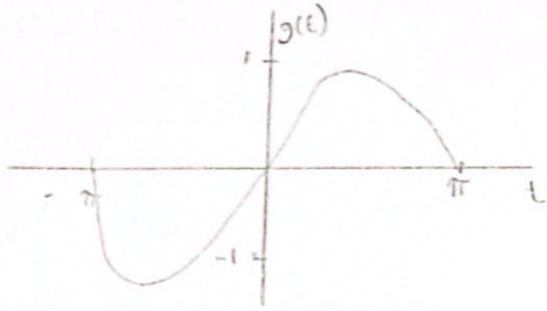


Evidencia 1.6

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$$g(t) = \frac{\sin(t)}{t} \quad -\pi < t < \pi$$

$$\sin(t) = \frac{e^{it} - e^{-it}}{2i}$$

$$f(\omega) = \int_{-\pi}^{\pi} \sin(t) e^{-i\omega t} dt = \int_{-\pi}^{\pi} \left(\frac{e^{it} - e^{-it}}{2i} \right) e^{-i\omega t} dt$$

$$= \frac{1}{2i} \left\{ \int_{-\pi}^{\pi} e^{it} e^{-i\omega t} dt - \int_{-\pi}^{\pi} e^{-it} e^{-i\omega t} dt \right\}$$

$$F(\omega) = \frac{1}{2i} \left\{ \int_{-\pi}^{\pi} e^{i(1-\omega)t} dt - \int_{-\pi}^{\pi} e^{-i(1+\omega)t} dt \right\}$$

$$= \frac{1}{2i} \left\{ \left[\frac{1}{i(1-\omega)} e^{i(1-\omega)t} \right]_{-\pi}^{\pi} - \left[\frac{1}{i(1+\omega)} e^{-i(1+\omega)t} \right]_{-\pi}^{\pi} \right\}$$

$$F(\omega) = \frac{1}{2i} \left\{ \frac{1}{i(1-\omega)} [e^{i(1-\omega)\pi} - e^{-i(1-\omega)\pi}] - \frac{1}{i(1+\omega)} [e^{-i(1+\omega)\pi} - e^{i(1+\omega)\pi}] \right\}$$

$$F(\omega) = \frac{1}{i(1-\omega)} \sin[(1-\omega)\pi] - \frac{1}{i(1+\omega)} \sin[(1+\omega)\pi]$$

$$F(\omega) = \frac{\pi}{i} \sin[(1-\omega)\pi] - \frac{\pi}{i} \sin[(1+\omega)\pi]$$

$$F(\omega) = i\pi \sin[(1+\omega)\pi] - i\pi \sin[(1-\omega)\pi] = i\pi \{ \sin[(1+\omega)\pi] - \sin[(1-\omega)\pi] \}$$

$$|F(\omega)| = \pi \{ \sin[(1+\omega)\pi] - \sin[(1-\omega)\pi] \}$$

$$\Theta = \tan^{-1} \left[\frac{\pi \{ \sin[(1+\omega)\pi] - \sin[(1-\omega)\pi] \}}{\Theta} \right] = \begin{cases} \omega > 0 & 90^\circ \\ \omega < 0 & -90^\circ \end{cases}$$

$$F(\omega) = \left| \pi \left(\frac{\sin((1+\omega)\pi)}{(1+\omega)\pi} - \frac{\sin((1-\omega)\pi)}{(1-\omega)\pi} \right) \right|$$

$$\phi(\omega) = \tan^{-1} \left(\frac{\pi \left(\frac{\sin((1+\omega)\pi)}{(1+\omega)\pi} - \frac{\sin((1-\omega)\pi)}{(1-\omega)\pi} \right)}{0} \right)$$