

Homework Problems

- 3.52: Let $x[n]$ be a causal stable sequence with z -transform $X(z)$. The *complex cepstrum* $\hat{x}[n]$ is defined as the inverse transform of the logarithm of $X(z)$; i.e.,

$$\hat{X}(z) = \log X(z) \xleftrightarrow{Z} \hat{x}[n],$$

- 3.56: A real finite-duration sequence whose z -transform has no zeros at conjugate reciprocal pair locations and no zeros on the unit circle is uniquely specified to within a positive scale factor by its Fourier transform phase (Hayes et al., 1980).

- 3.57: For a sequence $x[n]$ that is zero for $n < 0$, use Eq. (3.2) to show that

$$\lim_{z \rightarrow \infty} X(z) = x[0].$$

What is the corresponding theorem if the sequence is zero for $n > 0$?

- 3.59: Determine whether or not the function $X(z) = z^*$ can correspond to the z -transform of a sequence. Clearly explain your reasoning.