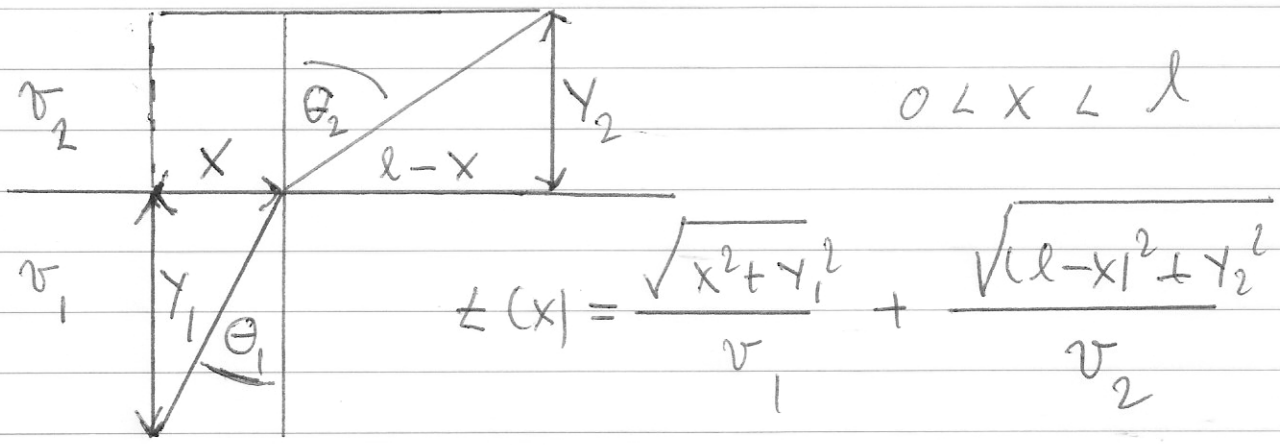


Principle of Least Time (Fermat's Principle)



$$\frac{dL(x)}{dx} = \frac{x}{v_1 \sqrt{x^2 + y_1^2}} - \frac{(l-x)}{v_2 \sqrt{(l-x)^2 + y_2^2}} \stackrel{!}{=} 0$$

$$0 = \frac{\sin \theta_1}{v_1} - \frac{\sin \theta_2}{v_2}$$

$$\frac{\sin \theta_1}{\sin \theta_2} = \frac{v_1}{v_2} = \frac{n_2}{n_1} \quad \text{Snell's Law}$$

n_1, n_2 indices of refraction

Second derivative: