Time Shifting.

if $y(t) = x(t - t_0)$

$$\because \; b_k = \frac{1}{T} \int_T x(t - t_0) e^{-jk\omega_0 t} \, dt$$

let $\tau = t - t_0$

$$\therefore \; \frac{1}{T} \int_T x(\tau) e^{-jk\omega_0(\tau + t_0)} \, d\tau$$

$$= e^{-jk\omega_0 t_0} \frac{1}{T} \int_T x(\tau) e^{jk\omega_0 \tau} \, d\tau$$

$$= e^{-jk\omega_0 t_0} a_k = e^{-jk(2\pi/T)t_0} a_k$$

$$\Rightarrow \quad x(t) \xleftrightarrow{FS} a_k$$

$$\Rightarrow \quad x(t - t_0) \xleftrightarrow{FS} e^{-jk\omega_0 t_0} a_k = e^{-jk(2\pi/T)t_0} a_k$$