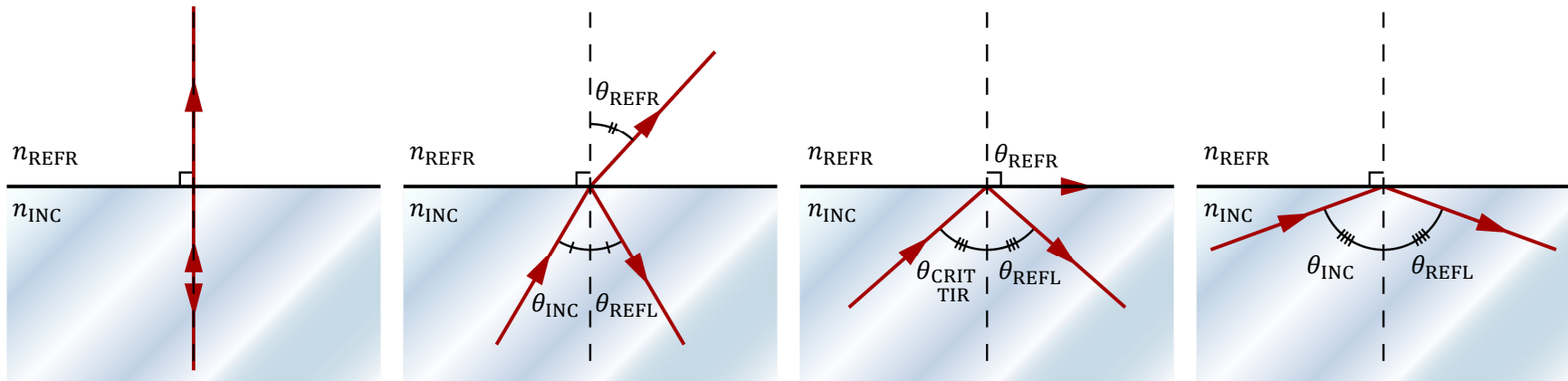


Total internal reflection

$$n_{\text{INC}} \sin \theta_{\text{INC}} = n_{\text{REFR}} \sin \theta_{\text{REFR}}$$



When $n_{\text{INC}} > n_{\text{REFR}}$ and $\theta_{\text{REFR}} = 90^\circ$, θ_{INC} is called $\theta_{\text{CRIT TIR}}$.

$$n_{\text{INC}} \sin \theta_{\text{CRIT TIR}} = n_{\text{REFR}} \sin 90^\circ$$

$$\sin \theta_{\text{CRIT TIR}} = \frac{n_{\text{REFR}} \sin 90^\circ}{n_{\text{INC}}}$$

$$\theta_{\text{CRIT TIR}} = \sin^{-1} \left(\frac{n_{\text{REFR}}}{n_{\text{INC}}} \right)$$