UNIVERSITY OF TEXAS AT DALLAS
Telecommunications Engineering

TE3302 Signals & Systems
Problem Set #4: Continuous-Time and Discrete-Time Properties

Date assigned: September 20, 2000
Date due: September 27, 2000

Homework is due at the beginning of class. Late homework will not be accepted.

Reading: *Signals & Systems*, Sections 2.0 and 2.1

You may use any computer program to help you solve these problems, check answers, etc.

Problem 4.1 Interconnection of Systems
  Problem 1.15 in *Signals & Systems*.

Problem 4.2 System Properties
  Problem 1.19 in *Signals & Systems*. Please justify your answers to receive full credit.

Problem 4.3
  In the class, a number of general properties of systems were introduced. In particular, a system may or may not be (1) memoryless, (2) Time invariant, (3) Linear, and (4) Causal. Determine which of these properties and which do not hold for each of the continuous-time systems listed in Problem 1.27 (a), (b), (c), and (f) in *Signals & Systems*. Please justify your answers to receive full credit. In each problem, $y(t)$ denotes the system output and $x(t)$ is the system input.

Problem 4.4
  Determine which of the properties listed in the previous problem hold and which do not hold for each of the discrete-time systems listed in Problem 1.28 (a), (b), and (f) in *Signals & Systems*. Please justify your answers to receive full credit. In each problem, $y[n]$ denotes the system output and $x[n]$ is the system input.