Phy 410
Quiz #5, Feb 26, 2010

The peak of the electromagnetic spectrum from a black body (#1) at temperature T_1=2000K is at a frequency ω_1. The peak of the spectrum from a second black body (#2) is at $3\omega_1$.

i)   What is the temperature of the second black body?

   Since the peak frequency scales linearly with temperature $(\propto \tau)$
   $$T_2=6000K$$

ii)   What is e_2/e_1 where e_i's correspond to the energy densities $(U/V)_i$?

   Since the energy density scales as the 4th power of temperature $(\propto \tau^4)$

   $$e_2/e_1=(6000K/2000K)^4=3^4=81$$