

**ECE 300**  
**Signals and Systems**  
 Homework 2

**Due Date:** Thursday September 15 at 1 PM

**Reading:** K & H, pp. 25-47 (skip the discrete-time stuff).

**Problems**

1. K & H, Problem 1.24, 1.25 and 1.26 (do them all together). Do not do parts **b** and **f**. You need to justify your answers. Fill in the following table (or a similar table) to summarize your results (put a Y or N for each question).

Part	Causal?	Memoryless?	Linear?	Time Invariant?
a				
c				
d				
e				
g				
h				
i				
j				

For part **c**, you should show  $y(t) = y(t_0)e^{t_0 \int x(\lambda)d\lambda}$  in order to determine the system is or is not causal and has memory or is memoryless.

For part **d** you should show  $y(t) = y(t_0)e^{3(t-t_0)} + \int_{t_0}^t 2e^{3(t-\lambda)} x(\lambda)d\lambda$  in order to determine the system is or is not causal and has memory or is memoryless.

For part **j** you should show  $y(t) = y(t_0)e^{\frac{3}{2}(t^2-t_0^2)} + \int_{t_0}^t 2e^{\frac{3}{2}(t^2-\lambda^2)} x(\lambda)d\lambda$  in order to determine the system is or is not causal and has memory or is memoryless.

If you have trouble with these, read pages 26-28 on integrating factors, and pages 58 and 59 on first order cases. However, you must show your work here and not just use the answers in the book.

2. K & H, Problem 1.31