Signals and Systems MATLAB HW2

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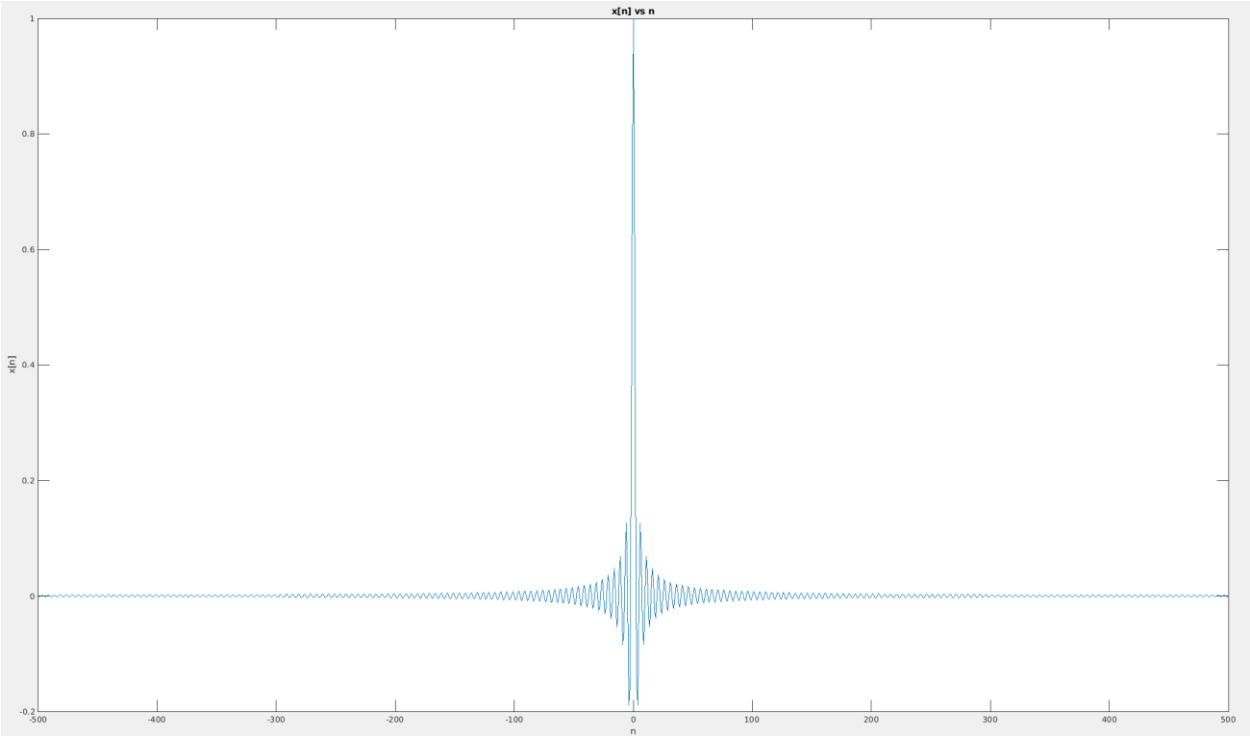
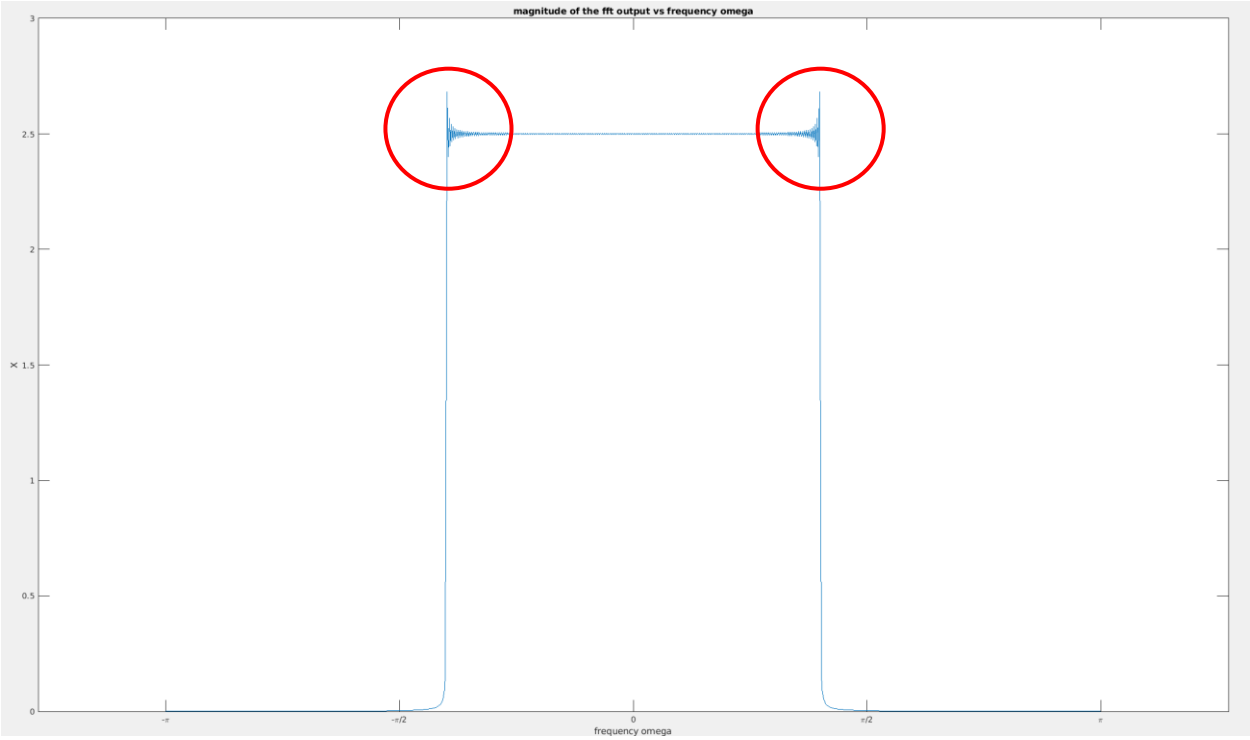
Part I

(a) $x[n]\ vs\ n$



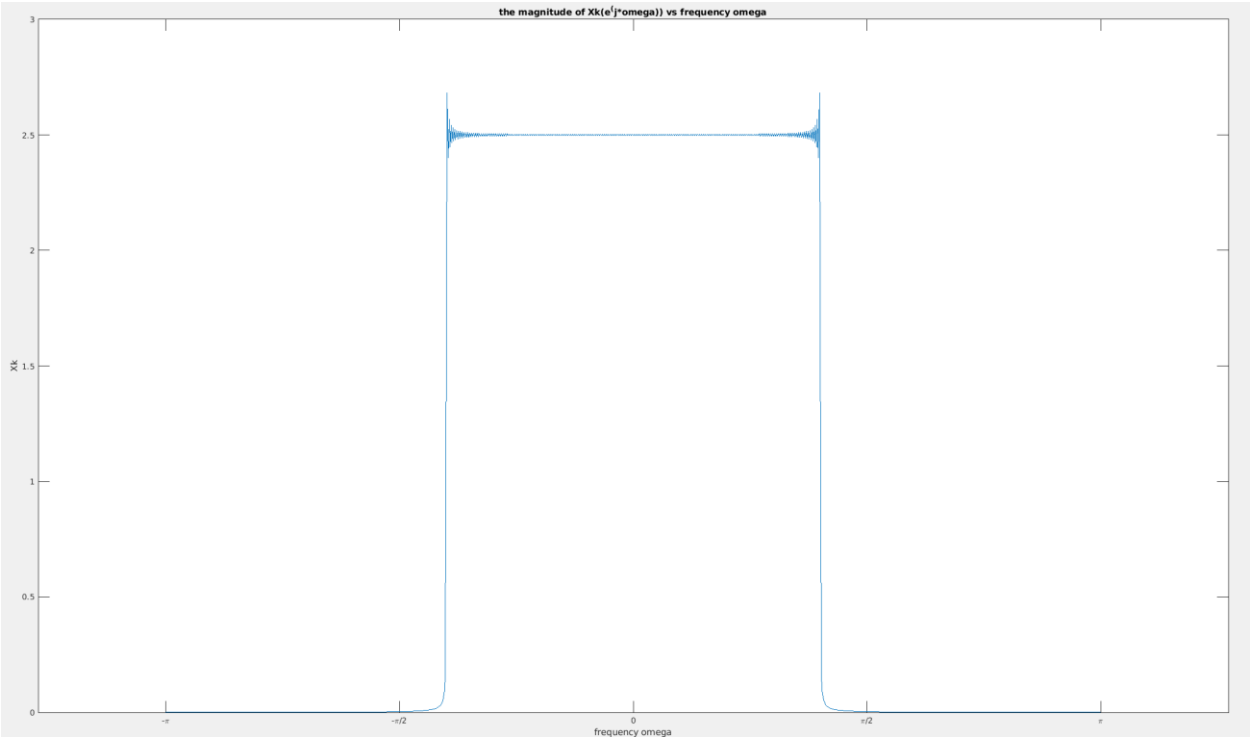
(b) $X\ vs\ \omega$

Gibbs phenomenon can be observed near discontinuity(red circles) : the partial sum near discontinuity exhibits ripples, and the peak amplitude remains constant with increasing N.



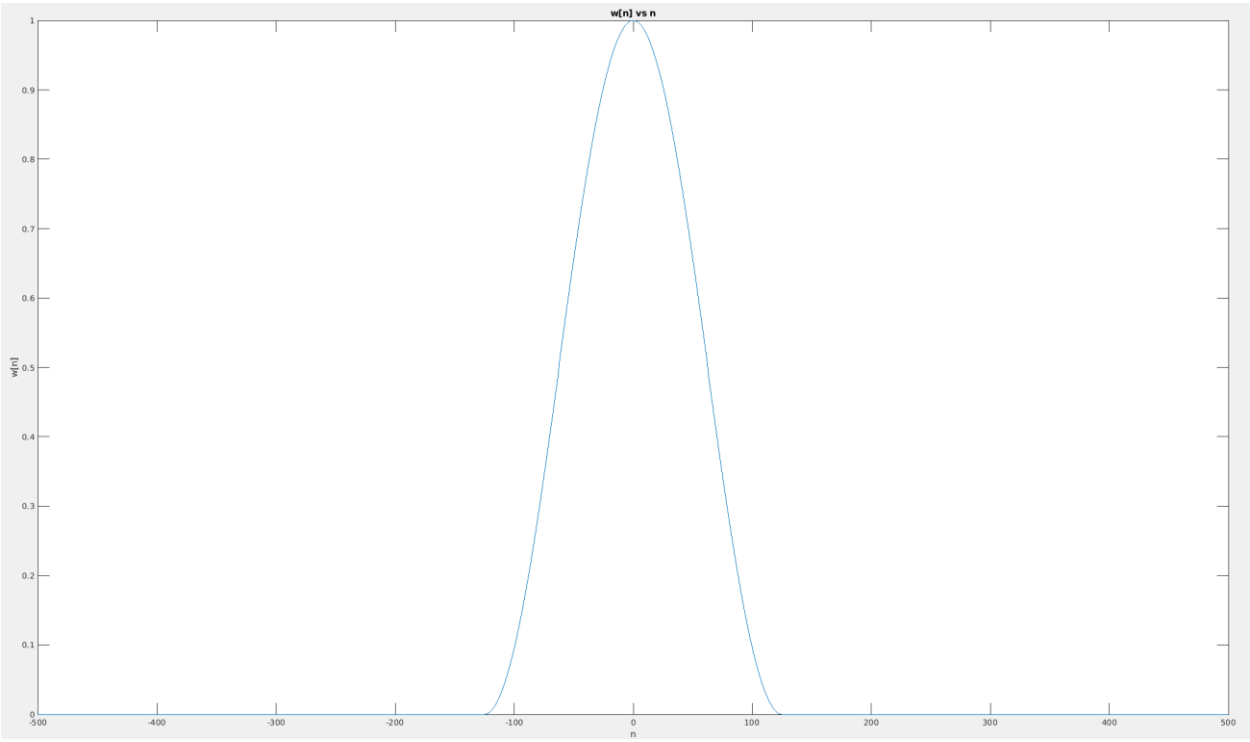
(c) $X_k(e^{j\omega})\ vs\ \omega$

From the observation, every points in (b) = (c). Thus, the figure is the same as Problem (b).

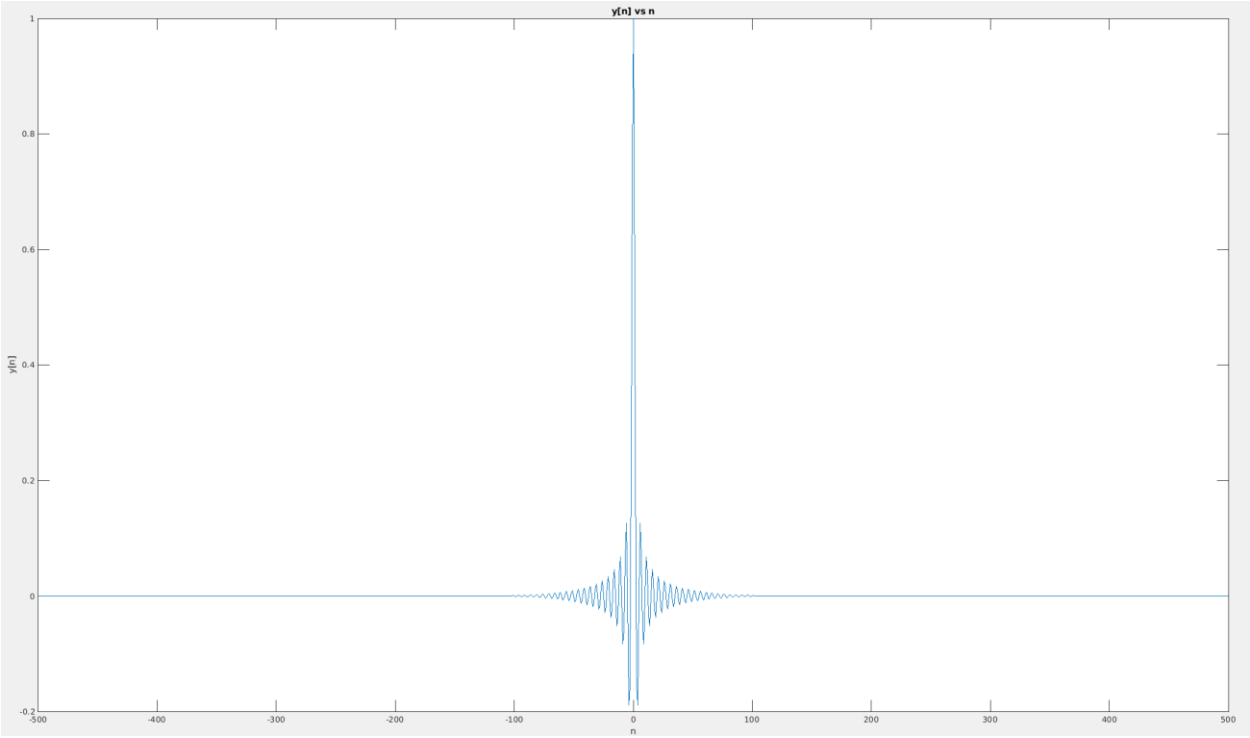


Part II

(d) $w[n]\ vs\ n$



(e) $y[n] vs\ n$



(f) $Y\ vs\ \omega$

Compare with Problem (b), Gibbs phenomenon was be mitigated near discontinuity(red circles) by multiplying input signal by a finite-duration signal $\omega(t)$, called the window function.