\#1 \quad Z_L = 0 \quad \Gamma = \frac{Z_L - Z_0}{Z_L + Z_0} = 1

\[ V_{\text{total}} = V^+ + V^- \quad V^- = \frac{\Gamma}{\Gamma^*} V^+ \]

\[ = \frac{V^+ + \Gamma V^+}{\sqrt{\Gamma^2 + 1}} \]

\[ = 2 V^+ \]

\#2 \quad \Gamma = \frac{Z_L - Z_0}{Z_L + Z_0} = \frac{-5}{96} = \frac{-0.052}{\text{96}} \rightarrow V_0^- = \Gamma V_0^+

\#3 \quad P = \frac{V^2}{Z_0} = \frac{1^2}{50} = \frac{0.02}{\text{50}} \text{ W}

\#4 \quad Z_0 = 50 \Omega \quad Z_L = 2.5 \Omega \quad \Gamma = -\frac{1}{2} \quad \text{C} = 3 \times 10^8 \quad l = 3 \text{ m} \quad T = 1 \text{ ns} \quad \rho w = 3 \times 10^8 \times 10^{-9} = 0.3 \text{ m}

a) \quad \text{Incident wave}

b) \quad \text{Reflected wave}

\text{Incident wave at} \quad x_1 = 2.76 \text{ m} \quad \text{Reflected wave at} \quad x_2 = 2.94 \text{ m}
b) another way to see this:

\[ \text{incident wave.} \]

\[ \text{incident wave.} \]

\[ \text{seen these two waves together} \]

\[ \text{reflected wave} \]

\[ \text{Find } x, x_1, x_2 \text{ from speed of light, pulse width, and time after incident wave reaches load:} \]

\[ 0.2 \times 9.5 \times 8 = 0.06 \text{ m} \]

\[ X_1 = 2.1 \text{ m} \]

\[ X_2 = 2.4 \text{ m} \]

\[ X \]

\[ X_1 \]

\[ X_2 \]

\[ L \]

\[ \text{Find } x, x_1, x_2 \text{ from speed of light } (c) \text{ time after wave reaches load at } L \text{ (which is } 5 \text{ s).} \]

\[ 3 \text{ m} \cdot 3 \times 10^8 \text{ m/s} = 0.9 \text{ m} \]