

# Procesamiento digital de señales

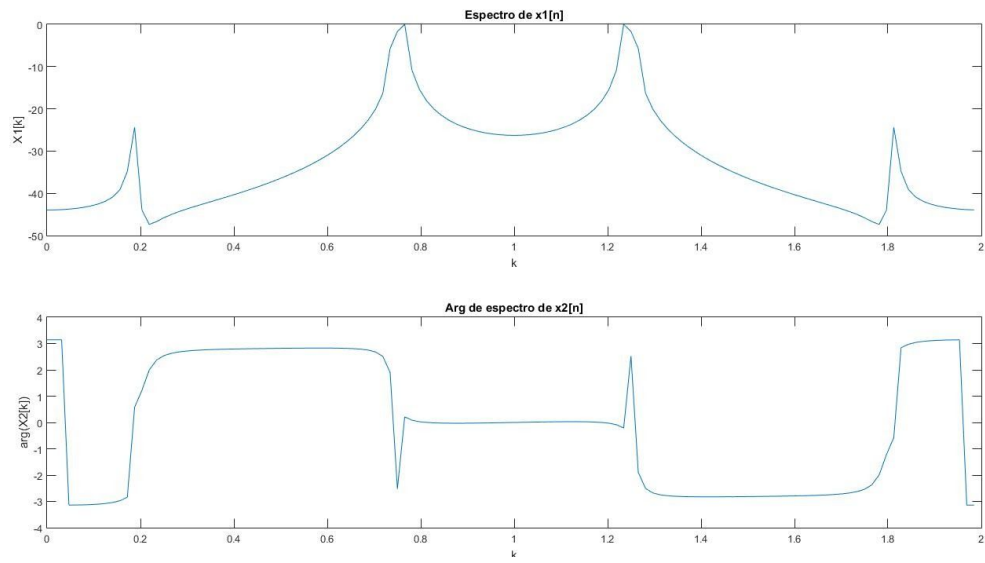
## Análisis espectral



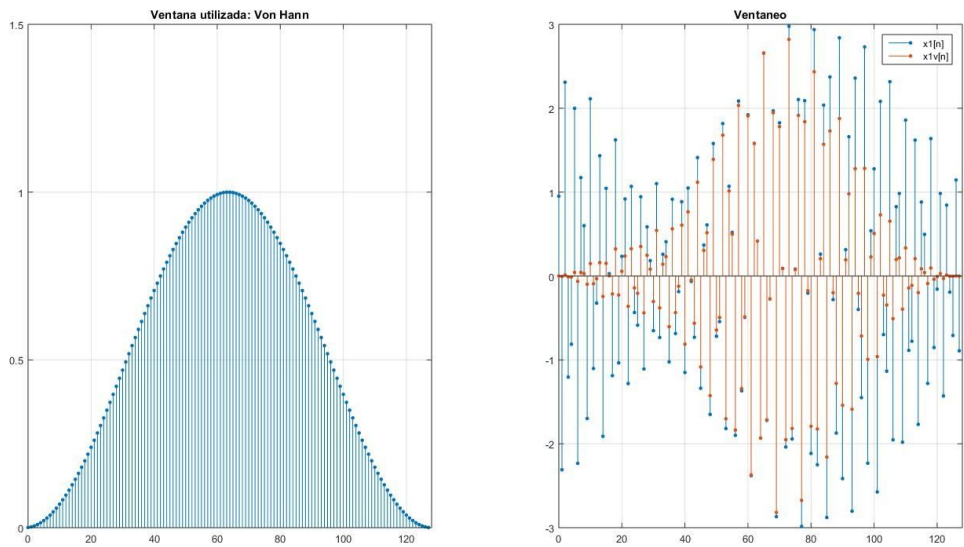
Integrantes:

- Barco Valentín
- Estrada Anselmo

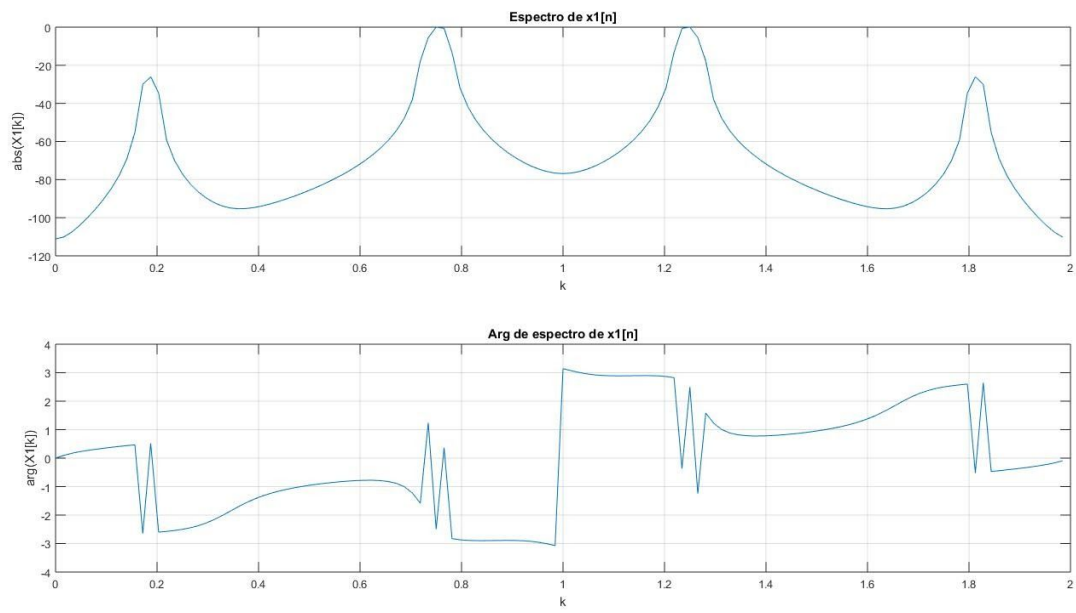
1 - a)



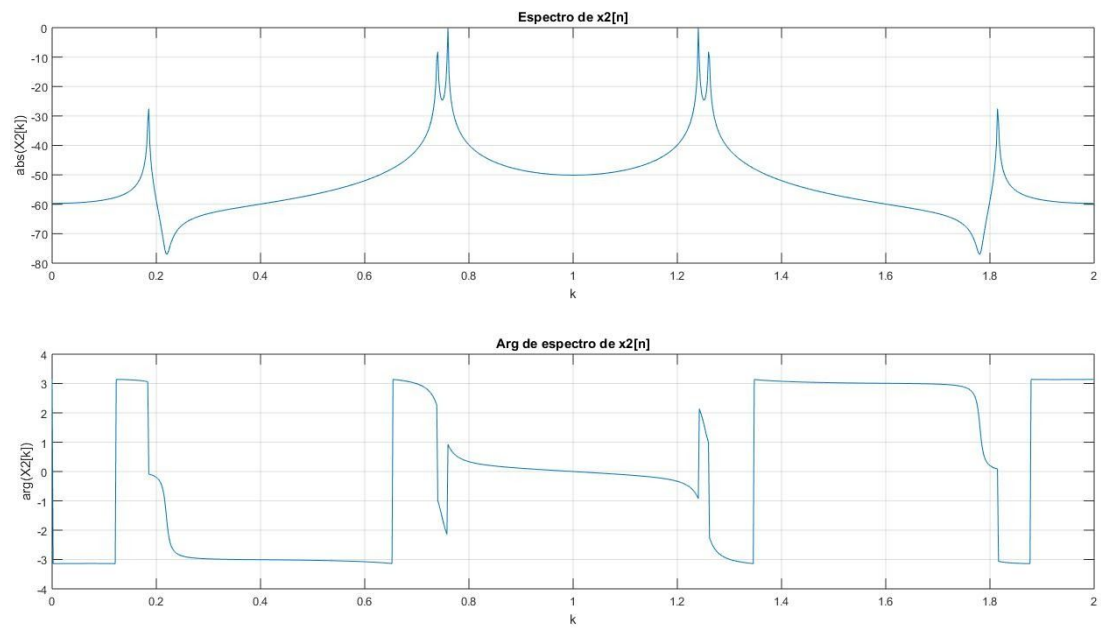
1 - b) Ventaneo



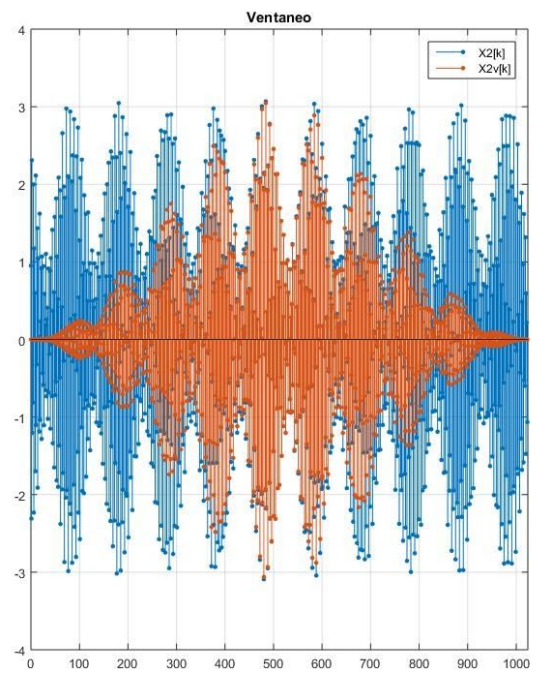
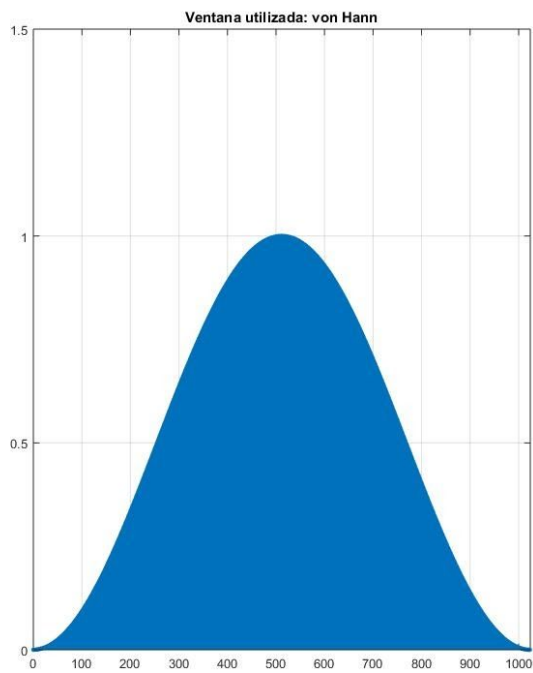
1 - b)



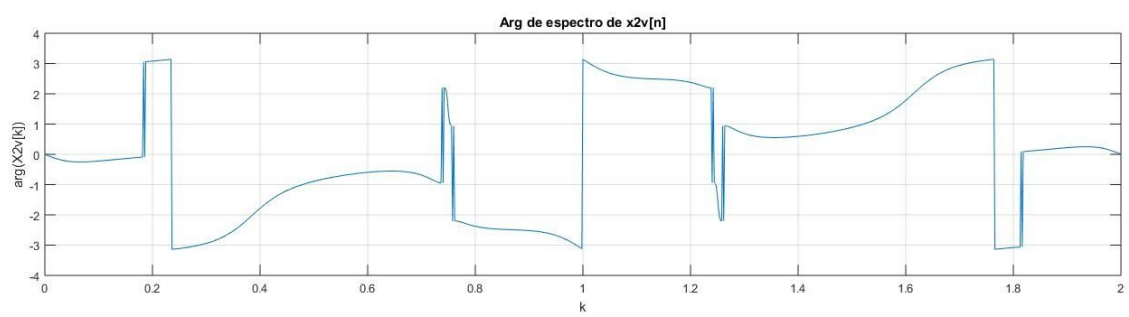
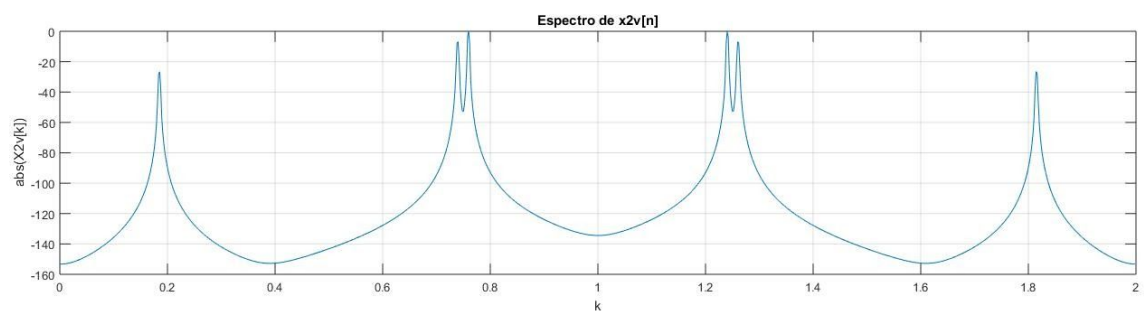
1 - c)



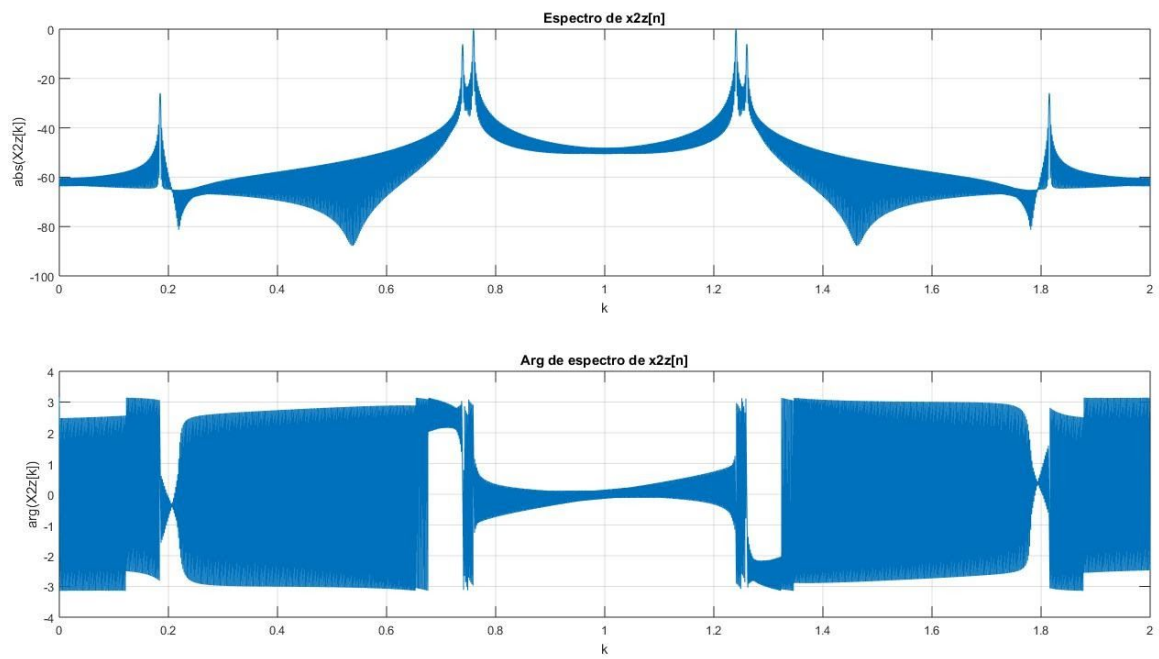
## 1 - d) Ventaneo



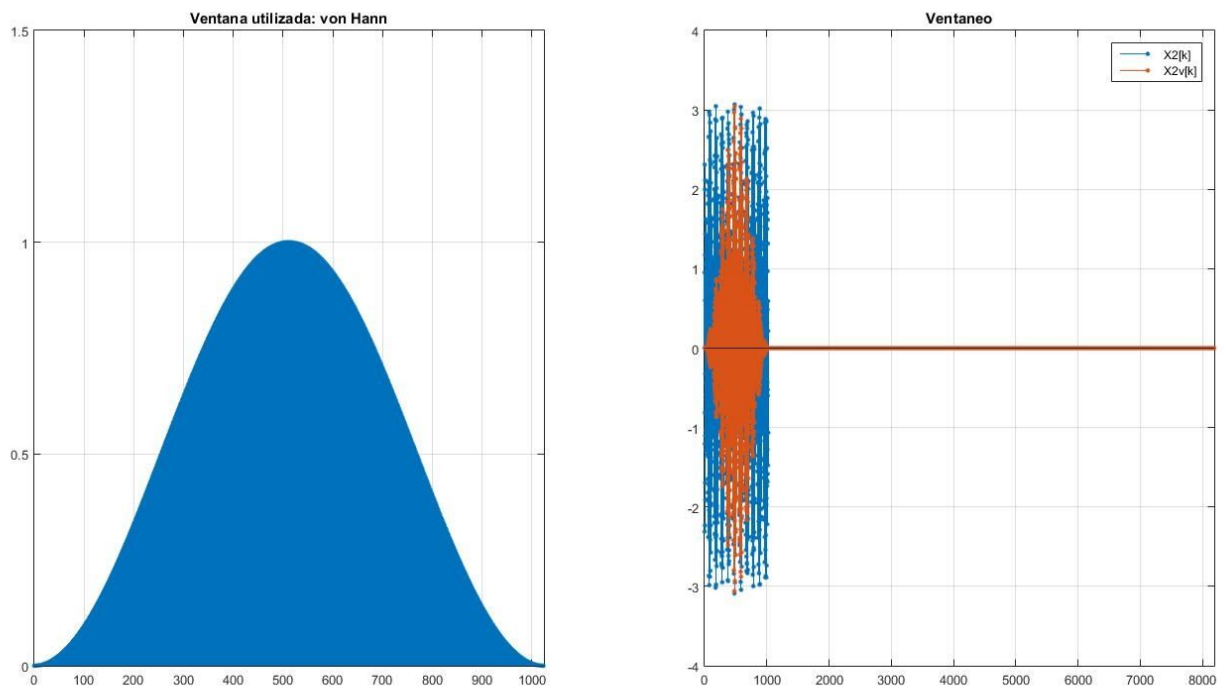
## 1 - d)



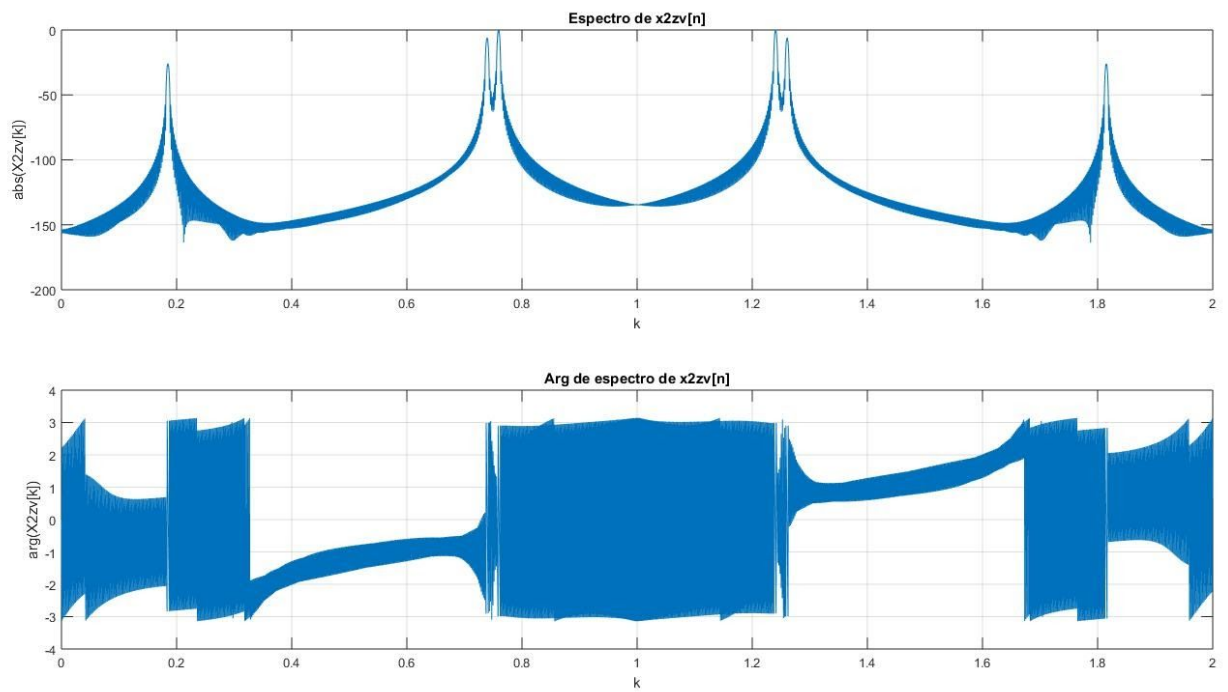
## 1 - e) Con padding



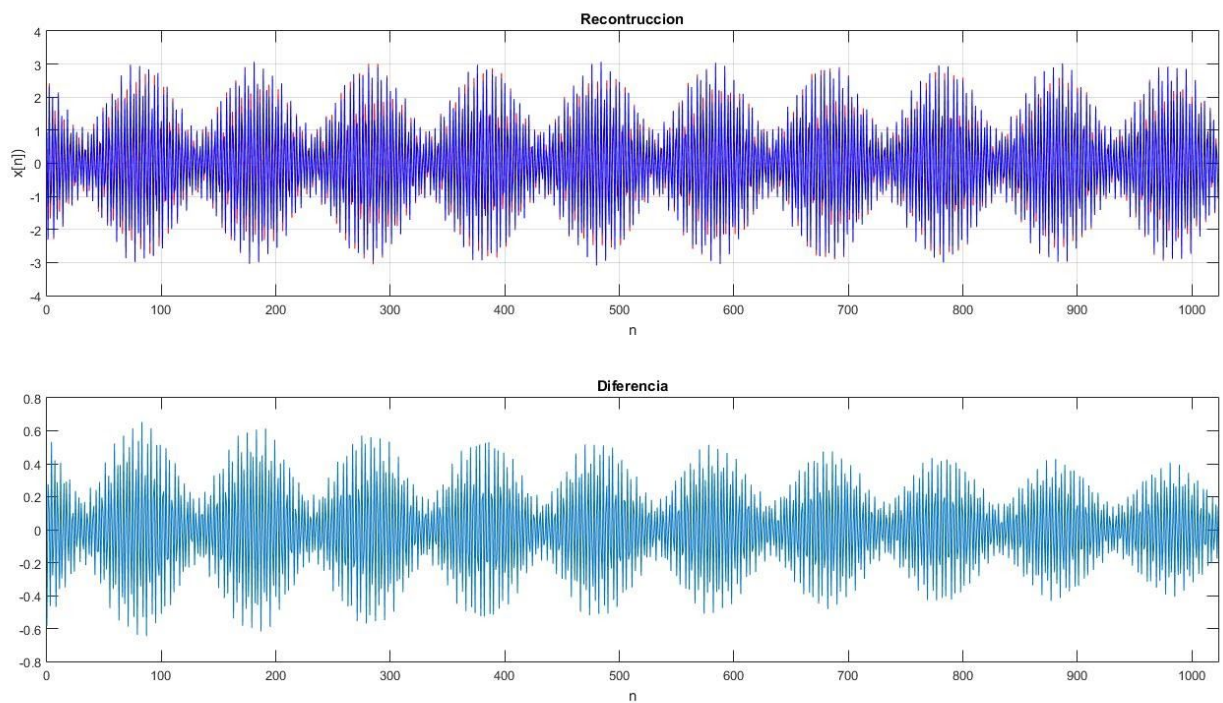
## 1- f) Ventaneo



1 - f) con padding y ventaneo



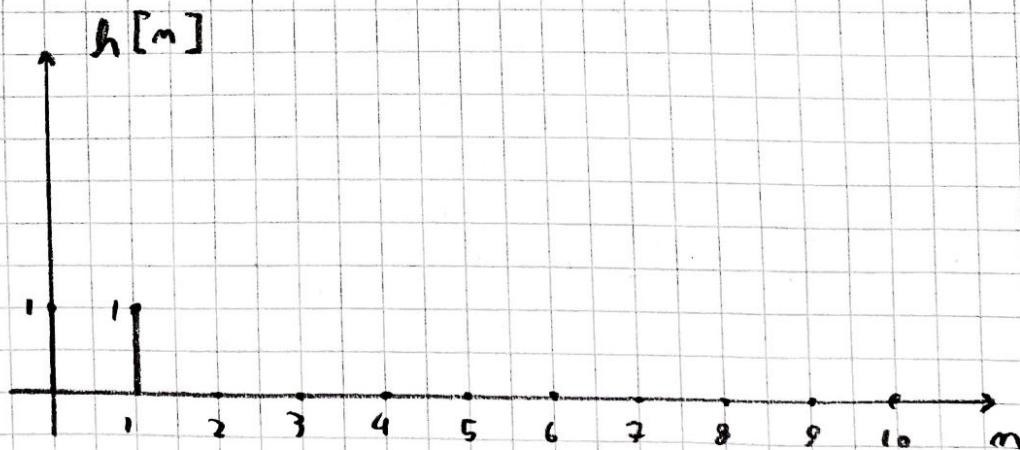
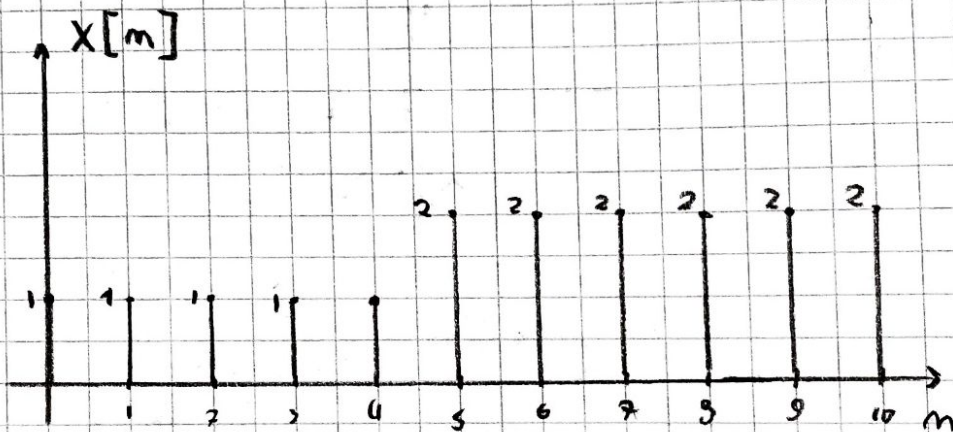
1 - g) Reconstrucción de la señal



## Esercizio 2:

a) 
$$X[m] = u[m] + u[m-5]$$

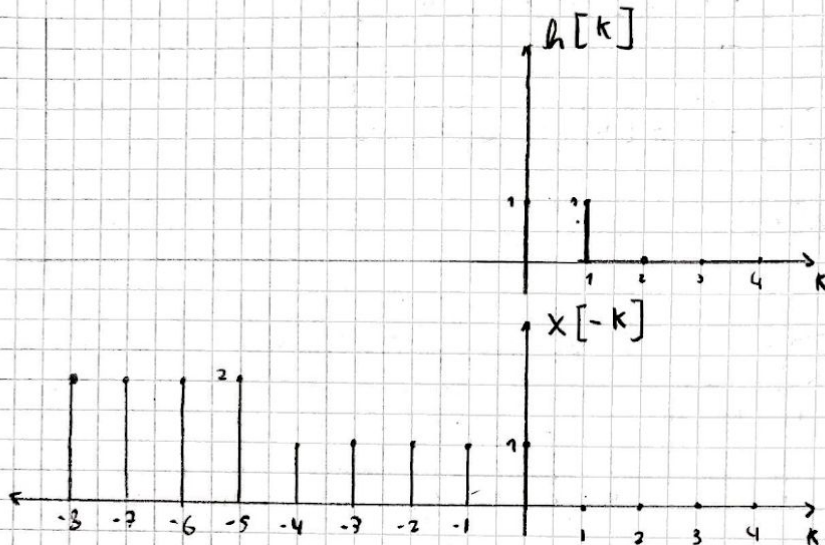
$$h[m] = \delta[m] + \delta[m-1]$$





a)

$$y[m] = \sum_k h[k] x[m-k]$$



$$y[0] = \sum_k h[k] x[0-k] = 1$$

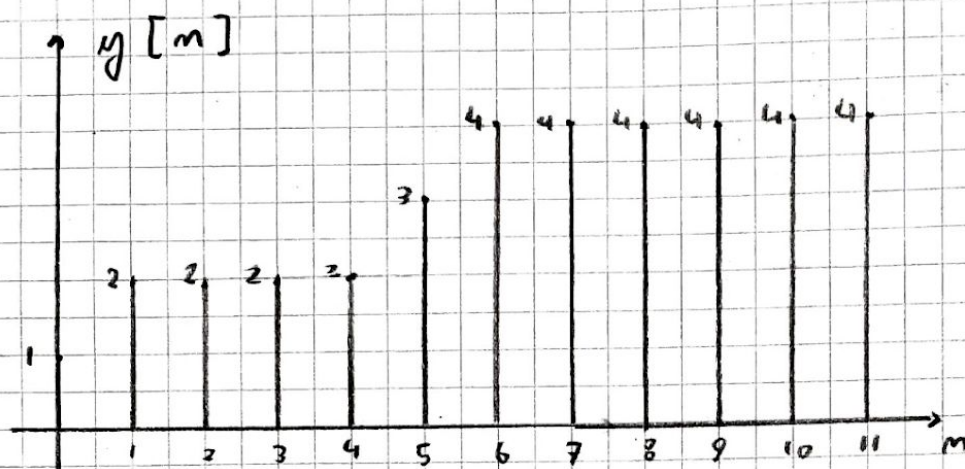
$$y[1] = \sum_k h[k] x[1-k] = 2$$

$$y[2] = y[3] = y[4] = y[1] = 2$$

$$y[5] = \sum_k h[k] x[5-k] = 2 + 1 = 3$$

$$y[6] \text{ an adelante} = 2 + 2 = 4$$





c) Solucion y guardos

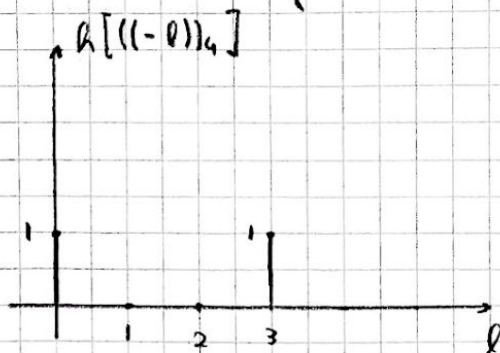
$$N = 4$$

$$P = 2$$

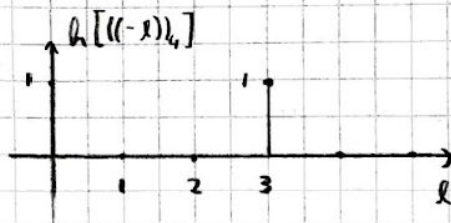
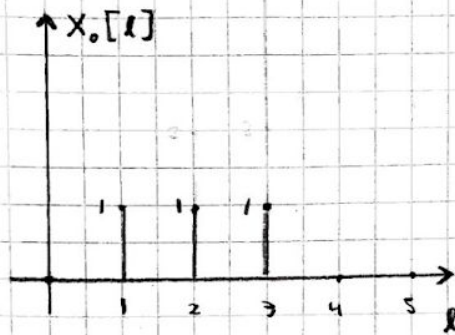
$$x_0[m] = \{0, 1, 1, 1\} \quad \text{agrega } (P-1) \text{ ceros.}$$

$$h[m] = \{1, 1, 0, 0\}$$

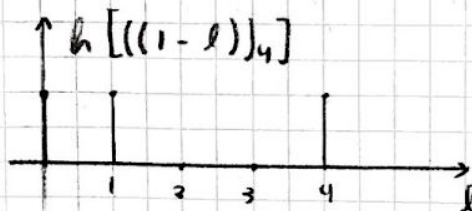
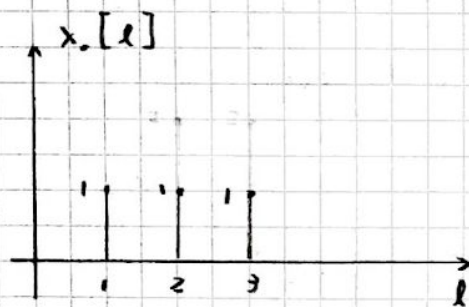
$$(x_0 \otimes h)[m] = \sum_l x_0[l] \cdot h[(m-l)]_4 = y_0[m]$$



## Etapa 1



$$y_0[0] = 1$$



$$y_0[1] = 1$$

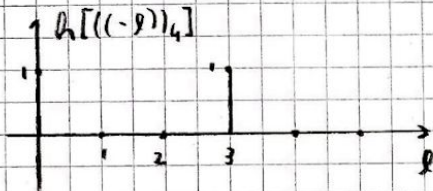
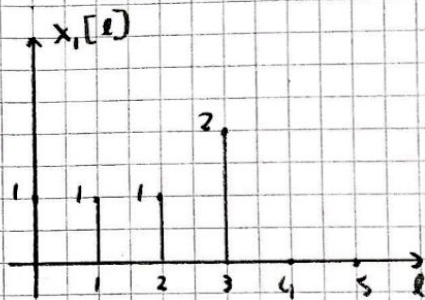
$$y_0[2] = 2$$

$$y_0[3] = 2$$

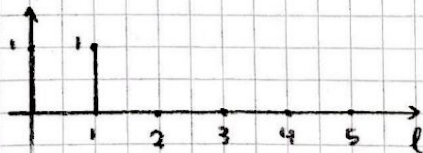
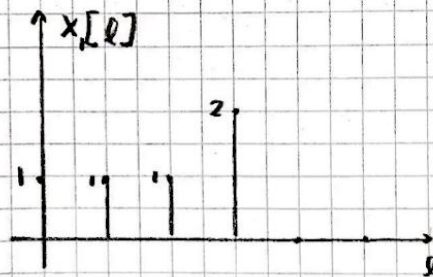
$$y_0[m] = \{x_1, 2, 2\}$$

Etape 2

$$x_1[n] = \{1, 1, 1, 2\}$$



$$y_1[0] = 1 + 2 = 3$$



$$y_1[1] = 1 + 1 = 2$$

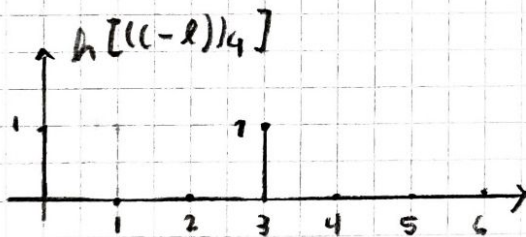
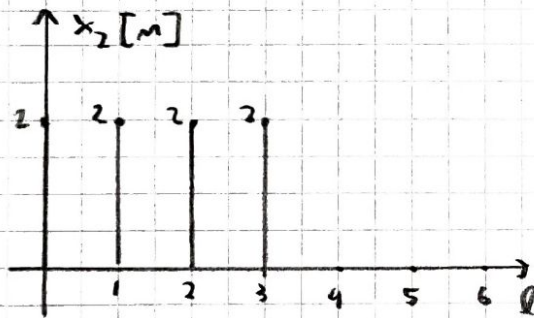
$$y_1[2] = 1 + 1 = 2$$

$$y_1[3] = 1 + 2 = 3$$

$$y_1[m] = \{\cancel{1}, 2, 2, 3\}$$

Etape 3

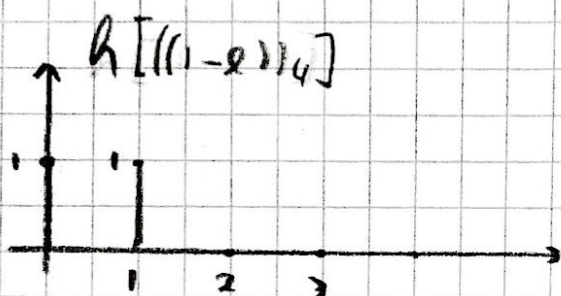
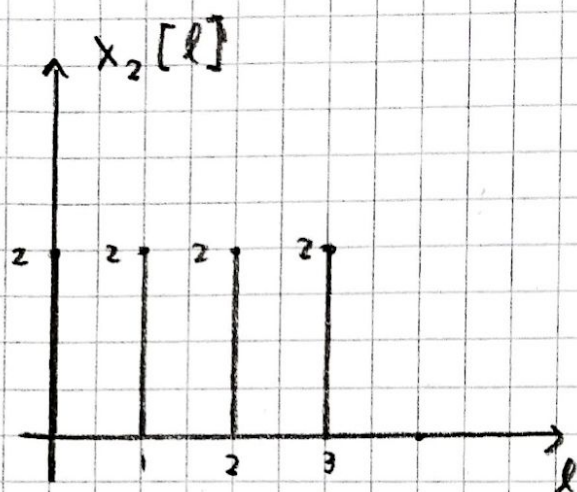
$$x_2[m] = \{2, 2, 2, 2\}$$



$$y_2[0] = 2 + 2 = 4$$

$$y_2[0] = 2 + 2 = 4$$





$$y_2[1] = 2 + 2 = 4$$

$$y_2[2] = 2 + 2 = 4$$

$$y_2[3] = 2 + 2 = 4$$

$$y_2[m] = \{X, 4, 4, 4\}$$

$m \rightarrow$	-1	0	1	2	3	4	5	6	7	8	...
$y_0[m] \rightarrow$	<del>X</del>	1	2	2							
$y_1[m] \rightarrow$				<del>X</del>	2	2	3				
$y_2[m] \rightarrow$							<del>X</del>	4	4	4	
$y[m] \rightarrow$	0	1	2	2	2	2	3	4	4	4	...

