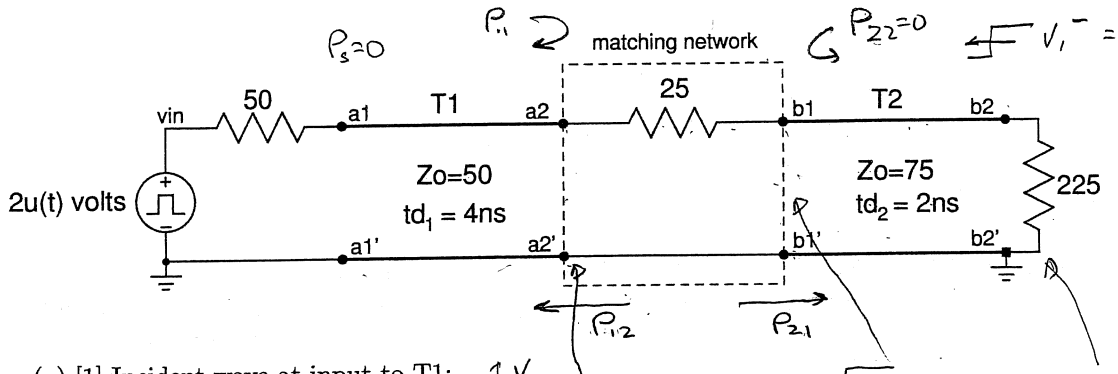
6. Two lossless transmission lines are connected through a matching network at their junction. Draw the voltages at the input terminal (a1) of T1 and the output terminal of T2 (b2).



(a) [1] Incident wave at input to T1: 1V

(b) [1] $\rho_S = \emptyset$

(c) [1] $\rho_L = \frac{225-75}{300} = 0.5$

(d) [1] $\rho_{11} = \frac{100-50}{150} = 0.33$

(e) [1] $\rho_{21} = (0.33+1)\left(\frac{75}{75+25}\right) = 1$

(f) [1] $\rho_{12} = (0+1)\left(\frac{50}{50+25}\right) = .667$

(g) [1] $\rho_{22} = 0$

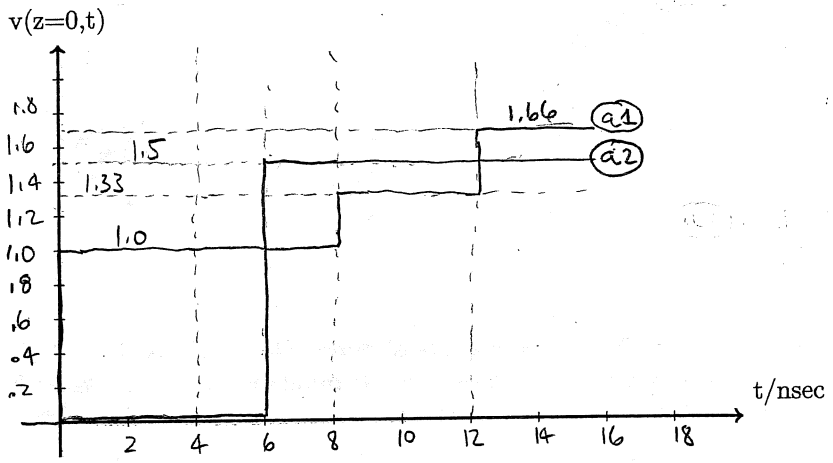
$V_1^+ \rightarrow 1.0V$

$V_1^- \leftarrow (0.5)(.667) = .33$

$V_1^- = 1.0(0.5) = .5$

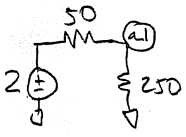
$V_L = V_1^+ + V_1^- = 1 + 0.5$

(a) [10] On the graph below, draw the voltages at the input terminal (a1) of T1 and the voltages at the output terminal (b2) of T2.



(h) [4] Determine the steady-state voltages at the input to the first line (a1 and a1') and the output of the second line (b2 and b2'). ($t = \infty$)

input:



$V_{a1} = 1.667$

[2]

output:

$V_{a2} = 1.5V$

[2]