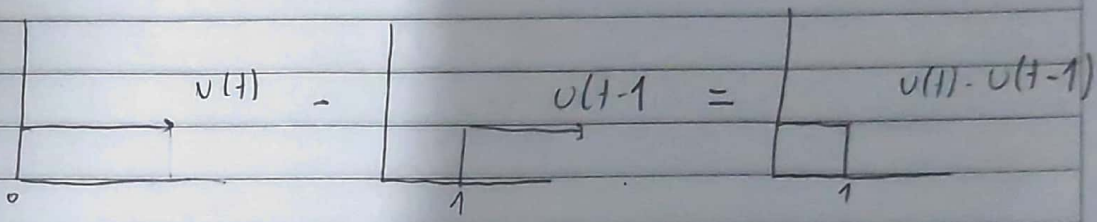
Parcial 2024/02

David Henao CC: 1000869892

1) Construya la señal $z(t) = x(t) + y(t)$ usando señales básicas

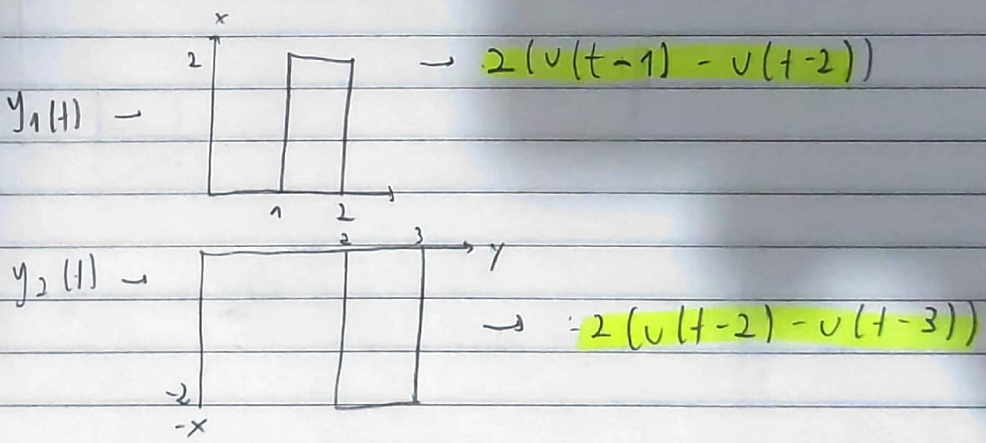
- $x(t) = 1$ para $-2 \leq t < 1$; $x(t) = 0$ para el resto
- $y(t) = 2$ para $1 \leq t < 2$
  -2 para $2 \leq t <$

- $x(t) =$



Ahora la desplazo 2 → $u(t+2) - u(t-1)$

- $y(t)$ → Tiene 2 partes



$y(t) = y_1 + y_2$

2) Grafique la señal

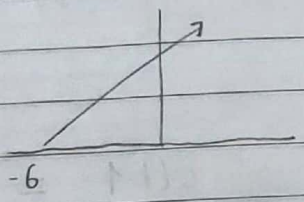
$w(t) = z(t) * r(2(t+K) - 6)$ con $K = 2(a+1)$ $a = 2$

Cedula = 1000869892 → $K = 2(2+1) = 6$

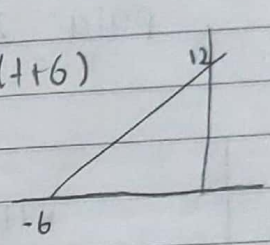
$w(t) = z(t) * r(2(t+6) - 6)$

r → rampa $\quad r(t) = \begin{cases} t & \text{si } t \geq 0 \\ 0 & \text{si } t < 0 \end{cases}$

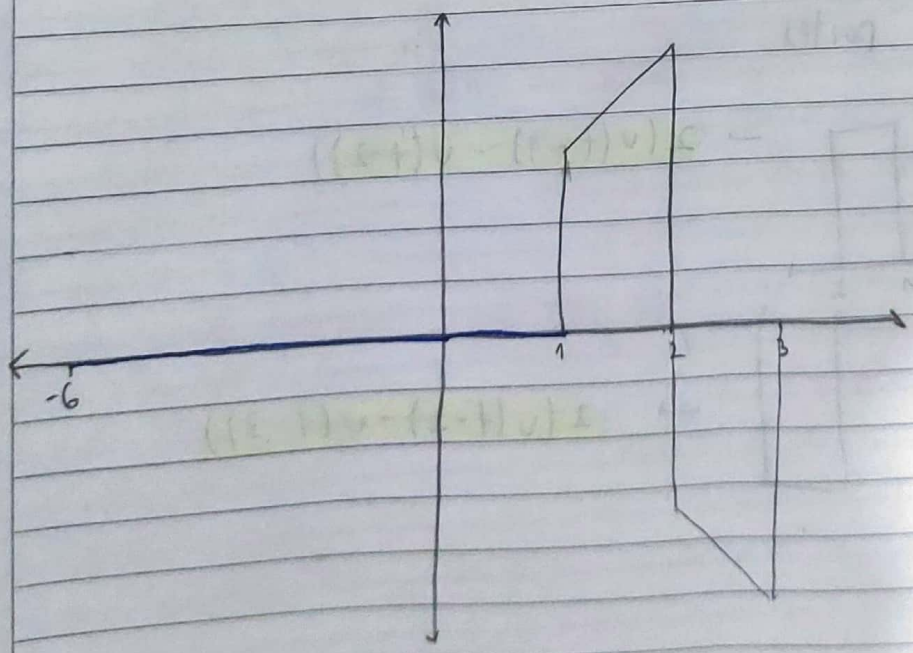
$r(t+6)$ →



$2r(t+6)$



$w(t) = z(t) * 2r((t+6) - 6)$



• vale 0

3) Encontrar la transformada de Fourier de

$x(t) = 4\cos(8\pi t + \pi/4) + 6\,\text{sen}(4\pi t + 5$

$X_1(t) = 4\cos(8\pi t + \pi/4)$; $X_2(t) = 6\,\text{sen}(4\pi t)$; $X_3(t) = 5$

Primero $X_3 \rightarrow \mathcal{F}\{5 \cdot 1\} = 10\pi\,\delta(\omega)$ ✓

- $\mathcal{F}\{4\cos(8\pi t + \pi/4)\} = 2e^{j\pi/4}\,\delta(f-4) + 2e^{-j\pi/4}\,\delta(f+4)$

- $\mathcal{F}\{6\,\text{sen}(4\pi t)\} = 3j\,\delta(f-2) - 3j\,\delta(f+2)$