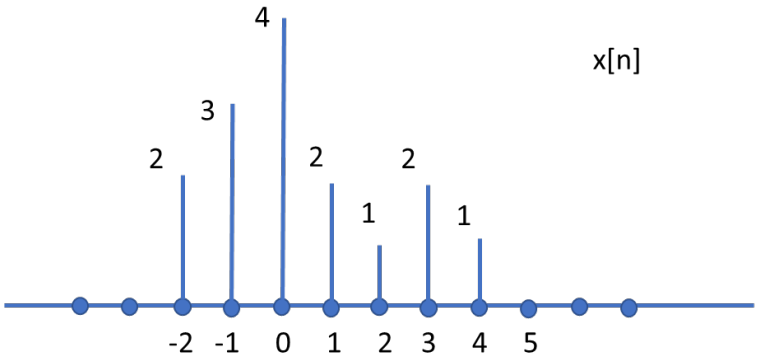
LTI systems

Exercises Lektion 8

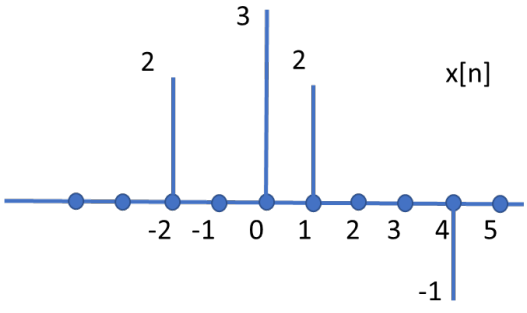
1. Show that $u[n] = \sum_{k=0}^{\infty} \delta[n-k]$.

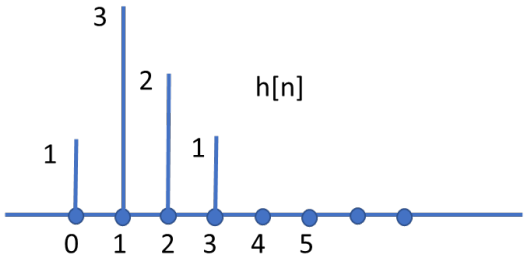
2. Given the discrete time signal x[n] shown below:



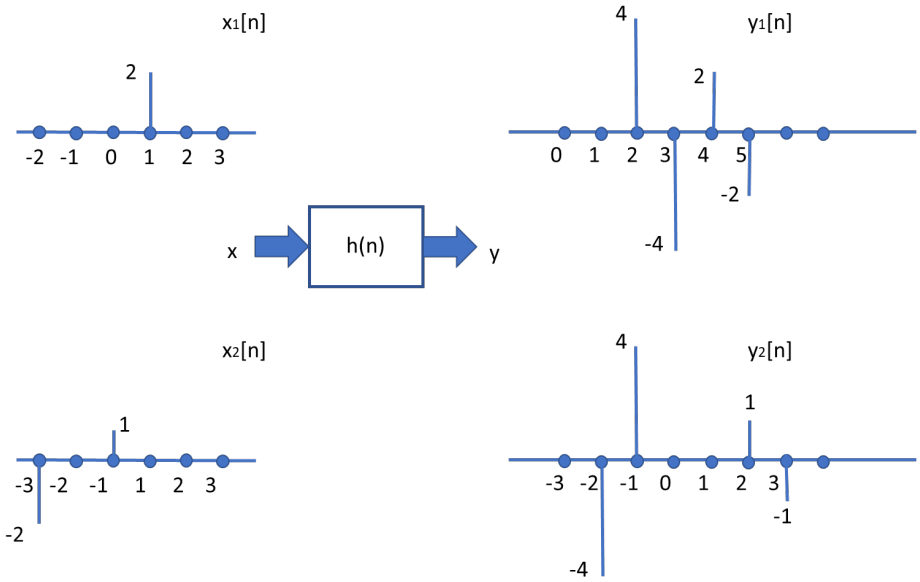
- Express the signal as a sum of impulses.
- Sketch and label the following signals:
  - x[n-2]
  - x[1-n]
  - x[n]u[2-n]
  - x[n-1]δ[n-3]

3. Calculate (and sketch) the outcome of the linear time invariant system with the impulse response h[n], given the input x[n] (both displayed below)





4. For a system having response h(n), the following relationship exists between two input and output signals:



Can h be a linear time invariant system? Is h causal?