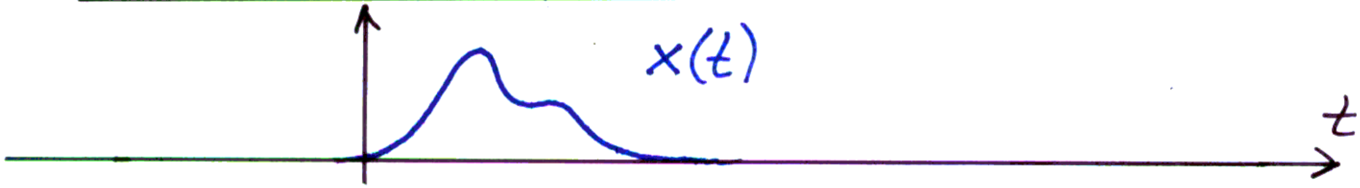
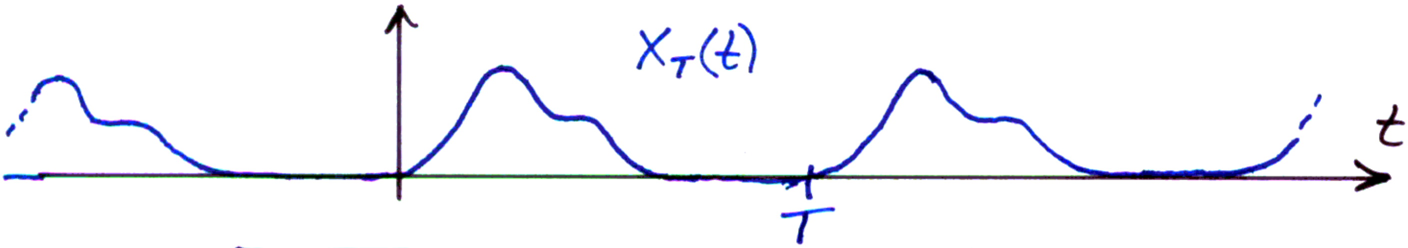
ÖVERGÅNG, FOURIERSERIER → FOURIERTRANSFORM





$$\boxed{x(t) = \lim_{T\to\infty} x_T(t)\ ; \quad t<\infty}$$

Frekvensbeskrivning:

$$c_k = \frac{1}{T}\int_T x_T(t)\cdot e^{-jk\omega_1 t}\,dt\,, \qquad \text{där} \quad x_T(t) = \sum_{k=-\infty}^{\infty} c_k \cdot e^{jk\omega_1 t}$$

Låt $T\to\infty$ $\Rightarrow \begin{cases} \omega_1 = \frac{2\pi}{T}\ (=\Delta\omega) \longrightarrow d\omega \\ k\cdot\omega_1 \longrightarrow \omega \end{cases}$

DEMO:
kretsdemo1;
Fserie → F.transform

$$\Rightarrow \begin{cases} T\cdot c_k = \displaystyle\int_{-T/2}^{T/2} x_T(t)\cdot e^{-jk\omega_1 t}\,dt \longrightarrow \int_{-\infty}^{\infty} x(t)\,e^{-j\omega t}\,dt \triangleq X(\omega) \\ x_T(t) = \displaystyle\frac{1}{2\pi}\sum_{k=-\infty}^{\infty} T\cdot c_k \cdot e^{jk\omega_1 t}\cdot\frac{2\pi}{T} \longrightarrow \frac{1}{2\pi}\int_{-\infty}^{\infty} X(\omega)\,e^{j\omega t}\,d\omega = x(t) \end{cases}$$

∴ Fourierserieutveckling av $x_T(t)$ $\xrightarrow{T\to\infty}$ Fouriertransform av $x(t)$