

# Ultimate DFT pair (N-pt. DFT):

$$\sum_{m=-\infty}^{\infty} x_a(t - mNT_s) \Big|_{t = nT_s, n=0,1,\dots,N-1} \xleftrightarrow[N]{\text{DFT}} \frac{F_s}{N} \sum_{l=-\infty}^{\infty} X_a\left(\frac{F_s}{2\pi}(\omega - l2\pi)\right) \Big|_{\omega = k\frac{2\pi}{N}, k=0,1,\dots,N-1}$$

where:  $x_a(t) \xleftrightarrow{\text{CTFT}} X_a(F)$

OR:

$$\sum_{m=-\infty}^{\infty} x_a(nT_s - mNT_s) \Big|_{n=0,1,\dots,N-1} \xleftrightarrow[N]{\text{DFT}} \frac{F_s}{N} \sum_{l=-\infty}^{\infty} X_a\left(\frac{l}{N}F_s - lF_s\right) \Big|_{k=0,1,\dots,N-1}$$