Given: f(t) shown to the right

Find: The Fourier Transform F(ω) using the integral definition. Express in cos form.

$$F(\omega) = \int_{-\infty}^{\infty} f(t) e^{-j\omega t} dt$$

$$= \int_{-\infty}^{\infty} [2\delta(t-1) + 2\delta(t+1)] e^{-j\omega t} dt$$

$$= 2\left(e^{j\omega} + e^{-j\omega}\right) \text{ from sketch}$$

$$= 4\left[\frac{1}{2}\left(e^{j\omega} + e^{-j\omega}\right)\right]$$

$$= \boxed{4\cos(\omega)}$$