## The Ideal Gas Law

Name: $\qquad$

1) A 30 g sample of propane is allowed to heat from 293 K to 310 K on a summer's day as the pressure increases from 0.94 atm to 1.04 atm . Assuming the gas is confined and allowed to expand as necessary
a) use the ideal gas law to determine the volume of gas initially in the sample.
b) use the ideal gas law to determine the volume of gas after the sample is heated.
c) use the combined gas law to determine the final volume of the gas. Does it agree with part (b)? (Use answer to part A to solve for final volume)

2a) Helium is collected at a high pressure of 210 psi . A 80 L tank is filled at the freezing point of water. How many moles of He gas are collected?
b) From problem \#2a, suppose the tank was emptied, and allowed to disperse at room temperature and pressure, approximately $77{ }^{\circ} \mathrm{F}$ and .98 atm . Using the amount of moles collected, what volume would the gas occupy? How many 2 liter balloons would this fill?
3) 5.6 g of carbon tetrachloride is in a 2.5 L container at $-100^{\circ} \mathrm{C}$. What is the pressure of the gas?
3) 0.207 atm

## The Ideal Gas Law

Name: $\qquad$

1) How many moles of a gas are in a 27.6 L container that is at 800 mmHg and $15^{\circ} \mathrm{C}$ ?
2) 30.0 grams of $\mathrm{NH}_{3}$ gas are confined to a 4.0 L tank at standard temperature. What is the pressure of the gas?
3) At what temperature would you need to have 22.7 g of oxygen gas in order to have the gas in a 15.2 L tank at standard pressure?
4) A gas at constant volume is cooled to a final temperature of 89 K . The initial pressure was 102.3 psi and the final pressure was 100 kPa . What was the initial temperature?

5a) A 100 L scuba tank containing mixture of $50 \% \mathrm{He}$ and $50 \% \mathrm{O}_{2}$ has a pressure of 62 psi at 298 K . How many moles of gas are in the tank?
b) What is the mass of the He and the mass of the $\mathrm{O}_{2}$ in the tank?
3) 261 K

5b) $24.5 \mathrm{~g} \mathrm{He}, 276 \mathrm{~g} \mathrm{O}_{2}$

