**Example 7-2:** Consider a right-sided complex exponential sequence,  $x[n] = r^n e^{j\hat{\omega}_0 n} u[n]$  when r = 1. Applying the condition of (??) to this sequence leads to

$$\sum_{n=0}^{\infty} |e^{j\hat{\omega}_0 n}| = \sum_{n=0}^{\infty} 1 \to \infty$$

Thus, the DTFT of a right-sided complex exponential is not guaranteed to exist, and it is easy to verify that  $|X(e^{j\hat{\omega}_0})| \to \infty$ . On the other hand, if r < 1, the DTFT of  $x[n] = r^n e^{j\hat{\omega}_0 n} u[n]$  exists and is given by the result of Section **??** with  $a = re^{j\hat{\omega}_0}$ . The non-existence of the DTFT is also true for the related case of a two-sided complex exponential, defined as  $e^{j\hat{\omega}_0 n}$  for  $-\infty < n < \infty$ .

McClellan, Schafer, and Yoder, *DSP First*, 2e, ISBN 0-13-065562-7. Prentice Hall, Upper Saddle River, NJ 07458. ©2016 Pearson Education, Inc.

