

Name: \_\_\_\_\_

### Pre-lab 8: Temperature and Absolute Zero

In this experiment we calibrate a thermometer constructed from a spherical glass bulb with a diameter of 6.5 cm. Determine the volume of this glass bulb and compute the number of air molecules contained in this volume for the conditions  $P = 101 \text{ kPa}$  (i.e., 1 atm) and  $T = 25^\circ\text{C}$ . Also, convert your result for number of molecules to a number of moles of gas. (Note that  $k_B = 1.38 \times 10^{-23} \text{ J/K}$ ,  $T_K = (1\text{K}/1^\circ\text{C})[T_C + 273.15^\circ\text{C}]$ , and 1 mole =  $6.02 \times 10^{23}$  objects).

Bulb Volume:  $V =$  \_\_\_\_\_ ( $\text{m}^3$ )

Number of molecules:  $N =$  \_\_\_\_\_

Moles of gas:  $n =$  \_\_\_\_\_ (moles)