Example 7-5: The energy of the sinc signal (expressed in the time domain) is

$$E = \sum_{n=-\infty}^{\infty} \left(\frac{\sin \hat{\omega}_b n}{\pi n} \right)^2$$

While it is impossible to evaluate this sum directly, application of Parseval's theorem yields

$$E = \sum_{n=-\infty}^{\infty} \left(\frac{\sin \hat{\omega}_b n}{\pi n} \right)^2 = \frac{1}{2\pi} \int_{-\hat{\omega}_b}^{\hat{\omega}_b} |1|^2 d\hat{\omega} = \frac{\hat{\omega}_b}{\pi}$$

because the DTFT of the sinc signal is one for $-\hat{\omega}_b \le \hat{\omega} \le \hat{\omega}_b$. A simple interpretation of this result is that the energy is proportional to the bandwidth of the sinc signal and evenly distributed in $\hat{\omega}$ across the band $|\hat{\omega}| \le \hat{\omega}_b$.

McClellan, Schafer, and Yoder, *DSP First, 2e*, ISBN 0-13-065562-7.