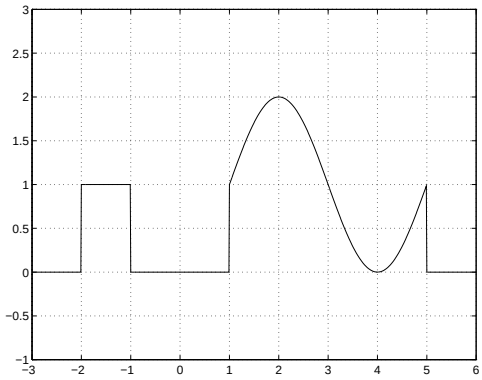
The Johns Hopkins University
Department of Electrical and Computer Engineering

505.460 — Introduction to Linear Systems — Spring 1996

Quiz No. 1.

Note, the first three problems all deal with the signal below:



1. Plot $2x(1 - t/2)$.
2. Find and plot the even and odd parts of the signal.
3. Find an expression for the signal.
4. Suppose that the input/output relationship of a system is described by:

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

   Which of the following properties does the system have? (Note, 50% of the grades will be given for the justification) Mermoryless? Time-invariant? Linear? Causal? Stable?
5. Suppose that the input $x_1(t) = e^{-2t}u(t)$ is fed into a linear time invariant (LTI) system, and the output is given by:

   $$y_1(t) = (e^{-2t} - e^{-3t})u(t)$$

   What will be the output of this system to

   $$x_2(t) = 2e^{-2(t-1)}u(t-1) + e^{-2(t+2)}u(t+2)$$

   Hint. This problem requires little computation.