

Use of an FFT to compute an  $\left. \begin{array}{l} k=0, 1, \dots, N-1 \\ \downarrow \end{array} \right\}$

Inverse DFT:

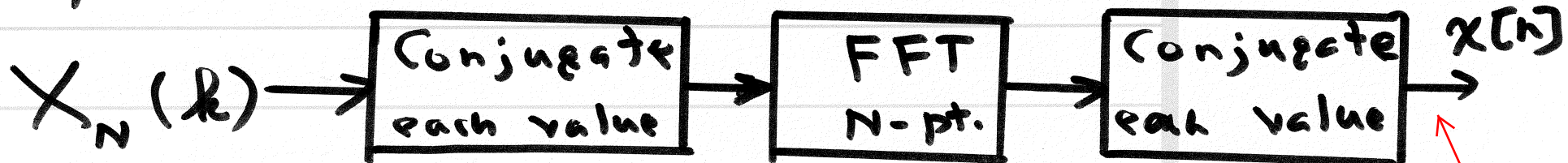
$$\text{DFT: } X_N(k) = \sum_{n=0}^{N-1} x[n] e^{-j 2\pi \frac{kn}{N}}$$

$$\text{IDFT: } x[n] = \frac{1}{N} \sum_{k=0}^{N-1} X_N(k) e^{j 2\pi \frac{kn}{N}}$$

Note:

$$x^*[n] = \frac{1}{N} \sum_{k=0}^{N-1} X_N^*(k) e^{-j 2\pi \frac{kn}{N}} \quad n=0, 1, \dots, N-1$$

Comparing from purely mathematical point of view:



Divide by N