

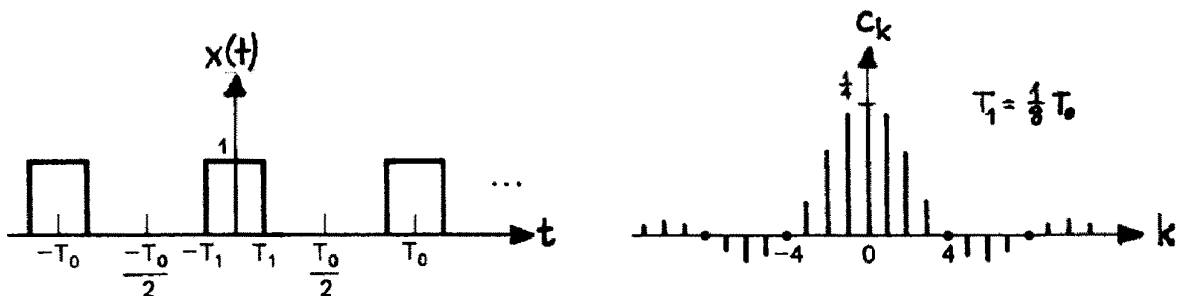
# Fourier-Analyse / Spektrum

## $x(t)$ periodisch

|                    |                              |
|--------------------|------------------------------|
| Grundperiode       | $T_0$                        |
| Grundfrequenz      | $f_0 := \frac{1}{T_0}$       |
| Grundkreisfrequenz | $\omega_0 := 2\pi \cdot f_0$ |

## Fourier-Reihe

$$x(t) = \hat{x}_0 + \sum_{k=1}^{\infty} \hat{x}_k \cdot \sin(k\omega_0 t + \varphi_k)$$
$$= \sum_{k=-\infty}^{\infty} c_k \cdot e^{jk\omega_0 t}$$



# Fourier-Analyse / Spektrum

**x(t) aperiodisch**

## Fourier-Integral

$$x(t) = \frac{1}{2\pi} \int_{-\infty}^{\infty} X(\omega) \cdot e^{j\omega t} d\omega$$

