform

**10.12.** By considering the geometric interpretation of the magnitude of the Fourier transform from the pole-zero plot, determine, for each of the following $z$-transforms, whether the corresponding signal has an approximately lowpass, bandpass, or highpass characteristic:

(a) $X(z) = \dfrac{z^{-1}}{1 + \frac{8}{9}z^{-1}}$, $|z| > \frac{8}{9}$

(b) $X(z) = \dfrac{1 + \frac{8}{9}z^{-1}}{1 - \frac{16}{9}z^{-1} + \frac{64}{81}z^{-2}}$, $|z| > \frac{8}{9}$

(c) $X(z) = \dfrac{1}{1 + \frac{64}{81}z^{-2}}$, $|z| > \frac{8}{9}$

**10.29.** By considering the geometric determination of the frequency response as discussed in Section 10.4, sketch, for each of the pole-zero plots in Figure P10.29, the magnitude of the associated Fourier transform.



(a)

(b)

(c)

(d)

(e)