Homework 2

Reading

- Chapter 8 in Oppenheim & Wilsky

Problems

- 8.1 Let $x(t)$ be a signal for which $X(j\omega) = 0$ when $|\omega| > \omega_M$. Another signal $y(t)$ is specified as having the Fourier transform $Y(j\omega) = 2X(j(\omega - \omega_c))$. Determine a signal $m(t)$ such that $x(t) = y(t)m(t)$.
- 8.2 Let $x(t)$ be a real-valued signal for which $X(j\omega) = 0$ when $|\omega| > 1,000\pi$. Supposing that $y(t) = e^{j\omega_c t}x(t)$, answer the following questions:
  1. What constraint should be placed on ω_c to ensure that $x(t)$ is recoverable from $y(t)$?
  2. What constraint should be placed on ω_c to ensure that $x(t)$ is recoverable from $\Re\{y(t)\}$?
- 8.3
- 8.22
- 8.26
- 8.28