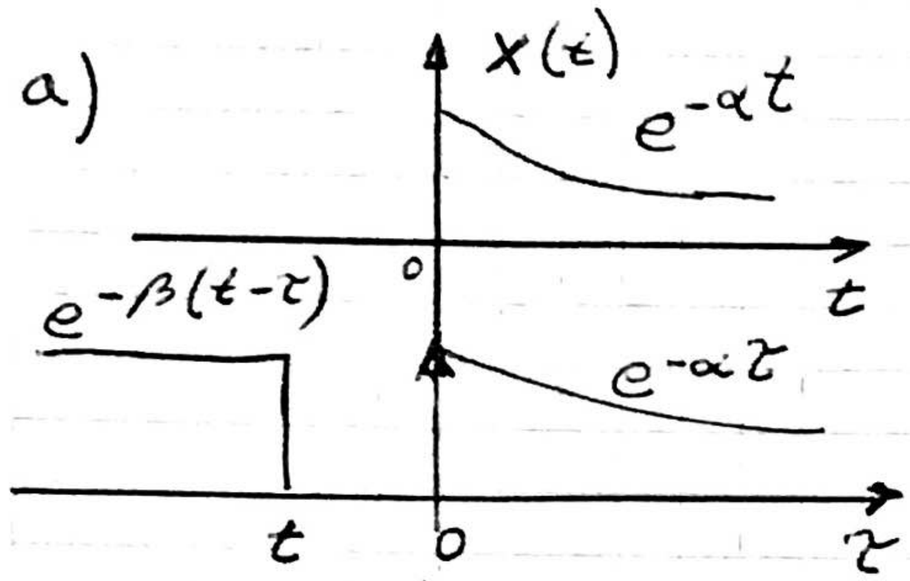
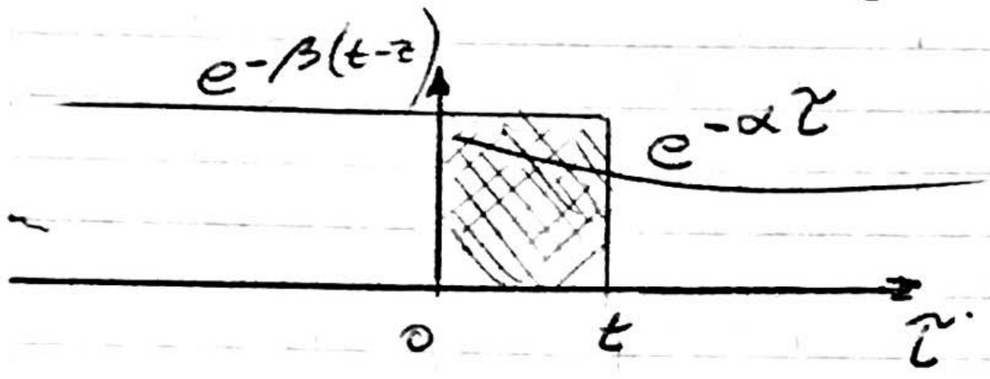
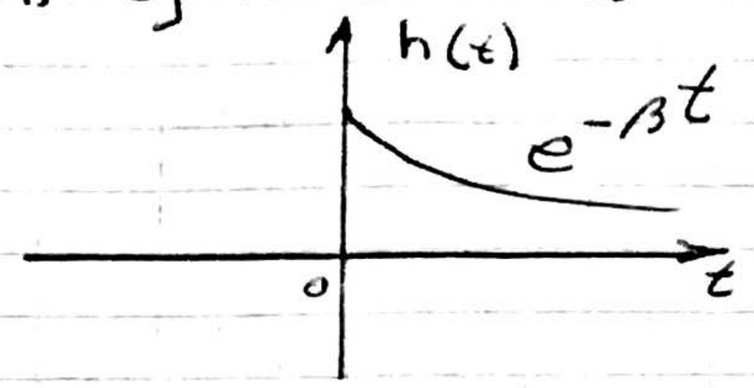
Resolución Ejercicios 3.2.

a)







p/ $t<0$ $\quad y(t)=0$

p/ $t>0$ $\quad y(t)=\int_0^t e^{-\alpha\tau}\cdot e^{-\beta(t-\tau)}\,d\tau$

$$y(t)=\int_0^t e^{-\alpha\tau}\cdot e^{-\beta t+\beta\tau}\,d\tau$$

$$y(t)=e^{-\beta t}\int_0^t e^{(-\alpha+\beta)\tau}\,d\tau$$

p/ $\alpha=\beta$

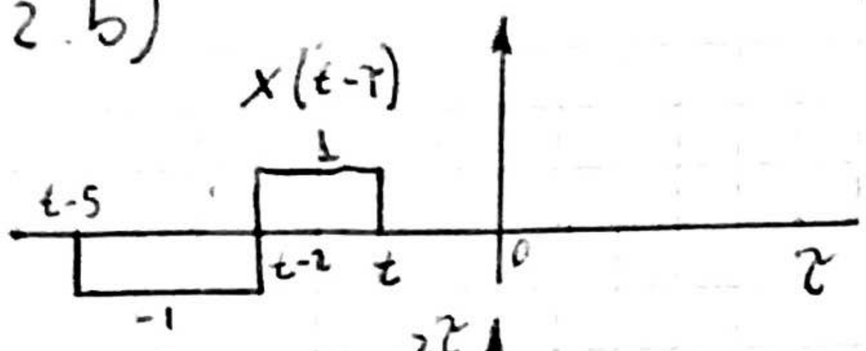
$$y(t)=e^{-\beta t}\,\tau\Big|_0^t=e^{-\beta t}(t-0)$$

$$\boxed{y(t)=e^{-\beta t}\cdot t}$$

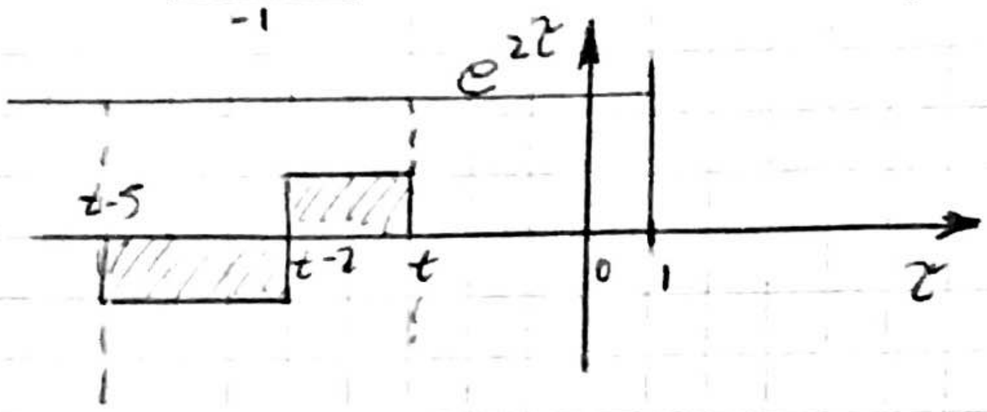
p/ $\alpha\neq\beta$

$$\boxed{y(t)=\frac{e^{-\beta t}}{-\alpha+\beta}\left[e^{(-\alpha+\beta)t}-1\right]}$$

3.2 b)



a)

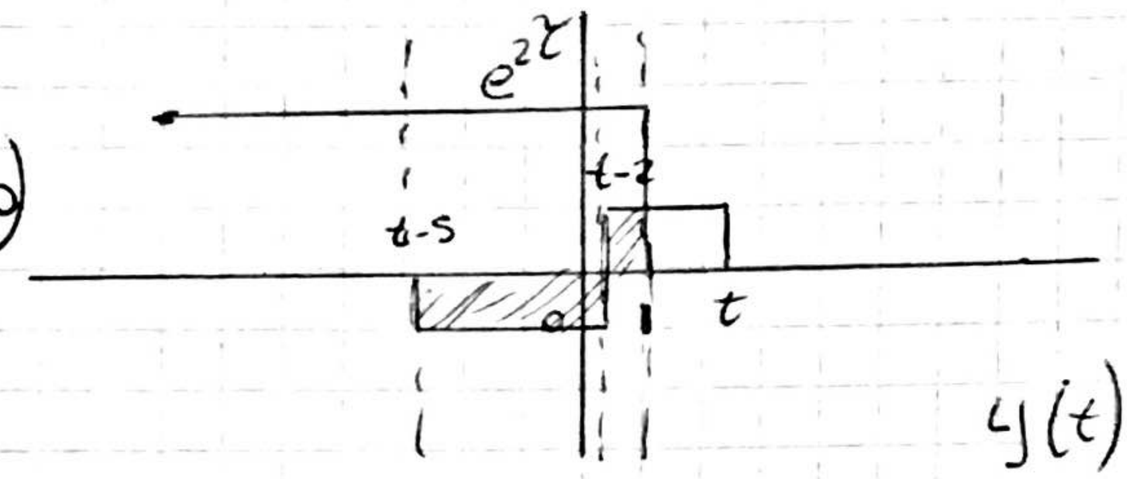


a) $\boxed{t > 2, \text{ p/ d}}$

$$y(t) = \int_{t-5}^{t-2} (-1)\, e^{2\tau}\, d\tau + \int_{t-2}^{t} 1 \cdot e^{2\tau}\, d\tau$$

$$y(t) = -\frac{1}{2}\left(e^{2(t-2)} - e^{2(t-5)}\right) + \frac{1}{2}\left(e^{2t} - e^{2(t-2)}\right)$$

b)

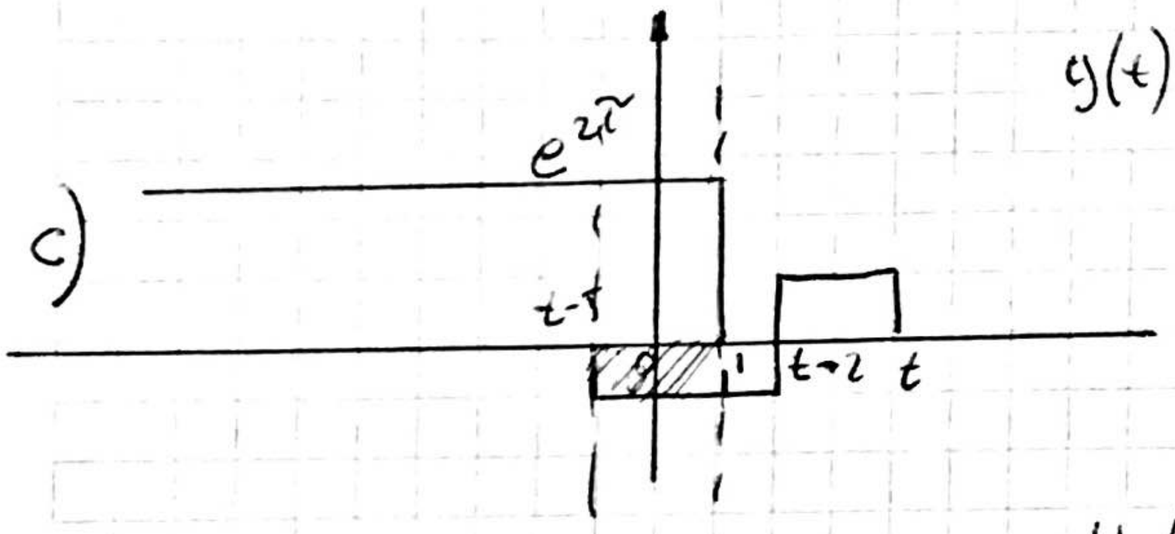


b) $\boxed{\text{p/ } 1 < t < 3}$

$$y(t) = \int_{t-5}^{t-2} (-1)\, e^{2\tau}\, d\tau + \int_{t-2}^{1} 1 \cdot e^{2\tau}\, d\tau$$

$$y(t) = -\frac{1}{2}\left(e^{2(t-2)} - e^{2(t-5)}\right) + \frac{1}{2}\left(e^{2} - e^{2(t-2)}\right)$$

c)

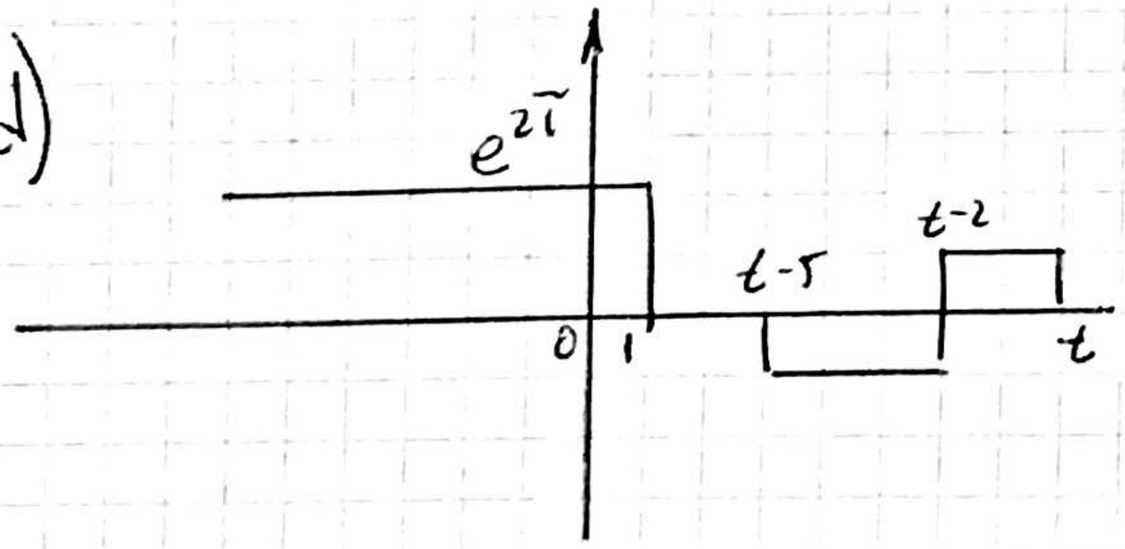


c) $\boxed{\text{p/ } 3 < t < 6}$

$$y(t) = \int_{t-5}^{1} e^{2\tau}(-1)\, d\tau$$

$$y(t) = -\frac{1}{2}\left(e^{2} - e^{2(t-5)}\right)$$

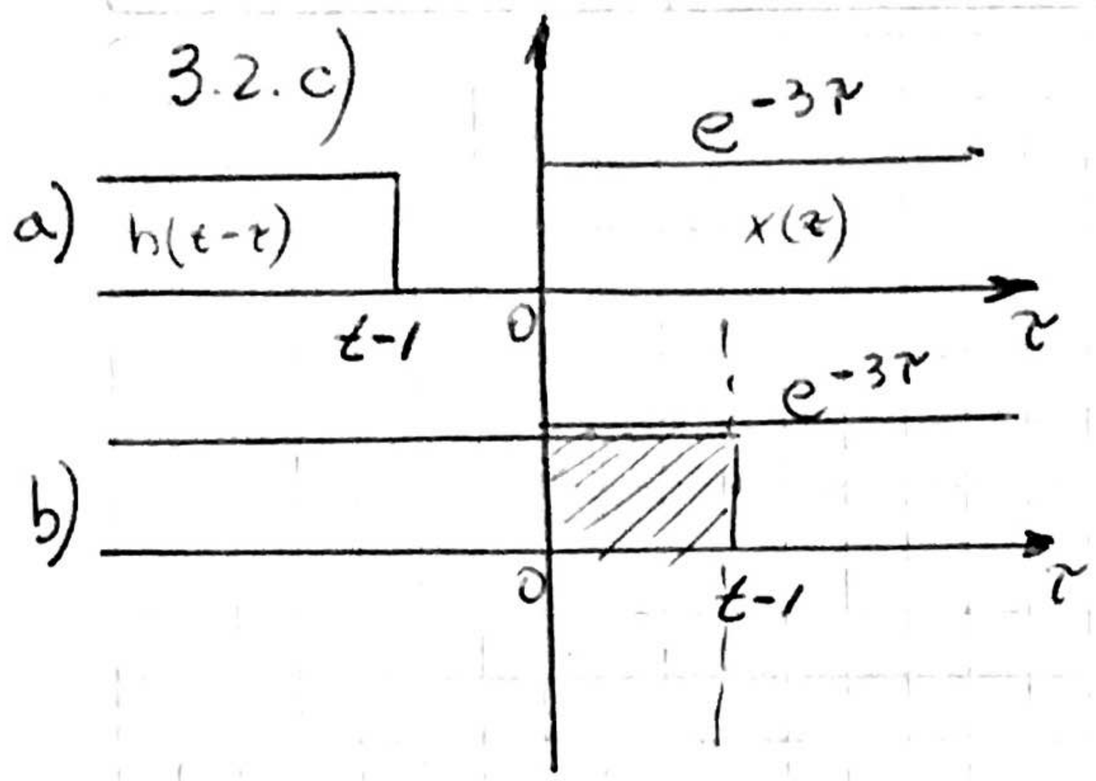
d)



d) p/ $\boxed{6 < t}$

$$y(t) = 0$$

3.2.c)



$y(t) = 0$ p/ $\boxed{t<1}$

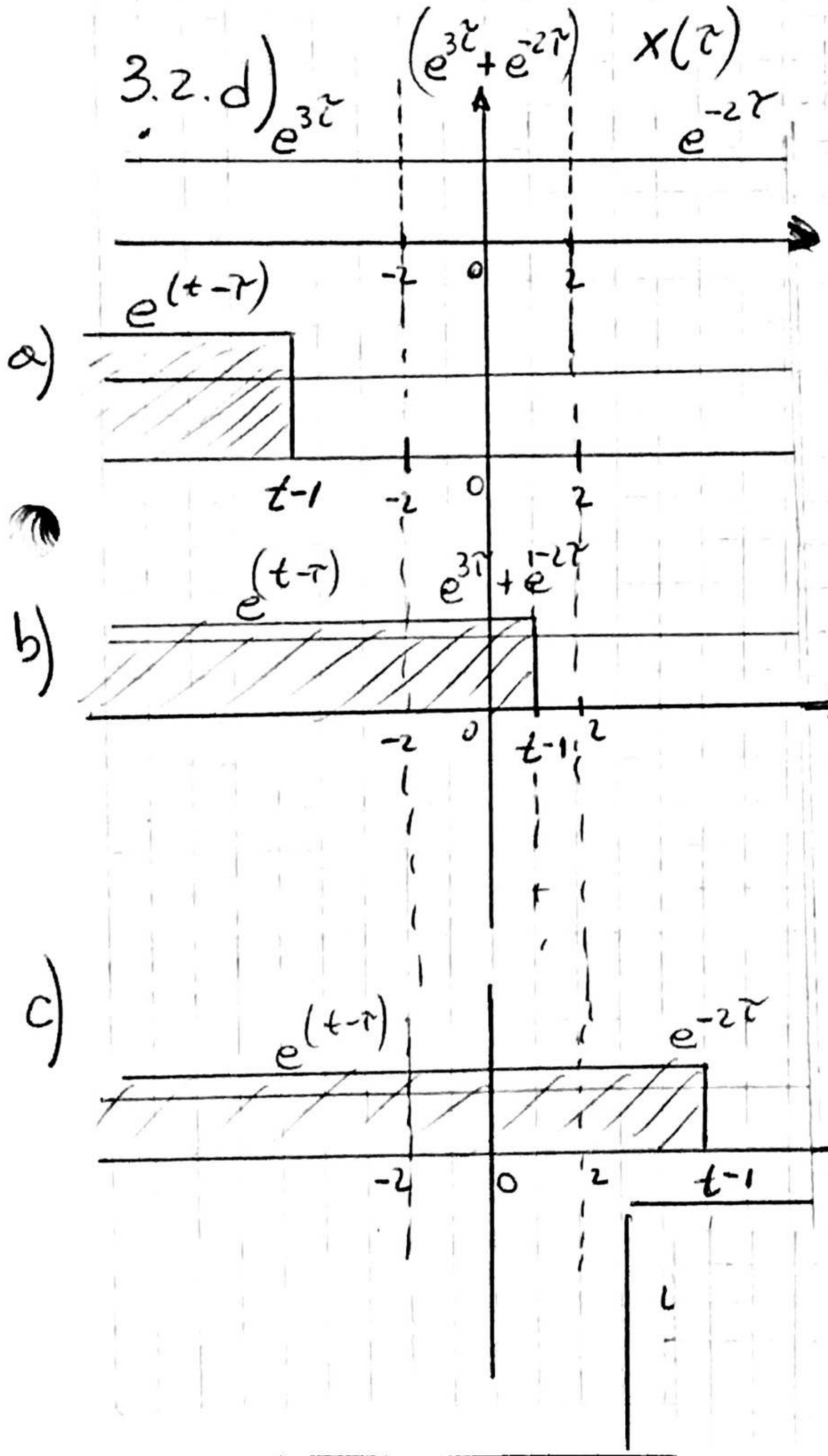
$y(t) = -\frac{1}{3} \cdot e^{-3t+3} + \frac{1}{3}$

p/ $\boxed{1<t}$

otra forma de expresarlo.

$$y(t) = \begin{cases} 0 & ; \quad t<1 \\ -\frac{1}{3} e^{-3t+3} + \frac{1}{3} & ; \quad 1<t \end{cases}$$

3.2.d)



a) p/ $t<-1$

$y(t) = \frac{e^{3t-2}}{2}$

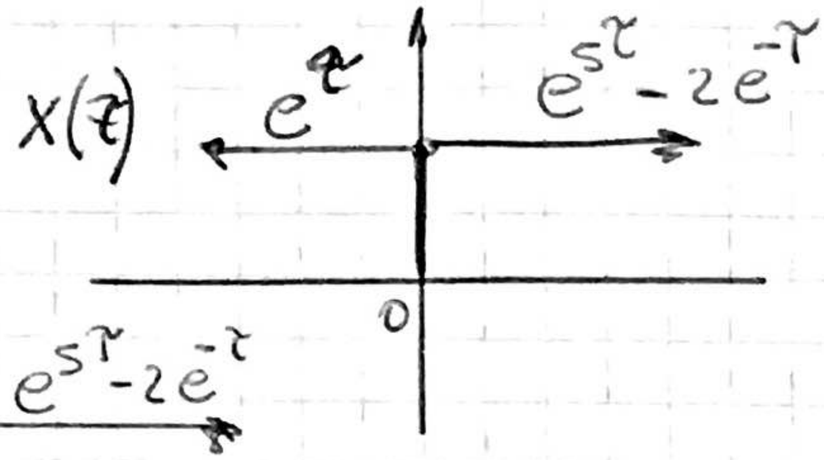
b) p/ $-1<t<3$.

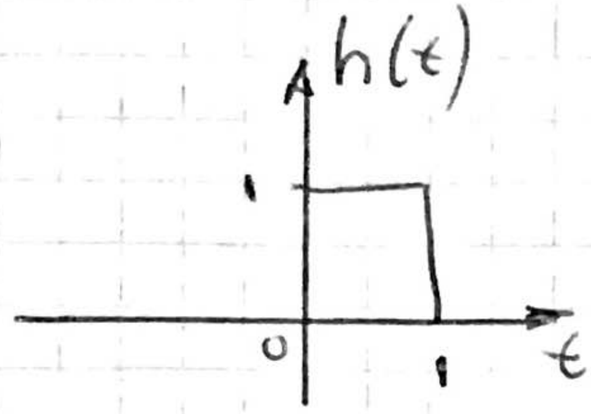
$y(t) = \frac{e^{3t-2}}{2} + \frac{e^{t}}{-3}\left[e^{-3(t-1)} - e^{6}\right]$

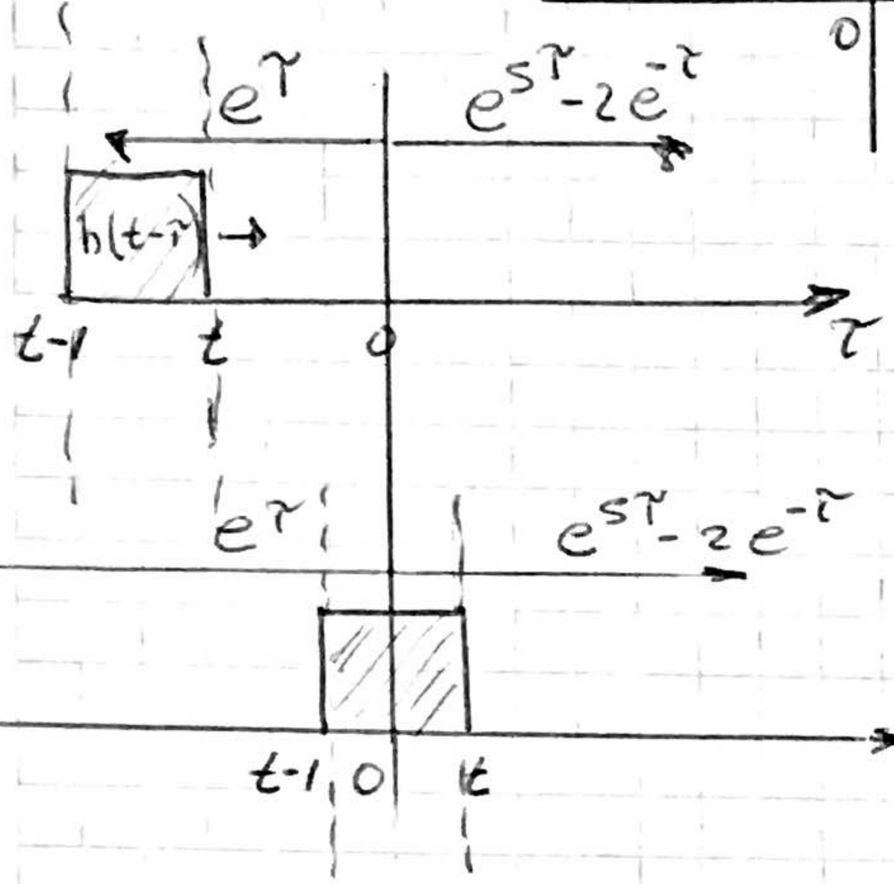
c) p/ $3<t$.

$y(t) = \frac{e^{t+4}}{2} - \frac{e^{t}}{3}\left[e^{-3(t-1)} - e^{6}\right]$

3.2.e)





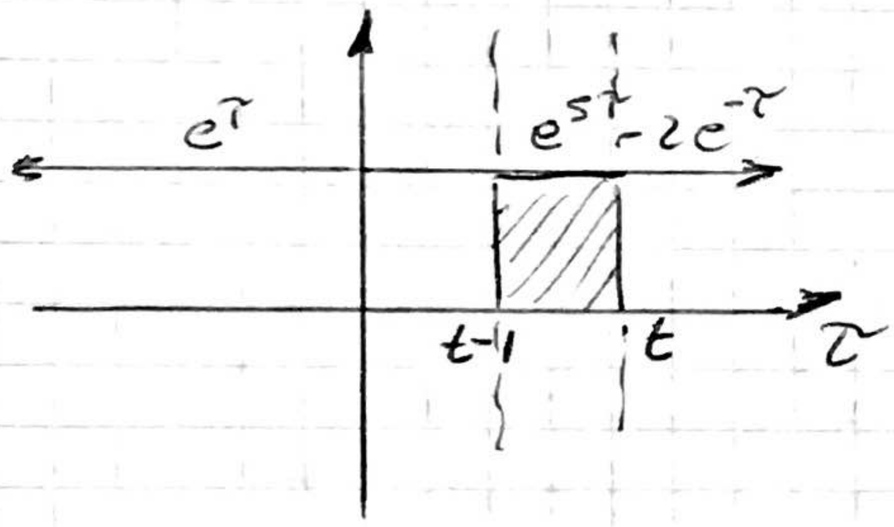


P/ $\boxed{t<0}$

$$\boxed{y(t) = e^{t} - e^{t-1}}$$

P/ $\boxed{0<t<1}$

$$\boxed{y(t) = 1 - e^{t-1} + \frac{1}{5}e^{5t} - \frac{1}{5} + 2e^{-t} - 2}$$



P/ $\boxed{1<t}$

$$\boxed{y(t) = \frac{1}{5}\left[e^{5t} - e^{5(t-1)}\right] - 2\left[e^{-t} - e^{-t+1}\right]}$$