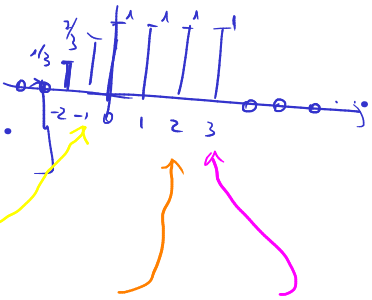
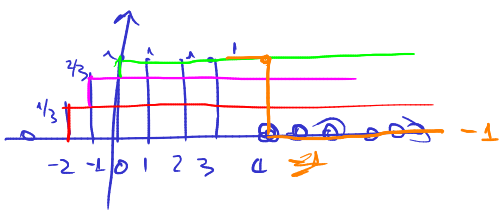
Ex. Week 3

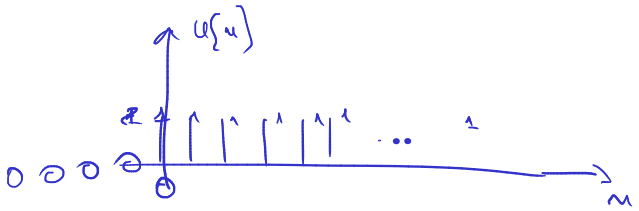


(1) $x[n] = \{\ldots 0, \frac{1}{3}, \frac{2}{3}, \underset{n=0}{1}, 1, 1, 1, 0 \ldots\}$

a) $x[n] = \frac{1}{3}\cdot\delta[n+2] + \frac{2}{3}\cdot\delta[n+1] + \delta[n] + \delta[n-1] + \delta[n-2] + \delta[n-3]$

b) $x[n] = \frac{1}{3}\cdot u[n+2] + \frac{1}{3}\cdot u[n+1] + \frac{1}{3}\cdot u[n] - u[n-4]$





$\delta[n] = u[n] - u[n-1]$

$u[n]$ 000|111111

$u[n-1]$ 0000|11111

$\delta[n]$ = 000010000

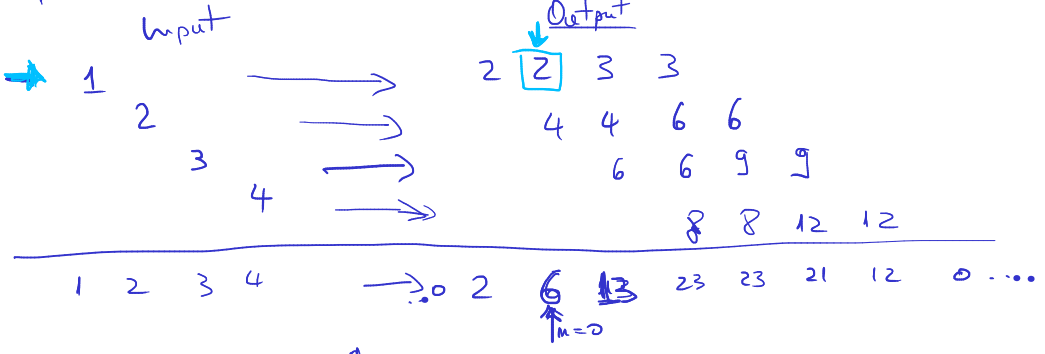
(2)

$x_1[n] = \{\ldots 0, \underset{\uparrow}{1}, 2, 3, 4, 0, \ldots\} = x[n]$

3 Ways

$x_2[n] = \{\ldots 0, \underset{\uparrow}{2}, 2, 3, 3, 0 \ldots\} = h[n]$

A)



B) $x[n] = \ldots 0\ 0\ \underset{\uparrow}{1}\ 2\ 3\ 4\ 0\ 0 \ldots$

h reversed = 3 3 2 2

3 3 2 2 → $y[0] = 0\cdot3 + 0\cdot3 + 1\cdot2 + 2\cdot2 = 6$

3 3 2 2 → $y[1] = 0\cdot3 + 1\cdot3 + 2\cdot2 + 3\cdot2 = 13$

3 3 2 2 → $y[2] = \ldots = 23$

3 3 2 2 → $y[-1] = 2$, $y[-2] = 0$