Homework #7
Due Tu. 3/20

1. (OW 4.37)
2. (OW 4.38)
3. (OW 4.43)
4. (OW 4.44)
5. (OW 4.51)

6. Correlation
   (a) Let the correlation be defined as
   \[ r(t) = \int_{-\infty}^{\infty} x(\tau) y(t + \tau) d\tau. \]
   Express \( R(j\omega) = \mathcal{F}\{r(t)\} \) in terms of \( X(j\omega) \) and \( Y(j\omega) \), the Fourier transform of \( x(t) \) and \( y(t) \) respectively.
   (b) Suppose \( x(t) = y(t) = e^{-|t|} \). Find \( R(j\omega) \) by evaluating the convolution integral in the time domain to get \( r(t) \) and then doing the FT.
   (c) Find \( R(j\omega) \) again, this time using frequency domain properties and the relationship derived in (a).