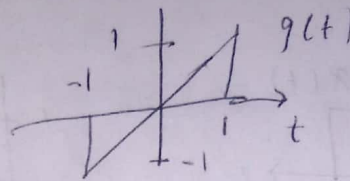
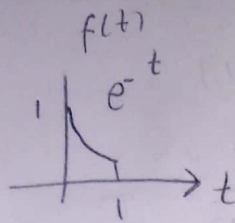


PRO4.

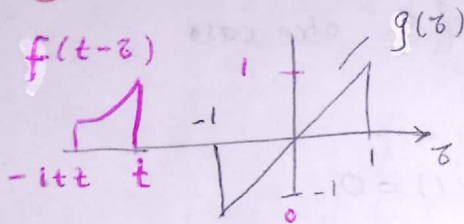
Montiel Cruz Jorge de Jesús



1. Realice la convolución de las señales anteriores.

① $c(t) = g(t) * f(t)$

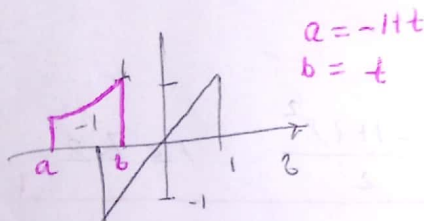
$$g(\tau) = \begin{cases} \tau & -1 \leq \tau \leq 1 \\ 0 & \text{otro caso} \end{cases}$$



$$f(t-\tau) = \begin{cases} e^{-(t-\tau)} & t-1 \leq \tau \leq t \\ 0 & \text{otro caso} \end{cases}$$

$t < -1 \rightarrow c(t) = 0.$

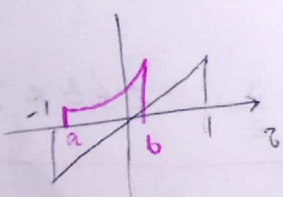
②



$$\int_{-1}^t e^{-(t-\tau)} \tau d\tau = e^{-t} (\tau-1) e^{\tau} \Big|_{-1}^t = 2e^{-(t+1)} + t - 1$$

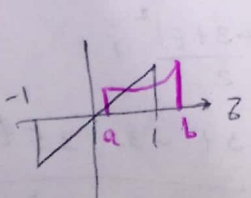
$-1 \leq t < 0.$

③



$$\int_{-1+t}^1 \tau e^{-(t-\tau)} d\tau = e^{-t} (\tau-1) e^{\tau} \Big|_{-1+t}^1 = -\frac{t-2}{e} + t - 1$$

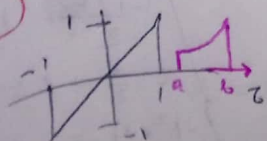
④



$$\int_1^t \tau e^{-(t-\tau)} d\tau = e^{-t} (\tau-1) e^{\tau} \Big|_1^t = \frac{2-t}{e}$$

$1 \leq t < 2$

⑤



$c(t) = 0$
 $t \geq 2$

aví
pues.

$$c(t) = \begin{cases} 2e^{-(t+1)} + t - 1 & -1 \leq t < 0 \\ -\frac{t-2}{e} + t - 1 & 0 \leq t < 1 \\ \frac{2-t}{e} & 1 \leq t < 2 \\ 0 & \text{otro caso} \end{cases}$$