**Combined Gas Law Problems**

*Use the combined gas law to solve the following problems:*

1) If I initially have a gas at a pressure of 12 atm, a volume of 23 liters, and a temperature of 200 K, and then I raise the pressure to 14 atm and increase the temperature to 300 K, what is the new volume of the gas?

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

3) A gas that has a volume of 28 liters, a temperature of 45 0C, and an unknown pressure has its volume increased to 34 liters and its temperature decreased to 35 0C. If I measure the pressure after the change to be 2.0 atm, what was the original pressure of the gas?

4) A gas has a temperature of 14 0C, and a volume of 4.5 liters. If the temperature is raised to 29 0C and the pressure is not changed, what is the new volume of the gas?

5) If I have 17 liters of gas at a temperature of 67 0C and a pressure of 88.89 atm, what will be the pressure of the gas if I raise the temperature to 94 0C and decrease the volume to 12 liters?

6) I have an unknown volume of gas at a pressure of 0.5 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?

7) 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?

8) If I have 2.9 L of gas at a pressure of 5 atm and a temperature of 50 0C, what will be the temperature of the gas if I decrease the volume of the gas to 2.4 L and decrease the pressure to 3 atm?

9) I have an unknown volume of gas held at a temperature of 115 K in a container with a pressure of 60 atm. If by increasing the temperature to 225 K and decreasing the pressure to 30 atm causes the volume of the gas to be 29 liters, how many liters of gas did I start with?

**Combined Gas Law Problems - Solutions**

1) If I initially have a gas at a pressure of 12 atm, a volume of 23 liters, and a temperature of 200 K, and then I raise the pressure to 14 atm and increase the temperature to 300 K, what is the new volume of the gas? **29.6 L**

2) A gas takes up a volume of 17 liters, has a pressure of 2.3 atm, and a temperature of 299 K. If I raise the temperature to 350 K and lower the pressure to 1.5 atm, what is the new volume of the gas? **30.5 L**

3) A gas that has a volume of 28 liters, a temperature of 45 0C, and an unknown pressure has its volume increased to 34 liters and its temperature decreased to 35 0C. If I measure the pressure after the change to be 2.0 atm, what was the original pressure of the gas?

**2.51 atm**

4) A gas has a temperature of 14 0C, and a volume of 4.5 liters. If the temperature is raised to 29 0C and the pressure is not changed, what is the new volume of the gas? **4.74 L**

5) If I have 17 liters of gas at a temperature of 67 0C and a pressure of 88.89 atm, what will be the pressure of the gas if I raise the temperature to 94 0C and decrease the volume to 12 liters? **136 atm**

6) I have an unknown volume of gas at a pressure of 0.5 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? **117 L**

7) 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? **30.3 L**

8) If I have 2.9 L of gas at a pressure of 5 atm and a temperature of 50 0C, what will be the temperature of the gas if I decrease the volume of the gas to 2.4 L and decrease the pressure to 3 atm? **160 K**

9) I have an unknown volume of gas held at a temperature of 115 K in a container with a pressure of 60 atm. If by increasing the temperature to 225 K and decreasing the pressure to 30 atm causes the volume of the gas to be 29 liters, how many liters of gas did I start with? **7.41 L**