Homework #3
Due Th. 9/28

Note:

OW	Oppenheim and Wilsky
SSS	Schaum's Signals and Systems
SPR	Schaum's Probability, Random Variables, and Random Processes

Be sure to show all your work for credit.

1. (SSS 5.75)
2. (OW 4.21 (a)-(d), (f))
3. (OW 4.22 (a)-(d)) + (SSS 5.69)
4. (OW 4.23)
5. (OW 4.27)
6. (OW 4.34)
7. (OW 4.36)
8. (OW 4.44)
9. (OW 4.51)
10. 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 $R(j\omega)$ using frequency domain properties and the relationship derived in (a).

    extra Find $R(j\omega)$ by evaluating the convolution integral in the time domain to get $r(t)$ and then doing the FT.