P4.3

1、无源端和负端的反射

∴ 初始状态还是 V_0, I_0.

∵ 右端断开.

∴ 断开处电流总电流为 0

∴ $I_0 + I_- = 0$

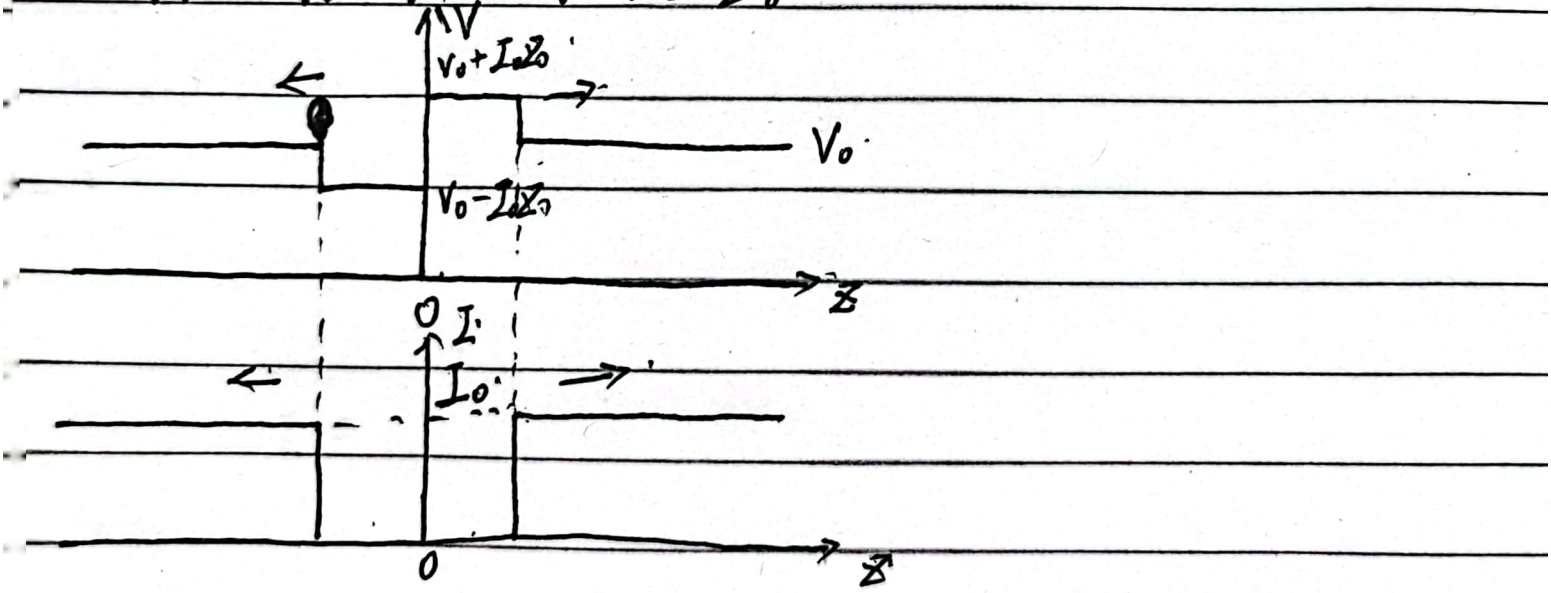
∴ $I = I_0 + I_- = 0$

$V_- = -I_- Z_0 = I_0 Z_0$.

∴ $V_{1P} = V_0 - V_- = V_0 - I_0 Z_0$.

右端断开处: $I_0 + I_+ = 0$

$V_r = V_0 + V_+ = V_0 + I_0 Z_0$.



2、$I_0 = \frac{P}{V_0} = \frac{1\times10^9 W}{600\times10^3 V} = \frac{5000}{3} A$

∴ $V_{max} = V_0 + I_0 Z_0 = 1.43\times10^6 V$

P4.4

1、在 $t=10^{-8}s$ 时，反射波 V_- 回到 $z=0$ 处

$\therefore L=\frac{1}{2}\cdot c\cdot t=1.5m$

2、

$V_{t=0}=0.5V$，$V_{t=10^{-8}}=0.25V$

$\therefore V_-=-0.25V$

$R_{L0}=\frac{Z_0R_L}{Z_0+R_L}$

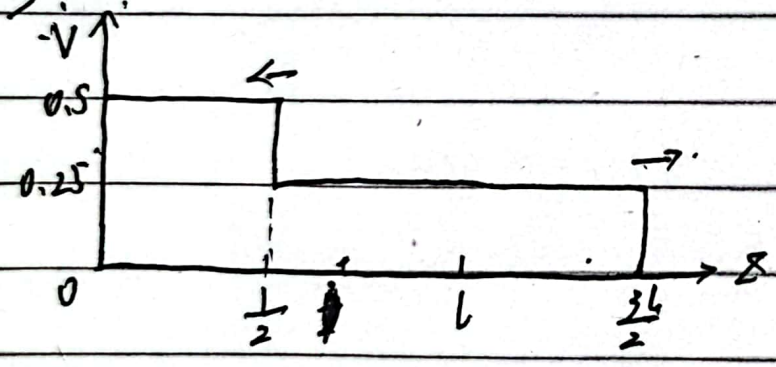
$\because V_-=V_+\cdot\left(\frac{R_{Ln_0}-1}{R_{Ln_0}+1}\right)$，$R_{Ln_0}=\frac{R_{L0}}{Z_0}$，$V_+=V_{t=0}=0.5V$

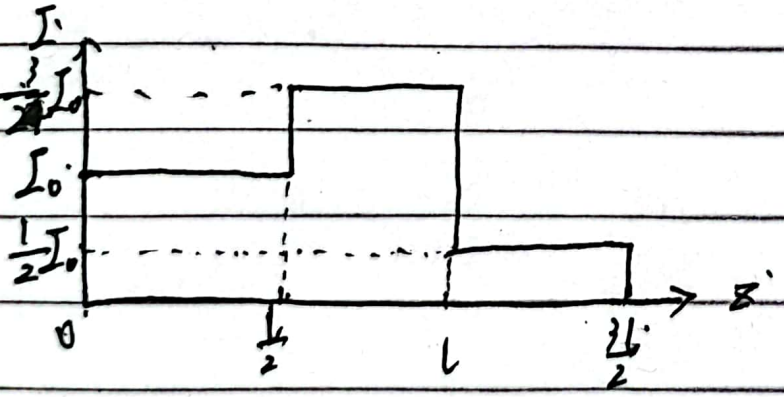
$\therefore \frac{R_{Ln_0}-1}{R_{Ln_0}+1}=-\frac{1}{2}$

$\therefore R_{L0}=\frac{1}{3}Z_0$

$\therefore R_L=\frac{1}{2}Z_0$

3、





$I_0=\frac{V_0}{Z_0}$