EE 451

Homework #3

Due September 7, 2001
(Updated September 6, 2001)

1. Problem 2.47 from the text.
2. Problem 2.58 from the text.
3. Problem 2.68 from the text.
4. Determine the impulse response $h[n]$ of the LTI system described by the difference equation

$$y[n] + 0.5y[n-1] = x[n] - 2x[n-2]$$

Is the system stable? Why or why not?

5. Determine the total solution for $n \geq 0$ for the difference equation

$$y[n] - 3y[n-1] - 4y[n-2] = x[n] + 2x[n-1]$$

when the input sequence is

$$x[n] = 4^n \mu[n]$$

and the system is initially at rest.

Is the system stable? Why or why not?

6. Consider the system shown below:

(a) Determine its impulse response $h[n]$.
(b) Show that $h[n]$ is equal to the convolution of the following signals:

$$h_1[n] = \delta[n] + \delta[n-1]$$
$$h_2[n] = \left(\frac{1}{2}\right)^n \mu[n]$$