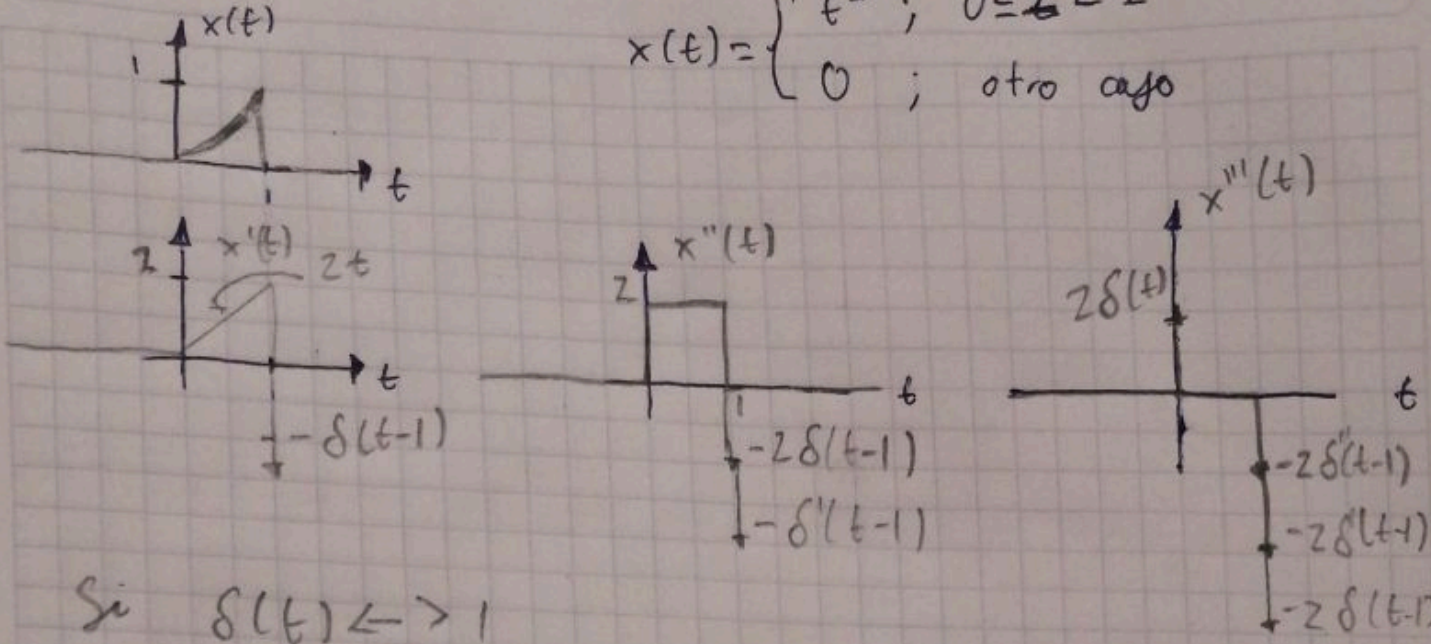
Evidencia 1.9 Encontrar $X(w)$

$$x(t) = \begin{cases} t^2 ; & 0 \le t < 1 \\ 0 ; & \text{otro caso} \end{cases}$$



Si $\delta(t) \leftrightarrow 1$

$2\delta(t) \leftrightarrow 2$

$-2\delta(t) \leftrightarrow -2$

$-2\delta(t-1) \leftrightarrow -2e^{-jw}$

$$x'''(t) = 2\delta(t) - \delta''(t-1) - 2\delta'(t-1) - 2\delta(t-1)$$

$$F\{x'''(t)\} = 2 - (jw)^2 e^{-jw} - 2jwe^{-jw} - 2e^{-jw}$$

$$= 2 - e^{-jw}[(jw)^2 + 2jw + 2]$$

$$= 2 - e^{-jw}(2 + 2jw - w^2)$$

$x(t) \leftrightarrow X(w) \Rightarrow x'''(t) \leftrightarrow (jw)^3 X(w)$

$$\Rightarrow (jw)^3 X(w) = 2 - e^{-jw}(2 + 2jw - w^2)$$

$$X(w) = \frac{2 - e^{-jw}(2 + 2jw - w^2)}{-jw^3}$$

$$X(w) = j\left(\frac{2 - e^{-jw}(2 + 2jw - w^2)}{w^3}\right)$$