Use of an FFT to compute an Inverse DFT:

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

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

$n = 0, 1, \ldots, N-1$

Note:

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

Comparing from purely mathematical point of view: