Example 11-6: Left-Sided Signal

Consider the right-sided exponential signal $x(t) = e^{-bt}u(t)$, where $b > 0$. We know that its Fourier transform is

$$X(j\omega) = \frac{1}{b + j\omega}$$

Now define the left-sided exponential signal $w(t) = x(-t) = e^{bt}u(-t)$. From (11.50) and Example 11-5 it follows that

$$W(j\omega) = \frac{1}{b - j\omega}$$

which is what we would obtain by evaluating the Fourier transform integral directly for $w(t)$. ■