

ECE-205 : Dynamical Systems

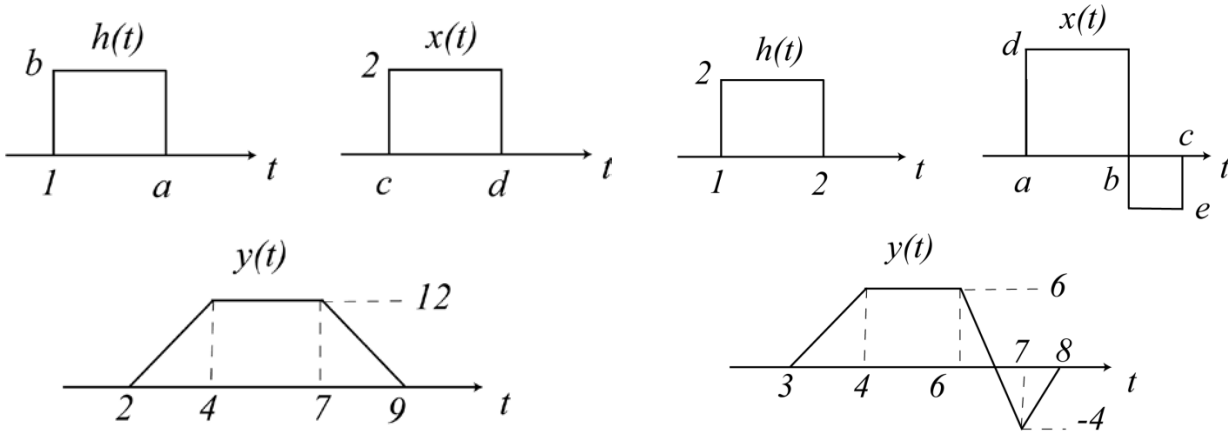
Homework #6

Due : Thursday April 18, 2013 at 5 PM

Exam 2, Friday April 19, 2013

- 1) Chapter 5, Problem 5.7
- 2) Chapter 5, Problem 5.9
- 3) Chapter 5, Problem 5.10
- 4) Chapter 5, Problem 5.11
- 5) Two LTI systems have impulse response, input, and output as shown below. Determine numerical values for the parameters a, b, c, d and e . *Note that the diagrams are not to scale!*

For the first system (on the left), assume $a-1 < d-c$ or $h(t)$ is narrower than $x(t)$.



Scrambled Answers: -2, 1, 2, 3, 3, 3, 5, 6, 6

6) Simplify the following integrals:

$$y(t) = \int_0^t e^{-(t-\lambda)} e^{-\lambda} d\lambda \quad y(t) = \int_{-1}^{t-1} e^{-3(t-\lambda)} e^{-\lambda} d\lambda \quad y(t) = \int_2^{t+1} e^{-2(t-\lambda)} \lambda e^{-2\lambda} d\lambda$$

Scrambled Answers:

$$y(t) = \frac{1}{2} [e^{-t-2} - e^{-3t-2}] u(t) \quad y(t) = te^{-t} u(t) \quad y(t) = \frac{1}{2} [t^2 + 2t - 3] e^{-2t} u(t-1)$$