**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 $-\infty < n < \infty$.