Homework 11
Due April 28th, 2017 at 5pm

The reading from Hecht this week focuses on the quantum nature of light. See Hecht pp. 37, 82-4, 139-41, and 174-5.

1. Expand the following periodic function in a sine-cosine Fourier series

$$f(x) = \begin{cases} 0, & -\pi < kx < 0, \\ \sin kx, & 0 < kx < \pi. \end{cases}$$

2. Repeat Problem 1. except find the exponential Fourier series.

3. Show that if a real $f(x)$ is expanded in a complex exponential Fourier series $\sum_{-\infty}^{\infty} C_m e^{imkx}$, then $C_{-m} = C_m^*$, where z^* is the complex conjugate of z.

4. (**a**) In a similar vein to Problems 1. and 2., do Hecht 11.11.1 and (**b**) Hecht 11.11.6.

5. (**a**) Hecht 11.11.38 and (**b**) Hecht 11.11.40.