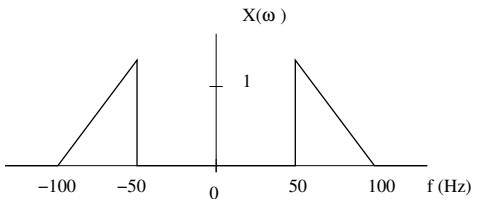
EE 342 – Homework 1

Due Jan. 23, 2005

1. The figure below shows the Fourier transform of a continuous-time signal $x_c(t)$.



This signal is sampled at 400 Hz to generate the discrete-time signal $x_d[n]$. The signal $x_d[n]$ is stored on a computer, then is converted to a continuous-time signal $y_c(t)$ with a reconstruction sampling rate of 200 Hz:

(a) Plot the Fourier transform of the discrete-time signal $x_d[n]$. Include the frequencies from -4π to 4π.

(b) Plot the Fourier transform of the continuous-time signal $y_c(t)$. Include the frequencies from -4π to 4π. Use a frequency range which includes all regions were $Y_c(\omega)$ is non-zero.

2. Write the Fourier series for the following signal:

$$x(t) = 2\cos(\frac{5}{7}\pi t) - 2cos(\frac{10}{3}\pi t)$$

3. Problem 8.1 (a), (c), (d), (f).

4. Problem 8.2 (d), (f), (g)

5. Problem 8.3 (b), (g)

6. Problem 8.4 (a), (c), (d), (e)

7. Problem 8.5 (a), (c), (d), (e)