1. In 2008, human civilization consumed $474 \cdot 10^{18}$ Joules of energy in total. Calculate the area for solar panels to supply the energy for Earth's consumption. Assume Sun is a black body with $T=T_{eff}=5800K$, and solar panels have 20% efficiency. Is it feasible to power Earth just from the solar power?

2. Effective temperature of the solar surface is T=5800K. Knowing this, distance from the Sun to Earth, solar and Earth's radius, Earth's albedo A=0.3 (fraction of radiation which is reflected) and assuming black body radiation for the Sun and Earth, show there is a greenhouse effect on Earth.