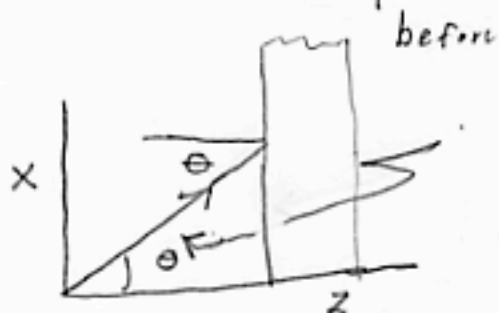


Next, we have $p_x^{in} = p_x^{out} \Rightarrow$

$$\left. \frac{n_1 x'}{[1+(x')^2]^{1/2}} \right|_{\text{before}} = \left. \frac{n_2 x'}{[1+(x')^2]^{1/2}} \right|_{\text{after}}$$



For this ray we have

$$x' = \frac{dx}{dz} = \tan \theta = \frac{\sin \theta}{\cos \theta}$$

$$\frac{x'}{[1+(x')^2]^{1/2}} = \frac{\frac{\sin \theta}{\cos \theta}}{\left[1 + \frac{\sin^2 \theta}{\cos^2 \theta}\right]^{1/2}} = \sin \theta$$

$$\therefore n \sin \theta \Big|_{\text{before}} = n \sin \theta \Big|_{\text{after}}$$

$$\Rightarrow \boxed{n_1 \sin \theta_1 = n_2 \sin \theta_2}$$

Snell's law