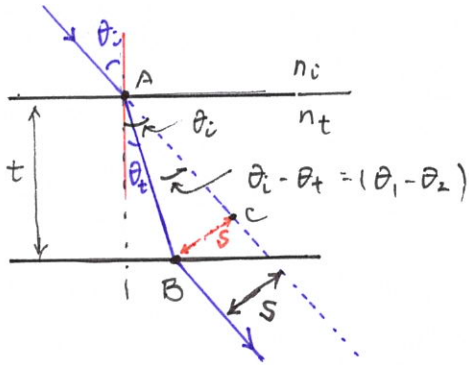


HW#1 Sol.



$$\bullet \theta_i \rightarrow \theta_1, \theta_t \rightarrow \theta_2, n_i \rightarrow n_1, n_t \rightarrow n_2$$

(i)  $\triangle ABC$ ,

$$S = \overline{AB} \sin(\theta_1 - \theta_2)$$

$$\overline{AB} \cos \theta_2 = t \rightarrow \overline{AB} = \frac{t}{\cos \theta_2}$$

$$\therefore S = \frac{\sin(\theta_1 - \theta_2)}{\cos \theta_2} t$$

$$\text{For } t = 3 \text{ cm}, n_2 = 1.5, n_1 = 1, \theta_1 = 50^\circ$$

$$(ii) \text{ Using Snell's law, } n_1 \sin \theta_1 = n_2 \sin \theta_2 \rightarrow \sin \theta_2 = \frac{1}{1.5} \sin 50^\circ$$

$$\theta_2 = \sin^{-1} \left( \frac{\sin 50^\circ}{1.5} \right) = \underline{\underline{30.7^\circ}}$$

$$\therefore S = \frac{\sin(19.3)}{\cos(30.7)} \cdot 3 = \underline{\underline{1.15 \text{ (cm)}}}$$