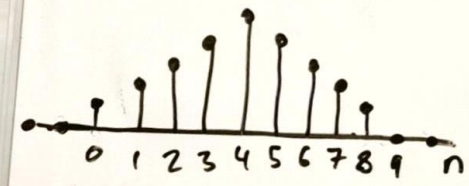
7. DFT, definition og anvendelse

- Definition: $X[k] = \begin{cases} \tilde{X}[k], & 0 \le k \le N-1 \\ 0, & \text{otherwise} \end{cases}$ ← $\tilde{X}[k]$: DFS $X[k]$: DFT ∿: Periodicity
  ker en periode def. fra $0 \to N-1$

$$\text{DFT} \to X[k] = \sum_{n=0}^{N-1} x[n] W_N^{kn} \quad \Big| \quad x[n] = \frac{1}{N} \sum_{n=0}^{N-1} X[k] W_N^{-kn} \leftarrow \text{Invers DFT}$$

DFT: Distret Frekvens

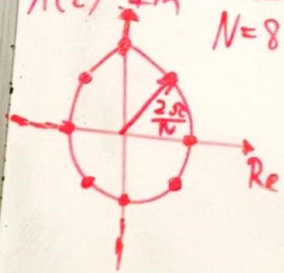
DTFT: kontinuert Frekvens



less than 9

Period less than 9 Causes "Aliasing"

$X(z)$ Im Sampling of DTFT $N=8$



twiddle factor ⇒ Representerer den fundamentale frekvens

Sequence $\left(W_N^k\right)^n$ is periodic and only N different values of twiddle factors

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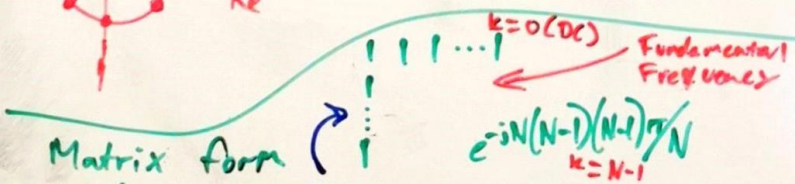

Matrix form $e^{-jN(N-1)(N-1)\pi/N}$

Vector of DFT Values = DFT Matrix · Signal vector

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For table over DFT, FS, DTFT, FT