

In-class problem linked to lecture pages 85-97

Consider a system of N objects, each of which has 2 degrees of freedom.

Show that $E = NkT$.

Phys. 301

In class for lecture pages 85-97

$$\# \text{ dof} = 2N$$

$$I = \frac{1}{T} \left[k \ln E^{2N/2} \right]$$

$$= \frac{1}{T} \left[k \ln E^N \right]$$

$$= \frac{1}{T} \left[N k \ln E \right]$$

$$= \frac{Nk}{E}$$

$$\int_0 E = NkT$$