## TRANSFORMADAS DE FOURIER DE SEÑALES DISCRETAS PERIÓDICAS

| DOMINIO DEL TIEMPO $\boldsymbol{x[n] = \sum_{k=\langle N\rangle} X[k]e^{jk\Omega_0 n}}$ $\boldsymbol{x[n]}$ ***periódica de periodo N*** | DOMINIO DE LA FRECUENCIA $\boldsymbol{X(e^{j\Omega}) = 2\pi \sum_{k=-\infty}^{\infty} X[k]\delta(\Omega - k\Omega_0)}$ |
|---|---|
| $x[n] = \cos(\Omega_1 n)$ | $X(e^{j\Omega}) = \pi \sum_{k=-\infty}^{\infty} \delta(\Omega - \Omega_1 - k2\pi) + \delta(\Omega + \Omega_1 - k2\pi)$ |
| $x[n] = \sin(\Omega_1 n)$ | $X(e^{j\Omega}) = \frac{\pi}{j} \sum_{k=-\infty}^{\infty} \delta(\Omega - \Omega_1 - k2\pi) - \delta(\Omega + \Omega_1 - k2\pi)$ |
| $x[n] = e^{j\Omega_1 n}$ | $X(e^{j\Omega}) = 2\pi \sum_{k=-\infty}^{\infty} \delta(\Omega - \Omega_1 - k2\pi)$ |
| $x[n] = \sum_{k=-\infty}^{\infty} \delta(\mathrm{n} - kN)$ | $X(e^{j\Omega}) = \frac{2\pi}{N} \sum_{k=-\infty}^{\infty} \delta\left(\Omega - \frac{k2\pi}{N}\right)$ |

## TRANSFORMADAS DE FOURIER DE SEÑALES CONTÍNUAS PERIÓDICAS

| DOMINIO DEL TIEMPO $\boldsymbol{x(t) = \sum_{k=-\infty}^{\infty} X[k]e^{jk\omega_0 t}}$ | DOMINIO DE LA FRECUENCIA $\boldsymbol{X(j\omega) = 2\pi \sum_{k=-\infty}^{\infty} X[k]\delta(\omega - k\omega_0)}$ |
|---|---|
| $x(t) = \cos(\omega_0 t)$ | $X(j\omega) = \pi\delta(\omega - \omega_0) + \pi\delta(\omega + \omega_0)$ |
| $x(t) = \sin(\omega_0 t)$ | $X(j\omega) = \frac{\pi}{j}\delta(\omega - \omega_0) - \frac{\pi}{j}\delta(\omega + \omega_0)$ |
| $x(t) = e^{j\omega_0 t}$ | $X(j\omega) = 2\pi\delta(\omega - \omega_0)$ |
| $x(t) = \sum_{n=-\infty}^{\infty} \delta(t - nT_s)$ | $X(j\omega) = \frac{2\pi}{T_s} \sum_{k=-\infty}^{\infty} \delta\left(\omega - \frac{k2\pi}{T_s}\right)$ |
| $x(t) = \begin{cases} 1, & \lvert t\rvert \le T_s \\ 0, & T_s < \lvert t\rvert < T/2 \end{cases}$ $x(t+T) = x(t)$ | $X(j\omega) = \sum_{k=-\infty}^{\infty} \frac{2\sin(k\omega_0 T_s)}{k}\delta(\omega - k\omega_0)$ |