یالطیف

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۹۸۱۴۳۰۳

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#3

$x[n] \overset{F}{\longleftrightarrow} X(e^{jw})$

الف) $x[n] = 0 \quad \text{for} \quad n < 0$

ب) ~~Re{x[n]}~~ $Re\{X(e^{jw})\} = 2\cos w - \cos 2w$

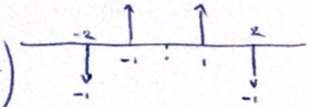
ج) $\int_{-\pi}^{+\pi} |X(e^{jw})|^2 dw = 14\pi$

د) $\int_{-\pi}^{+\pi} X(e^{jw}) dw < 0$

$x_{even}[n] \overset{F}{\longleftrightarrow} Re\{X(e^{jw})\} \Rightarrow 2\cos w - \cos 2w = e^{jw} + e^{-jw} - \frac{1}{2}e^{j2w} - \frac{1}{2}e^{-j2w} \xrightarrow{F^{-1}}$

$x_{even}[n] = \delta[n+1] + \delta[n-1] - \frac{1}{2}\delta[n+2] - \frac{1}{2}\delta[n-2]$

$x_{even}[n] = \frac{x[n] + \cancel{x[-n]}}{2} \Rightarrow x[n] = 2x_{even}[n] = 2\delta[n+1] + 2\delta[n-1] - \delta[n+2] - \delta[n-2]$



$\int_{-\pi}^{+\pi} |X(e^{jw})|^2 dw = 2\pi \sum_{n=-\infty}^{+\infty} |x[n]|^2 = 2\pi\left((2)^2 + (2)^2 + (1)^2 + (1)^2\right)$

$= 2\pi(10) \neq k^2 = 0 \Rightarrow k^2 = -6 \rightsquigarrow k = \pm 6j = -6j$ ✓

$\Rightarrow$