

## HONORS CHEMISTRY

### WORKSHEET 7a.

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

1. A hot air balloon is filled with  $8.4 \times 10^5$  L of air at  $55^\circ\text{C}$  on a hilltop where the barometric pressure is 742 mm Hg. When the balloon lands at sea level, the air pressure is 760 mm Hg and the air inside the balloon has cooled down to  $42^\circ\text{C}$ . What is the balloon's volume when it lands?

2. Find the volume occupied by 2.0 kg of methane gas ( $\text{CH}_4$ ) at  $-10^\circ\text{C}$  and a pressure of 1.2 atmospheres.

3. The Garfield balloon in the Macy's Thanksgiving Day Parade contains 13,900 cubic feet of helium. On a day when the temperature is  $8^\circ\text{C}$  and the barometric pressure is 756 mm Hg, what mass of helium is this? One cubic foot = 28.317 L.

4. One fall day, a weather station in Bolton, MA recorded a temperature of  $6.6^\circ\text{C}$  and a barometric pressure of 29.78 inches of Hg. If a party balloon is inflated to a volume of 9.8 L outdoors at this location, and then brought indoors into a room at  $24^\circ\text{C}$  and 758 mm Hg, what would its indoor volume be?