Le10

Thursday, 20 March 2025 09:14

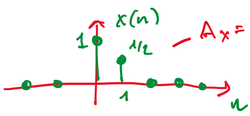
Es1

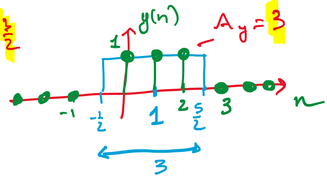
$x(n) = \delta(n) + \frac{1}{2}\delta(n-1)$

$y(n) = \text{rect}\left(\frac{n-1}{3}\right) = \text{rect}\left(\frac{t-1}{3}\right)\Big|_{t=n}$

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

1) DISEGNARE $x(n)$ E $y(n)$
2) CALCOLARE $z(n) = x * y(n)$
3) CALCOLARE $v(n) = [x(n-3)] * [y(n+2)] = x * y(n-3+2) = x * y(n-1)$

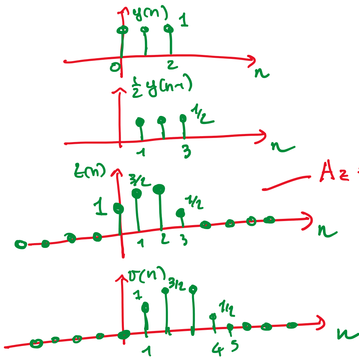




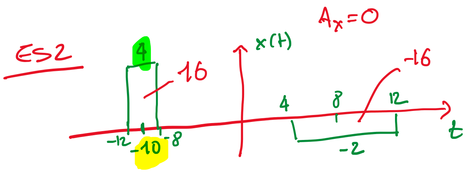
$x * y(n) = \left[\delta(n) + \frac{1}{2}\delta(n-1)\right] * y(n)$

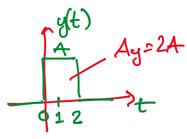
$= \delta(n) * y(n) + \frac{1}{2}\delta(n-1) * y(n)$

$= y(n) + \frac{1}{2}y(n-1)$



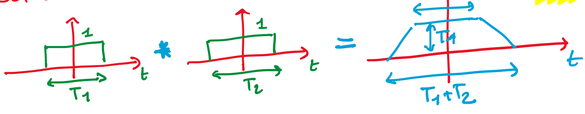
Es2





TROVARE $z(t) = x * y(t)$

REGOLA CONV. TRA RETTANGOLI



$y(t) = A\,\text{rect}\left(\frac{t-1}{2}\right) = A\,\text{rect}_2(t-1)$

RETTANGOLO DI BASE 2: $\text{rect}_a(t) = \text{rect}\left(\frac{t}{a}\right)$

$x(t) = 4\,\text{rect}_4(t+10) - 2\cdot\text{rect}_8(t-8)$

$z(t) = x * y(t)$

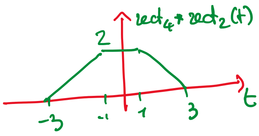
$= \left[4\,\text{rect}_4(t+10) - 2\,\text{rect}_8(t-8)\right] * \left[A\,\text{rect}_2(t-1)\right]$

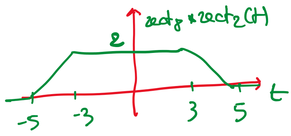
$= 4A\,\text{rect}_4(t+10) * \text{rect}_2(t-1)$

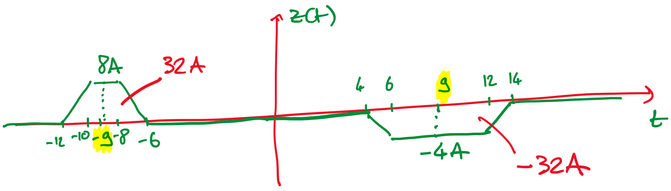
$- 2A\,\text{rect}_8(t-8) * \text{rect}_2(t-1)$

$z(t) = 4A\,\text{rect}_4 * \text{rect}_2\left(t \overset{+9}{\cancel{+10-1}}\right)$

$- 2A\,\text{rect}_8 * \text{rect}_2\left(t \overset{-9}{\cancel{-8-1}}\right)$







$A_z = 0$