# Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Hour: \_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_

# Chemistry II: *The Combined Gas Law*

Solve the following problems. As always, include enough work and show the units to ensure full credit.

1. The pressure of a gas changes from 120 kPa to 50 kPa. The volume changes from 45 L to 40 L. If the initial temperature is 81oC, what is the final temperature in oC?
2. A sample of nitrogen goes from 21 m3 to 14 m3 and its pressure increases from 100 kPa to 150 kPa. The final temperature is 300 K. What was the initial temperature in Kelvins?
3. A sample of argon goes from 500 K to 350 K and its pressure changes from 280 kPa to 380 kPa. If the initial volume is 18 dm3, what is the final volume?
4. A sample of neon experiences a pressure drop from 75 kPa to 53 kPa. The temperature increases from 27oC to 93oC. If the initial volume is 12 L, what is the final volume?
5. The volume of a sample of helium increases from 5 L to 25 L and its temperature drops from 2000 K to 1750 K. If the initial pressure is 1500 mm Hg, what is the final pressure?
6. The temperature of a gas increases from 212oC to 380oC. The volume goes from 30 dm3 to 18 dm3. If the final pressure is 1.85 atm, what was the initial pressure?
7. If I initially have 4.0 L of a gas at a pressure of 1.1 atm, what will the volume be if I increase the pressure to 3.4 atm?
8. A toy balloon has an internal pressure of 1.05 atm and a volume of 5.0 L. If the temperature where the balloon is released is 200 C, what will happen to the volume when the balloon rises to an altitude where the pressure is 0.65 atm and the temperature is –150 C?
9. A small research submarine with a volume of 1.2 x 105 L has an internal pressure of 1.0 atm and an internal temperature of 150 C. If the submarine descends to a depth where the pressure is 150 atm and the temperature is 30 C, what will the volume of the gas inside be if the hull of the submarine breaks?
10. People who are angry sometimes say that they feel as if they’ll explode. If a calm person with a lung capacity of 3.5 liters and a body temperature of 360 C gets angry, what will the volume of the person’s lungs be if their temperature rises to 390 C. Based on this, do you think it’s likely they will explode?