ECE 360
HOMEWORK #6
Due October 23, 2002

- Read 8.1, 8.2, 8.3, 8.4 and 8.7 from Ambardar.
- Office Hours: M,T 10:00-11:30 am, F 12:00-1:30 pm.

1. [25] 8.1 (a), express Fourier series in all three forms, identify the period of the signal and all of the harmonics present, draw the magnitude and phase spectrum, and compute the signal power.

2. [12] 8.2 from Ambardar.

3. [15] 8.5 for signal 2 from Ambardar. In part (d), just find the signal power.

4. [28] 8.7 a, b, c, d for signal 5 and signal 6. (You can use the symbolic toolbox in MATLAB to take integrals as long as you include your MATLAB commands in your solution.)

5. [20] Consider the system with transfer function $H(s) = \frac{10}{s+5}$.

The input to the system $x(t)$ is a square wave with amplitude 20 and period 3. For the output y(t), find the numerical values for the dc component and the first, second and third harmonics of the polar form of the Fourier series. (Hint: You can use the Fourier series results developed in class for this signal.)

Extra Credit: Plot the approximated output using the first 3 harmonics in MATLAB.