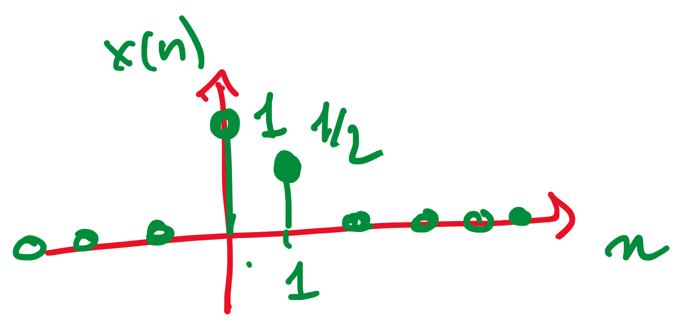
Le10

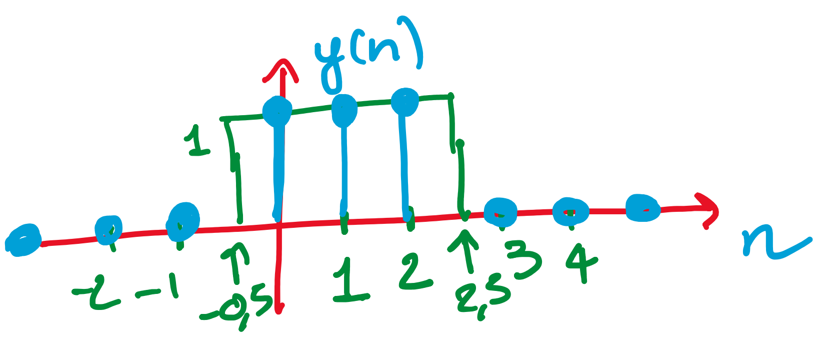
Thursday, 19 March 2026 08:36

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

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

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





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

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

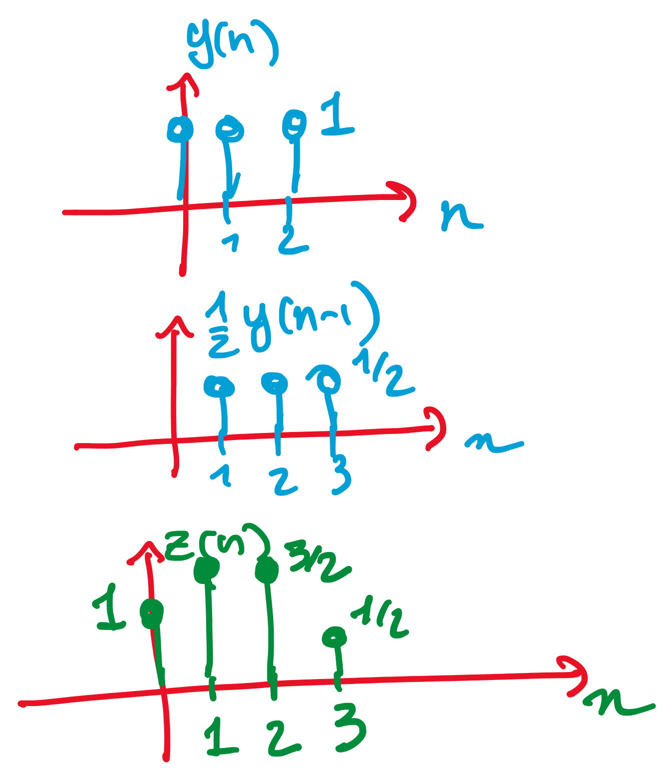
$= \delta(n) + \delta(n-1) + \delta(n-2)$

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

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

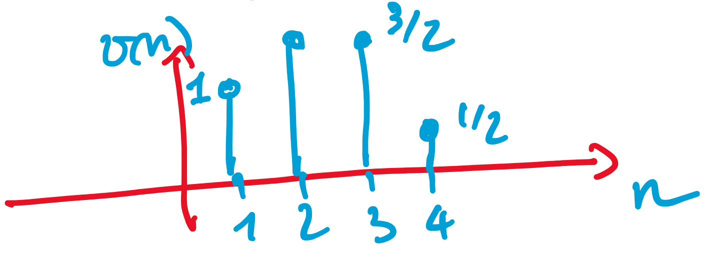
$= \delta(n) * y(n) + \frac{1}{2}\delta(n-1) * y(n)$

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

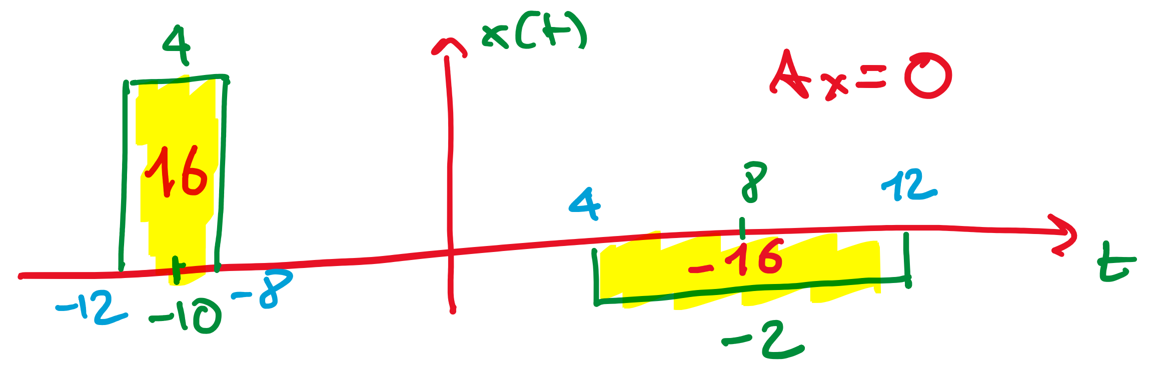


$v(n) = x(n-3) * y(n+2)$

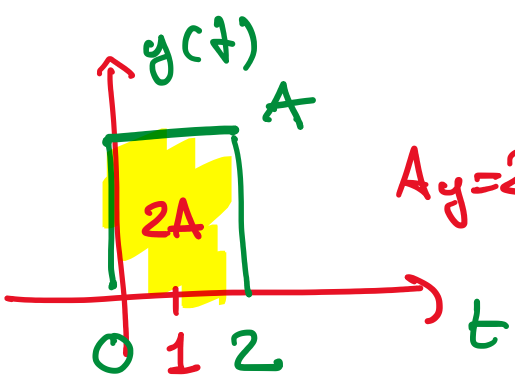
$= x * y(n-3+2) = x * y(n-1) = z(n-1)$



ES 2 TROVARE $z(t) = x * y(t)$ CON



$A_x = 0$



$A_y = 2A$

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

$x(t) = 4\,\text{rect}\left(\frac{t+10}{4}\right) - 2\,\text{rect}\left(\frac{t-8}{8}\right)$

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

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

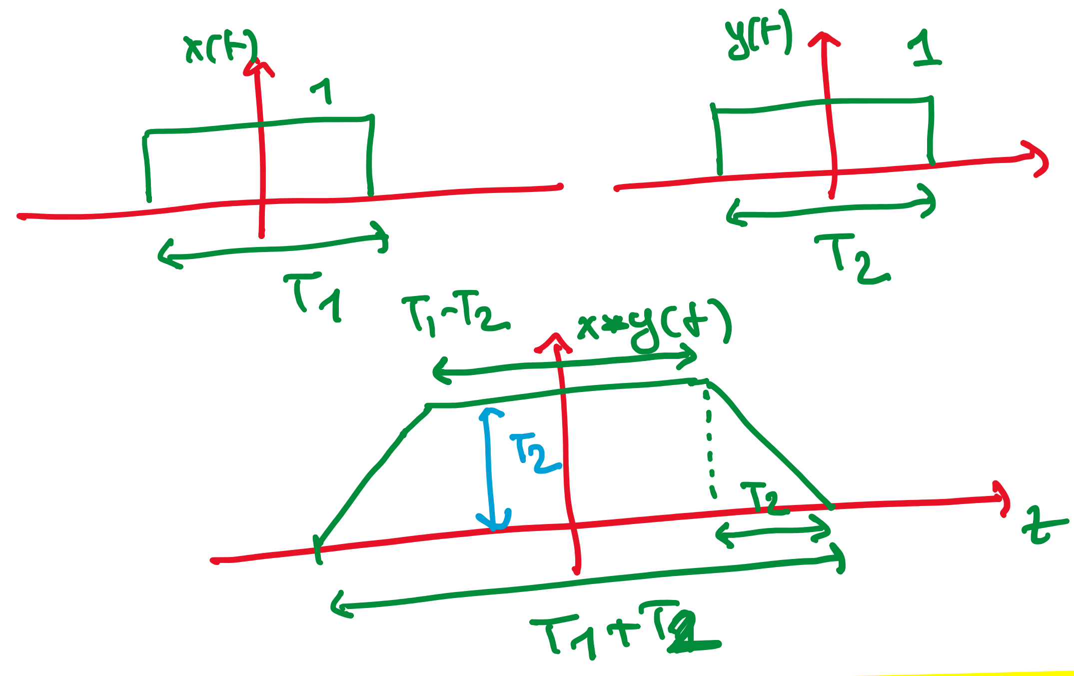
$= 4A\,\text{rect}_4(t+10) * \cancel{A}\,\text{rect}_2(t-1)$

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

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

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

NOTA: CONVOLUZIONE TRA DUE RETTANGOLI

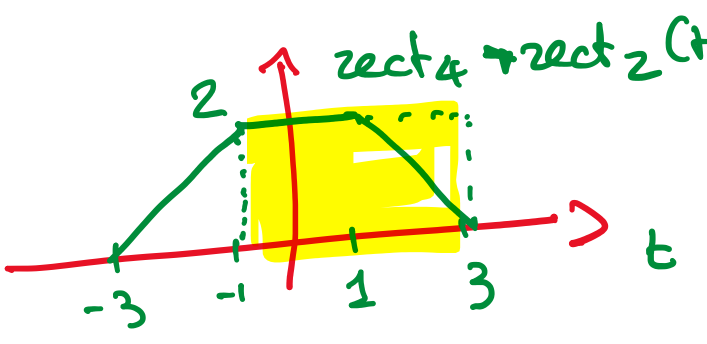


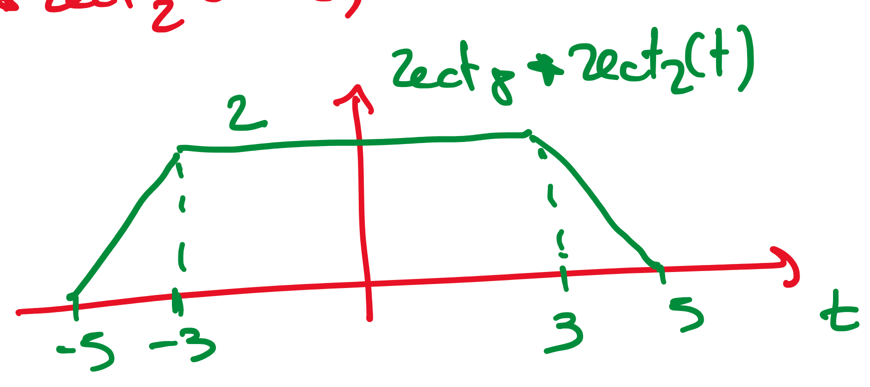
$T_1 \geq T_2$

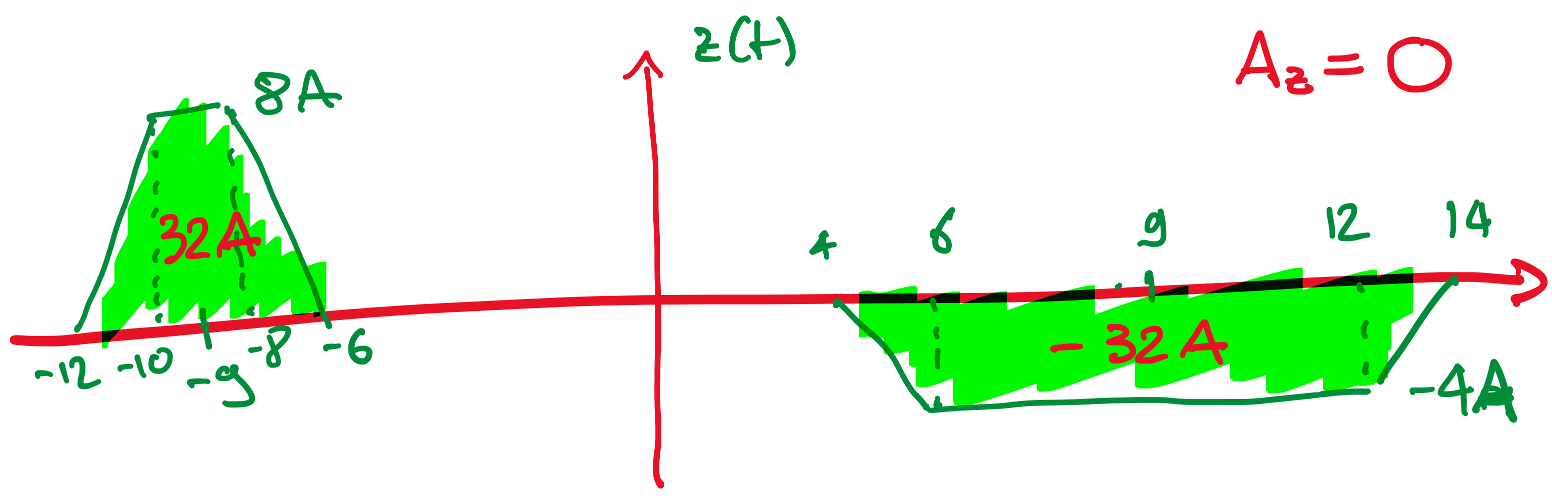
VALIDA SOLO NEL CONTINUO

$z(t) = 4A\,\text{rect}_4 * \text{rect}_2\,(t+9)$

$- 2A\,\text{rect}_8 * \text{rect}_2\,(t-9)$







$A_z = 0$