

PHYS 4310, Quiz 1

1. Show:

$$\frac{\int_0^\infty E \exp(-E/k_B T) dE}{\int_0^\infty \exp(-E/k_B T) dE} = k_B T.$$

2. In class, we saw that that the Rydberg constant, $R_H = 109,700 \text{ cm}^{-1}$, is also equal to 92.1 nm and 13.6 eV. What is 1000 cm^{-1} in units of (a) μm and (b) meV? (Wavenumbers are commonly used for Raman spectroscopy, laser linewidths, various quantities in atomic physics, Fourier transform infrared spectroscopy, etc.)