

## Homework 5

### Chapter 5

Class 1. Are the following systems BIBO stable; yes or no:

- a)  $h(t) = e^t$
- b)  $h(t) = \text{rect}(t)e^{-t}$
- c)  $h(t) = A\cos(100t)$
- d)  $h(n) = a^{-|n|}$
- e)  $h(n) = u(n)e^{-n/10} \cos(10n)$

Class 2. The signal  $x(t)$  is input to system 1 with an impulse response of  $h_1(t)$ . The output is this system input to a second system with an impulse response of  $h_2(t)$ . Find and plot the output of the second system if  $h_1(t) = \text{Rect}[\frac{t-1}{2}]$ ,  $h_2(t) = \text{Rect}[\frac{t-1}{2}]$  and  $x(t) = \delta(t-5)$ .

Class 3. Find the unit step response for a system with an impulse response of  $h(t) = 2u(t)e^{-2t}$ .