



No bound charges

(dielectric \Rightarrow volume charge)

$$\text{Eqn. 4.99 } \frac{\tan \theta_1}{\tan \theta_2} = \frac{\epsilon_1}{\epsilon_2}$$

$$\frac{\tan \theta_1}{\tan 45^\circ} = \frac{3\epsilon_0}{\epsilon_0} = 3 \Rightarrow \theta_1 = 71.6^\circ$$

$$\frac{\tan \theta_2}{\tan \theta_1} = \frac{5\epsilon_0}{3\epsilon_0} = \frac{5}{3} \Rightarrow \theta_2 = 78.7^\circ$$

$$\frac{\tan \theta_3}{\tan \theta_2} = \frac{7\epsilon_0}{5\epsilon_0} = \frac{7}{5} \Rightarrow \theta_3 = 81.9^\circ$$