6. The isothermal compressibility κ_T and the adiabatic compressibility κ_S are defined by

$$\kappa_T = -\frac{1}{V}\left(\frac{\partial V}{\partial p}\right)_T \quad \text{and} \quad \kappa_S = -\frac{1}{V}\left(\frac{\partial V}{\partial p}\right)_S \ ,$$

where the symbols have their usual meanings. Show that $\kappa_S/\kappa_T = 1/\gamma$ where γ is the ratio of principal specific heats.