**ATOC 3500/CHEM 5151**

**Mass of Earth’s Atmosphere**

**Problem 2**

**Lecture 1**

Find the following two pieces of information, and use them to calculate the total mass of Earth’s atmosphere in kilograms.

(1a) Average radius = \_\_\_\_\_\_\_(km)

(1b) Multiply by 1000 m/km to get \_\_\_\_\_\_\_\_\_\_ (m)

(1c) Use the equation for the surface area of a sphere (S.A. = 4R2) to calculate the surface area of the Earth in square meters: \_\_\_\_\_\_\_\_\_\_\_\_ (m2)

(2a) Average surface pressure = \_\_\_\_\_\_\_\_\_ (mbar)

(2b) Multiply by 100 kg m-1 s-2/mbar to get \_\_\_\_\_\_\_\_ (kg m-1 s-2)

(3) Noting that pressure is force per unit area, multiply the answer for (1c) by the answer for to get total force of the atmosphere \_\_\_\_\_\_\_\_\_\_\_\_\_ (kg m s-2)

(4) Noting that force due to gravity is “mass x gravity” and using a value of 9.8 m s-2 for gravity of Earth, divide your answer for (3) by gravity to get \_\_\_\_\_\_\_\_\_\_\_\_\_ (kg), the total mas of Earth’s atmosphere.

(5) Does this answer match the book (don’t worry about the values to the right of the decimal). If not, you have an error in your calculation somewhere!