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$x[n] = \{-1, 0, 1, 2\}$

$y[n] = \{-2, 2, 2, -2\}$

$x[n] * y[n] = C[n]$

$C[n]\, z^{-1} \times \frac{1}{2} + C[n]\, \frac{1}{2} = d[n]$

$\frac{1}{2}\left(C[n]\, z^{-1} + 1 \right) = d[n]$

$-1 \times -2 = 2$

$0 \times 2 = 0$

$1 \times 2 = 2$

$2 \times -2 = -4$

$C[n]$

$C[n] = \{2, 0, 2, -4\}$

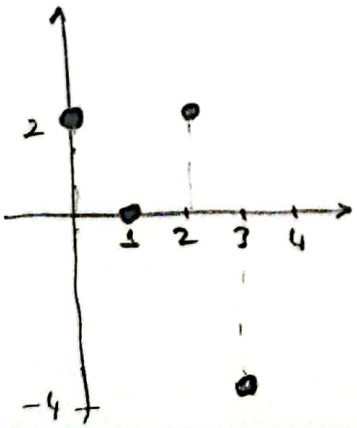
$\frac{1}{2}\left(C[n]\, z^{-1} + 1 \right)$

delay

n	x	y	C	D
0	-1	-2	2	0
1	0	2	0	1,5
2	1	2	2	0.5
3	2	-2	-4	1,5

a) draw the convolved signal

$C[n] = \{2, 0, 2, -4\}$

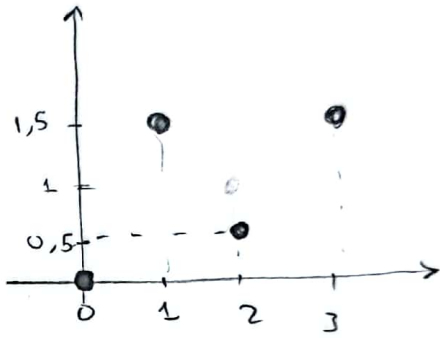


b) if $C[n]$ is applied to a first order moving average filter (FIR), find and draw its outputs signal $d[n]$.

$d[n] = \frac{1}{2}\left(C[n]\, z^{-1} + 1 \right)$

delay

$d[n] = \{0, 1.5, 0.5, 1.5\}$



the filter will straighten the signal.