1. Determine whether the following signals are periodic, and when possible find the fundamental period:

- (a)  $x(n) = \cos(10n + \pi) + \sin(\pi n/2)$ (b)  $x(n) = e^{(j 3\pi n/7)}$ (c)  $x(n) = \cos(3\pi n/17 + 0.3\pi)$ (d)  $x(n) = \sin(100\pi n)/n$ (e)  $x(n) = e^{(j 3\pi n/7)}$ (f)  $x(n) = \cos(3n + 0.3\pi)$
- 2. For the shown a discrete x(n), sketch each of the following signals derived from x(t):



3. For each system, determine whether it is (1) linear, (2) time invariant, (3) recursive, and (4) causal:

(a)  $y(n) = \sum_{m=-\infty}^{\infty} x(n-m) \cdot h(m)$ , h(n) = [u(n-1)-u(n)](b)  $y(n) = x(n-1) \cdot x(n-2)/3$ (c)  $y(n) = x(n+1) \cdot u(n)$ 

4. Determine the output of the systems described by the following difference equations with input and initial conditions as specified:

(a) y[n] = x[n] - 0.5 y[n-1], x[n] = u[n-1], y[-1] = 1(b)  $y[n] = 2 x[n] - 0.5 x[n-1], x[n] = \delta[n-1]$ 

- Assigned: Sunday June 28, 2015
- Deadline: Thursday July 2, 2015