Math Gas Law Questions (for Introductory Chemistry)

1. Convert 4.9×10^2 atm to torr.

2. A flexible vessel contains 35 L of gas when the pressure is 1.2 atm. What will the volume be when the pressure is 0.76 atm, the temperature remaining constant? Which gas law is relevant? _____

3. A sample of gas in a balloon at 5.56 L and $17.0°C$ is heated to $37.0°C$. What is the new volume of the gas assuming the pressure is unchanged. Which gas law is relevant? _____

4. The volume of a sample of gas measured at $26.85°C$ and 1.00 atm is 10.0 L. What must the final temperature (in Celsius) be in order for the gas to have a final volume of 7.50 L at 1.50 atm pressure? Which gas law is relevant? _____

5. How many moles of gas are in a gas sample occupying 1.42 L at 581 mm Hg and 307 K? Which gas law is relevant? _____

6. An ideal gas at 400 K and 380 mm Hg is contained in a <u>flexible vessel</u>. Its volume is halved but its final pressure is unchanged. What is the final temperature in K? Which gas law is relevant? _____

7. At $25.0°C$ and 1.30 atm pressure, it is found that 3.02 L of gas weighs 7.70 g. The calculated molecular mass of the gas is? [Hint: use PV=nRT to establish the number of moles. This is the number of moles in 7.70 g. Now calculate the molecular mass]

8. (Partial pressure) A sample containing a mixture of helium, neon, and argon has a total pressure (P_t) of 662 mm Hg (Torr). If P_{He} = 341 Torr and P_{Ne} = 112 Torr, what is Pa_{Ar}?

9. (Partial pressure) A container at 1 atm (P_t = 1 atm) has the following composition: P_{N2} = 573 Torr, P_{O2} = 100 Torr, P_{CO2} = 40 Torr, and P_{H2O} = 47 Torr. What is the percent of volume % of O_2? What is the mole % of O_2?