Homework 3: due 02/02/18 EE 324: Signals and Systems II

1 Continuous time systems

Compute the impulse response of the following systems as well as the outputs with inputs $x(t) = e^{-t}$ and zero initial condition y(0) = 0. 1. $\dot{y}(t) = x(t)$ 2. $\dot{y}(t) - y(t) = x(t)$

2 Discrete time systems

Compute the impulse responses of the following systems as well as the outputs with inputs x[k] = 1.

1. y[k] - 0.6y[k-1] = 2x[k]2. y[k] - 0.3y[k-1] - 0.4y[k-2] = x[k]

3 Laplace transform

1. $x(t) = u(t) + e^{-t}$ 2. $x(t) = e^{-t+1} \sin(t)$