The Fresnel Equations in E.Hecht, Chapter 4, Equations 4.32, 4.33 and 4.38, 4.39 are expressed in terms of angle of incidence, φ_o, and angle of refraction, φ_1.

    (a) Rewrite these Fresnel equations in terms of the angle of incidence φ_o and the dielectric function ε.

    (b) Simply the Fresnel equations assuming for the ambient dielectric function $\varepsilon_a = 1$; nonmagnetic media: $\mu_a = \mu_s = 1$; and a linear isotropic non-absorbing substrate with a dielectric function ε_s. Show that under these conditions the sum of reflection and transmission is equal 1.