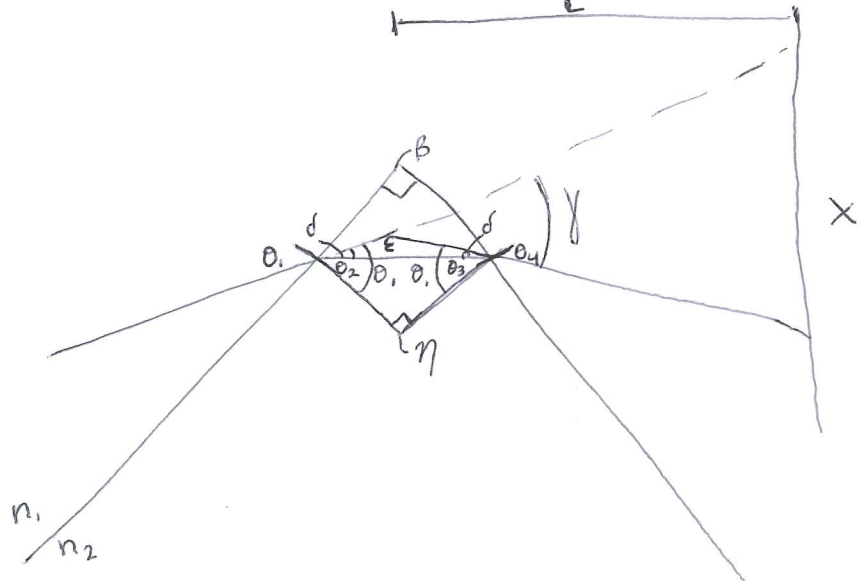

Relationship between θ_1 and α

★Minimum Deviation Condition

$\theta_1 = \theta_4$

$\theta_2 = \theta_3$

$n_1 \sin\theta_1 = n_2 \sin\theta_2$

$n_2 \sin\theta_3 = n_1 \sin\theta_1$

$\theta_2 + \theta_3 + \eta = \pi$

$\frac{\pi}{2} + \frac{\pi}{2} + \eta + \beta = 2\pi$ ★ Quadrilateral Property

$\eta = \pi - \beta$

$2\theta_2 + \eta = \pi$

$2\theta_2 + \pi - \beta = \pi$

$2\theta_2 = \beta$

$\theta_2 = \frac{\beta}{2}$

$\theta_2 = \frac{\pi}{4}$

$\delta = \theta_1 - \theta_2$

$\varepsilon + 2\delta = \pi$

$\varepsilon = \pi - 2\delta$

$\gamma = \pi - \varepsilon$

$\gamma = \pi - (\pi - 2\delta)$

$\gamma = 2\delta$

$\delta = \frac{\gamma}{2}$

$\theta_1 - \theta_2 = \frac{\gamma}{2}$

$\theta_1 = \frac{\gamma}{2} + \theta_2$

$$\theta_1 = \frac{\arctan\left(\frac{x}{L}\right)}{2} + \frac{\pi}{4}$$

$$n_2 = \frac{n_1 \sin\left(\frac{\arctan\left(\frac{x}{L}\right)}{2} + \frac{\pi}{4}\right)}{\sin\left(\frac{\pi}{4}\right)}$$

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