

GAS LAWS WORKSHEET #1:

On a separate piece of paper or notebook, solve each problem. Show the equation used, identify what is given in the problem, substitute the values into the equation and carefully solve for the unknown. Express answers with units and correct significant figures. NAME THE GAS LAW YOU USED.

1. At what Celsius temperature will a gas occupy 45.9 L if, at STP the gas occupies 30.5 L? (constant pressure)
2. A 14.2 L sample of gas exerts a pressure of 125 kPa. What pressure will the gas exert if its volume is reduced to 8.53 L? (constant temperature)
3. Calculate the final pressure of a gas that initially occupied 13.7 L at 27.0 C and 2.81 atm, if final conditions are 12.0 C and 88.0 L.
4. A mixture of three gases, A, B, and C, has a total pressure of 245 kPa. If the pressures of gases A and B are 107 kPa and 55 kPa, respectively, what is the pressure of gas C?
5. A metal container holds a gas at a pressure of 0.55 atm at a temperature of -125 C. What will the pressure be when the temperature is increased to 175 C?
6. What is the volume at STP of a sample of carbon dioxide gas that has a volume of 75.0 ml at 30.0 C and 620 mm Hg?
7. Determine the total pressure of a gas mixture that contains CO ( $p = 1.53$  atm), Ne ( $p = 0.25$  atm) and He ( $p = 78.1$  kPa).
8. A mass of air occupies a volume of 5.7 L at a pressure of 0.52 atm. What is the new pressure if the same mass of air at the same temperature is transferred to a 2500 mL container?
9. A volume of 20.0 L of oxygen gas is warmed from -30.0 C to 85.0 C. What is the new volume if pressure is constant?
10. A carbon dioxide cylinder at a pressure of 325 kPa and a temperature of -5.2 C is delivered to a restaurant. What is the pressure inside the cylinder (in atmospheres) after it warms to room temperature (22.5 C)?
11. State the type of mathematical relationship (direct or inverse) and describe the type of graph that would be produced for the following laws: a. Boyle's Law b. Charles' Law c. Gay-Lussac's Law

Answers: 1) 138 C, Charles' 2) 208 kPa, Boyle's 3) 0.416 atm, Combined  
4) 83 kPa, Dalton 5) 1.7 atm, Gay-Lussac 6) 55 mL, Combined  
7) 2.55 atm, Dalton's 8) 1.2 atm Boyle's 9) 29.5 L, Charles'  
10) 3.54 atm, Gay-Lussac's