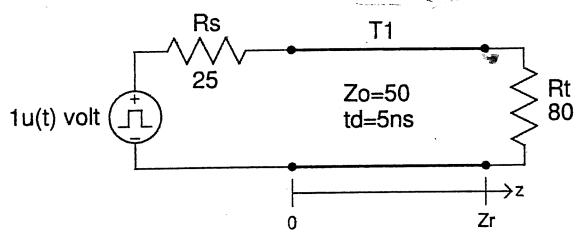


10. Consider the circuit below. T1 is a lossless transmission line with $Z_0 = 50\Omega$ $t_d = 5\text{ns}$.

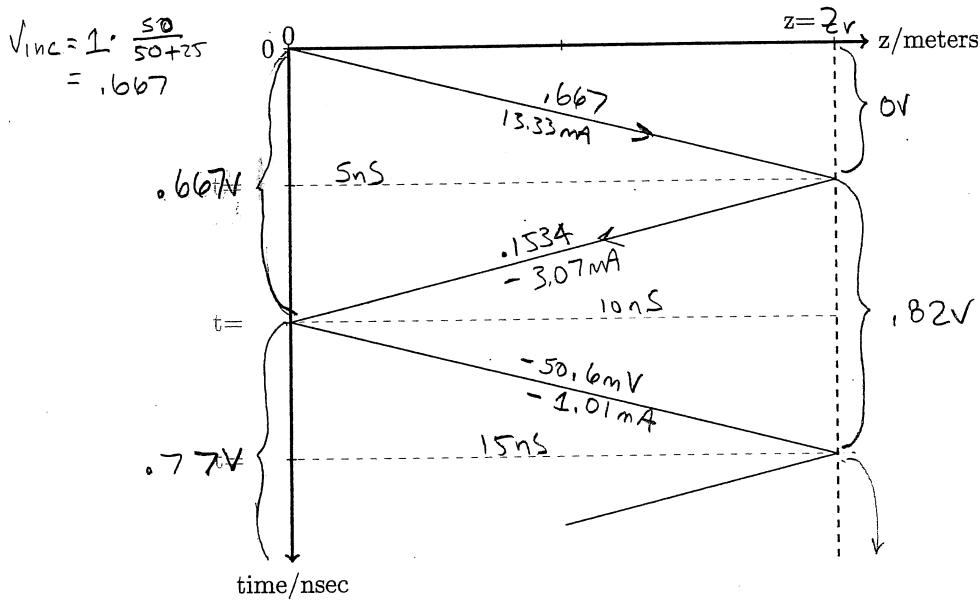


(a) Determine ρ_s and ρ_l .

$$\rho_s = \frac{25 - 50}{25 + 50} = \frac{-25}{75} = -0.33$$

$$\rho_l = \frac{80 - 50}{80 + 50} = \frac{30}{130} = 0.23$$

(b) Fill in the numerical voltage and current values for the first three wave components and add the time and length scales in the lattice diagram shown below. Include units as appropriate.



(c) Sketch the voltage at the beginning and end of the line ($z = 0$) and ($z = Z_r$) for $0 \leq t \leq 15\text{ns}$. Include voltages and time on the axes. Indicate voltage levels that do not fall on the axis marks.

