Gas Laws WS
Combined Gas Law

Name: _____

Period: _____ Date: _____

1) **The Combined Gas Law** combines Boyle's Law, Charles' Law, and Gay Lussac's Law stating that the _____, _____, and _____ of a gas are all related to one another. The _____ and _____ are inversely proportional to one another, but both are directly proportional to the _____ of a gas. The mathematical formula for the law is:

$$\frac{P_1V_1}{T_1} = \frac{P_2V_2}{T_2}$$

2) If I initially have a gas at a pressure of 12 atm, a volume of 23 liters, and a temperature of 250 K and the pressure is raised to 14 atm and the temperature is increased to 310 K, what is the new volume of the gas?

3) A gas takes up a volume of 17 liters, has a pressure of 2.3 atm, and a temperature of 299 K. If the temperature is changed to 350 K and the pressure is lowered to 1.5 atm, what is the new volume of the gas?

4) A gas that has a volume of 28 liters, a temperature of 45°C, and an unknown pressure has its volume increased to 34 liters and its temperature decreased to 35°C. If the pressure after the change is 2.0 atm, what was the original pressure of the gas?

5) A gas has a temperature of 14°C, a pressure of 1.0 atm, and a volume of 4.5 liters. If the temperature is raised to 29°C and the pressure is not changed, what is the new volume of the gas?

6) If I have 17 liters of gas at a temperature of 67°C and a pressure of 88.89 atm, what will be the pressure of the gas if I raise the temperature to 94°C and decrease the volume to 12 liters?

7) I have an unknown volume of gas at a pressure of 0.50 atm and a temperature of 325 K. If I raise the pressure to 1.2 atm, decrease the temperature to 320 K, and measure the final volume to be 48 liters, what was the initial volume of the gas?

8) If I have 21 liters of gas held at a pressure of 78 atm and a temperature of 900.K, what will be the volume of the gas if I decrease the pressure to 45 atm and decrease the temperature to 750 K?

9) If I have 2.9 L of gas at a pressure of 5.0 atm and a temperature of 50.°C, what will be the temperature of the gas if I decrease the volume to 2.4 L and decrease the pressure to 3.0 atm?

10) I have an unknown volume of gas held at a temperature of 115 K in a container with a pressure of 655 atm. If by increasing the temperature to 225 K and decreasing the pressure to 315 atm causes the volume of the gas to be 29.5 liters, how many liters of gas did I start with?