Antonia Yepes Quintero

(1) = $z(t) = x(t) + y(t)$ señales basicas

$= u(t+2) - u(t+1) + 2u(t-1 - 4u(t-2) + 2u(t-3)$

(2) Grafique la señal $w(t) = z(t) \cdot r(2(t+k)-6)$

$K = 2(a+1) = 2(1+1) = 4$

$a = 1$

$w(t) = z(t) \cdot r(2(t+4)-6)$

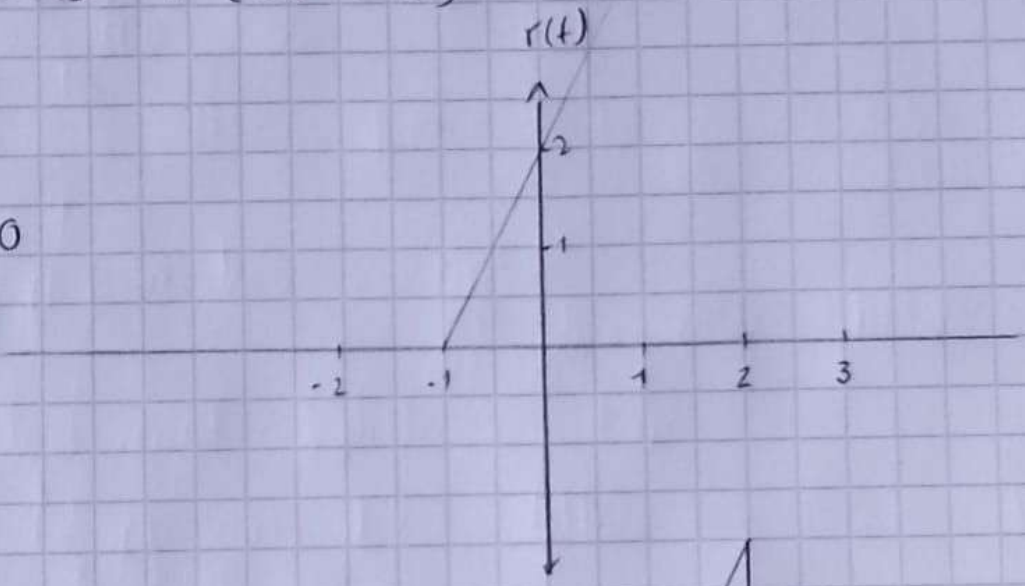
$w(t) = z(t) \cdot r(2t+8-6)$

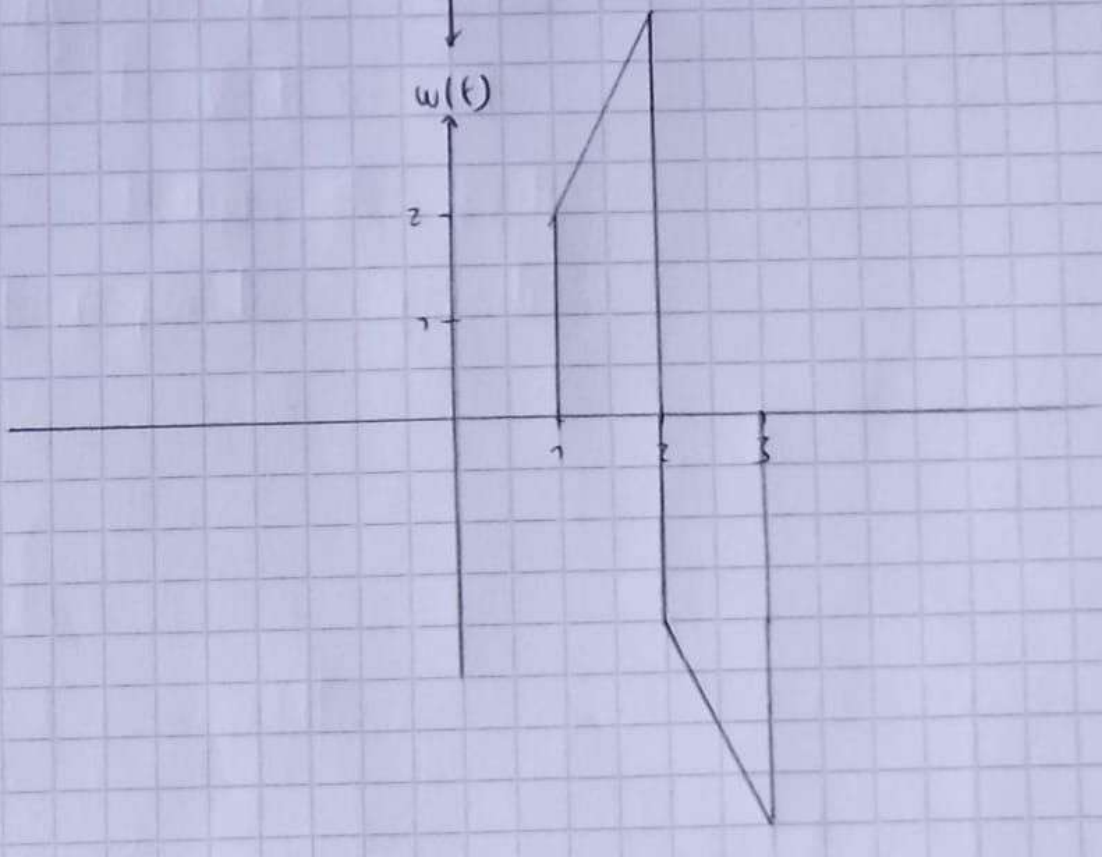
$w(t) = z(t) \cdot r(2t+2)$

$r(t) =$

$2t + 2 \geq 0$

$t \geq -1$





transf fourier

$$x(t) = 4\cos\left(8\pi t + \frac{\pi}{4}\right) + K \cdot \text{Sen}\left(4\pi t\right) + 5$$

$K = 2(a+1) = 2(1+1) = 4$
$a = 1$

$$x(t) = 4\cos\left(8\pi t + \frac{\pi}{4}\right) + 4\,\text{Sen}\left(4\pi t\right) + 5$$

$$\left.\begin{aligned} \omega_1 &= 8\pi = \frac{2\pi}{T_1} \\ T_1 &= \frac{2\pi}{8\pi} = \frac{1}{4} \\ \omega_2 &= 4\pi = \frac{2\pi}{T_2} \\ T_2 &= \frac{2\pi}{4\pi} = \frac{1}{2} \end{aligned}\right\} \quad \frac{T_1}{T_2} = \left(\frac{\frac{1}{4}}{\frac{1}{2}}\right) = \frac{2}{4}$$

① Reescribir $\text{Sen}(4\pi t)$ en exponenc compl

$$\text{Sen}(4\pi t) = \frac{e^{j4\pi t} - e^{-j4\pi t}}{2j}$$

$$\mathcal{F}\{\text{Sen}(4\pi t)\} = \mathcal{F}\left\{\frac{e^{j4\pi t} - e^{-j4\pi t}}{2j}\right\}$$

Transformada $e^{j\omega_0 t} \rightarrow X(\omega - \omega_0)$

$$\mathcal{F}\{e^{j4\pi t}\} = 2\pi\,\delta(\omega - 4\pi)$$

$$\mathcal{F}\{e^{-j4\pi t}\} = 2\pi\,\delta(\omega + 4\pi)$$

Expresion completa

$$\mathcal{F}\{\text{Sen}(4\pi t)\} = \frac{1}{2j}\left[2\pi\,\delta(\omega - 4\pi) - 2\pi\,\delta(\omega + 4\pi)\right]$$

$$\mathcal{F}\{\text{Sen}(4\pi)\} = \frac{1}{2j}\, 2\pi \left[\delta(w-4\pi) - \delta(w+4\pi)\right]$$

$$4\,\mathcal{F}\{\text{Sen}(4\pi)\} = 4j\pi \left[\delta(w+4\pi) - \delta(w-4\pi)\right]$$ //(A)

② Constante

Transf cte $= 2\pi c\,\delta(w)$

$\mathcal{F}\{5\} = 2\pi \cdot 5 \cdot \delta(w)$

$\mathcal{F}\{5\} = 10\pi\,\delta(w)$ //(C)

③ $4\cos\left(8\pi t + \frac{\pi}{4}\right)$

$$4\,\mathcal{F}\left\{\cos\left(8\pi t + \frac{\pi}{4}\right)\right\}$$

$$\frac{4}{2}\,\mathcal{F}\left\{e^{j(8\pi t + \frac{\pi}{4})} + e^{-j(8\pi t + \frac{\pi}{4})}\right\}$$

$$2\,\mathcal{F}\left\{e^{j8\pi t}\, e^{j\pi/4} + e^{-j8\pi t}\, e^{-j\frac{\pi}{4}}\right\}$$

$$2\left[e^{j\pi/4}\,\mathcal{F}\{e^{j8\pi t}\} + e^{-j\frac{\pi}{4}}\,\mathcal{F}\{e^{-j8\pi t}\}\right]$$

$$2\left[e^{j\pi/4} \cdot 2\pi\,\delta(w-8\pi) + e^{-j\pi/4} \cdot 2\pi\,\delta(w+8\pi)\right]$$ //(B)

(A) + (B) + (C)