

# 練習題 1:

(Sol):

機四 C

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$$t = \frac{L_i}{V_i} + \frac{L_r}{V_r} = \frac{n_i \sqrt{x^2 + h^2} + n_r \sqrt{(L-x)^2 + h^2}}{c}$$

$$\frac{dt}{dx} = \frac{1}{c} \left\{ n_i \cdot \frac{1}{\cancel{2}} (x^2 + h^2)^{-\frac{1}{2}} \cdot \cancel{2} x + n_r \cdot \frac{1}{\cancel{2}} [(L-x)^2 + h^2]^{-\frac{1}{2}} \cdot (-1 + \cancel{2} x) \right\} = 0$$

$$\frac{d}{dx} (L-x)^2 = \frac{d}{dx} (L^2 - 2xL + x^2) = -2L + 2x$$

$$\text{set: } D_i^2 = x^2 + h^2, D_r^2 = (L-x)^2 + h^2 \Rightarrow \sin \theta_i = \frac{x}{D_i}, \sin \theta_r = \frac{L-x}{D_r}$$

$$\text{原式} \Rightarrow \frac{1}{c} [n_i \cdot D_i^{-1} x + n_r D_r^{-1} (-L+x)] = 0$$

$$\Rightarrow n_i \sin \theta_i = n_r \sin \theta_r \quad \text{得證} \#$$