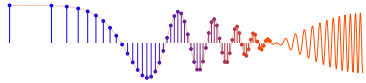
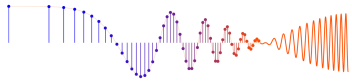


EXERCISE 7.1: Find the system function $H(z)$ of an FIR filter whose impulse response is

$$h[n] = \delta[n] - 7\delta[n-2] - 3\delta[n-3]$$

McClellan, Schafer and Yoder, *Signal Processing First,* ISBN 0-13-065562-7.
Prentice Hall, Upper Saddle River, NJ 07458.

SOLUTION



$$H(z) = \sum_{n=0}^{3} h[n]\, z^{-n}$$

EQUALS ONE AT n=0

$$= \sum_{n=0}^{3} \left(\delta[n] - 7\delta[n-2] - 3\delta[n-3] \right) z^{-n}$$

$$= z^{-0} - 7z^{-2} - 3z^{-3}$$

$$H(z) = 1 - 7z^{-2} - 3z^{-3}$$