1085948736 Jader Chingal

① Construir la señal $z(t) = x(t) + y(t)$

$x(t) \longrightarrow [-2,-1]: x(t) = 1$

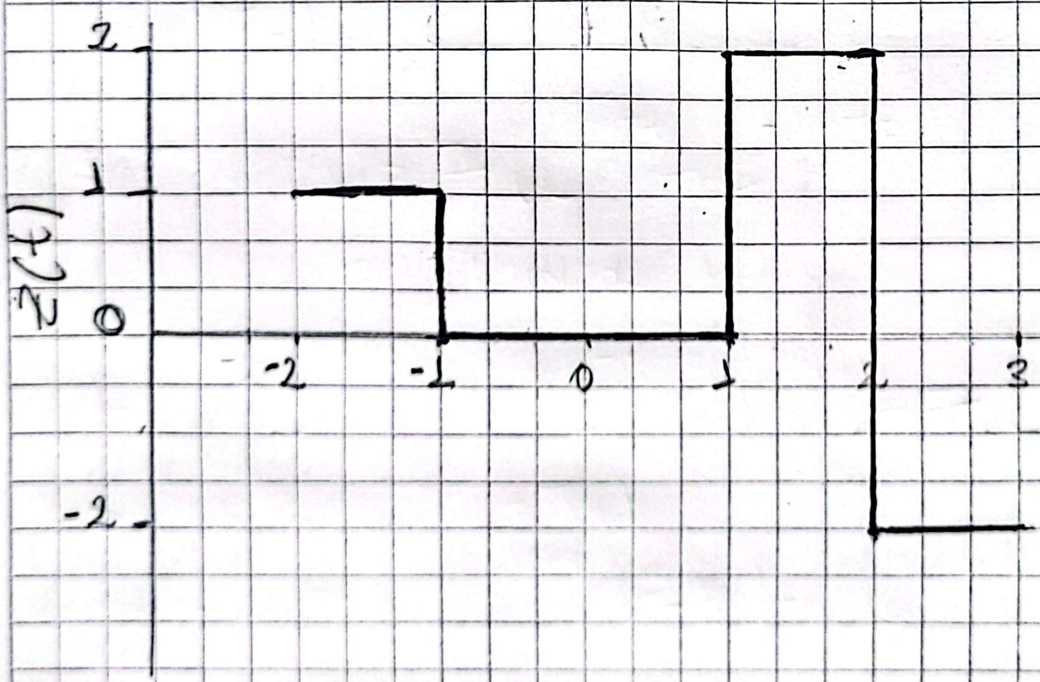
fuera del intervalo $x(t) = 0$

$y(t) \longrightarrow [1, 2): y(t) = 2$
$[2, 3): y(t) = -2$

fuera de los intervalos $y(t) = 0$

Sumamos $x(t)$ y $y(t)$ en los intervalos

$$z(t) = \begin{cases} 1, & si\ t \in [-2, -1) \\ 0, & si\ t \in [-1, 1) \\ 2, & si\ t \in [1, 2) \\ -2, & si\ t \in [2, 3) \\ 0, & \text{en otro caso} \end{cases}$$



(2) $w(t) = z(t)\, r(2(t+k)-6)$

$k = 2(a+1)$; $a = 6$

$k = 2(6+1) = 14$

función $r(t)$ = función escalón definida

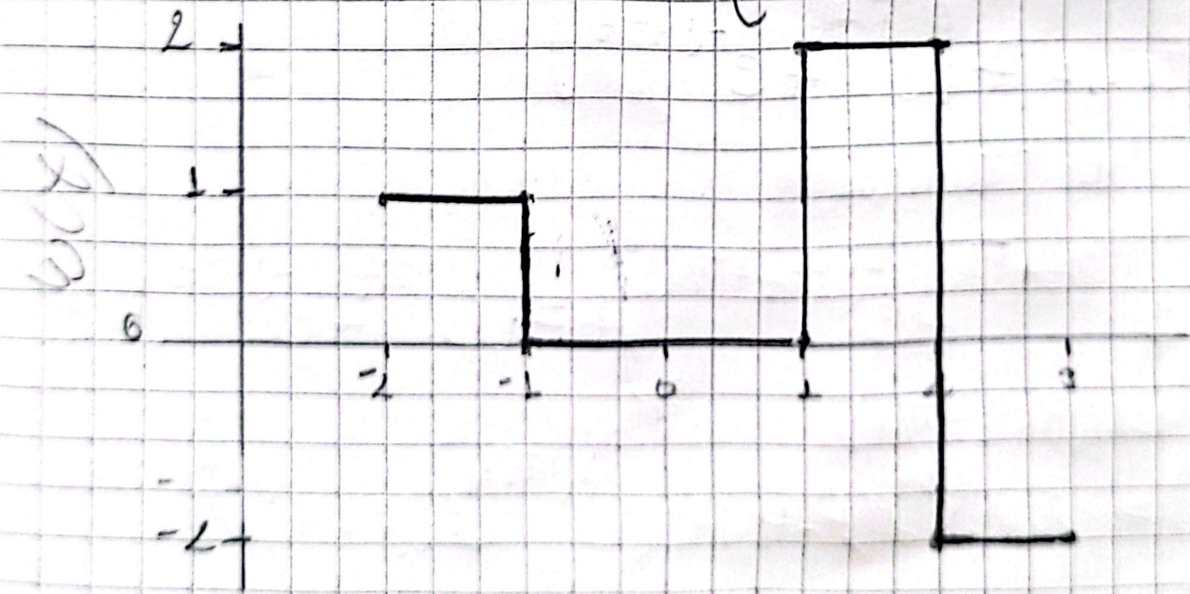
$$r(t) = \begin{cases} 1 & ; \text{ si } t \geq 0 \\ 0 & ; \text{ si } t < 0 \end{cases}$$

$r(t) \rightarrow \quad 2(t+k)-6 \geq 0$

$t \geq \frac{6}{2} - k$

$t \geq \frac{6}{2} - 14 = 3-14 = -11$

$$r(2(t+k)-6 = \begin{cases} 1, & t \geq -11 \\ 0, & t < -11 \end{cases}$$



3).

$$x(t) = 4\sin(8\pi t + \pi/4) + k\cos(4\pi t) + 5$$

$$k = 2(a+1) = 2(6+1) = 14$$

$$x(t) = 4\sin(8\pi t + \pi/4) + 14\cos(4\pi t) + 5$$

Usamos:

$$\sin(8\pi t + \pi/4) = \frac{e^{j(8\pi t - \pi/4)} - e^{-j(8\pi t + \pi/4)}}{2j}$$

Sustituyendo

$$4\sin(8\pi t + \pi/4) = 2j\left(e^{j(8\pi t + \pi/4)} - e^{-j(8\pi t + \pi/4)}\right)$$

ahora representamos el coseno

$$\cos(4\pi t) = \frac{e^{j4\pi t} + e^{-j4\pi t}}{2}$$

$$14\cos(4\pi t) = 7\left(e^{j4\pi t} + e^{-j4\pi t}\right)$$

juntamos los terminos

$$x(t) = 2j\left(e^{j(8\pi t + \pi/4)} - e^{-j(8\pi t + \pi/4)}\right) + 7\left(e^{j4\pi t} + e^{-j4\pi t}\right) + 5$$

↳ Para $4\sin(8\pi t + \pi/4)$

$$f\{\ \} = 2je^{j\pi/4}\delta(f-4) - 2je^{-j\pi/4}\delta(f+4)$$

↳ Para $14\cos(4\pi t)$

$$f\{\ \} = 7\delta(f-2) + 7\delta(f+2)$$

↳ 5 $\quad f\{5\} = 5\delta(f)$

Norma

$$F\{x(t)\} = 2je^{j\pi/4}\delta(f-4) - 2je^{-j\pi/4}\delta(f+4) + 7\delta(f-2) + 7\delta(f+2) + 5\delta(f)$$