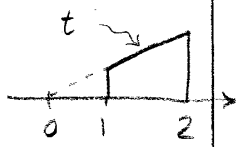
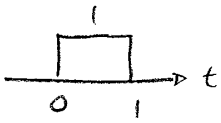
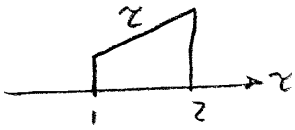
① $h(t) = \text{ramp}(t)\,[u(t-1) - u(t-2)]$



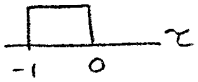
$x(t) = \text{rect}(t - 1/2)$



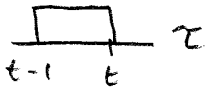
$h(\tau)$



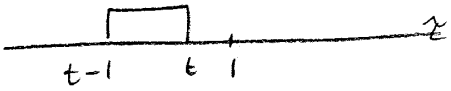
$x(-\tau)$



$x(t-\tau)$

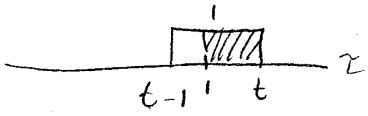


case 1



$t < 1$, $y(t) = 0$ (no overlap)

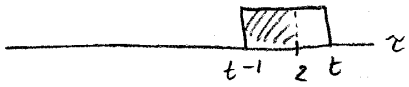
case 2



$1 \le t \le 2$, $y(t) = \int_1^t \tau\, d\tau = \frac{\tau^2}{2}\Big|_1^t$

$= \frac{t^2}{2} - \frac{1}{2}$

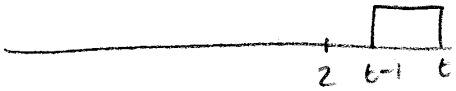
case 3



$2 \le t \le 3$, $y(t) = \int_{t-1}^{2} \tau\, d\tau = \frac{\tau^2}{2}\Big|_{t-1}^{2}$

$= 2 - \frac{(t-1)^2}{2}$

case 4



$y(t) = 0$ (no overlap)
$t > 3$

overall:

$$\boxed{y(t) = \begin{cases} 0, & t < 1 \\ \frac{t^2}{2} - \frac{1}{2}, & 1 \le t \le 2 \\ 2 - \frac{(t-1)^2}{2}, & 2 \le t \le 3 \\ 0, & t > 3 \end{cases}}$$

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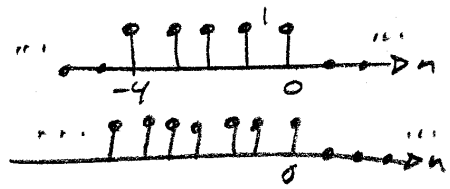
② $x[n] = \text{rect}_2[n+2]$

$h[n] = u[-n]$



index m	-4	-3	-2	-1	0	1	2	3	4	5	6
h[n]	1	1	1	1	1	0	0	0	0	0	0
x[0-m]					1	1	1	1	1		
x[-1-m]				1	1	1	1	1			
x[-2-m]			1	1	1	1	1				
x[-3-m]		1	1	1	1	1					
x[-4-m]	1	1	1	1	1						

$y[0] = 1$

$y[-1] = 1+1 = 2$

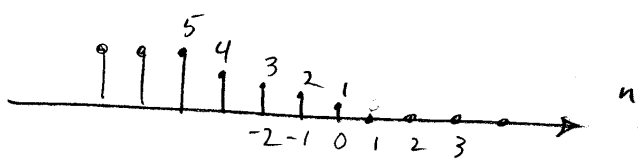
$y[-2] = 1+1+1 = 3$

$y[-3] = 1+1+1+1 = 4$

$y[-4] = 5$

$y[-6] = 5$

$y[-7] = 5$

$\vdots$

$y[n]$