Exercícios de final de capítulo

5. A discrete-time signal $x[n]$ is shown in Figure P2.29-1.

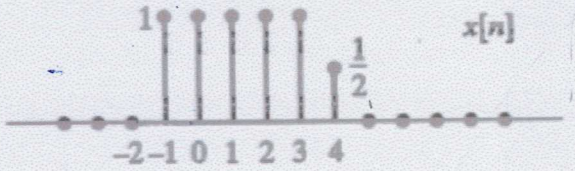
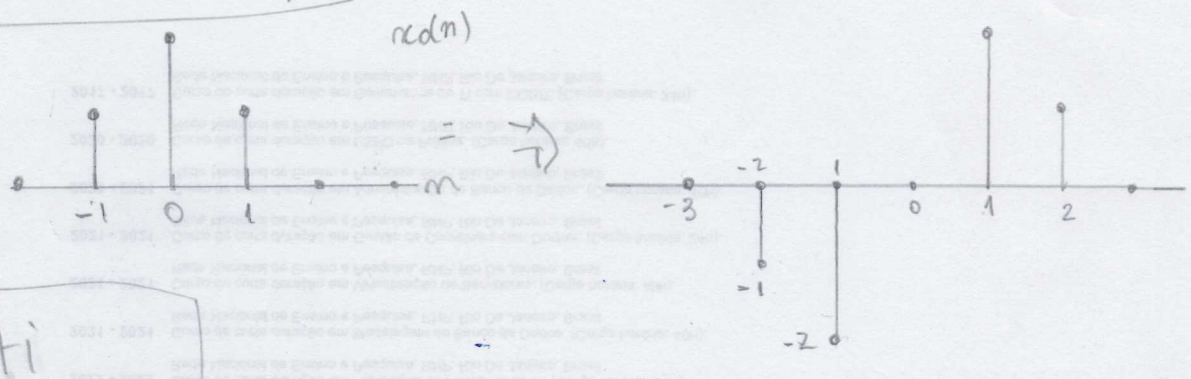


Figure P2.29-1

Sketch and label carefully each of the following signals:

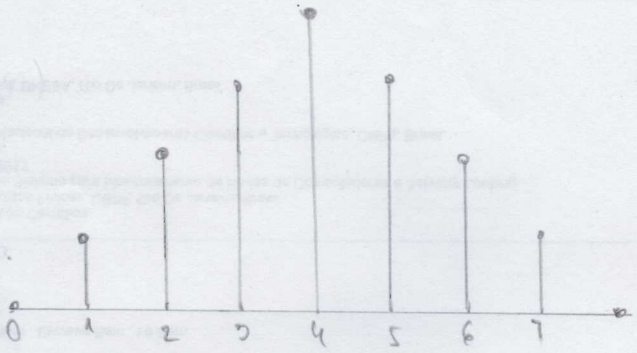
(a) $x[n-2]$
(b) $x[4-n]$
(c) $x[2n]$
(d) $x[n]u[2-n]$
(e) $x[n-1]\delta[n-3]$

Exercício 7 cap2



LTI
não causal

a) Determine the response to the input $x_1(n)$



$x(n) = \delta(n+1) + 2\delta(n) + \delta(n-1)$

$y(n) = -\delta(n+2) - 2\delta(n+1) + 2\delta(n-1) + \delta(n-2)$

transformada Z $= \frac{Y_0}{X_0} = \frac{-z^2 - 2z + 2z^{-1} + z^{-2}}{z + 2 + z^{-1}}$ $\begin{matrix} :(z^2) \\ :(z) \end{matrix}$ $\frac{1 + 2z^{-1} - 2z^{-3} - z^{-4}}{-1 + 2 + z^{-1}}$

$1 + 2z^{-1} - 2z^{-3} - z^{-4} \quad | -1 + 2z^{-1} + z^{-2}$

$-1 - 2z^{-1} - z^{-2} - z^{-4} \quad \underline{1 - z^{-2}} = -z + z^{-1}$

$-z^{-2} - 2z^{-3} - z^{-4}$

$+z^{-2} - 2z^{-3} + z^{-4}$

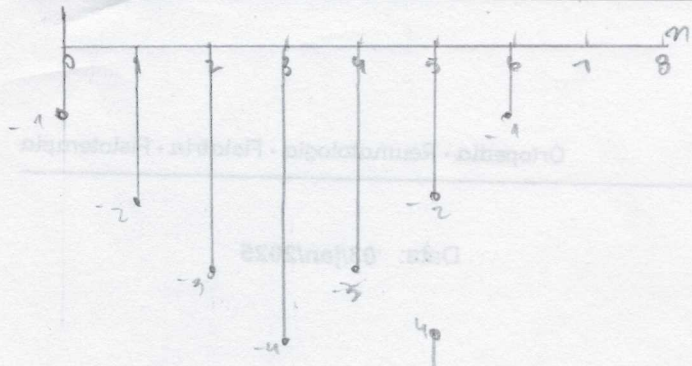
0

$\therefore h(n) = -\delta(n+1) + \delta(n-1)$

$y_1(n) = x_1(n) * h(n) = x_1(n) * (-\delta(n+1) + \delta(n-1))$

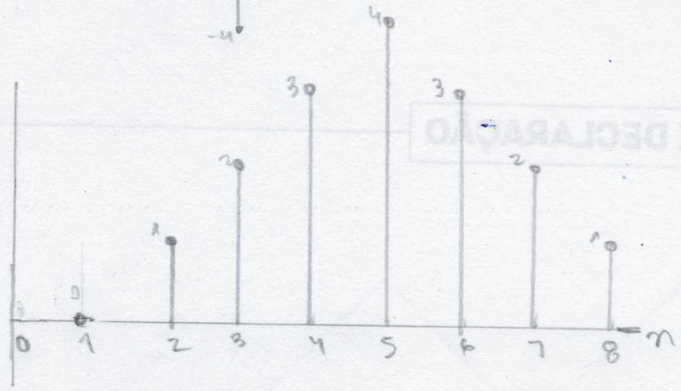
$= -x_1(n) * \delta(n+1) + x_1(n) * \delta(n-1)$

$\therefore y_1(n) = -x_1(n+1) + x_1(n-1)$



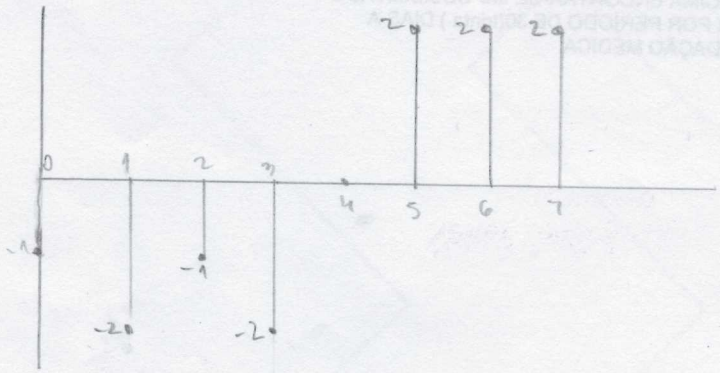
$-x_1(n+1)$

+

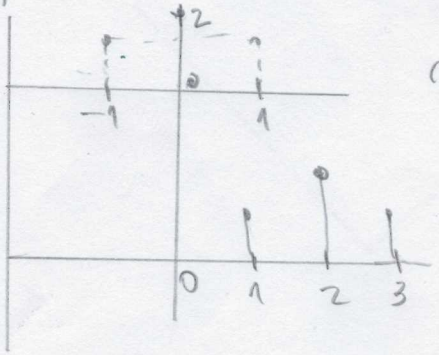


$x(n-1)$

a) Response to the inputs

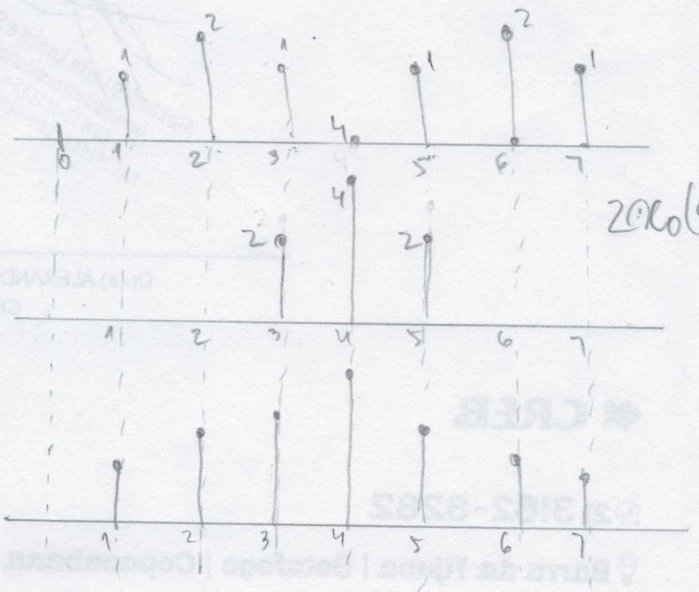


b) System impulse response (we need 7 points, so have 3 components)



$x_{(0)}(n-2)$

$x_0(n-2) + x_0(n-6)$



$2x_0(n-4)$

$x_1(n) = x_0(n-2) + x_0(n-6) + 2x_0(n-4)$

$y_1(n) = y_0(n-2) + x_0(n-6) + 2x_0(n-4)$