

## Some Potentially Useful Relationships

$$E_{\infty} = \lim_{T \rightarrow \infty} \int_{-T}^T |x(t)|^2 dt = \int_{-\infty}^{\infty} |x(t)|^2 dt$$

$$P_{\infty} = \lim_{T \rightarrow \infty} \frac{1}{2T} \int_{-T}^T |x(t)|^2 dt$$

$$e^{jx} = \cos(x) + j\sin(x) \quad j = \sqrt{-1}$$

$$\cos(x) = \frac{1}{2} [e^{jx} + e^{-jx}] \quad \sin(x) = \frac{1}{2j} [e^{jx} - e^{-jx}]$$

$$\cos^2(x) = \frac{1}{2} + \frac{1}{2} \cos(2x) \quad \sin^2(x) = \frac{1}{2} - \frac{1}{2} \cos(2x)$$

$$\text{rect}\left(\frac{t-t_0}{T}\right) = u\left(t-t_0 + \frac{T}{2}\right) - u\left(t-t_0 - \frac{T}{2}\right)$$