HW #8 Jesus G. / G.

8.3 Transmission Line / wave propagation II

1. Solve 5.8f

$$V = V_+ e^{-j\beta z} + V_+ |\rho| e^{j(\theta_\rho + \beta z)} \qquad \beta = \frac{\omega}{v_p}$$

$$V = V_+ e^{-j\beta z} + V_- e^{j(\theta_\rho + \beta z)} \Rightarrow$$

$$\Rightarrow V(z,t) = Re\left[|V_+| e^{j\omega t} e^{-j\beta z}\right] + Re\left[|V_-| e^{j\omega t} e^{j(\theta_\rho + \beta z)}\right]$$

for $\tilde{V}_+ = |V_+| e^{-j\beta z}$ and $\tilde{V}_- = |V_-| e^{j(\theta_\rho + \beta z)}$

$$V(z,t) = Re\left[\tilde{V}_+ e^{j\omega t}\right] + Re\left[\tilde{V}_- e^{j\omega t}\right] = Re\left[(\tilde{V}_+ + \tilde{V}_-) e^{j\omega t}\right]$$

$V(z)$ for $\omega t = \pi/4$ from $\omega t_1 = \frac{\theta_\rho}{2}$; $\omega t = -\frac{\theta_\rho}{2} + \frac{\pi}{4}$

$$V(z) = Re\left[(\tilde{V}_+ + \tilde{V}_-) e^{j(-\frac{\theta_\rho}{2} + \frac{\pi}{4})}\right] \qquad |\rho| = \frac{1}{2} \qquad \rho = |\rho| e^{j\theta_\rho}$$