Gas Law Worksheet I

1. 3.00 moles of a gas are placed in a 4.55 L container at 245 °C. What is the pressure in atm?

2. 65.85 grams of nitrogen gas are placed in 17.5 L container. The pressure is 1988 mm Hg. What is the temperature, in °C?

3. A gas is placed in a 2.00 L container at 25 °C and 550.0 mm Hg. The gas is now compressed to a volume of 0.75 L at constant temperature. What is the new pressure?

4.   a) A gas is placed in a heavy container. The container is now heated. What happens to the gas and why?
        b) A gas is placed in a container with a moveable piston. It is then cooled down at constant pressure. What happens? Explain.
        c) A gas is placed in a container at a certain temperature and pressure. More gas is added and in order to keep the pressure and volume constant the temperature had to change. Was the container heated or cooled? Explain.

5. A gas is placed in a 3.45 L container at 45 °C and 2.7 atm. It is then compressed to a pressure of 8.25 atm and a volume of 0.550 L. What is the new temperature?

6.   In a certain experiment a sample of helium in a vacuum system was compressed at 25 °C from a volume of 200.0 mL to a volume of 0.240 mL where its pressure was found to be 30.0 mm Hg. What was the original pressure of the helium?

7. 5.0 moles of a gas is put into a container of 2.0 L. More gas is added to the flask so that there is now 15 moles of the gas present. What must the new volume be if temperature and pressure are to remain constant?

8. A 7.0 L container is filled with 10.0 moles of a gas. The pressure is read at 4.00 atm, what is the temperature of the gas, in °C?

9. 3.0 L of a gas has a pressure of 12.0 atm. What is the new pressure if the gas is expanded to 17.0 L?

10. A gas is at 135 °C and 455 mm Hg in a 2.00 L container. It is cooled down to a temperature of 25 °C. If it is kept in the same container, what is its new pressure?

11. 155.0 grams of oxygen gas are put in a 4.50 L container at 35 °C. What is the pressure, in atm?

12. A gas in a piston is heated up. If the pressure remains the same, what will happen to the volume? Why?

13. A lighter-than-air balloon is designed to rise to a height of 6 kms at which point it will be fully inflated. At that altitude the atmospheric pressure is 210 mm Hg and the temperature is -40 °C. If the full volume of the balloon is 100,000.0 L, how many kilograms of helium will be needed to inflate the balloon?