Gas Laws Worksheet  
(Chapter 5)

Boyles Law: \( P_1 V_1 = P_2 V_2 \)  
(Inverse Relationship)  
\( P = \) Pressure in atmospheres \((\text{atm})\)  
1 atm = 760 torr = 760 mm Hg

Charles’ Law: \( \frac{V_1}{T_1} = \frac{V_2}{T_2} \)  
(Direct Relationship)  
\( V = \) Volume in liters \((\text{L})\)

Combined Gas Law:  
\[
\frac{P_1 V_1}{T_1} = \frac{P_2 V_2}{T_2}
\]

\( T = \) Temperature in Kelvin \((\text{K})\)

Ideal Gas Law: \( PV = nRT \)  
\( n = \) Number of moles

Density of a gas: \( d = \frac{\text{mass}}{\text{vol.}} = \frac{P(MW)}{RT} \)  
\( R = \) Ideal gas constant  
\( R = 0.082057 \text{ L(atm)/K(mol)} \)

Using the proper equations solve (complete) each question. Assume all are “ideal” gasses.

1. What is the pressure of a gas if you compressed the gas from its original 500 mL at 3.4 torr to a volume of 302 mL?

2. At what temperature will a gas be at if you allow it to expand from an original 456 mL at 65 °C to 3.4 L?

3. If you have 0.56 moles of an ideal gas at 87 °C and a pressure of 569 torr, what volume will the gas take up?

4. You have a gas at 453 mm Hg with a volume of 700 mL and a temperature of 25 °C, what will the temperature of the gas be, if you change the pressure to 278 mm Hg and a volume of 1200 mL?

5. Analysis of a gaseous chlorofluorocarbon, \( \text{CCl}_x\text{F}_y \), shows it contains 11.79 % C and 69.57 % Cl. In another experiment you find that 0.107 g if the compound fills a 458 mL flask at 25 °C with a pressure of 21.3 mmHg. What is the molecular formula of the compound?