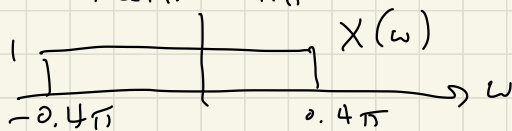


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$$w[n] = 0.1 \operatorname{sinc}(0.1\pi n) \quad \longleftrightarrow$$

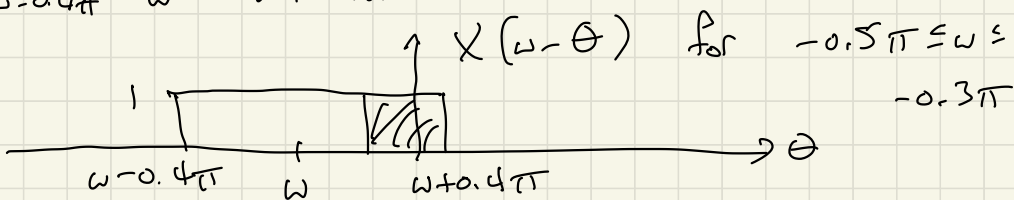
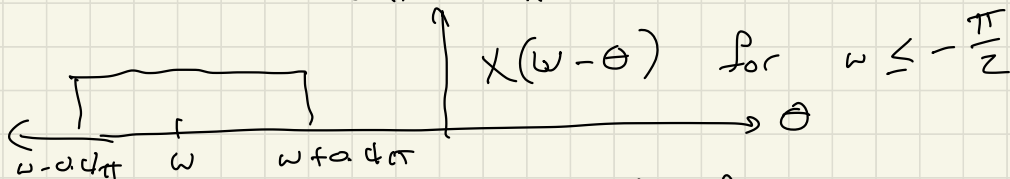
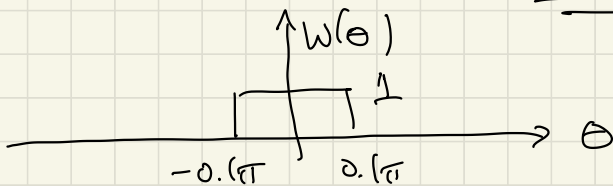


$$x[n] = 0.4 \operatorname{sinc}(0.4\pi n) \quad \longleftrightarrow$$



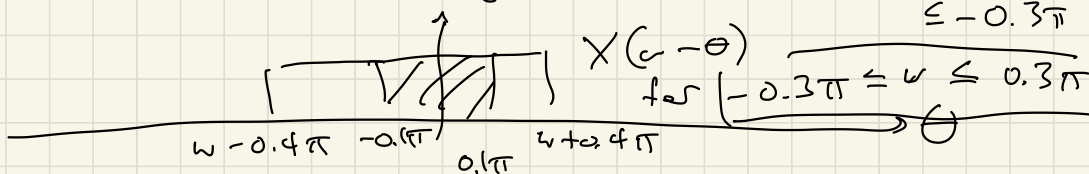
$$y[n] = w[n] * x[n]$$

$$Y(\omega) = \frac{1}{2\pi} W(\omega) * X(\omega) = \frac{1}{2\pi} \int_{-\pi}^{\pi} W(\theta) X(\omega - \theta) d\theta$$

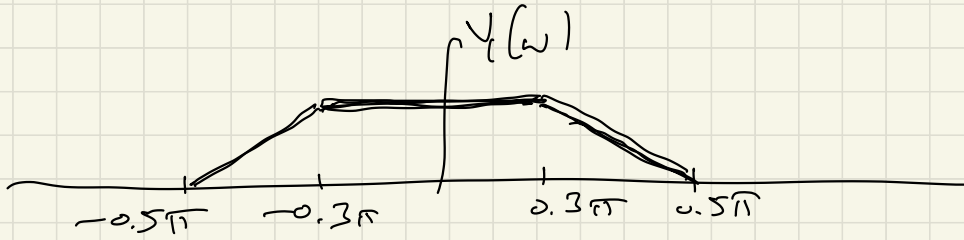


$$\frac{1}{2\pi} \int_{-\pi}^{\pi} W(\theta) X(\omega - \theta) d\theta = \frac{1}{2\pi} ((\omega + 0.4\pi) - (-0.1\pi))$$

$$= \left[ \frac{1}{2\pi} (\omega + 0.5\pi) \right]_{\text{for } -0.5\pi \leq \omega \leq -0.3\pi}$$



$$\frac{1}{2\pi} \int_{-\pi}^{\pi} W(\theta) X(\omega - \theta) d\theta = \frac{1}{2\pi} 0.2\pi = 0.1$$



$$Y(\omega) = \begin{cases} 0 & \omega \leq -0.5\pi \\ \frac{\omega}{2\pi} + \frac{1}{4} & -0.5\pi \leq \omega \leq -0.3\pi \\ 0.1 & -0.3\pi \leq \omega \leq 0.3\pi \\ \frac{1}{4} - \frac{\omega}{2\pi} & 0.3\pi \leq \omega \leq 0.5\pi \\ 0 & 0.5\pi \leq \omega \end{cases}$$