

46. (a) Approximating $n = 1$ for air, we have

$$n_1 \sin \theta_1 = (1) \sin \theta_5 \implies 56.9^\circ = \theta_5$$

and with the more accurate value for n_{air} in Table 34-1, we obtain 56.8° .

(b) Eq. 34-44 leads to

$$n_1 \sin \theta_1 = n_2 \sin \theta_2 = n_3 \sin \theta_3 = n_4 \sin \theta_4$$

so that

$$\theta_4 = \sin^{-1} \left(\frac{n_1}{n_4} \sin \theta_1 \right) = 35.3^\circ .$$