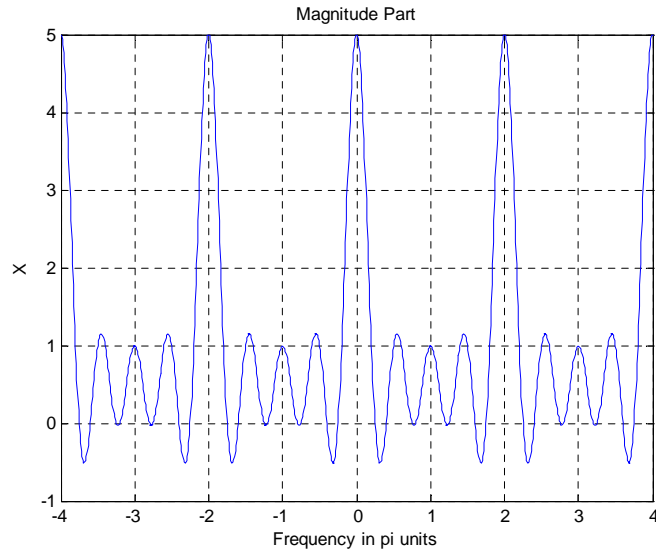


## DTFT vs. DFS

Instructor: Chun-Tang Chao 趙春棠

- **Nonperiodic**  $x[n]=\{1,1,1,1,1\}$

**DTFT:** (Note: The magnitude response below is not the absolute value.)



- **Periodic**  $\tilde{x}[n]$ : ( $N_1$  is fixed, for example,  $N_1=2$  in the following diagram)

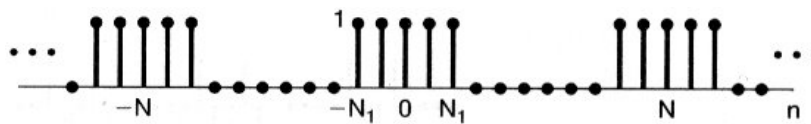
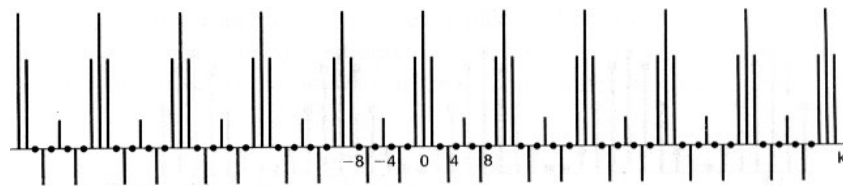


Figure 3.16 Discrete-time periodic square wave.

**DFS**  $\tilde{X}[k]$  for different  $N$  values:



(a)  $N=10$



(b)  $N=20$



(c)  $N=40$

**【Excerpted from “Signals and Systems”, Oppenheim and Willsky, Ver. 2, Prentice-Hall. 】**