EECS 206 – Winter 2002

Problem Set #13 – Apr. 12 – Solutions will be posted Apr. 17

These are practice problems - do not turn in solutions!
Relevant Lectures: 4/8, 4/10, 4/12
Relevant Reading: Chapter 8: 8.1 to 8.12
Relevant Items in the DSP First CD: Homework problems: Explore all the problems in Chap. 8!

1. Consider the System Function for a second-order IIR filter with complex poles:

$$H(z) = \frac{z^2}{(z-p)(z-p^*)}$$

   where $p = re^{j\theta}$. Verify that

$$h[n] = \frac{1}{\sin\theta} r^n \sin(\theta n + \theta) u[n]$$

2. Textbook, Problem 8.10 (b) and (c), pp. 312-3.
   Hint: Use the delay property of Z-transforms.

3. Textbook, Problem 8.12, p. 313.

4. Textbook, Problem 8.15 (e), p. 315. And add:

   (f) Calculate $y[n]$ for $x[n] = \cos(2\pi n/3)u[n]$.

5. Textbook, Problem 7.15, p. 247.

6. Textbook, Problem 8.19, p. 318.