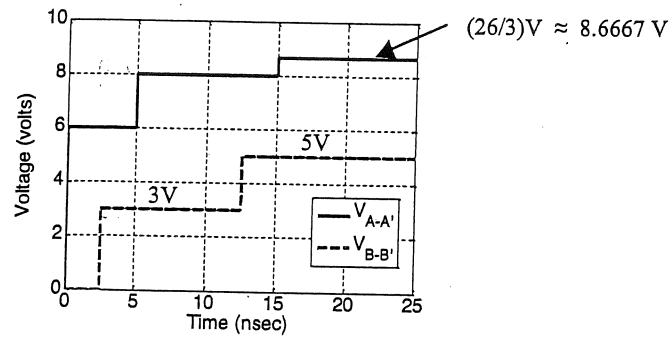



(a) Determine the delay times $t_{r1}$ of line 1 and $t_{r2}$ of line 2.

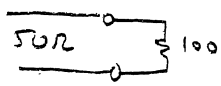
$t_{R_1} = 2.5\,nS$

$t_{R_2} = 5\,nS$

(b) Determine the generator resistance $R_G$.

$6 = 12\left(\frac{50}{50+R_g}\right) \quad R_g = 50\Omega$

(c) Determine the reflection coefficient $\rho_{11}$ at the junction between the two lines.



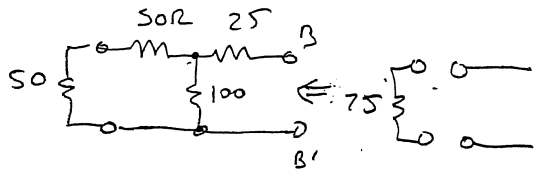

$\rho_{11} = \frac{100-50}{150} = \frac{1}{3}$

(d) Determine the transmission coefficient $\rho_{21}$ at the junction between the two lines.

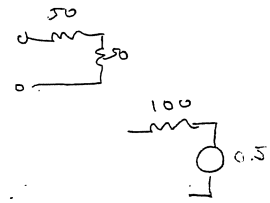
from graph; $\rho_{21} = \frac{V_{BB}}{V_{AA}} = \frac{3V}{6V}\frac{V_{trm}}{V_{inc}} = 0.5$

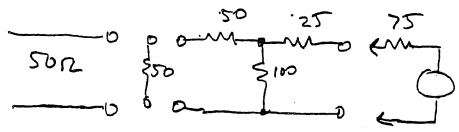
$= 1/3$

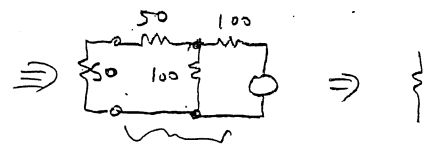
(e) Determine the reflection coefficient $\rho_{22}$ and the transmission coefficient $\rho_{12}$ at the junction between the two lines.



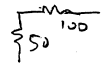

$\rho_{22} = 0$




$\rho_{12} = (1+\rho_{22})\, R_{\text{div}}$




$\frac{50}{150} = \frac{1}{3}$

(f) Determine the unknown terminating resistance $R_T$.

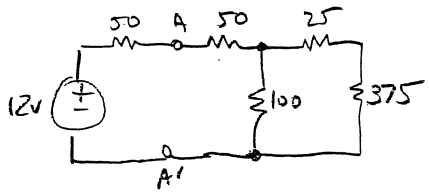
$V_{BB}$ sees positive reflection of 2V

$\rho_L = \frac{2}{3} = 0.667$

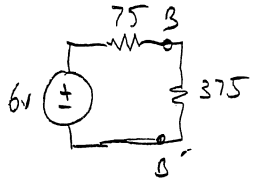
$0.667 = \frac{R_L - 75}{R_L + 75} \Rightarrow R_L = 375\Omega$

Also, reflection from smph is 2V, incident was 3 so $\rho_L = .667$

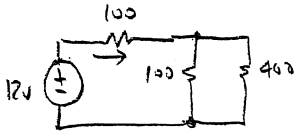
(g) Determine the steady-state voltages (i.e. for $t \to \infty$) at the input of the first line (A-A') and at the input of the second line (B-B').




$\Rightarrow$ thev equiv




$V_{BB} = 5V$




$I = 0.667$

$V_{AA} = 8.667V$