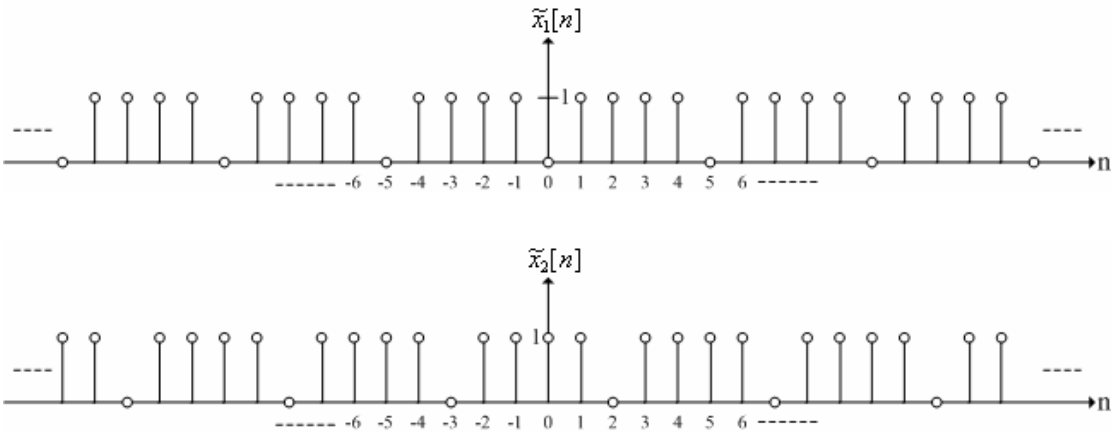
Homework No. 7-1

Due 13:10, May 14, 2008

1. Consider the following two signals



(1) Let $x_1[n]=\begin{cases}\tilde{x}_1[n] & n=0\sim 4\\ 0 & o.w.\end{cases}$ and $x_2[n]=\begin{cases}\tilde{x}_2[n] & n=0\sim 4\\ 0 & o.w.\end{cases}$. Compute and draw the linear convolution of $x_1[n]$ and $x_2[n]$. (15%)

(2) Compute and draw the periodic convolution of $\tilde{x}_1[n]$ and $\tilde{x}_2[n]$. (25%)

(3) Compute and draw the 5-point circular convolution of $x_1[n]$ and $x_2[n]$. (25%)

(4) Compute and draw the 9-point circular convolution of $x_1[n]$ and $x_2[n]$. (25%)

(5) Compare the results of (1) and (4). (10%)

Note: *N*-point circular convolution of $x_1[n]$ and $x_2[n]$ is defined as:

$x_3[n]=\sum_{m=0}^{N-1}x_2[m]x_1\left[\left((n-m)\right)_N\right]$ where $\left((n)\right)_N$ is *n* modulo *N*.