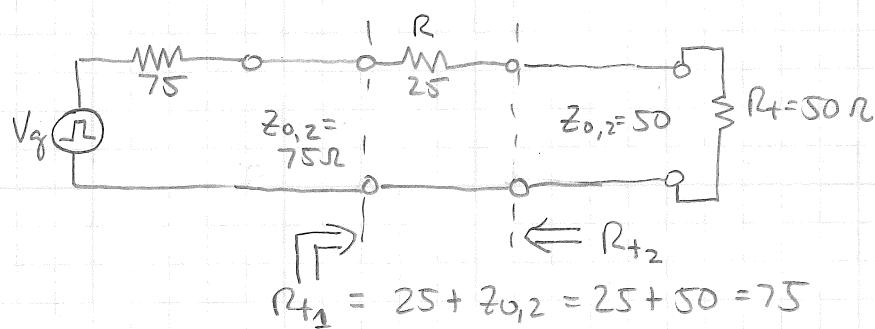
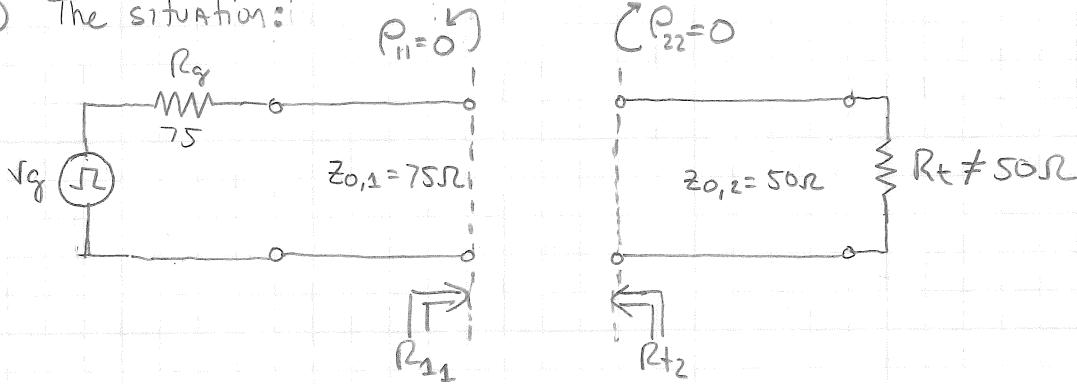


In this case, a wavefront from the left encountering the boundary R_{+1} should see an impedance of 75Ω . Since the right-hand side of the boundary is at a lower impedance, the only connection for the resistor that will present a higher impedance to the wavefront will be a series one that when added to $z_{0,2}$ equals 75Ω . This would be a 25Ω series resistor.



Thus a series 25Ω resistor will present an interface with $P_i=0$ resulting in no reflections. Furthermore, since $z_{0,2}$ is terminated in its characteristic impedance, no reflection will even be generated at the load. Thus the interface R_{+2} need not be considered to meet the reflectionless criterion.

4(b) The situation:

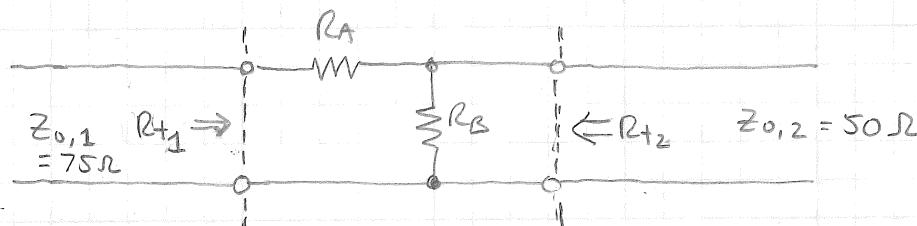


Since $R_t \neq Z_0,2$, a reflection will be generated at the load. Thus we must satisfy two conditions $P_{11}=0$ & $P_{22}=0$.

A wave from the left must "see" a higher impedance ($Z_0,1$) than $Z_0,2$ can present.

A wave from the right must "see" a lower impedance ($Z_0,2$) than $Z_0,1$ can present.

The simplest configuration of resistors that will allow R_{t1} to appear higher than $Z_0,2$ and R_{t2} to appear lower than $Z_0,1$ would be:



R_A , when added to the parallel combination of $R_B + Z_0,2$ equals $Z_0,1$.
 R_B , in parallel with R_A added to $Z_0,1$ equals $= Z_0,2$

So we can express R_{t1} , R_{t2} as:

$$R_{t1} = R_A + R_B \parallel Z_0,2 \quad \text{and}$$

$$75 = R_A + \frac{50R_B}{R_B + 50}$$

$$(75 - R_A)(R_B + 50) = 50R_B$$

$$R_{t2} = R_B \parallel R_A + Z_0,1$$

$$50 = \frac{R_B(R_A + 75)}{R_B + R_A + 75}$$

$$50(R_B + R_A + 75) = R_A R_B + 75 R_B$$

$$\textcircled{A} \quad R_A R_B + 50 R_A - 25 R_B = 3750$$

$$\textcircled{B} \quad R_A R_B + 25 R_B - 50 R_A = 3750$$

negating \textcircled{B} and adding \textcircled{A} and \textcircled{B}

$$+ \underline{-R_A R_B + 50 R_A - 25 R_B = -3750}$$

$$100 R_A - 50 R_B = 0 \quad \text{OR} \quad \underline{2 R_A = R_B}$$

4(b) cont.

Plugging this back into A

$$RAR_B + 50R_A - 25R_B = 3750$$

$$R_A(2R_A) + 50R_A - 25(2R_A) = 3750$$

$$2R_A^2 = 3750$$

$$R_A = 43.3 \Omega \quad \text{and since } R_A = \frac{R_B}{2}$$

$$R_B = 86.6 \Omega$$

Thus, the network looks like:

