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Evidencia 1.8

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$$F(\omega) = \int_{-\infty}^{\infty} f(t)\, e^{-i\omega t}\, dt = 0 + 2\int_0^{\pi} \operatorname{sen} t\, e^{-i\omega t}\, dt + 0$$

$$= 2\,\frac{e^{-i\omega t}(-i\omega \operatorname{sen} t - \cos t)}{\omega^2 + 1}\Bigg|_0^{\pi} = 2\left[\frac{e^{-i\omega\pi}(+1) + 1}{\omega^2 + 1}\right]$$

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

$$|F(\omega)| = \frac{2}{\omega^2+1}\sqrt{(\cos\omega\pi + 1)^2 + \operatorname{sen}^2\omega\pi} = \frac{2}{\omega^2+1}\sqrt{\cos^2\omega\pi + 2\cos\omega\pi + 1 + \operatorname{sen}^2\omega\pi}$$

$$= \frac{2\sqrt{2}}{\omega^2+1}\sqrt{1 + \cos\omega\pi}$$