ECE 300
Signals and Systems
Homework 9

Due Date: Thursday November 3 at 1 PM

Reading: K & H, pp. 221-231

Note: Use the Fourier transform table given out in class. Note that the triangle function on this table is different than that in the book. Also, you do not need to plot the figures in the problems where the text problem says to plot the figure.

Problems

1. For the function $g(t) = \int_0^t e^{-\frac{\lambda}{2}} d\lambda$

    a. Determine the Fourier transform $G(\omega)$ by evaluating the integral and then computing the Fourier transform
    b. Determine the Fourier transform $G(\omega)$ by using the integration property
    c. Show that your answers to **a** and **b** are the same

2. Find the fraction of the total signal energy (as a percentage) contained between 100 and 300 Hz in the signal $x(t)$ given below:

    $$3. \quad x(t) = 5\,\text{sinc}\left(\frac{t}{0.002}\right) + 5\,\text{sinc}\left(\frac{t}{0.001}\right)$$

4. K & H, Problem 4.19

5. K & H, Problem 5.14

6. K & H, Problem 5.16 (**a,b,c** only)

7. K & H, Problem 5.18 (very short)

8. K & H, Problem 5.19 (For part **c** you should get $y(t) = 6x(t) - 2$)

9. K & H, problem 5.20 (short)

10. K & H, Problem 5.21 (very short)

11. K & H, Problem 5.25 (very short)

12. K & H, Problem 5.27 (short, you should get $y(t) = A\pi\sin(\omega_o t)$)

Fall 2005-06