

Homework 12

Date Assigned: Friday, November 10, 2006

Date Due: Wednesday, November 15 (items 1-4) and Monday, November 20, 2006 (item 5)

Reading: Please continue to study Chapter 4 (all sections) in the Lathi text on the Fourier transform.

Exam 3 will be on Friday, November 17.

Lab Project: By November 20, please write an abstract describing your lab design project. Include the title, the names of the participants, and a brief description of what you plan to do. Please send your abstract to Professors Wismer and Kozick by email: wismer@bucknell.edu and kozick@bucknell.edu

Problems: Please do items 1-4 for Nov. 15 and item 5 for Nov. 20.

1. Find the Fourier transform of the functions $\delta(t)$ and $\delta(t - 1)$ using the *definition* of the Fourier transform, not the table. In other words, compute the integral that defines the Fourier transform for these time functions. (Hint: Recall the “sifting” property of impulse functions.)
2. Please solve the following problems in the Lathi text for **Wednesday, November 15**.
Problem 4.2-1.
3. Sketch $F(\omega) = 2000 \operatorname{sinc}(1000\omega)$. Using the tables, find the inverse Fourier transform, $f(t)$, and sketch $f(t)$.
4. What is the Fourier transform of $\sin(2\pi 1000t)$? Sketch the 2-sided spectrum.
5. Please solve the following problems in the Lathi text for **Monday, November 20**.

Problems 4.2-4 and 4.3-3(a).