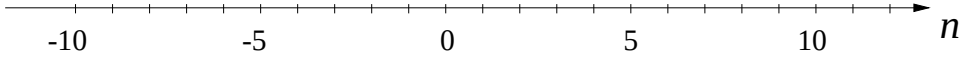
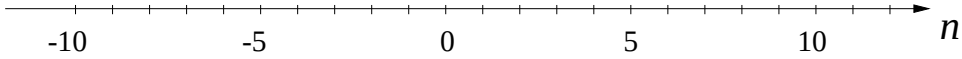
PROBLEM:

Let $x[n] = u[n] - u[n-7]$ and $h[n] = \begin{cases} (\frac{1}{2})^n & 0 \le n \le 3 \\ 0 & \text{otherwise.} \end{cases}$

(a) Plot $x[n]$.

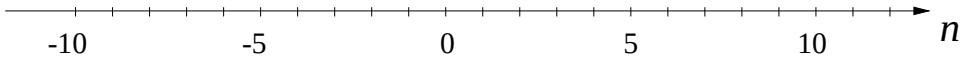


Plot $h[n]$.



Label the amplitudes for each sample.

(b) If we now assume $x[n] = \delta[n] + \delta[n-1] + \delta[n-2]$ and $y[n] = x[n] * h[n]$, where $h[n]$ is as defined above, plot $y[n]$ on the axis below.

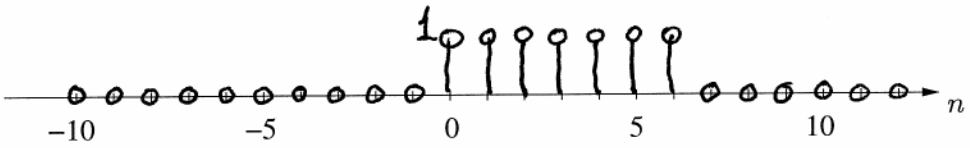


McClellan, Schafer and Yoder, *Signal Processing First*, ISBN 0-13-065562-7.
Prentice Hall, Upper Saddle River, NJ 07458.

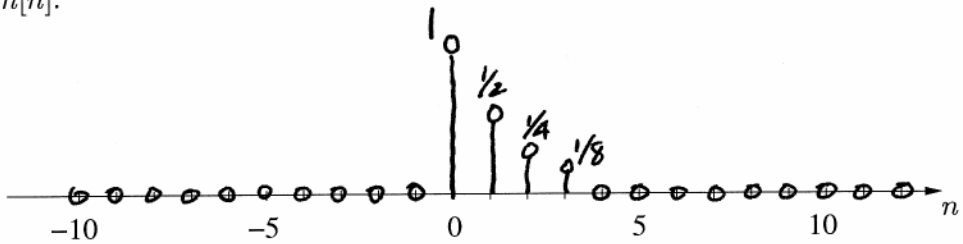
SOLUTION

Let $x[n] = u[n] - u[n-7]$ and $h[n] = \begin{cases} (\frac{1}{2})^n & 0 \le n \le 3 \\ 0 & \text{otherwise.} \end{cases}$

(a) Plot $x[n]$.



Plot $h[n]$.



Label the amplitudes for each sample.

(b) If we now assume $x[n] = \delta[n] + \delta[n-1] + \delta[n-2]$ and $y[n] = x[n] * h[n]$, where $h[n]$ is as defined above, plot $y[n]$ on the axis below.

1 1/2 1/4 1/8
1 1 1
1 1/2 1/4 1/8
1 1/2 1/4 1/8
1 1/2 1/4 1/8
1 3/2 7/4 7/8 3/8 1/8