17.31. **Model:** γ is 1.40 for a diatomic gas and 1.67 for a monoatomic gas.

Solve: **(a)** We will assume that air is a diatomic gas. For an adiabatic process,

$$T_f V_f^{\gamma-1} = T_i V_i^{\gamma-1}$$

Thus

$$\left(\frac{V_i}{V_f}\right) = \left(\frac{T_f}{T_i}\right)^{\frac{1}{\gamma-1}} = \left(\frac{1123 \text{ K}}{303 \text{ K}}\right)^{\frac{1}{1.40-1}} = 26.4$$

(b) For argon, a monatomic gas,

$$\left(\frac{V_i}{V_f}\right) = \left(\frac{1123 \text{ K}}{303 \text{ K}}\right)^{\frac{1}{1.67-1}} = 7.07$$