

Problem 3

$$(c) \quad x[n] * \delta[n] = x[n]$$

$$x[n] \xleftrightarrow{\text{F.T.}} X(e^{j\omega})$$

$$\delta[n] \xleftrightarrow{\text{F.T.}} 1$$

$$\begin{aligned} X(e^{j\omega}) &= X(e^{j\omega}) \cdot 1 = x[n] * \delta[n] \\ &= X e^{j\omega} \xleftrightarrow{\text{IFT}} x[n]. \end{aligned}$$

$$\therefore x[n] * \delta[n] = x[n]$$

Thus, proved. ~~Ans:~~