EE 30344 — Signals and Systems I

Quiz 3

September 18, 2006

1. Let $x(t) = t \cdot (u(t-2) - u(t-4))$.

   (a) Sketch $x(t)$ and $x(2t+2)$.

   (b) Is there an LTI system with output $x(2t+2)$ for an input $x(t)$? Explain.

   (c) Sketch $x(t) * h(t)$ for

   $$h(t) = \frac{1}{2}\delta(t) + \frac{1}{2}\delta(t+2)\,.$$

2. Consider the system given by

   $$y[n] = \begin{cases} x[n] & \text{if } x[n] \geqslant 0 \\ 0 & \text{if } x[n] < 0 \end{cases}$$

   (a) Is this system linear, time-invariant, causal?

   (b) Determine its impulse response.