

## EE 2000 Assignment # 3

*(taken from Dr. Jingxian Wu, University of Arkansas, 2020.)*

1. Determine whether the following systems are linear or non-linear, causal or non-causal, time invariant or time variant, and memoryless or with memory

(a)  $y(t) = 2x(t) + 3$

(b)  $y(t) = 2x^2(t) + 3$

(c)  $y(t) = Atx(t)$

(d)  $y(t) = x(t)u(t) - x(t)u(-t)$

(e)  $y(t) = \int_{-\infty}^t x(\tau) d\tau$

(f)  $y(t) = \int_0^t x(\tau) d\tau$

(g)  $y(t) = x(t)x(t-2)$

(h)  $y(t) = \frac{1}{T} \int_{t-T/2}^{t+T/2} x(\tau) d\tau$