[tex59] **Ideal−gas entropy and Boltzmann's H−function**

Consider N particles of a classical monatomic ideal gas confined to a box of volume V at temperature T. Show that the entropy $S(T,V,N) = S_0 + nR\ln[(T/T_0)^{3/2}(V/V_0)]$ previously inferred from the empirical relations $pV = nRT, C_V = \frac{3}{2}nR$ can be derived via $S = -Nk_B H(\infty)$ from the stationary value of Boltzmann's H-function,

$$H(t) = \int d^3r \int d^3v\, f(\mathbf{r},\mathbf{v},t) \ln f(\mathbf{r},\mathbf{v},t).$$