Combined Gas Law Worksheet #2

1. **Helium in a 100 mL container at a pressure of 66.6 kPa is transferred to a container with a volume of 250 mL. What is the new pressure if no change in temperature occurs? What is the new pressure if the temperature changes from 20°C to 15°C?**
2. **What will have to happen to the temperature of a sample of methane if 1000 mL at 98.6 kPa and 25°C is given a pressure of 108.5 kPa and a volume of 900 mL?**
3. **A gas has a volume of 225 mL at 75°C and 175 kPa. What will be its volume at a temperature of 20°C and a pressure of 1.0×10^5 kPa?**
4. **A gas is heated to 80°C and has a pressure of 180 kPa. If the container expands to hold a volume of 800 mL, what was the volume of the gas, (in litres), at a temperature of 50°C and 120 kPa pressure?**
5. **A 200 mL sample of gas is collected at 50 kPa and a temperature of 271°C. What volume would this gas occupy at 100 kPa and a temperature of -14°C?**
6. **Calculate the volumes of the following questions at STP:**
   (a) 24.6 L at 25°C and 104 kPa **(b) 150000 mm^3 at 100°C and 75.00 kPa**
   (c) 0.045 L at -45.0°C and 140.0 kPa **(d) 0.5 L at 115°C and 148000 Pa**
7. **A certain sample of gas has a volume of 0.452 L measured at 87°C and 0.620 atm. What is its volume at 1 atm and 0°C?**
8. **The human lung has an average temperature of 37°C. If one inhales Alaskan air at 1 atm and -28.9°C and then holds it, to what pressure will the air in the lungs rise? (The bursting strength of the human lung is over 2 atm. Will they burst?) Is this question realistic?**
9. **A cylindrical coffee can is welded shut at 20°C at sea level. Its height is 20 cm and its radius is 15 cm. If the bursting strength of its "tin" plate is 3.75 atm, to what temperature may it be heated before bursting?**